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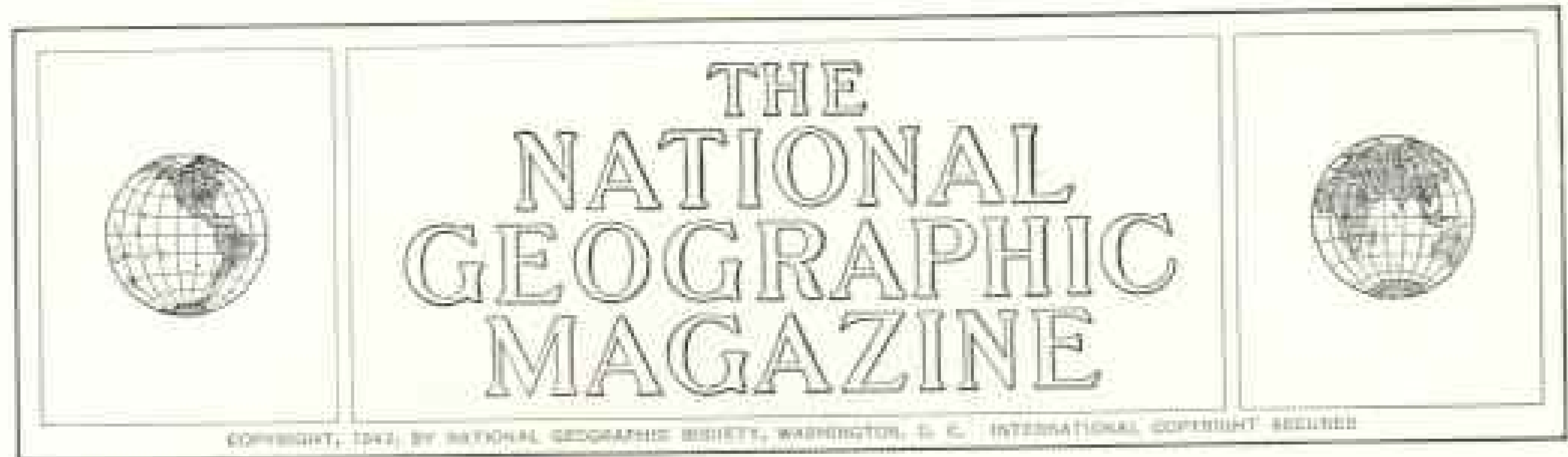

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"Blood, Toil, Tears, and Sweat"

An American Tells the Story of Britain's War Effort, Summed up in Prime Minister Churchill's Unflinching Words

By Harvey Klemmer

TWO years ago the German hosts, drunk with victory, stood on the English Channel and prepared exultantly for the conquest of Britain.

The Nazis had swept everything before them—Poland, Denmark, Norway, the Low Countries, France. There remained only a cluster of islands nearly the size of the State of Oregon to complete the subjugation of western Europe.

It looked like an easy job. The British had been thrown out of Norway. They had been sent reeling back from the front in France and Belgium, their fighting strength nearly exterminated on the beach at Dunkirk. Italy had come into the fray and Japan hovered expectantly in the background.

Perhaps the British, seeing what had happened to their allies, would adopt the course of wisdom and sue for peace. If they didn't, if they persisted in being stubborn—well, the Fuehrer had had an answer for everything so far and he probably had an answer for Britain.

When Blitz Met Bulldog

The weeks went by. The British didn't sue for peace and Hitler got ready to administer the coup de grace. Long-range guns were mounted on the French coast; invasion barges were assembled; troops were moved into position; supplies were brought up; airfields were made ready for a kind of assault unknown to the Spaniards in the days of the Armada and unknown to Napoleon. With binoculars one could see from Dover the German preparations.

Britain braced herself for the blow. There was no thought of surrender, regardless of what the odds might be. Machine guns were mounted by the sea. Coastal areas were closed, barricades erected, tank traps installed.

The great weakness, of course, was the lack of equipment. Nearly a thousand cannon had been lost in France. Tanks were few. There were not even enough rifles to go around. The outlook wasn't very bright in Britain that summer, and we who were privileged to be there felt like mourners at the bier of a friend.

I met Vincent Sheean one evening in Berkeley Square.

"What chance do you give them?" I asked, afraid to hear the reply.

"Less than 50 percent," he said, lugubriously. Some set the odds much lower.

The Germans massed for the kill. But something happened. The kill didn't come off. The German guns were answered, shell for shell. The invasion barges were dispersed. The Luftwaffe was sent scuttling back to its lair. Britain stood.

It was no accident that Hitler failed to take the British Isles. He tried hard enough. He failed because he underestimated the British will to resist and the British capacity to take punishment. Above all, he failed because he underestimated the scope of the British war effort.

Hitler is not the only one to err in the latter regard. Again and again, since returning to America, I have been surprised at the lack of understanding here concerning the resources of Britain and the manner in which those resources have been massed to build up the country's military strength. This, in my opinion, is one of the great stories of the war.

Wide World

Under a Camouflage Canopy, King George Inspects a Field Ambulance Station

Britain lives and works and fights under the constant danger of attack from the air and from the sea. The British Isles are smaller than the area of New York and Pennsylvania, and no place in the islands is more than 70 miles from the sea. Her coasts are separated from the enemy by a distance which is less than that which separates New York from New Brunswick, N. J.

To outline some of the salient facts is the purpose of this narrative.

Modest R.A.F. Beat Vaunted Luftwaffe

One explanation for our failure to grasp the magnitude of Britain's war effort is the British habit of understatement. The Luftwaffe was publicized to the point where it was generally regarded as invincible. We heard very little about the Royal Air Force; yet, when the showdown came, it was the R.A.F. which came out on top.

I saw thirty or forty air battles in Great Britain. I never saw one in which the R.A.F. boys weren't tearing the Nazis to pieces. The simple fact is that the Nazis aren't nearly so good as they said they were, while the British are a whale of a lot better.

Another explanation for our lack of understanding stems from the emphasis placed on "life as usual" during the blitz.

In an effort to minimize the effect of German bombs, the British—and their friends as well—got into the habit of portraying a country where everything went on as before, including activities which have no place in a beleaguered fortress.

To say that everyone is working hard, and

British Combine

Winston Churchill Inspects a Commando Unit, Daring Band of Coastal Raiders

The Prime Minister examines the knife of one of the daredevils, whose faces are blackened to make them almost invisible in a night attack. The formidable weapon is razor sharp along both edges. Lightning dashes of these fighters into occupied countries for sabotage and espionage began soon after Dunkirk (page 151).

that soldiers, sailors, and airmen are at their posts, does not make much of a story. It is much more romantic to picture lovers strolling in the bomb-bruised night, and London cabbies threading scenes of devastation and death to deliver a dinner guest.

It is human nature to thrill to such tales, but unfortunately in so doing we miss the real story—the fact that Britain, even under fire, was forging the greatest military machine in the history of the Empire and one of the mightiest striking forces in battle history.

Some nations are strong in the air, some on the sea, some on the land. Britain manages to be strong in all three branches.

The United States may displace her in the air, on the sea, and on the land, but I do not believe that it is any exaggeration to rate Britain, as of June 1, 1942, as the greatest all-round military force on earth.

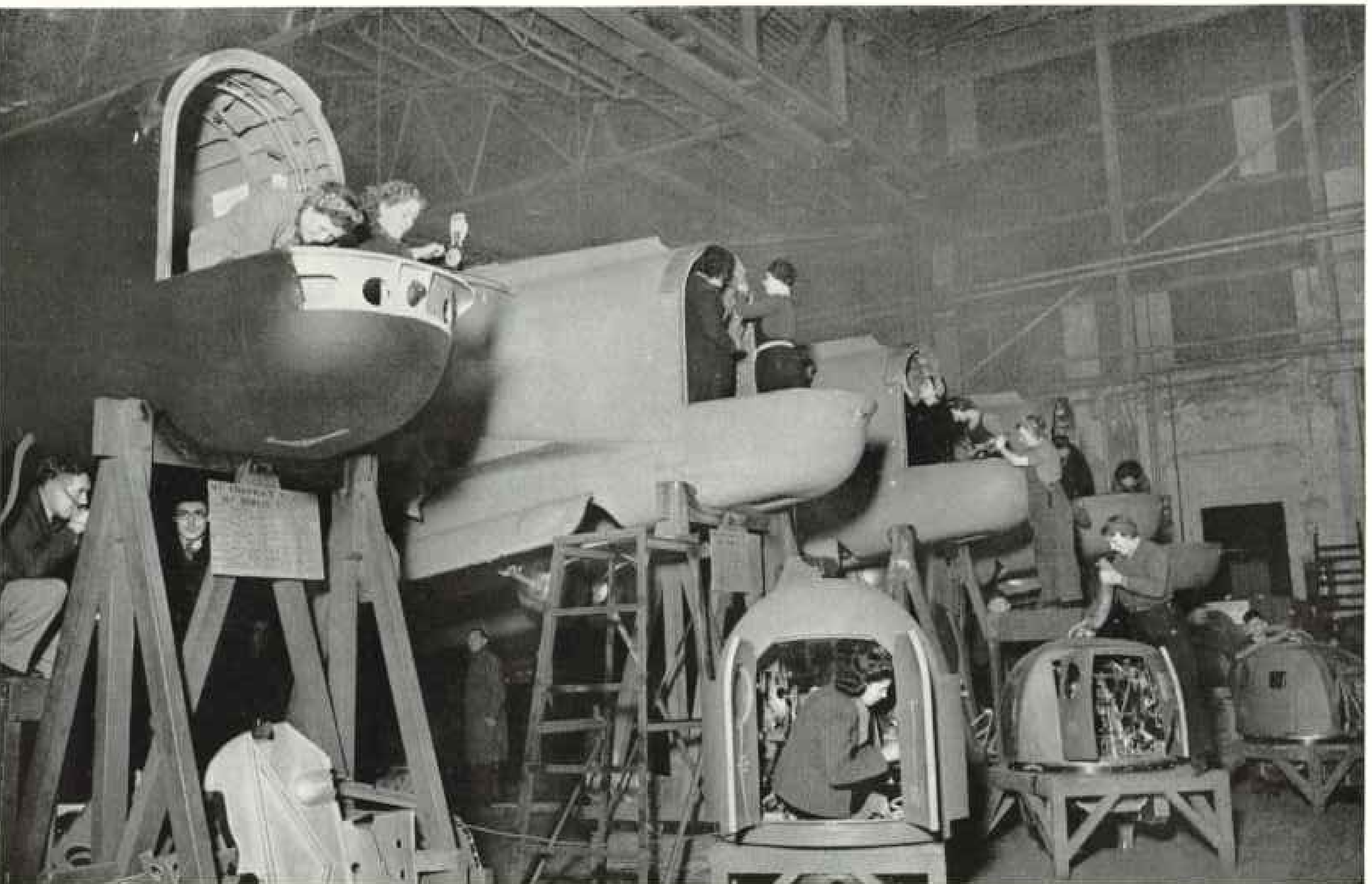
The Colonies and Dominions have helped splendidly, of course,* but the bulk of this incredible job has been done by a little country with a third the population of the United States, a fourth of the industrial capacity, and about a thirty-third of the area. The

* See "Canada's War Effort," by Bruce Hutchison, in the NATIONAL GEOGRAPHIC MAGAZINE for November, 1941, and "The Making of an Anzac," by Howell Walker, April, 1942.

British Combine

Beneath an Umbrella of Kite Balloons, a Coastal Convoy Passes from One British Port to Another

Although these little sisters of the big barrage balloon are not so well known, they are credited with downing at least six enemy aircraft and saving 200 ships in coastwise traffic around Great Britain. Royal Air Force squads service the balloons at depots, and naval drifters take them to any vessel on request. A "kite" barrage makes dive bombing and mast-high attacks hazardous. Lifeboats are outswung on all the merchantmen and are ready for instant lowering.



British Combine

Girls Put Finishing Touches on Big Stirling Bombers, Now Winging Their Way over Germany Almost Nightly

Here a feminine crew on the assembly line fits rear gun turrets in a military aircraft production plant. Half the workers in British aircraft factories are women (page 162). The Stirling, carrying up to eight tons of bombs, weighs 30 tons when fully loaded. It has a range of 2,000 miles and a speed of some 300 m.p.h.

British Combine

Instead of Plowshares to Swords, It's Iron Fences to Guns and Bombs in This War

Workmen remove the railing from the home of Lord Beaverbrook, former Minister of War Production. Only iron fences of historical interest, or those needed for safety, have escaped the nationwide salvage drive (page 156). Castles have yielded hundreds of swords, pikes, and suits of armor in the intensive search for metal.

all-out assault of the Axis enemy has been met by an all-out response.

The foundation upon which the British war effort rests is a simple obligation known as National Service. Everybody in Britain is expected to contribute to the common cause. Nelson's famous dictum, "England expects every man to do his duty," has been enlarged to include women and children (pages 145, 152, 154, 156, 160, 162, 166).

The National Service Act decrees that "All persons of either sex for the time being in Great Britain are liable to national service, whether under the Crown or not, and whether in the armed forces of the Crown, in civil defense, in industry, or otherwise."

Nine million men are registered for service in the armed forces or employed in vital war work. Another 5,000,000 are registered for fire watching. Every two weeks a new age group is called upon to register.

Men are liable for military service between the ages of 18½ and 51. So many men have been taken into the Army that there has been a clamor for the release of coal miners, agricultural workers, and others considered necessary to keep up production of munitions and food. The military has yielded little.

Women Help with Antiaircraft Guns

More than five million women have registered for work in the uniformed services, in civil defense, in armament factories, or in some other branch of the war effort. Like men, women are liable to compulsory service up to the age of 51, although only unmarried women between 20 and 30 are now being recruited. Married women between those ages may volunteer (pages 162, 163).

Women even serve with combatant units—with antiaircraft batteries, for example—but such service is voluntary. The three branches of military service—air, sea, and land—all have women's auxiliaries. Women, by doing work formerly done by men, have done much to release men for combatant service.*

Married women who possibly can do so are expected to serve in one of the auxiliaries, in civil defense, or in industry. Wives with husbands in the armed forces, or women required at home, are not asked to work in another part of the country. Moreover, no woman with a child under 14 living with her is expected to work away from home. Outside of these exceptions, and a few others, the women of England, like the men, are expected to do their part.

The children are also registering for National Service. A million and a half boys and girls from 16 to 18 years old have signed up. That puts everyone from 16 to 51 in the front line of the fight against Hitler.

The British system of National Service, if applied to the United States, would result in the enrollment of 60,000,000 persons.

R.A.F. Turns from Defense to Attack

The exploits of the R.A.F. are by now a familiar saga. The boys of the R.A.F. stopped the Nazis at a time when they might well have overrun the British Isles and those remaining portions of western Europe still undespoiled by virtue of the existence of a free Britain.

The achievements of the R.A.F. came as a thrilling surprise to many of us who were abroad at the time; we had heard so many stories of the size of the German Air Force, of the Reich's great research facilities, and the superiority of Nazi planes.

The first inkling we had that the R.A.F. might be able to take care of itself came during the evacuation from Dunkirk, when the British put an umbrella of planes over the French coast and kept it there for three days while some 335,000 men were saved from death or capture.

Later I met a plane builder who did not seem to be at all worried about the prospects in the air, and still later I talked with an airman who said:

"We have air superiority over these islands. Eventually we shall gain air superiority over the Continent. That will be the beginning of the end."

This was on the eve of the Battle of Britain. The airman's assertion proved to be true. The Germans were never able to gain mastery over more than a fringe of British coast and they were soon forced to relinquish that. When they lost 185 planes in a single day, they stopped coming in the daytime.

For eight months they came over at night, but eventually they decided that these raids, too, were not worth the expense of putting them on.

The British concentrated on fighting quality rather than quantity in the production of planes.

There is no doubt that Great Britain is first in the air. The R.A.F. may or may not be the biggest air force in the world, but it is certainly the strongest. Eventually the United States, with its larger population and superior industrial capacity, should rule the skies. As this is written, Britain enjoys that distinction.

* See, by Harvey Klemmer, in the NATIONAL GEOGRAPHIC MAGAZINE, "Everyday Life in Wartime England," April, 1941, and "Rural Britain Carries On," October, 1941.

From the beginning of the war to date, the British—and Dominion and Allied squadrons operating with them—have brought down 10,000 German and Italian planes. R.A.F. losses have been around 4,000.

The most deadly months for the Axis were August and September of 1940, when some 2,400 planes were lost over Britain compared to less than 800 lost by the R.A.F. The British were knocking them down so fast during the summer and fall of 1940 that people began to joke about which was the greater menace, falling bombs or falling bombers!

A year ago the people of Britain were cleaning up the wreckage caused by German bombers. Today bombers are going in the other direction. More than a thousand planes in a single night now roar over Germany and the occupied areas, strewing countless incendiaries and dropping high-explosive bombs of a size and destructiveness never before achieved.

Raids are planned with the cooperation of the Ministry of Economic Warfare to insure maximum destruction of plants and supplies necessary to the enemy war effort. Railway centers come in for special attention. The British deny any intention to punish the civilian population, but one would have to be extremely naive to deny that civilian casualties are bound to result from such raids.

The Might of R.A.F. "Airmadas"

In mass attacks upon such German war industry and supply centers as Lübeck, Rostock, Cologne, and Essen, tremendous "airmadas" gave the Nazis a bitter taste of the pulverizing power of the R.A.F.

Thundering night assaults completely knocked out the Baltic war-supply ports of Lübeck and Rostock. Then came the attack on Cologne by more than a thousand planes, featuring Britain's mighty four-engined bombers. In 90 minutes on the night of May 30 eight square miles of Cologne were laid waste, with armament and engine factories smashed or burned.

Essen, site of the huge Krupp armament works, soon was hit almost as hard as Cologne.

The R.A.F. is aided in its work, both offense and defense, by the Fleet Air Arm.

Many nations are represented in the R.A.F., especially the occupied nations, such as the Netherlands, Poland, Belgium, Norway.

Thousands of men are now becoming available through the Empire Training Scheme, which is for men of the British Dominions.

The additional thousands being trained in the United States are chiefly Englishmen. There is a lack of space in Britain and plenty of space in the United States. Americans now as a rule join the U. S. Army Air Forces.

The backbone of British defense has hitherto been the Royal Navy. If we accept Admiral Mahan's classic hypothesis that seapower consists of fighting ships plus merchant vessels plus bases, then Britain is first at sea.

We may outbuild her in merchant ships from now on, but at this point the British merchant marine is equal to that of the rest of the free world put together. Britain has bases everywhere.

At the outbreak of war, the Royal Navy included 15 battleships, seven aircraft carriers, 58 cruisers, 205 destroyers, and 57 submarines. Many ships have been lost, of course, including such famous vessels as the *Hood*, *Repulse*, and the new *Prince of Wales*. British shipyards, however, have turned out a substantial amount of new tonnage, and 50 overage destroyers were secured from the United States. As a result, the Navy today is stronger than it was at the beginning of the war.

The responsibilities of the Royal Navy are colossal. The Admiralty's primary responsibility, of course, is to prevent a sea-borne invasion of the homeland. The Navy must also maintain communications with the rest of the Empire and with military outposts wherever they may be, and ensure the delivery of foodstuffs and war materials necessary for a munitions output nearly as great as our own.

Convoying of merchant vessels puts a terrible strain on the Navy. German submarines are much more numerous than in the last war and are able to operate from vastly superior bases. The British, meanwhile, are deprived of the use of bases in southern Eire.

The Navy, finally, must keep close watch on the German Fleet to make sure that it does not escape into the Atlantic and do irreparable damage to convoys taking munitions to the United Kingdom and the Soviet Union.

In keeping with the best traditions of the Royal Navy, commanders have never hesitated to attack and on occasion have defeated superior forces. The famed encounter between the German pocket battleship *Graf Spee* and a force of light British vessels is a case in point. The *Graf Spee* was theoretically safe from the cruisers which forced her to end her career.

Epic of "H.M.S. *Pepperpot*"

How the British tar keeps his sense of humor in the face of danger and death is well illustrated by the story of the 5,270-ton cruiser *Penelope*. Drydocked at Malta with a bad hole in her side, she fought off repeated air attacks but was so heavily sprayed

British Combine

Relic of the Crimean War, This 36-pounder Will Serve in Battle Once More

Since 1858 the old cannon has stood here in the market place at Westbury, Wiltshire. Now it is sacrificed in the scrap-metal campaign. The iron will be melted down and used for modern sinews of war.

with shrapnel that four men were killed and fifty wounded. Because her plates were now riddled with a thousand holes, the *Penelope's* men dubbed her "H.M.S. *Pepperpot*." When they stopped the holes with wooden plugs, they took to calling her "H.M.S. *Porcupine*."

The ship's guns were nearly worn out and the captain had "picked up a bit of a splinter," but he put to sea, anyway, and the crippled cruiser dodged heavy bomb attacks to reach Gibraltar. She crossed the Atlantic "quite uneventfully" for repairs in the United States, and there reporters pried from the modest skipper the epic tale of the "*Pepperpot*."

Side by side with the Royal Navy go the vessels of the Merchant Navy. British shipping has suffered grievously in this war as in the last. Hundreds of ships have been sent to the bottom and thousands of sailors have lost their lives.

It takes a special kind of courage to go to sea today. Death by drowning or by torpedo blast is about the best fate to which a seaman may look forward.

The experiences of men in lifeboats have become so commonplace that many are hardly reported in the newspapers; yet some of them make the epic of Bligh of the *Bounty* look like a Sunday-school picnic. There are men who have spent a month in a lifeboat in the North Atlantic in the middle of winter. Literally hundreds have died in a sea of blazing oil.

A shipping friend recently offered me an opportunity to cross on one of his freighters. I asked him what cargo the ship was carrying. He said she had on board, among other things, 600 tons of dynamite. I declined the invitation.

British shipyards, in addition to naval vessels, have also been pushing ahead with all possible speed on the construction of merchant ships.

Even bombs do not silence the roar of the riveters. Work goes on day and night, and it now appears that, with the aid of America's huge building program, British seapower will once more be able to weather the strain of a major conflict.

Army of 2,250,000, Plus Home Guard

Britain has never gone in for a large standing army. One reason is the fear dating from

British Combine

The Duke of Kent Accepts a Gift of Ambulances from the United States

John G. Winant, United States Ambassador (left center) made the presentation on behalf of the British and American Ambulance Corps. Smart WAAFS (members of the Women's Auxiliary Air Force) stand at attention beside the cars, which they will drive for the R.A.F.

Oliver Cromwell that a large army might be used for the suppression of civil liberties. This feeling also finds expression in the adverse British attitude toward creation of a special officer class.

The British Army, with the possible exception of the Russian, is by far the most democratic in Europe. A large proportion of its officers, including its generals, have, for a century past, risen from the ranks. Today every officer must pass through the ranks.

Another reason for the lack of a large army in Britain has been the fact that the defense of the country for centuries was entrusted to the Navy and during recent years has been split between the Navy and the R.A.F. About one half the Army at any time is employed on garrison service abroad.

The Regular Army consisted of approximately 250,000 men in time of peace. Today it embraces 2,250,000, to which must be added some 1,750,000 members of the Home Guard.

The Home Guard is a unique force. It sprang into being in May, 1940, when operations of Nazi parachute troops in France, Norway, Belgium, and the Netherlands made the British realize their own danger from such attacks. After the fall of France, when everyone expected that the Germans would immediately try to invade the British Isles, the force increased enormously. The men of Britain just seized whatever weapons they could get their hands on and went into the fields to watch for parachutists. Those who could not get rifles used shotguns; those who could not get shotguns used pitchforks; those who could not get pitchforks used clubs.

Men of the Home Guard range from 17 to 65 years of age—officially. Actually, I have seen boys under 17 in the fields, and many below that age are now enrolled in a cadet force and other juvenile organizations. As for the older men, many a village patriarch who cannot remember when he was 65 is pre-

pared to resist invaders with whatever weapon may come to hand.

Since December, 1941, membership in the Home Guard has been compulsory for men between 18 and 51 not called for the Army (page 161). Every effort is made, however, to preserve its volunteer character.

Members of the Home Guard serve in their spare time and without pay. They patrol roads, guard strategic points, and meanwhile prepare to impede the enemy in every possible way.

They have received special training in guerrilla warfare, and if an enemy should succeed in setting foot on the soil of Britain he would find himself opposed by thousands of guerrillas skilled in the art of individual combat and animated by a fierce determination to die rather than submit to an alien conqueror.

This determination to defend their islands is a fanaticism with the British. It has been in their blood for a thousand years, and it is a factor which prospective invaders would do well not to ignore.

Invasion Plans Smashed by R.A.F.

There has been much speculation as to whether or not the Germans actually attempted to invade England in the summer of 1940. To us in London the first intimation that something was afoot came when a group of German prisoners passed through.

We were used to seeing German airmen in the railway stations. These men, however, were not airmen; they were infantrymen, and immediately the country began to seethe with rumors that the Germans had attempted an invasion and had been repulsed with heavy losses.

The British have never settled the matter officially. The only evidence I encountered of an attempted invasion was the report of a friend on the southeast coast who said that splintered barges and some bodies were being washed ashore. Hotelkeepers in the vicinity were said to have secured enough wood for the winter from the barge remnants.

Joe Harsch, formerly Berlin correspondent for the Christian Science Monitor, later told me he had seen trainloads of wounded soldiers passing through Berlin at the time of the rumored invasion attempt. William Shirer, in *Berlin Diary*, mentions these same trains.

My personal opinion, verified unofficially by a British military man, is that the Germans were all set to invade, but that the R.A.F. succeeded in smashing up the invasion fleet before it was able to get under way.

The British Army is the third strongest in existence. The great land powers of the moment are Germany and the Soviet Union. The question of which is the greater is now being resolved. On the land, as on the sea and in the air, the United States is growing rapidly in power. But today Britain is supreme, after Germany and Russia.

The British, realizing that with their limited population they cannot hope to compete with Germany on a quantity basis, are attempting to train a force of unexcelled striking power. Churchill describes his men as "hardened, nimble, and alert."

According to those who have seen them in action, this is another understatement. The men are getting the hardest kind of battle training (page 157).

Commando Raids a Prelude to Invasion

Specially trained to raid the enemy coast are the famed Commandos. These tough troopers, under the brilliant leadership of Lord Louis Mountbatten, have made daring raids into enemy territory and no doubt will make many more (page 143).

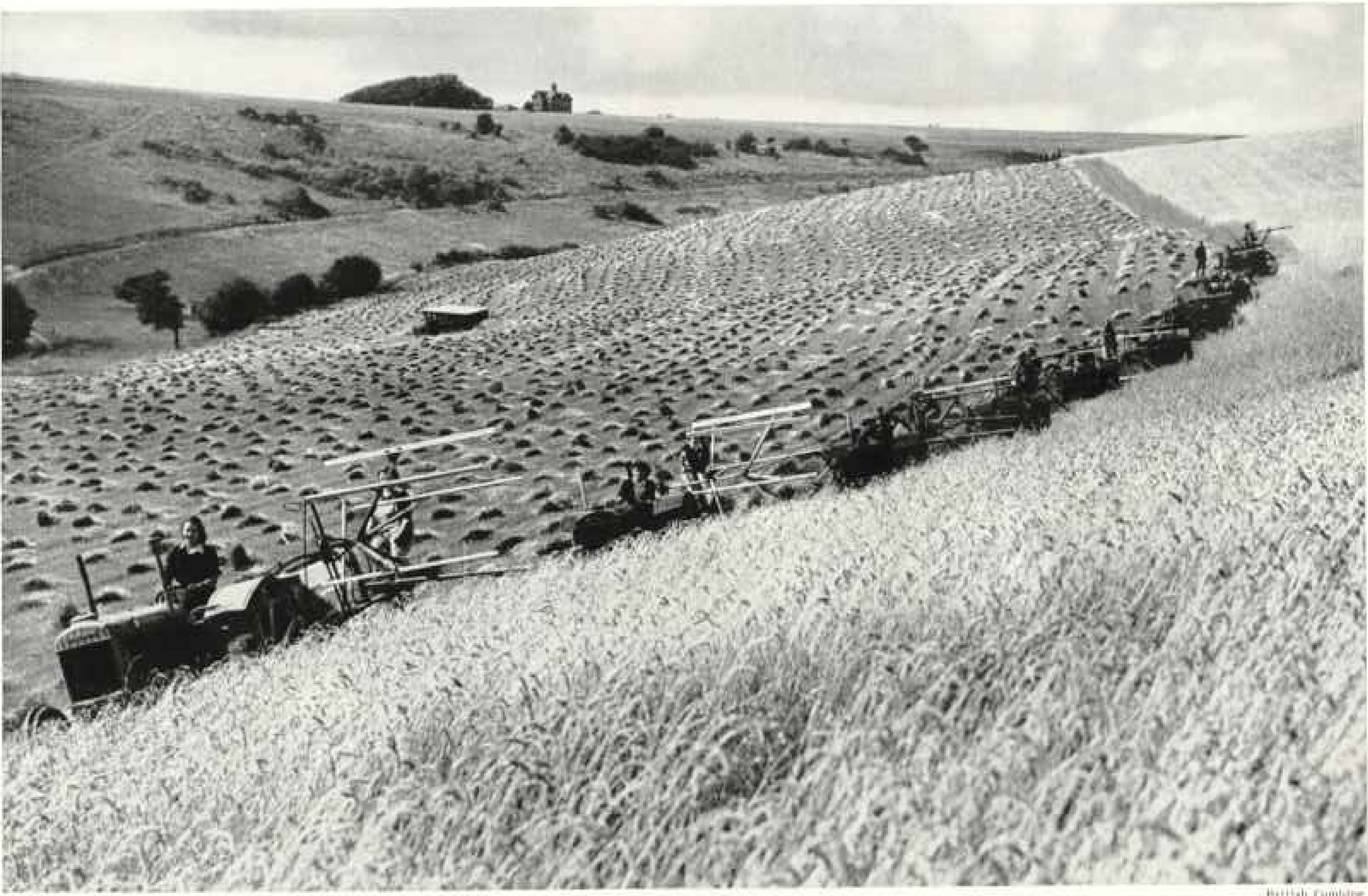
An individual Commando raid may not be important, but this type of warfare has great possibilities for confusing and harassing the enemy. English raids were highly successful in the Napoleonic Wars, and they have begun auspiciously in this war.

The enemy never knows where the Commandos will strike next, and he never knows when a raid may develop into an invasion. When the United Nations invade—as they eventually will—the disconcerting attacks of the Commandos undoubtedly will play an important part in the operation.

Much has been said and written, but little is actually known about the Commandos. The men must be good physical specimens; they must have a thorough knowledge of hand-to-hand fighting, and they must be extremely resourceful. They have some unique weapons, including a combination knife-knuckle duster which is said to be very useful at close quarters.

One of the most spectacular Commando attacks was the raid on St. Nazaire on March 28 of this year. The objective was destruction of a lock gate in the harbor. A former American destroyer, the U.S.S. *Buchanan*, renamed the *Campbeltown*, was rammed into the gate and exploded.

Landing in the face of enemy fire is one of the most difficult of all military operations. The fact that Hitler couldn't do it when he had everything on his side shows what the United Nations are going to be up against when it is their turn to invade.



British Combine

Derelict Land, Untouched for 20 Years, Produces a Sea of Wheat on the Sussex Downs

Land Army girls, of whom there are 20,000 in Britain, drive self-binders across the 400-acre field to harvest the bumper crop. Everybody helps on the farms. A hundred thousand tractors have been mobilized for farm work, compared with 3,000 during the last war. They are "manned" nonstop, in shifts (page 158).

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"Now Is the Time to Bring Home to the German People the Wickedness of Their Rulers"—Winston Churchill

Countryfolk in an English inn listen to one of the Prime Minister's broadcasts. They also may hear radio programs from enemy countries if they choose. Great Britain, where free speech is jealously preserved, has little to fear from Nazi propagandists. Germany prescribes the death penalty for listeners to foreign broadcasts.

British Combine

Land Army Girls Tackle a Hertfordshire Field with Tractors and Plows

One driving a two-furrow plow, and another on a three-furrow, do their bit to free two men for military service. Nearly 6,000,000 acres of new land have been planted since war began. Swamps have been reclaimed, and fields fallow for centuries have been put to the plow. Three-quarters of the new land has been planted in cereal grains (page 157).

The defeats suffered by Britain thus far in the war have led some to question her ability ever to challenge Germany on land. There are two explanations for these defeats: One is the fact that such landings as the one in Greece were lost causes from the beginning, undertaken only as delaying actions and to fulfill commitments which could not honorably be disregarded.

A second explanation involves what must inevitably be the pattern of Britain's land strategy until she gets substantial assistance from her allies—the hit-and-run attack as distinguished from pitched battles in the classic sense. Britain has neither the arms nor the men to slug it out with Germany. She must pursue a different kind of strategy, one that will permit her to make use of her overwhelming superiority in sea power and her developing superiority in air power.

Britain, with Germany, is like a pack of dogs harrying a bull. The bull is stronger than any one of the dogs, and he can break out of the ring at will. He can't escape, though, and eventually the dogs bring him down.

The R.A.F., the Royal Navy, and the armies of the British Commonwealth are the dog pack which has been harassing the Nazi bull for nearly three years. With the Russians holding the front on the east, and with our help on the other sides, the pack eventually should be able to close in and bring this encounter to an end.

Britain's "Fourth Arm"—Civilian Defense

The development of aerial warfare has brought into being a new type of service—Civilian Defense. Civilian Defense is known in Britain as the "Fourth Arm." During a period when the Army was immobilized because of its inability to get at the enemy, the

Fourth Arm held the fort and by so doing probably saved the day for all of us.

In their methodical, unspectacular way, the British laid the foundation for an excellent service prior to the outbreak of war. I remember vividly the day war was declared. The siren sounded 15 minutes after Prime Minister Chamberlain told the Nation that a state of war existed with Germany.

Instantly, as if by magic, air-raid wardens appeared in the streets. People were quickly shepherded into places of shelter. The fire houses were thrown open and little gray pumps drawn by taxicabs went scooting about the city.

Civil defense was very much on the job. It has remained on the job from that day until this and must be given a large share of the credit for enabling Britain to resist the fury of Nazi bombs.

A rigid blackout has been enforced since the first night of the war. Buildings have been sandbagged. Thousands of persons—principally old people and children—have been evacuated to places of safety in the country.

The British have paid a great deal of attention to gas. The entire population has been supplied with gas masks and is constantly exhorted to carry them.

The greatest hazard with which the British have had to contend is fire. There were 6,000 firemen in England at the beginning of the war. Almost overnight the service was expanded to include 80,000 full-time firemen and 150,000 part-time firemen. Hundreds of thousands of fire watchers, in addition, were recruited.

The Germans probably dropped as many as 100,000 incendiary bombs on British cities in a single night. That British cities still stand is a tribute to the work of the National Fire Service.

The Medical Services have also been drastically expanded. The British were prepared to handle 3,000 dead a night and 10,000 to 12,000 wounded. Casualties were never that high, but there were times when medical facilities were stretched to the breaking point. The ambulances are driven by women, usually mere slips of girls, and they function with the utmost precision regardless of what is coming down from the skies.

The social services, already before the war probably the most advanced in the world, likewise have skyrocketed in scope. Scores of new services have been evolved to look after evacuees, to take care of bombed-out people, to feed men whose families have been sent to the country, to maintain the Nation's health.

These services have contributed mightily to the well-being of wartime Britain. They have helped to maintain morale, and it is no doubt partly because of their efforts that the Nation's health is in many respects actually better than it was in time of peace.

There are innumerable other branches of the civil defense services—the squads who demolish wrecked buildings, the men who dig out trapped victims, the emergency-repair squads, the camouflage experts, the workers at rest and feeding centers, and so on.

The repair squads are an interesting feature of the air-raid setup. There are hundreds of these squads in British cities. Each unit is complete with carpenters, bricklayers, electricians, plumbers, glaziers, roofers, and their helpers. They are on the job almost before the last enemy plane has disappeared, and emergency repairs on damaged properties often are finished by the time the occupants sit down to breakfast.

German Planes Yield Tons of Scrap

Salvage is another important activity. Everything that possibly can be used in the war effort is collected—rags, bones, metal, paper, rubber. Crashed British planes are repaired so that they may fly again. German planes, shot down in the Battle of Britain, have contributed miles of wire and many tons of alloys and steel to British industry (p. 164).

Lord Beaverbrook told the people last October that if they would turn in 100,000 tons of waste paper, he could divert 25,000 tons of shipping to the carriage of war supplies to Russia. The people responded enthusiastically and turned in practically everything except personal papers and secret documents.

In the first two years of the war the amount of waste paper salvaged exceeded 500,000 tons, and the amount of scrap metal was approximately the same. Even the minute round disks of paper produced in the perforating of postage stamps have been salvaged to the extent of some scores of tons.

Railway lines, streetcar lines, barges, old boatbuilding yards, and abandoned factories are providing a good source of metal. Printing shops are scoured for type and old plates.

Even blitzed buildings are made to yield their quota of salvaged material. Four million dollars' worth of material has come from debris during the past year. Bricks are used for building shelters, emergency water tanks, and the like. The R.A.F. uses large quantities for runways. Even the valueless rubble is made to serve, principally as fill for low areas or for ballast in ships sailing to America and

British Combine

On a Graphed Glass A.T.S. Volunteers Check the Accuracy of Artillery Fire

The girls, who wear a special uniform of white skirt, blue jacket, and white blouse, are stationed at an experimental range. Because these Auxiliary Territorial Service members are attached to the Royal Artillery, they wear the colors of that branch of the service, blue and red, in their field service caps. Delicate spotting mechanisms used at this station are responsive to women's sensitive hands.

ultimately to make road surfaces in New York City.

Swords, Armor, Love Letters Salvaged

As part of the salvage campaign, the iron fences of England are being torn down (page 146). Only those of definite historical interest, or those required for safety, are being spared.

Old castles are being denuded of swords, pikes, and suits of armor.

The extent of the salvage effort is indicated by a letter received at the Salvage Office of the London, Midland, and Scottish Railway. The letter was accompanied by a key. The sender wrote:

"The house belonging to this key has been bombed. Please accept for salvage."

There is also the story of an old lady who was worried about her love letters.

"If I bring in a lot of old letters," she asked, "will anyone read them?"

The attendant at the salvage station assured her that the letters would not be read, but suggested that if it would add to her peace of mind she could tear them into small pieces.

"Perhaps I will," said the old lady, "but if I can't part with them, I'll bring instead a lovely set of false teeth."

Intensive bombing of Britain ended in May, 1941. Since then there have been only sporadic raids. If the Luftwaffe comes back in force, as it may well do, the civil defense workers of Britain are ready to meet—and to take—whatever the Germans have to offer. Seven miles of ambulance trains were drawn up outside British cities at the height of the blitz. They are still there.

War on the Factory Front

This is a mechanical war, and victory will probably be decided by our ability to produce goods. Here, as in the creation of armed forces and as in civilian defense, the British have done a remarkable job.

Most of us tend to underestimate the industrial capacity of Britain. We forget that Britain normally produces more ships than the rest of the world put together, that she has a great metallurgical industry, that she is an exporter of locomotives and mining machinery, and that many of the world's great dams and bridges have been built by British engineers.

British Combine

Toughening up for Tommies Means Swimming with Full Packs

"Hardened, nimble, and alert," is the way Prime Minister Winston Churchill describes the modern British soldier (page 151). This is one of a series of exercises calling for great physical strength which troops in training must undergo, in addition to routine drills.

Wars today are decided by engine power. This is where Britain really shines. In marine engines, of course, she is pre-eminent. In the manufacture of automobile engines, she is surpassed only by the United States. The performance of British aircraft engines is a topic of conversation wherever airmen gather. It is, I think, a significant fact that our new Warhawk plane is to be powered by a Rolls-Royce engine, made by Packard.

The British were slow in converting their factories after the outbreak of war. Apparently they were proceeding on the assumption that this war would follow the pattern of the last and that there was no need for haste. The arrival of German troops on the Channel changed all that. British industry was rapidly converted to war purposes and today is running full blast in the production of munitions.

The Government starts with the assumption that machine tools must be employed 168 hours a week wherever possible. Manufacture of luxuries has virtually ceased, and manufacture for export is permitted only where it is required to meet the needs of the Colonies and Dominions or to earn necessary foreign exchange. The automobile industry has been converted 100 percent to war production. So has the radio industry.

Old plants have been modernized and new plants constructed in every section of the country, principally with public funds. Operation is by private management. Manufacturers are allowed to make a small profit which, however, the Government retains until after the war, when it will be utilized for reconverting the business to peace requirements. There have been some cases of profiteering, but these are being stamped out. Raw materials are rationed to make sure that they are utilized in the production of essentials.

Up to now, Great Britain has been the principal source of supply for the war against the Axis, although American production is now passing that of Great Britain and will soon be the dominant factor in the war.

Plane and Tank Production Soars

British arms production today is three times that achieved in the spurt after Dunkirk and ten times what it was at the outbreak of war. Production has increased 40 percent in the last six months. Ernest Bevin, Minister of Labor and National Service, talks grimly of running it up another 40 percent during the coming winter.

Britain has secured much help from the United States. She has also sent much help abroad. Lord Halifax recently pointed out that, whereas Britain received from us some 2,000 planes in 1941, she sent abroad approximately 9,000 planes. The ratio for tanks was 200 to 3,000. Eighty percent of the output of British factories is now being shipped to Russia, the Middle East, and the various other theaters of war.

Tank production has increased fivefold since 1940 and twofold since August of last year. Lord Beaverbrook recently revealed that output of two-pounder guns has reached a rate of 30,000 a year. Naval ships are being produced almost four times as rapidly as in the last quarter before the outbreak of war. The rate for merchant tonnage, meanwhile, has doubled.

These figures are the more remarkable when it is remembered that British industry was for many months subjected to nightly attacks from the air. Production fell off slightly during the first few weeks of the blitz, but has increased steadily ever since.

Partly as a protection against bombing and partly to spread the work, the manufacture of armaments has been greatly decentralized. A certain tank consisting of 8,000 parts is being manufactured by 6,000 firms. The firms range from big plants to backyard garages.

An All-out Conversion Program

Every conceivable kind of conversion has been carried out. During the last six months more than 4,000 factories have been shifted to new work. Torpedoes are now being produced in a plant that formerly made boots and shoes; air engine parts are being made in a hairpin factory; a manufacturer of tops is now producing airplane parts.

Small business is handling a large share of British production. There are about 100,000 firms in Great Britain employing fewer than 25 workers each. The majority of them are now working on war contracts. Small or large, the firms of Britain have rallied to the war effort and, despite blackouts and bombs, are producing goods at a rate never achieved in time of peace.

British agriculture is also doing its part. Nearly six million acres of new land have been brought into cultivation. This means that the total area under crops is now nearly 50 percent above peacetime figures (pp. 152, 154).

Land which has not produced since the days of the Spanish Armada is being put under the plow. About three-fourths of the new land has been planted in cereal grains.

Swamps have been reclaimed. Golf courses, sports grounds, city lots, and cemetery extensions are being made to yield food. Famous gardens, once noted for their fragrance, are now given over to cabbages. Britain, in her third year of war, is bringing in the biggest harvest of the century.

Non-farmers do their bit to augment the Nation's food supply. R.A.F. pilots grow radishes beside their machines. Chickens cluck in the fashionable squares of London. A million bees have been turned loose in the heather of Camberley forest. Potatoes are flourishing at Hampton Court and at Sandringham. A field of flax which was planted experimentally by King George V is being extended.

Everybody helps to get in the crops—men, women, old people, children. Soldiers are sent to work in the fields. Twenty thousand women have enrolled in the Women's Land Army. Ten thousand schoolboys have been recruited to help.

Flower gardens have been turned into vegetable gardens, of which there are now about three million. Villagers' and work peoples' allotments number nearly two million. About sixty million dollars' value of vegetables is thus produced by individuals, and land to that extent is released for production of grain.

Scientific research has been directed to such matters as means for increasing the number of multiple births of calves so as to aid beef production.

A hundred thousand tractors have been mobilized, compared to 5,000 in the last war. They are manned nonstop, in shifts, to make sure that they are always busy. Four thousand schoolboys over 16 have been trained to relieve the regular drivers. Britain is now the most highly mechanized farming country in Europe.

The reason for growing food in Britain is to relieve the strain on shipping. Half the food of Britain must be brought from abroad. The German submarine warfare makes this expensive and perilous.

Robert S. Hudson, Minister of Agriculture, declares that a five percent increase in farm production will save 1,500,000 tons of shipping. Britons fully realize the importance of shipping. They are making their ancient acres produce as never before.

Labor Knows Unions' Fate under Axis

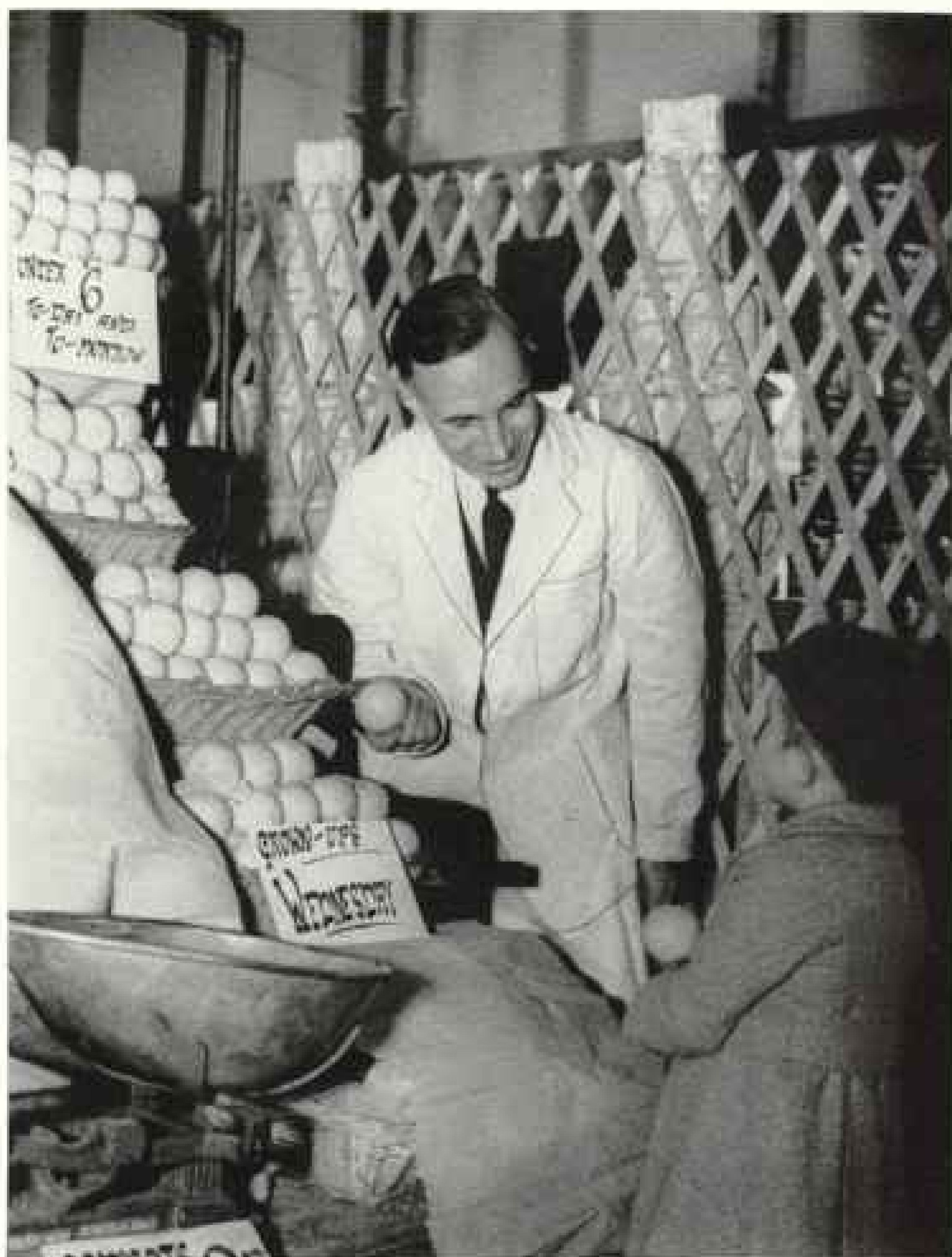
Most of the credit for the miracles of production now being achieved in Britain, both in the factory and on the farm, rightfully belongs to labor. The working people of Britain realize that an Axis victory would

mean the enslavement of workers everywhere, and they have given unstintingly of time and effort to make sure that this terrible contingency does not come to pass.

British labor relations today revolve about a revolutionary piece of legislation known as the Essential Work Order. This measure was inspired by labor itself to make sure that every worker was permitted to make the maximum contribution to the war effort —and, conversely, to make sure that the worker took advantage of the opportunity thus vouchsafed.

The Essential Work Order guarantees a minimum weekly wage to workers in essential industries and protects them against dismissal. At the same time, the Order prevents the stoppage of work by the workers. In case of dispute, both parties have recourse to special arbitration tribunals.

The Order does not freeze either wages or hours. It is, in its simplest form, a device to make sure that industry, on one hand, provides work and that labor, on the other hand, gets the work done.



British Combine

"Under Six? Have an Orange; Grown-ups Can Wait!"

On Mondays and Tuesdays the grocer sells his precious fruit only to children and invalids. If there are any oranges left, adults may buy them the rest of the week. Ships must use their cargo space to carry munitions of war and essential staples to Britain. Sugar ration is half a pound a week to each person. Meat is rationed by price—24 cents' worth a week to a consumer.

Although the Essential Work Order contains plenty of teeth, compliance has been largely voluntary. Industry has been promised that wartime restrictions will be removed the moment victory is achieved, and labor is assured, by unanimous vote of Parliament, of the restoration of every right and privilege it has relinquished for the sake of the war effort.

Britain is the most highly unionized of the great powers. The unions today have more members than at any period in their history—well over 7,000,000. If American workers were to organize to the extent that British workers have, the Committee for Industrial Organization and the American Federation of Labor would have upwards of 20,000,000 members instead of the 10,000,000 they do have.

As a result of the patriotic attitude of British workers, work stoppages have been infinitesimal in this war. There has not been a strike of any consequence in two years. Government officials declare that time lost through labor disputes represents only one day per man each 15 years, or an average of seven seconds a day.

In view of the many harassments to which the workers have been subjected—long hours, rationing, the blackout, travel difficulties, to

British Combine

An R.A.F. Pilot Tells Parachute Makers How One of Their Chutes Saved His Life

Hands in pockets and self-conscious, he stands on a table and describes his experiences. Equally embarrassed fellow pilots await their turn. Such informal talks inspire factory personnel to even greater efforts. Portraits of the King and Queen hang on the wall.

British Combine

Sergeant Major Hollness and Two of His Sons Prepare to Go on Parade While Mother Gets Sunday Dinner

Like nearly all other men in the Dover and Folkestone areas, they are members of the Home Guard. Though officially Home Guards must be between the ages of 17 and 65, there are hundreds of younger and older men in its ranks (page 150). Most hold civil jobs in the daytime and drill evenings, Sundays, and holidays.

British Combine

"20's Sign on Today"—Girls Just Out of Their Teens Register for War Service

All British girls and women between 16 and 31 are subject to draft for noncombatant service. Unmarried women between 20 and 30 were called first. Capt. Oliver Lyttelton, Minister of Production in the British War Cabinet, reported June 10: "Today 77½ percent of the boys and 67½ percent of the girls between the ages of 14 and 17 are engaged in war work" (page 147 and below).

mention a few—the achievements of British labor constitute one of the brightest pages being written by Britain in World War II.

Britons Work 60- or 65-hour Week

Hours of work in Britain have been incredibly long. In the period following Dunkirk, the workers drove themselves 75 and 80 hours a week. Production shot up and the country was saved.

Eventually, however, the country found itself in the position of the man who was teaching his horse to eat sawdust instead of oats—just when he got the thing settled the horse died. British workers got up to 80 hours a week, but from there on production, instead of increasing, declined. The Government had to call a halt.

Hours have now been reduced to an average of 60 to 65 hours for men and 55 to 60 for women. Beyond that, according to the Industrial Health Research Board, there is damage to health, loss of interest, and—eventually if not immediately—an actual decrease in output.

Wage rates and total earnings have increased considerably during the war. However, the cost of living has gone up more than wages. Skilled workers in certain occupations no doubt have bettered their position, but the workers as a whole have had to accept a reduction in their standard of living, since prices have risen by 30 percent compared to a 27 percent rise in wages. The Government's policy now is to prevent any further increase in living costs and thus avoid the need of additional wage increases.

Unemployment in Britain has dropped from 1,330,000 in September, 1939, to less than 200,000 today. The unemployed are about equally divided between men and women. They consist almost exclusively of unemployables and persons in transition from one job to another.

Half of Aircraft Workers Are Women

Women have taken their place beside men in the British war effort. A million and a half women are working in the munitions factories and other vital industries. Their number is being increased, as this is written, at the rate of 5,000 a day. Half the workers in aircraft factories are women. Eventually the proportion will reach 70 percent (page 145).

British Combine

Eyes and Ears of the R.A.F.—Observer Corps Men Relax in a Rest Hut

With their mates, they keep 24-hour watch at one of the hundreds of listening posts scattered at strategic points all over Britain. They warn the Royal Air Force immediately upon seeing or hearing aircraft of uncertain identity. Similar observation posts now are manned by watchers along both the Atlantic and Pacific coasts of the United States.

Britain's women are also repairing automobiles, unloading ships, sweeping chimneys, laying telephone lines, delivering mail. A hundred thousand have transport jobs, including 40,000 on the railways. They carry baggage, collect tickets, and operate signals. Nearly 1,200 are serving as bus conductors in the London area alone.

The authorities have begun to worry about what to do with all of these women after the war, since a large percentage of them probably will want to go on working. Many girls are now studying and training in their spare time for definite jobs useful in the postwar world.

Important social changes are bound to occur in Britain as a result of the wholesale induction of women into industry. The word "male" in British statutes has been construed to include women unless they are specifically exempted. This is only one small indication of the important part played by women in the British war effort and the equally important part they are destined to play in the peace.

The boys and girls of Britain, no less than their parents, have been mobilized for victory. A national youth movement was inaugurated at the beginning of the war. Organizations such as the Boy Scouts and the Girl Guides are fully mobilized.

Young people who do not belong to any organization are invited to join the Youth Service Corps, whose members do about 80 different kinds of jobs. Among them are painting curbstones to aid drivers in the blackout, digging gun and searchlight emplacements, carrying messages in air raids, and doing odd chores for the Home Guard.

Britain's Toll in Blood and Tears

The all-out war effort we have been discussing has not been achieved without a harrowing expenditure of blood and suffering. There is a miserable canard to the effect that Britain lets others do her fighting for her. The Nazis employ this canard on every possible occasion, and they change it to appeal to whatever country they happen to be "softening up" at the moment.

According to Goebbels, Britain is always fighting to the "last Frenchman," the "last Dutchman," the "last Greek." Now Britain is supposed to be fighting to the "last American." We had a variant of this canard some

British Combine

From This Scrap Heap of Nazi Planes, England Reclaims Alloys and Steel

Tons of metal and miles of wire have been salvaged for industry from thousands of German bombers and fighters shot down in the Battle of Britain (page 155). As for the swastika, cut from this "write-off," it is going home with the corporal as a souvenir.

years ago under the title, *England Expects Every American to Do His Duty.*

I am happy to help spike this kind of propaganda. The British are not angels, nor are they supermen. They are subject to all the frailties and the limitations of others. There is one thing, however, that can't truthfully be said about them. That is that they are afraid to do battle when it is necessary to do battle in defense of their country. A million Britons laid down their lives in the combined effort to win the last war. The British are prepared, if necessary, to do it again.

Empire casualties for the first two years of the war, according to Clement R. Attlee, Deputy Prime Minister, aggregated 183,550. Of these casualties, 48,973 were killed, 46,363 wounded, 58,458 taken prisoner, and 29,756 reported missing.

Seventy out of every 100 men killed or wounded in land fighting have been British; the others are accounted for by the Dominions, the Colonies, and India. The proportion of British casualties to the total for sea and air fighting is much higher—perhaps as much as 90 percent.

Capt. David Margesson, now Lord Margesson, when Secretary of War, told the House of Commons that nearly half the Allied troops in the Middle East came from Britain, that 46 percent of those in Crete came from Britain, and 33 percent of those in Greece. No Dominion or Colonial troops were sent to Norway. On the Western Front, United Kingdom troops were in the ratio of 70 to 1 in relation to the rest of the Empire.

These figures are cited not to minimize the contribution of the Dominions and Colonies, which has been magnificent, but to show that Britain is pulling her weight in the great battle now under way to keep the world safe for the democratic way of life.

The ravages of the Battle of Britain, it goes without saying, were borne more or less exclusively by the inhabitants of the islands. Some 43,000 men, women, and children have been killed to date in this ghastly encounter. More than fifty thousand have been seriously injured, many of them maimed for life.

High Taxes and Short Rations

There are a thousand bomb victims still lying in the hospitals of Britain, and 1,500 war orphans are available for adoption by the kind-hearted people of the world.

Property losses of the war—bomb damage,

sunken ships, destroyed or captured installations, lost supplies, and so on—run into many billions.

It takes money to win a war, and the British are spending money to the limit of the national exchequer. More money was spent in the first two and a half years of this war than in the four and a quarter years of the last war. Sixty-eight percent of the national income is being spent on the war, $17,000,000,000 out of an annual income of $25,000,000,000.

Hugh Dalton, President of the Board of Trade, describes Britain's present system as "fortress economics." Business goes through the motions of producing at a profit, and labor goes through the motions of working for wages, but the whole thing boils down to a kind of Spartan socialism under which employer and employee alike work for the State and are allowed to retain just enough of the necessities of life to enable them to keep going.

It's the same system used by the Axis, except that this one is voluntary and the producers hope to get rid of it, or at least to ameliorate it, when the war is over.

Americans who are concerned about taxation should take a look at Britain. Income taxes begin at $440. A married man with two dependents and an income of $2,500 a year pays $12 a year in the United States. In Britain he pays $530. The top rate here is 81 percent; there it is 97.5 percent.

Indirect taxes have been heavily increased. Cigarettes cost 30 cents a pack, a fair cigar is 75 cents, gasoline 40 cents a gallon, automobile tax from $50 to $200, according to size of car; and there is a "purchase tax" varying from 20 percent to 40 percent, according to the class of goods.

With a 30 percent rise in the cost of living, Britons have had to tighten their belts to the limit to keep the war machine going.

We in the United States are just beginning to experience shortages. Britain has been on short rations for two years.

Britain is definitely beginning to look shabby. The people try to keep up appearances, to keep their cities clean and their clothes in repair, but the facilities and the materials just aren't available. Meanwhile, food is rigorously plain and scarce.

The basic sugar ration is half a pound a week per person. The ration for fats is the same, for bacon or ham four ounces, jam four ounces, cheese three ounces, tea two ounces. The fat ration, which includes two ounces of butter a week, is about half the amount per person consumed here. Meat is rationed by price, each person being allowed 24 cents' worth of meat per week.

Milk is rigidly controlled. Expectant and nursing mothers, and children under five, are allowed a pint a day; others get two pints a week, plus one tin of canned milk a month and one tin of dried skimmed milk per family per month. Milk is supplied free to persons in the first group if the family income is below a certain figure.

Eggs are like nuggets. The allotment is three a month, but few people are able to average more than two.

Rationing Permits One Dress a Year

Clothing is rationed by coupon to about half the peacetime average.

The British man this year gets enough coupons to buy a suit or overcoat, a pair of shoes, a sweater, a couple of shirts, some underwear, and several pairs of socks.

The British woman is able to buy one dress, two pairs of shoes, two pairs of gloves, eight handkerchiefs, nine pairs of hose, and a couple of pieces of underwear. The people of Britain have found that they can do without a lot of things formerly considered necessary to a halfway decent standard of living.

Soap is also rationed, each person being allowed about a pound a month. Coal is allocated at a rate of roughly one ton a month. Motoring for pleasure has been abolished. The owner of a medium-sized car considered essential to the war effort is allowed about 12 gallons of gasoline a month.

Shortages are rapidly becoming acute. "Please bring your own hairpins," reads a sign over a hairdressing establishment in Great Yarmouth. Country housewives are lighting fires with flint to save matches. Ten million goldfish are starving for want of imported food. Bottles are standardized to save glass. Business executives use kitchen tables in lieu of desks. It is always difficult and sometimes impossible to get anything repaired. Three hundred thousand babies will have to do without new buggies this year.

A War by, for, and of the People

The British carry on. Their morale is incredible. Out of the thousands of persons I met in Britain, only one was willing to concede the possibility of defeat.

They pan the Government and heckle speakers and vote unpopular candidates out of office. They growl at Churchill and Churchill growls back. They criticize the military and clamor loudly for a second front. A Nazi, planked down in their midst, would think that it was all over, that Hitler and Goering and Goebbels and Himmler had only to walk across the Channel and take charge.

British Combine

Woman's Place Is in the Brickyard in Islington Borough

"Every British man and woman is subject to a draft to work or fight. The workers in industries are frozen in their jobs. They cannot work where they like: they are directed to work where the Government decrees. Out of a population of 33 millions of men, women, and children between the ages of 14 and 65, 22 millions are working full time either in industry, the armed forces, or civil defense. The remaining 11 millions represent married women with young children, the sick, and those physically unfit to work. There are no part-time workers included in the figure of 22 million. This is equivalent to a mobilization of about 60 million people in the United States"—Capt. Oliver Lyttelton.

It's a mistake that has been made before. These people take their democracy seriously. They insist on the exercise of their civil liberties with an enemy at the door. They insist on the right to overthrow, through the exercise of the ballot, any government which does not prosecute the war to their satisfaction.

They insist on having books with their bullets, and the stimulation of theaters and art galleries and concerts and lectures. They insist upon the right to go fishing or to walk in the fields or to travel about the country or to bet upon a horse race. They insist upon the preservation of the social services they have been erecting for the past century. They insist, finally, upon the right to worship as they please.

There is one thing more: They insist that the sacrifices they are making, and will make, shall not be in vain. Britons in every walk of life envision a land where the lust for power is supplanted by the will to do good, where the evils of the factory system are cured, where the cruelties of the struggle for existence are assuaged, where the inequities of an archaic social system are removed.

And the people of Britain, in dreaming of this new land, envision it as part of a world where nations are able to trade with one another and exchange people and spread culture and grow great without the periodical recourses to arms which have characterized world history up to now.

The people of Britain have gone all-out to win the war.

I think we may count on their co-operation in the even more difficult job of winning the peace.

The Pith of Peru

A Journey from Talara to Machu Picchu, with Memorable Stopovers

By Henry Albert Phillips

NO OTHER country on the globe presents more surprising contrasts than Peru.

Peru is a composite of the entire South American Continent. She shares nearly everything found within the borders of her sister Republics, from arid desert to luxuriant vegetation, from coastal plain to highest mountains, from dried-up cities, such as Talara, Salaverry, and Mollendo on the west coast, to well-watered Iquitos, over the Andes on the Amazon. Finally, the Andes cut the Republic into two parts, giving it the variety and benefits of three zones of climate (map, page 170).

Similarly in history. Peru represented mother Spain as the Viceregal State, enjoying the highest honors, the most powerful privileges, and the richest perquisites of colonial life. Peru's associations with the Conquest were the most brilliant, the most colorful, and the most harrowing of all. Records and remains of the rise and fall of both the pre-Inca and the Inca Empires are within the boundaries of what is now Peru.*

Although I had previously traversed Peru many times, by land, sea, and air, it was not until I settled down and spent some time in Miraflores, that well-named "Behold the Flowers" suburb of Lima, that I could honestly say I was beginning to get under the skin of Peru and feel what it was all about.

"Patio Life" of Peru

In Miraflores I found quarters with a high-caste family. We lived the "patio life" of Old Spain, with that additional touch of Indian civilization that makes for the real Peruvian. Our dwelling was up a quiet side street shaded with pepper and flame trees.

You pulled a bell handle at one side of a fancy grilled gate which permitted an enviable glimpse of our flower-draped patio with its walls and benches and tinkling fountain of genuine Valencian tiles. In due time Florentino would come to the gate, buttoning his white coat on the way. If you looked sharp, you could see Christina peeping through the portiere. José would steal halfway down the stairs, broom in hand.

Going into Lima from Miraflores was always an adventure. I never hurried. I have seen cases in which hurry spoiled South America.

I turn the corner into the "Rambla," as I call it, because the shaded promenade is so reminiscent of the Rambla on which I used to stroll to the bird market in Barcelona. I sigh as I glance at the huge ancient ceiba trees at the near-by Circle being cut down to make a two-way motor road.

Like a true Miraflоriano, I sit down appreciatively for a moment, and thus become part of the scene. I catch the spirit of the gathering of *helados* boys—the "Good Humor" ice-cream peddlers of Peru—who can't seem to make up their minds whether or not to jump aboard their bicycle carts.

Women pass by on their way from market, their baskets filled with strange fruits and vegetables half smothered in flowers. Indian servant maids drift about everywhere. They are distinguishable by the two braids down their back, tied with red ribbon.

Water Supply Is Rationed

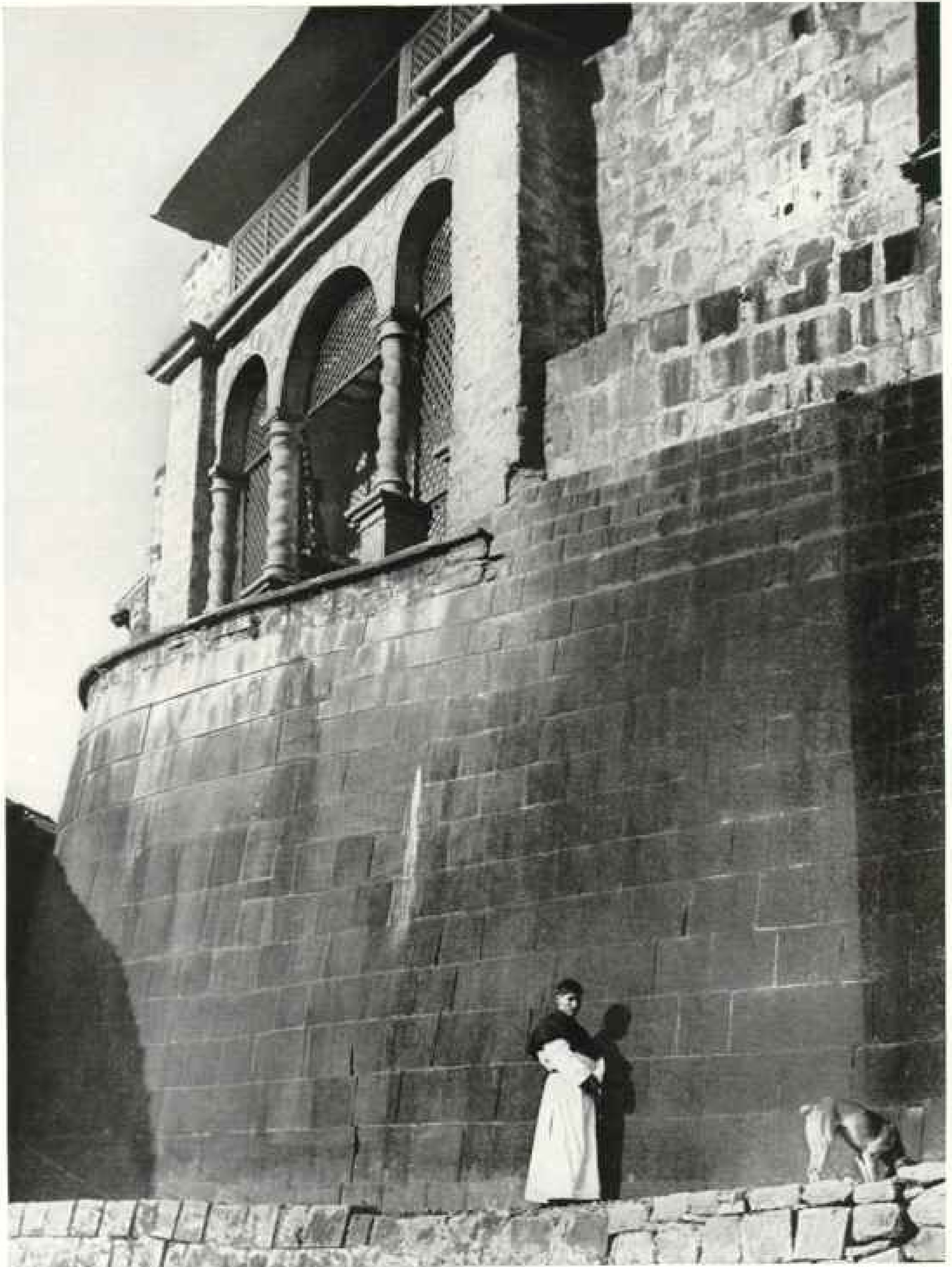
At length I reach the corner where the big colonial house stands behind the wall with the candlelit shrine. There pious passers-by may enjoy a prayer through the wrought-iron grill. I have to stand aside while the district irrigation controller regulates the flow of irrigation water released into the district's sluiceway gutters for the daily allotment.

Every property owner has his own little side sluice, left open just long enough to flood his grounds. By this means the flowers and shade trees, all the green boulevards and parks, the golf courses and cricket grounds of a great city originally laid out on an arid plain are watered by the melting snows from distant mountaintops.

I wait at the stop sign until the huge bus comes roaring along. For three cents I enjoy a leather-cushioned four-mile scenic ride into Lima. Shade trees line the boulevards. Spanish-style mansions dot the way with flowers climbing over walls in which majolica shrines are often set. Long vistas of new houses reflect a building boom, the disappearing patio giving way to unwalled balconies.

All roads enter Lima with a grand gesture worthy of the "City of Kings," so-called because it was founded on Epiphany, Feast of the Three Kings. Parks are landscaped trop-

* See "Incas: Empire Builders of the Andes," by Philip Ainsworth Means, with 10 paintings in color by H. M. Herget, National Geographic Magazine, February, 1938.



Three Lions

Monastery of Santo Domingo Perches on Foundations of the Inca Temple of the Sun

The Spanish church seems rough and fragile above this masterpiece of stone masonry which centuries of earthquakes have failed to shake apart. When the conquering Pizarros looted the city they found the Temple of the Sun richly decorated with gold. Inca or pre-Inca walls and doorways are almost everywhere in Cuzco.

ical vistas, broad avenues shrink within the medieval narrow streets of the inner city, and no prospect is without its ornate white government palace or two.

At length I come to Plaza San Martín, center of New and Greater Lima which has a population of 545,000. Hotel Bolívar faces one side of the square; the 8-story "skyscraper" housing the United States Embassy stands opposite. The new million-dollar San Martín movie palace is on the corner.

One side, happily, has been left just a remnant of 19th-century Madrid-Paris with cafes and gloomy shops, where the literati and tired travelers sit at the sidewalk tables and gaze dreamily through the arcades at the rearing equestrian statue of General San Martín, the Argentine deliverer.

Girón de la Unión, the narrow main street, ties the New World with the Old; the ancient Church of La Merced is a sturdy knot midway. At the other end of this thoroughfare is Plaza de Armas, once the lively center of Old Lima, if not of the entire New World.

Here Francisco Pizarro sits on horseback surveying the plaza of the city he founded. Inside the chapel at his back I found him again in a glass showcase, with the head of his mummified remains ingloriously bashed in.

The dazzling-white new Government Palace fills one entire side of the square. The Archbishop's Palace with Moorish balconies overhanging its ornate white façade stands out in contrast to the splendid baroque Cathedral, massive and majestic.

Lima Helped Shape Continent's Destiny

The glories of Lima belong to a tale that has oft been told.* They are important because of their part in shaping the social and political contour of the whole continent.

Highlights are the Torre-Tagle Palace with its Moorish screened balconies through which the Marquis often peered down upon an excited populace; the Perricholi Palace, built by the Viceroy for his mistress, Micaela Villegas, the Du Barry of Peru; the House of the Inquisition, once the terror of the New World, now so peaceful while only beggars and stray dogs seek the shade of its pillared portico, and, founded nearly a hundred years before Harvard, San Marcos University, whose halls were crowded with Interchange students.

I took time off while at Lima to dash down the coast a hundred miles or so, as far as Pisco, whence comes the drink of the same name.

Our motorbus would plunge along for an hour through a waterless sandy waste. Suddenly, a turn of a corner, or a dip down into a new valley would bring us abreast of luxuriant vegetation.

In more than 30 of these coastal valleys cotton, Peru's major agricultural product, was being cultivated. At the time of my visit, in June, a majority of the 40,000 cotton pickers were in the fields. Pisco is the principal point of export of the local Tanguis variety, which composes 89 percent of Peru's cotton crop.

I left Lima in quest of Greater Peru by way of its sea portal, Callao.

I saw scarcely a building in the city of Callao that did not show shattering marks of earthquake. The latest convulsion had seriously damaged the new 8-million-dollar concrete docks which had promised unlimited increase of commerce with the United States.

Gold, Guano, and Petroleum

Each time I sailed out of Callao, I recalled my first journey down the west coast, which marked the beginning of my Peruvian pilgrimage. I always remembered the sultry morning our Grace liner, *Santa Rosa*, put into the port of Talara.

Beyond the desert oil town were sand dunes bristling with some 2,500 oil derricks. I didn't even bother to go ashore, but with many other passengers contented myself vicariously in purchasing a rug, blanket, fur, knitted dolls, or silver llamas brought on board by native vendors (Plate III).

Nor did I wax enthusiastic over Peru's narrow strip of coast that stretches for 1,500 miles along the Pacific, most of it stark desert.

Little by little I learned of Peru's fabulous riches. Let but a trickle or a stream touch her parched deserts and they spring into luxuriant verdure.

Desert lands of Talara carried enough liquid "black gold" in their pockets to give Peru third place in petroleum in South America.

Those rainless, waterless, grassless, foodless reefs, the Chincha Islands, which we steamed past 120 miles south of Callao, were inhabited by five million or more fish-eating birds.

Those mountains of white deposit held the "white gold" of Peru, guano, which had paid Peru's debts, financed her wars, and built the incredibly costly Transandean railway.†

Finally there were the Cordilleras which peered down at us through the mist from a height of more than four miles. They had pushed a large part of Peruvian territory sky-

* See "Lure of Lima, City of the Kings," by William Joseph Showalter, NATIONAL GEOGRAPHIC MAGAZINE, June, 1930.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Peru's Wealth-producing Birds," by R. E. Coker, June, 1920, and "Most Valuable Bird in the World," by Robert Cushman Murphy, September, 1924.

The Rugged Andes, Rising 20,000 Feet Above the Coast, Form a Barrier to Inland Peru

Through this mountain wall no rivers flow to the Pacific. Peruvian ships from Callao serving the interior at Iquitos have to go through the Panama Canal, around the northern part of the continent, and up the Amazon, a distance of 7,000 miles, though it is only 625 air miles away. Within the secluded mountain heights, centering around Cuzco and Machu Picchu, the Inca civilization flourished before Spanish Conquistadores came. Because Peru is such a three-dimensional land, The Society's cartographers carefully fashioned a clay model from accurate contour maps, then reproduced it here by photography. The boundary with Ecuador, long in dispute, was settled at the Pan American Conference in Rio de Janeiro, January 29, 1942.

Pan American-Grace Airways, Inc.

Soaring High above Arequipa Is Icy-topped El Misti

This third largest city of Peru itself is 7,550 feet above sea level; the snowy summit of the volcano is over 11,500 feet higher. The gleaming white town is built of *sillar*, an easily cut porous lava (page 172).

ward into heaps of almost inaccessible rocky wilderness. Worthless waste? Why, there was gold in those hills, and treasures of silver and copper and lead, and so on.

Take the single example of that "impossible" Cerro de Pasco region. American-financed mines had reaped millions of dollars' worth of mineral wealth out of Cerro de Pasco, up there 15,000 feet high in the Andes!

And I recall Salaverry, the next port of call after Talara, where the wonders of Peru began to dawn on me. I remember going ashore and taking a motorcar to Trujillo, a few miles inland, arriving in time to be doused with water at every stop, in a democratic celebration of the Carnival. My chauffeur laughed uproariously, until he got a pailful of Carnival spirit.

An Archeological High Spot

We drove out to Chan-Chan, one of the world's archeological high spots, which had been the capital of the great Chimú dynasty. One time it was a city of a quarter million, surrounded by a wall 40 feet high, a large part of which still remains.

Palaces, temples, aqueducts, forts, big burial mounds—all were built of adobe mud, and still stand in impressive ruins after nearly 2,000 years.*

I shall never forget Mollendo, port of the turbulent tide. There I was towed ashore on a tin-ore scow with scores of pelicans hitch-hiking on its gunwales.

A half dozen other passengers and I were hoisted in a wooden "basket" and dumped on the quay with an assortment of other American cargo.

I turned to my seat mate and asked him if he could speak English.

"That depends if you'll be understandin' me," he replied, with a rich Scotch burr.

* See "Air Adventures in Peru" and "A Forgotten Valley of Peru," by Robert Shippee, National Geographic Magazine, January, 1933, and January, 1934, respectively.

He had been 40 years in Peru and knew every inch of it, he told me, as we walked up and down the sand-dune streets of Mollendo. The outstanding object of the town was a big barn of a movie palace.

That 107-mile journey from Mollendo would have been a tedious trip without my missionary Scotsman to point out the sights.

For the first hour we could not hear each other talk for the violent waves that broke noisily against the rocky shore alongside the train. At length we struck out across the sand dunes of San José which resembled a fantastic sea frozen stiff. Suddenly we jumped out of the sand pits, and the Andes rose majestically before us in a sweeping panorama of a half dozen 4-mile peaks.

"Every one of them has been my parsonage for weeks at a time," he assured me. "Come along wi' me, mon, if you would see the pith of Peru!

"Over there, beyond the horizon, has long been m' parish. I've gone over it, horse and burro back, climbin' the backbone of the continent, fording the Perené River; spending week ends with Chuncho Indians, like barefoot Biblical folk all muffled up in their gloomy robes and cowls; gettin' a friendly lift on the road to Huancayo from the Indian women mountaineers and their children with their red-quilted skirts and straw hats.

"Or, maybe I'd be spendin' days and nights on the way to Puno and Lake Titicaca, wi' pagan native dancers and havin' to listen to them dance to the pipe the night through! That's a parish for you!"

On the "Roof Garden of Eden"

At Arequipa we parted for a few days, he to his parochial duties, I to one of the world's most famous halfway-house inns.

Quinta Bates (*quinta* means a farm) for some 40 years has been owned and dominated by the one and only Tia (Auntie) Bates.

Perhaps it was breakfast there that I liked best of all. I was awakened by the whistling bread boy on his donkey stumbling down the lane beneath my window. I arose as the street cleaner was raising clouds of dust by brushing back the dirt to the very spot from which he had swept it the morning before.

Now I can plainly hear the faithful Honorio, Indian houseboy, polishing the boots as he waits patiently for me to stir, when he will tap gently and leave the ewer of hot water. While I am shaving he will be drawing my bath in a Noah's-Archaic tub, in a neighboring birdhouselike lodging for paying guests.

At length I pass along the porch, by the familiar life-sized wooden Inca idol, and trip up a flight of steps. Lo! I am on the roof garden of Eden!

I select a seat at a small table beneath a big sun umbrella. Tomasa is sweeping up—not dust, but flower petals! Honorio appears with my tray.

Then Honorio gives a sweep of his hand toward El Misti, the volcano in Arequipa's front yard, which is a third again as high and quite as beautiful as Fujisan. Like a cake with the frosting trickling down its side, its top is covered with last night's heavy fall of snow.

At teatime Tia Bates sat at the head of the table and poured. We were always interrupted by Juanita bringing the chickens and the eggs, and also her 4-month-old latest baby, all of which she managed to tote three miles from her little hacienda.

The Overhead of a Godmother

"I am the baby's godmother," Tia Bates explained, "her mother's godmother, and her grandmother's. And godmother to a thousand other Indians. They come to me for gifts on their birthdays. If they die in babyhood I must provide a shroud and a painted coffin."

After dinner Tia brought me her guest book in which to write my name. It was an honor. Here was a eulogistic poem by guest Noel Coward; encomiums by General Pershing, Premier Venizelos, Prince Edward of Wales; autographs of Bengali princes, British admirals, and Japanese diplomats.

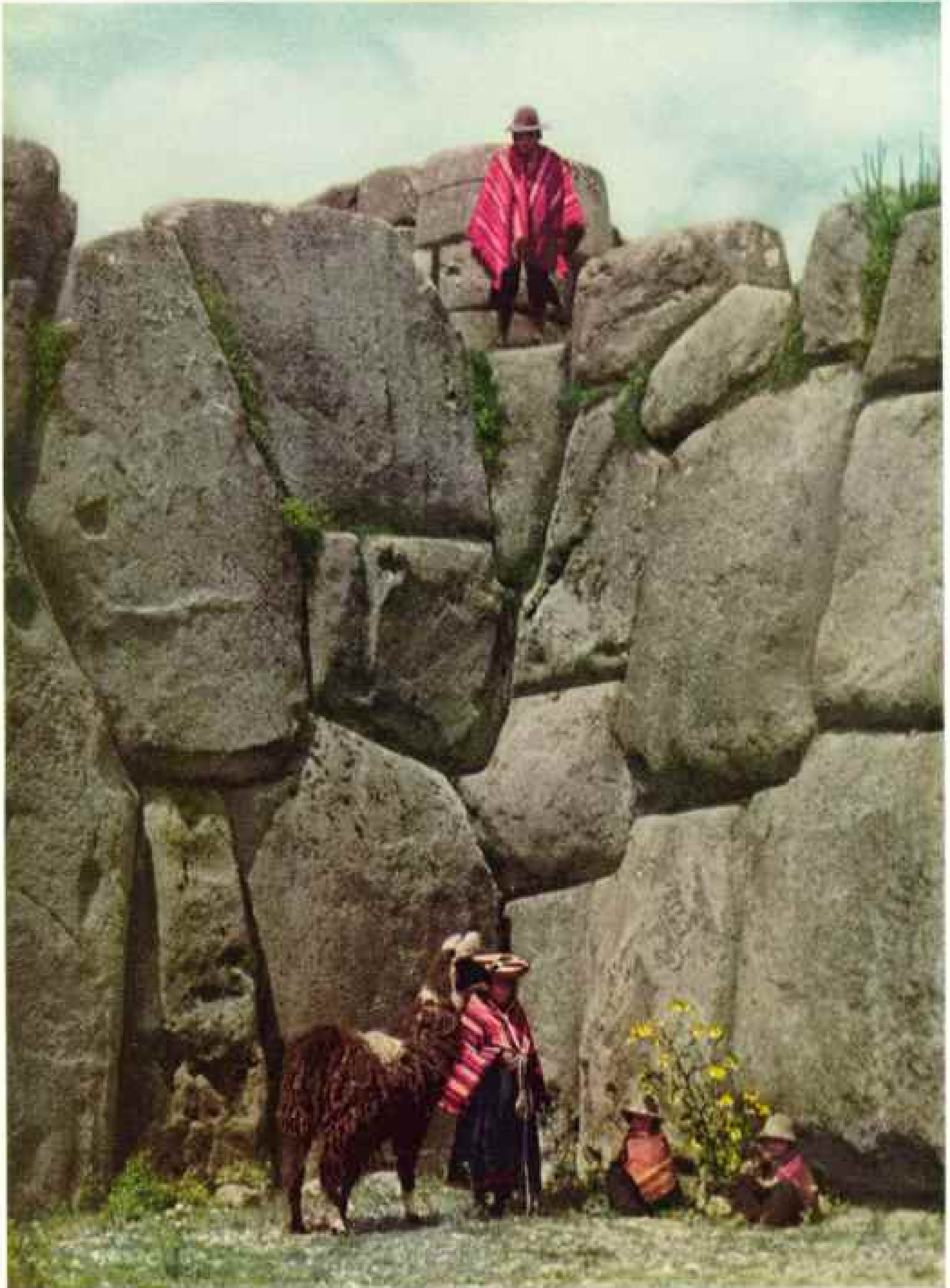
There we would sit chatting about home until the clanging ancient bells of the cathedral reminded her that she must rise at 6 o'clock and go to mass.

Next morning Tia and I went to town. We took the miniature careening tram at the corner, ceremoniously assisted by the English-speaking traffic policeman.

"All of our building material has been poured from Old Misti, our pet volcano," she remarked, as we passed by a mile or more of white stone houses. "The white lava is porous, easy to saw into blocks, and lasts forever. This is our reward for being battered by quakes and roasted alive for centuries.

"All Arequipeño houses are vaults, except that of Quinta Bates," she rambled on. "Every window in town is barred at night, not to keep out thieves but to keep in the girls. It is an old Spanish custom."

Plaza de Armas, Arequipa, I shall long remember for its flowers, palms, and shady benches. It is bounded on three sides by Moorish arcades. The fourth side is distinguished by the 300-foot façade of the cathedral. Only one other façade is "grander,"



© National Geographic Society

Finlay by Henry Clay Gipson

Pre-Inca Indians Cut and Placed the Mighty Stones of Sacsahuaman

This monumental fortress, on the heights above Cuzco, is one of the most amazing works of ancient man in the Western Hemisphere. Some of the huge stones measure 15 to 20 feet in height and weigh many tons. No mortar or cement was used. The boulders were shaped and fitted so accurately that a knife blade cannot be thrust between them. The builders knew not the use of iron; stone tools, fiber ropes, and primitive mechanical devices erected this wall.

© National Geographic Society

Kodachrome by Kühne, Movietonews

Flags of the American Nations Fly over Peru's Legislative Palace during a Pan-American Conference

Crowds wait for delegates to emerge from a session of the Eighth International Conference of American States. Peru's red and white standard flies from the high point of the palace, which faces Bolívar Plaza in the heart of Lima. The head of the bronze horse hides the illustrious rider—Simón Bolívar, the Liberator, who helped free northern South America from Spanish rule.

© National Geographic Society

Kodachrome by Kulme, Moriatmenn

Indian Hands with the Skill of Ages Fashioned These Wares Spread on a Steamer's Deck

Vendors have come aboard to display llama rugs, woolen blankets, Indian dolls, and native gray fox furs while the ship stops at Talara, Peru. Handiwork is decorated with geometric designs and silhouettes of the haughty llama, camel-like burden-bearer of the highlands (Plate VI).

"And José Checked His Horse Just in Time . . ."

A gay caballero in leather chaps chats with a society girl crowned with a fine Spanish mantilla. His dashing garb blends Peruvian and Spanish styles.

© National Geographic Society

Kodachromes by Kaiser, Moelsmeews

Feet and Shoulders Answer the Rhythm of a Spanish Guitar

Wearing flowers redder than their ruffled dresses, girls go through the slow steps of a Spanish dance. On the wall is an outdoor shrine.

Flowers and Fiesta Finery Gleam in a Setting Like Old Spain

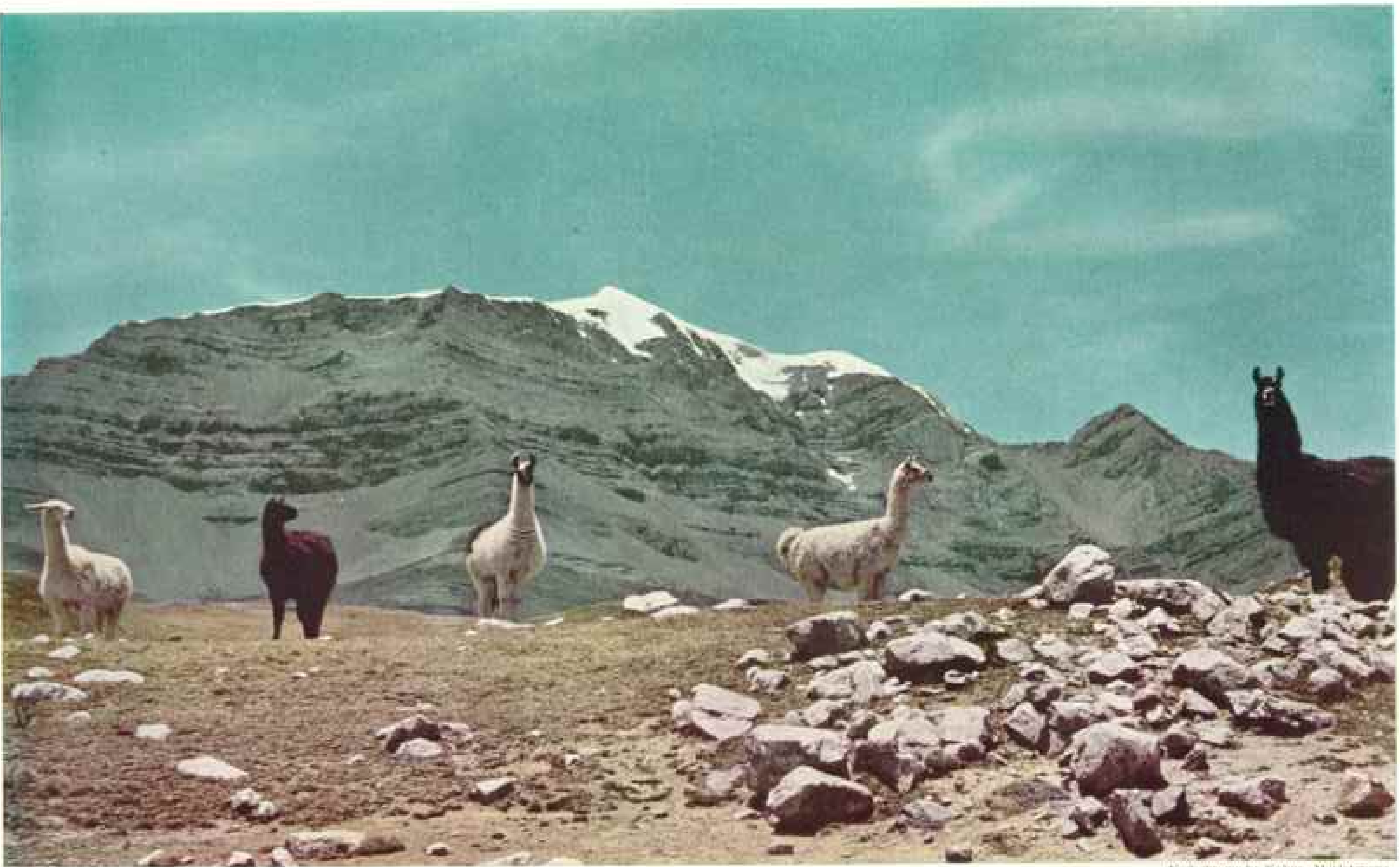
The two girls at the left wear tortoise-shell combs in their hair, while three others display black mantillas. The scene is a patio of a private home in Lima.

© National Geographic Society

Kodachromes by Kuhne, Moristonews

Andalusia Never Showed Finer Shawls Nor Lovelier Ladies

Such elaborate costumes blossom forth during the Lima social season. Some homes are private museums of old tile and ironwork.



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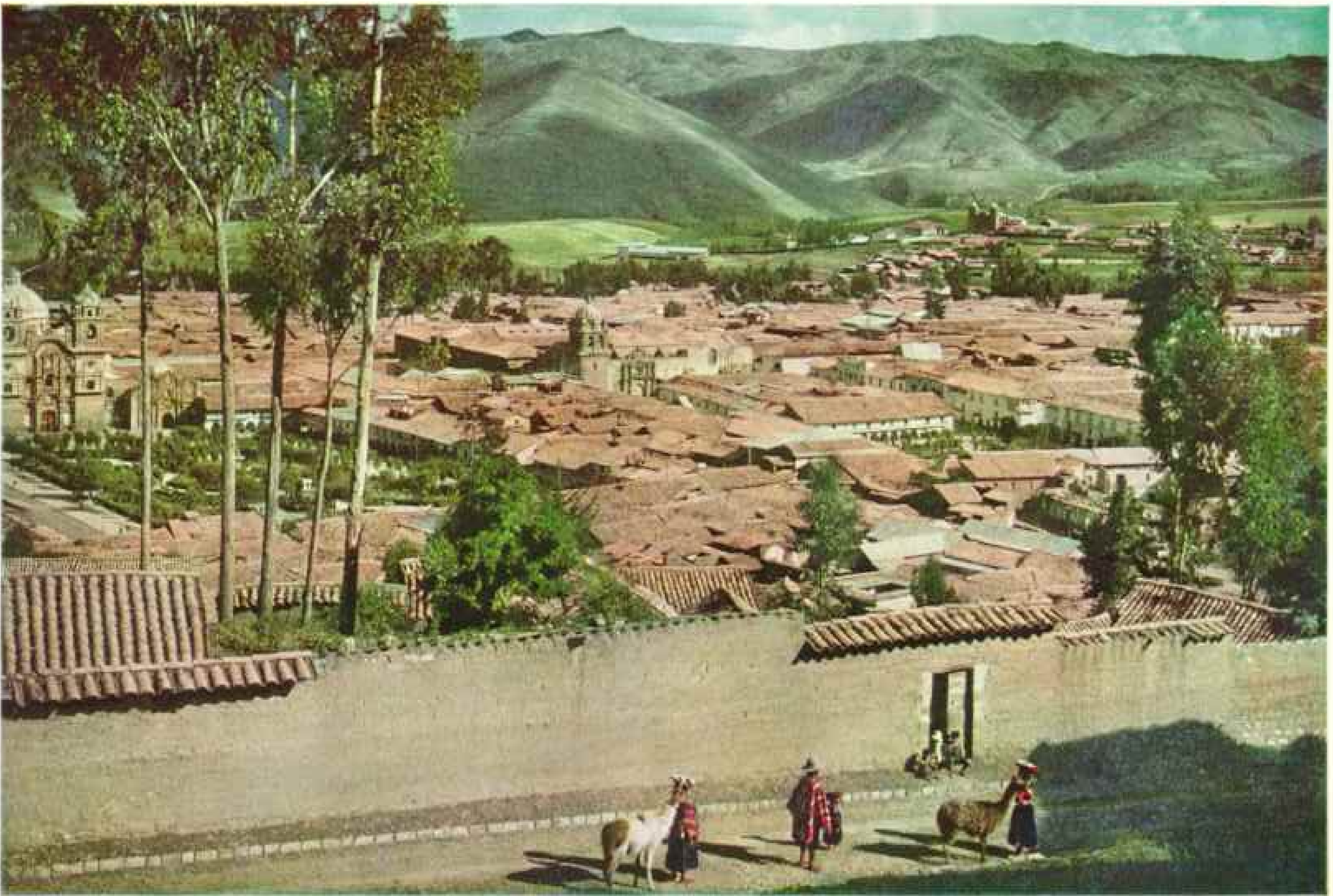
Kodachrome by Kühne, Morristown

To the High-country Llama Goes Much Credit for Development of Andean Trade and Mining

The animal was the ancient Incas' beast of burden. Even today, with roads and railroads, the llama is the four-legged freight of the high Andes. It will carry about a hundred pounds, and if overloaded it protests by emitting from its mouth what an early chronicler described as "a wonderful stinking water." Related to the camel, the llama is the largest and strongest of a group which includes the alpaca, guanaco, and vicuña. All supply wool. Here five llamas graze more than three miles above sea level near Cerro de Pasco.



© National Geographic Society

Photo by Henry Clay Gipson

Indian Life in Cuzco Has Changed Little since the Tile-roofed Plateau City Formed the Center of the Inca Empire

© National Geographic Society

Kodachrome by Kolmo, Moctezuma

Patricians of Peru Inherit Style and Grace from Spanish Ancestors

The fan, the mantillas, the flowered shawl of the woman at the right, and the tiles decorating the courtyard came from Spain. Spanish blood predominates in most of the old families of Lima and other Peruvian cities. Even today, cultural ties with the European homeland are jealously guarded. Many of the Spanish families in California came there from Peru and other countries of western South America.

and that is the amazing new movie palace built in commemoration of the quattrocentennial.

"The legend says," explained Tia Bates, "that when the Inca and his followers reached this spot where the Plaza now is, the people said that they were very tired. He replied, '*Ari quepay*,' which means, in Quichua, 'Yes. Let us rest.'"

As we left Arequipa, dashing across the plateau at the base of El Misti, though ten miles away, we could feel the chill from the heavy snow.

"El Misti is the 'Great Door' of legend," said my missionary friend. "You are now passing through the portal into the Land of the Inca. More than 800 years ago the Inca moved in and took over all existing Indian nations, all the way from Colombia to about what is now Santiago, Chile. Four hundred years later the Spanish Conquistadores marched in and conquered the Inca!"

Later, we moved close alongside invalids standing neck-deep in an open lake of mud at the sulphur-and-iron springs of Yura.

From there on, our brave little engine pulled up gradually to the topmost vertebrae on the backs of the high mountain ridge—from 7,550 feet at Arequipa to 14,665 feet at Crucero Alto, 555 feet higher than Pikes Peak!

"There you have one of the rarest sights in the world," said the missionary, pointing to the first herd of wild vicuñas grazing within a few hundred yards of the train. "When I began my roamin' o' these highlands, there were many more of them. But they slaughtered the beasties for their fur. That's why there's a prohibition on the sale of their skins."

Their yellowish-brown fur shone beautifully in the bright sunlight.

"They're proud in their own right," continued my friend. "They won't associate or cohabit with the other Andean beasties we'll be meetin' up wi' soon. Nor can they be bred in captivity.

"The vicuña, the llama, the alpaca, and guanaco all subsist in these high altitudes, eating only this stubby, dusty vegetation and taking up a bit of sand and pebbles with each mouthful.

"The vicuñas would starve in an alfalfa patch three miles or more down at sea level without their sandpaper diet. Their teeth would grow so fast they could chew no more. In captivity they have to be filed down."

Indian women now began to appear in bright-red shawls and the men with their *mantas*, or ponchos, like striped oriental rugs, with a slit for their heads to pass through. All of them wore their mantles muffled high about their ears against the penetrating cold.

On every tiny mountain station platform was a heap of bags.

"*Coca*," said my mentor. "Like bay leaves. Every Indian you meet is chewing it. It seems to do something for them and little to them. They'll climb 30 miles of mountain without food—on coca. And they'll lie down on the job and refuse to budge, without their dole of coca.

"Ask these mine people who employ Indian help. Part of the contract is to supply them with their daily ration of coca. It doesn't get in its work as a stimulant until they mix a little wood ash with it."

Alpaca Coats—on the Hoof

We crept on, up and up, for another hour, before we came upon herds of alpacas, with their long coats hanging in cascades almost to the ground. These animals furnish a major part of the wool you see Indian women forever spinning and knitting.

A sign at the station announced 13,900 feet.

Wherever the old Inca trail converged near the tracks we came upon caravan after caravan of llamas laden with bags of coca, together with bundles of fagots and twigs, mounds of fungus growth dug from the earth like peat, and sacks of animal dung—all used for fuel.

"There you see the camel of the Andean desert, the llama," said the missionary distastefully. "An irksome beast, an' a rebel, if y' please. He will lie down, if in his opinion the load is too great, or more than 100 pounds. He does not bite, but he spits, leaving a stain an' a stink that never disappear. An herbivorous beast, more or less like a tin-can-eating goat," he added, as we watched the llamas nibbling brown tufts (Plate VI).

"A horse can't stomach that fodder. Every night my mount would be runnin' away down into the valley seekin' honest grass, leavin' me to be rescued by Indians."

The sun was setting like a bronze copper kettle over the Andes when we reached Santa Lucia in the heart of a silver-mining district. The station platform was like a stage set.

The Indian colony had spread a feast. Although we had lately patronized the cafe-diner section of the first-class coach, the mountain air had resharpened our appetites. We piled out, took our places at crude tables, and ate liberally, for about 25 cents, of golden chicken soup, fricasseed fowl, chicken liver and hearts roasted on a spit, corn on the ear, goat cheese, and oranges.

By the time we reached Juliaca, end of the first day's run, I was ready to flop into bed and coddle my ailment. But next morning my mountain sickness had disappeared for good.

Three Lions

After Centuries These Pisac Hanging Gardens Are Still in Use

In the Peruvian high Andes Incas terraced steep mountainsides to make these narrow gardens. Water was brought from long distances by irrigation ditches, often stone-lined, carved in the slope faces. Indians and cattle seem of ant size as they work and browse on the step pastures.

Because of the extreme altitude of more than 12,500 feet, I painstakingly picked my way with leaden feet from the breakfast table to the station square.

No fewer than a hundred Indian women, each with her numerous brood of children at her feet, her wares spread out in a 5-foot circle, made up a streamer of unfurled color on both sides of the curb. They offered everything that could be turned off of their never-idle knitting needles, each article a blaze of chromatic colors with Indian tints thrown in for good measure: gloves, half-fingered mitts, sweaters, shawls, socks, hose, baby garments, and Inca skullcaps with ear tabs, worn by the barefoot Indian men.

We saluted the once-a-week "down" train, bound for Puno, Lake Titicaca, and started out on our second day's journey. We just crawled along, noisily puffing and grinding as we climbed toward the summit more than 1,500 feet higher up.

The scene was ever changing according to Nature's whims and gifts, even to local building materials. Where there was neither stone nor wood, adobe was used. Indian contentment with roofing of leaves and twigs and mud exhibited no envy for corrugated roofs.

The Cradle of the Potato

Ayaviri was another stop-and-eat depot.

"Hereabouts is the cradle of the potato," my mentor informed me. "Maybe you'll see them servin' no less than a dozen varieties."

Living patches of color buzzed around tables set with steaming victuals. One old woman

at the end of the platform was the local counterpart of the soda jerker, milking the family cow directly into a tin cup, at two cents a jerk. I bought the hindquarter of a ewe lamb almost too young to leave its mother—about three pounds, baked barbecue style in corn husks, 6 cents.

We crawled on again, across meadows enclosed with stone fences like those on my Connecticut farm, vainly trying to elude a glistening glacier that chilled us to the bone.

"Watch out for one of Nature's miracles!" called the missionary, pointing to the stream running downhill close to the tracks toward the ascending train. "We've reached the Continental Divide." For the first time in hours we moved along on level ground.

"Look at the river. No flow at all. It is motionless." We went along a little farther and then began to go downhill. The river went with us! "Now! Y'rr same stream! flowin' two ways within a hundred yards! Two ticks ago it was flowin' down one side of the Andes into the Pacific. Now you see it runnin' down the other into the Atlantic!"

With our descent a new scene began to unfold. Glacier and barren wilderness disappeared. Even the drab, dark manta gave place to ponchos with rich stripes of color.

We were entering the granary of the Inca. Bright-red shawls flashed like poppies among the golden fields of wheat. There was a primitive threshing floor at nearly every turn. One or two were active, the ripe grain being winnowed by casting it high in the air.

Eventually we came upon a full-fledged Andean harvest home! Several communities had assembled for the big doings. A 10-acre lot was spread knee-deep with sheaves heavy with ripe grain. All the cattle, burros, and llamas were herded at one end. A gang of beaters, some of them on horseback, stole up behind them with whips.

The crowd made a ring to keep the animals from jumping the fence. A signal was given by the master of ceremonies. A half-dozen Indians began blowing conch horns.

The crowd began to shout. The beaters began whipping the beasts. The animals went wild, and were run round and round, trampling the grain from the husks, until they dropped from exhaustion.

I was sorry to have our geographical fairy tale come to an end early that evening when we arrived at Cuzco, the terminus of this wonder railroad. Mollendo to Cuzco—506 miles scaling the Andes!

Francisco Pizarro and his men invaded Cuzco, then a city of 200,000, after betraying and murdering the Emperor Atahualpa. They found the Temple of the Sun, the palaces and the dwellings of the Inca nobles embellished with gold. They looted them and set upon the ruins their own temples and dwellings. Thus Cuzco, "navel of the universe," became the cornerstone of the Conquest (pages 168, 185).

Within a short distance of the Hotel Ferrocarril, I found myself walking between Incan foundation walls, like no other walls in the world. They were blocks of stone often weighing tons, chosen for their flawless beauty and smoothness, with corners and edges fitted together without mortar so perfectly that water could not seep through or time get a crumbling toehold. By contrast, the superimposed Spanish stucco structures seemed puny and transitory.

I just wandered about. Sooner or later I always found myself back again in the perfect Plaza de Armas of that most consistent Spanish colonial town on the continent. Of all I viewed from under each lovely arch, I rank the *portales* of Cuzco's vast quadrangle among the most esthetically satisfying in the world (Plate VII).

It was the same with the Monastery of Santo Domingo, imposed on the striking walls (page 168). The Christian church looked almost fragile resting on the sturdy shoulders of the pagan Temple of the Sun. Within this monastery are preserved the finest remains of the Inca Empire.

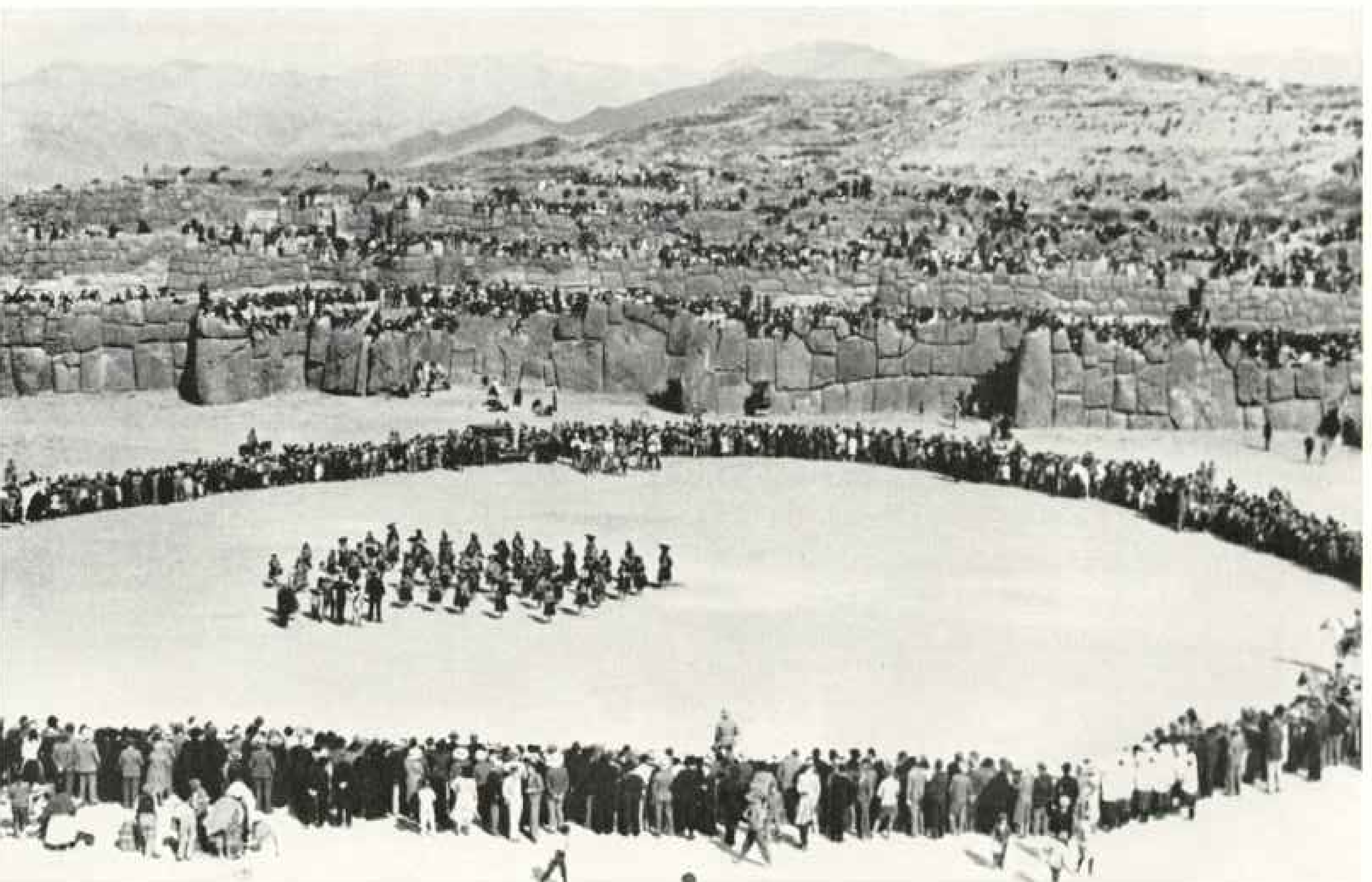
A Village of Superlative Charm

On a hill overlooking the tiled roofs and Spanish patioed city stands Sacsahuaman. Engineers have come from the ends of the earth to study this fortress set up to protect Cuzco. Three gigantic tiers of symmetrical zigzag walls cornered with granite blocks some 12 feet thick and 20 feet high, form a three-layer stronghold more than a half mile in length (page 184 and Plate I).

My pet attraction was the result of a Sunday interlude, when I played hooky on Cuzco and visited Pisac, the village that delighted me beyond any other (Plates XV and XVI).

Shortly after leaving Cuzco, my Indian driver found the river road, and we struck out between corrugated hills serenely covering the landscape like folds of Venetian velvet. Wild flowers carpeted the sides of the road. Inca ruins crowned every prominent hill.

Each Quichua village had its fine-lined colonial church with a sweet-toned bell summoning its ornamental congregation. Farmers were plowing, their oxen drawing a wooden tooth through the soil, just as their ancestors did a thousand years ago. Caravans of wood-bearing llamas were forever barring the right of way as if they owned it.



V. L. Amis

Indians Dance on the Esplanade at Sacsahuaman Fortress as Their Ancestors Did

The three tiers of walls, made of gigantic boulders carefully fitted together, provide a grandstand for spectators. This vast pre-Inca stronghold on the hills above Cuzco is more than a half mile long (page 183 and Color Plate I).

Julius Rosher from Three Lions

Against Inca-terraced Hillsides an Airplane Seems Out of Place

Indian women trot to market carrying corn in the blankets on their backs unmindful of the winged transport which has invaded Cuzco's calm. The airport lies outside the ancient town, cradled in the mountains 11,440 feet above sea level.

V. L. Amils

These Bobbing Bundles of Reeds Seem to Have Sprouted Legs

Bodies of the Indian carriers are concealed by huge loads of reeds cut from a small Andean lake. More than a hundred persons were jog-trotting homeward in this odd procession near Oropesa. These reeds, called *lomillo*, serve after wetting as a substitute for rope. At Lake Titicaca boats and sails are made by tying together bunches of the reeds.

An hour's ride brought me to the bridge that crossed the river into Pisac. The village itself was just another Indian community. The market place was a spacious churchyard, shaded by two enormous spreading *pisonay* trees, their branches ablaze with bright-red blossoms. The church was a very ancient tumble-down house of God, quadrangular in form, with a portal on the side facing the market, topped by a rickety cupola supporting many bells.

The merchants were all women. Save for a few booths, they had squatted themselves in long rows with alleyways in between, spreading their wares at their feet.

The women's ubiquitous red shawls gave the keynote. They wore them sashwise as a carrier for vegetables, flowers, wood, or other merchandise bought and sold, and with usually a baby half concealed in their depths. Ornaments of silver tinkled around their necks and wrists. Their faces were shaded by wide felt *monteras*, or pancake hats, the brim faced with red and gold and fastened with a ribbon under their chins.

Many womenfolk had further ornamented their gay bonnets with fresh flowers. They all wore many skirts of orange, yellow, red, and purple, edged with contrasting colors.

The men were as brightly plumaged as the women. Their ear-tabbed hoods were knitted in a potpourri of color. Their mantas were as gay as striped oriental rugs. Their short breeches left their legs bare down to sandals fashioned from strips of automobile tires.

Sunday—Day for Mass and Market

Sunday in Pisac is not only market day and fiesta, but holy mass day as well. The rites begin with the violent ringing of the many bells by two Indian small-boy custodians dancing around on the roof.

Instantly the market begins to break up. Many of the menfolk pause at the fountain near the church door to wash their hands and feet, as do faithful Mohammedans about to enter a mosque.

One of the most pictorial features is the two lines of mayors of near-by communities, standing on either side of the portal like a guard royal. They are distinguished from other worshipers by their long cloaks. Each mayor carries a thick staff encrusted with silver, and has a big conch-shell horn swung around his neck. At a signal they file in (Plate XIV).

I followed them, half blinded for a moment

by the brilliantly lighted altar, and stumbling over squatting and kneeling Indians, their babies, small children, and dogs fairly covering the dirt floor of the church. The service began with the playing of the organ.

I made out two Indian boys pumping away at a couple of huge bellows such as I have seen blowing a blacksmith forge. The organ was a 16th-century museum piece, with square graduated wooden pipes. A young man with a dark, sensitive face played Gounod's Sacred Heart Mass with closed eyes, save when the waning wind caused his instrument to wheeze. Then he signaled to the sweating pumpers to give him more air.

Betweenwhiles, a tall gray-haired gentleman with the air of a grandee intoned the choral parts of the service, reading from a huge hand-illuminated missal. The thin quavering voice of the priest filled in the intervals, chanting the Office of the Mass. The grandest moment of all was at the Elevation of the Host: the custodians rang the bells in the cupola, the altar boys tinkled the sanctuary bells, the Indians prostrated themselves.

The climax came with the mayors raising their conch horns and blowing them with all their might!

One morning before daybreak I boarded the *autocarril*, a "chartered private train" consisting of a Diesel-driven automobile mounted on a narrow-gauge railway, which was to carry me from Cuzco to Machu Picchu.

There I found Dr. Osgood Hardy, his wife, and a couple of college students. Dr. Hardy was going back to the spot where he had spent several years with the National Geographic Society-Yale University Peruvian Expeditions sent to explore Inca civilization.*

Into the Heart of Incaland

Our little armchair chariot went scuttling off into the dawn on one of the most scenic journeys in the world, ducking under a viaduct of the Inca, then cutting like a rocket through the retreating shadows of night, plunging ahead into the heart of Incaland.

We went screeching through cuts, along the edges of precipices, our siren warning donkey pack trains and llamas laden with firewood and grass to vacate our right of way. The track walker peered from under his straw tepee and regarded us sleepily, having no record of our special train. For a couple of minutes a horseman galloped along beside us, his colored poncho flying picturesquely in the wind. A dozen stacks of cornstalks with human legs stepped off the track to let us pass.

As the sun rose above the mountain, we dipped down into a broad valley, the hillsides all gold, green, and purple with rippling wheat and barley and newly plowed fields. Husked corn was spread out to dry over hundreds of square yards, for this was their April autumn.

At length we entered a dark canyon, with just enough space for our railroad and the Urubamba River to squeeze through.

The little stream boils and roars as if with anger at thus being crowded. The rock walls rise nearly 2,000 feet above and lean slightly forward, almost shutting out the light. The sun suddenly broke through the threatening clouds like a lighted lantern raised to the window of a darkened room.

We soon began to see and feel the effects of dropping down to 8,000 feet. Cactus reminded us that we were still in arid Peru and on the edge of the Tropics.

It was not yet 7 o'clock when our tiny express pulled to one side and halted on a switch. It seemed ages since we had left Cuzco. We had covered so much ground geographically and historically. In less than three hours we had skimmed over the threshold of a civilization established for centuries and then destroyed overnight 400 years ago.

We had arrived at Ollantaitambo, the village where the expedition had been stationed years before. We walked a mile or so along a crumbling wall before we found the house that Hardy helped rebuild from the ruins of a colonial mansion.

The tenants were hospitable and remembered Dr. Hardy. They chatted together for some time while we stood around in the patio; children, chickens, donkey, pigs, and other members of the family paused in their daily routine to look on and listen.

We then climbed up nearly 2,000 feet to the summit of a ridge crowned by impressive remains. Here had once stood the strategic outpost guarding against enemy advances on Cuzco through the narrow Urubamba Valley.

The summit and slopes were chiseled with square openings like portholes built, as usual, of faultless blocks of granite. It was an awe-inspiring military work, yet lacking in that esthetic beauty of those battlements and sentry boxes of Old Spain which we had glimpsed from the railway less than an hour before.

I pushed on alone, across the flower-carpeted quiet valley into the village. I had to pick my way among Inca ruins. At one point an irrigation groove was chiseled through a wall of rock, and two mangy dogs drank water that was still trickling into a shapely bathing pool.

* For detailed reports of the National Geographic Society-Yale University Peruvian Expeditions, see the NATIONAL GEOGRAPHIC MAGAZINE for April, 1912; April, 1913; February, 1915, and May, 1916.

A little farther on stood a lovely colonial church in the last stages of decay. The gateway in the crumbling wall was barred by a fallen tree so that the donkey in the churchyard might graze undisturbed amongst the graves of forgotten Conquistadores.

I stood there alone amidst the ruined remains of two mighty empires—that of the Golden Inca on the one side, and that of a once almighty and glorious Spain on the other. In like manner, since the beginning, one conquering nation after another had advanced up this valley, in the end only to be conquered and overrun by Nature's jungle forces and ground to powder by the artillery of Time.

On this lovely Sunday morning, triumphant Nature was once again looking down serenely over this once-populous green valley, with its many unsightly pigpens and cow yards and with but a handful of the conquering races, now mixed and going to seed.

It was a sobering experience.

We piled back into our train just in time to go plunging through a tropical downpour.

Several hours later we reached a point on the narrow-gauge railroad that runs from Cuzco. There we transferred to a waiting motorcar which took us skidding a few miles along a muddy trail to where a tiny suspension bridge spanned the river.

We had at last arrived at the foot of the precipitous mountain trail leading up the steeps of Machu Picchu on the very top of which was that lost Inca city and stronghold that remained undiscovered, even by the indefatigable gold-hunting Conquistadores.

Only Half a Mile—Straight Up!

We found horses waiting in the rain to carry us up, but not enough for all. I elected to walk up.

During a lifetime filled with adventure, I have made many ascents all over the world. This scramble up the dizzy heights of Machu Picchu was the toughest of them all.

"It is only 2,000 feet up," I was told.

Sure. Only a half mile, straight up. But it turned out to be more than four miles by zigzag, climbing at the sharpest angle at which any creature short of a housefly could keep on his feet.

But that was only half of it. I carried impedimenta: an overnight sack, a heavy camera in a case, winter-weight clothes against the initial cold, topped by an overcoat that was soon waterlogged and clung to me like a giant leech, impeding every step of the way.

The rain was the greatest impediment of all. The drops were like pointed icicles that cut my face and half blinded me and took away the little breath that was left me. The narrow burro trail was obliterated by the downpour and provided an excellent sluiceway.

"No wonder the Spaniards never found Machu Picchu!" I kept repeating.

I have little recollection of arriving at the summit.

A commodious shelter house for the accommodation of travelers had been provided by the Government, including fireplaces.

With morning came sunshine.

The mists were rolling upward like a stage curtain.

The grandest city of the Inca lay in its entirety high above the lodge. It was reached and explored by well-preserved staircases all over the place—some 3,000 in all!

Every step of the way was embellished with objects of supreme interest: remains of dwellings, palaces, and temples; broad plazas, burial and parade grounds; shrines, mystic markers, baths, and fountains.

Every section of the titanic walls was designed as a functioning part of a fortress, the whole forming a community of a thousand terraces. It was a giant penthouse in the clouds with setbacks that overlooked appalling abysses and breath-taking vistas.

For hours I wandered through the vast labyrinth of stone halls, terraces, plazas, and streets.

Finally, I found myself quite alone on earth. No living familiar sight or sound was near or in prospect. I was looking down on the white ruins of a granite city, its history sealed in mystery. Far below, the pygmy river trickled in silence.

Surrounding mountainsides were terraced by hundreds of ghostly "farms," their soil brought from distant fertile valleys and watered by miracles of irrigation.*

Mount Huayna Picchu towered beside me across the abyss, scaled, heaven knows how, by the Incas' lookouts!

Without realizing it, I had climbed to the highest point of this dead metropolis, ensepulchred on the pinnacle of an almost inaccessible mountain. My seat was the Clock of the Sun, the Torreón of the Inca capital.

I was sitting on the top of the world, with clouds brushing my face, with some understanding of the meaning of Shangri-la.

Figuratively and literally, I had reached the peak of Incaland. My quest and inquiry could go no farther, ascend no higher.

My panoramic Peruvian pilgrimage had come to a distinguished end.

* See "Staircase Farms of the Ancients" (Peruvians), by O. F. Cook, National Geographic Magazine, May, 1916.

© National Geographic Society

Kodachrome by Kuhne, Metrotonews

Bright Skirts and Capes Are Warm and Gay

Two Indian mothers and their children pause by the roadside on the way to the famous market of Huancayo, nearly 11,000 feet up in the Andes. Bitter mountain winds call for heavy, full-length garments. Outer skirts are of brilliant flannel and hide several petticoats. The number and quality of her skirts denote a woman's social rank. Besides a puppy, one mother carries a spindle for spinning llama-wool as she walks.

© National Geographic Society

Chuncho Indians in Woolen Capes Resemble Shrouded Fates

They live along Peru's Perené River on the edge of the tropical Amazon jungle. The dark beads are berries.

Kodachrome by Kühne, Moviemons

Togalike Robe and Headpiece Recall the Dress of Classic Rome

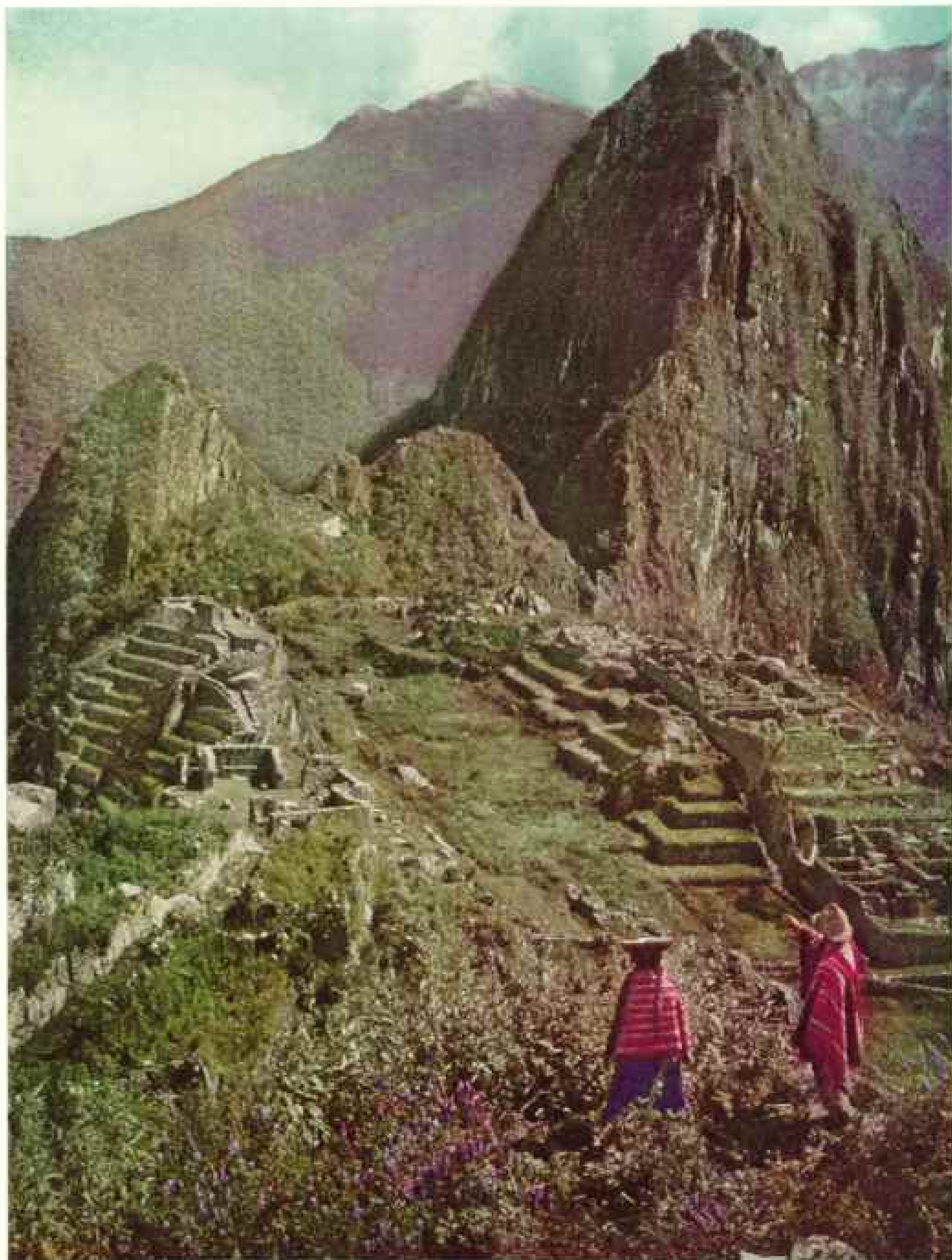
The crownless straw hat is hand colored. Living in a moist land of bananas, melons, and mangoes, this Chuncho Indian works on a coffee plantation.

© National Geographic Society

Finlay by Henry Clay Gipson

Native Dancers Display Fantastic Costumes against a Background of Puno and Lake Titicaca

Indian and Spanish motifs both are evident in the gaudy nightmare garb of the beastlike figures and of the man in appliquéd maroon knickers and jacket. Four Indians play small wooden Panpipes. The Indians of Puno are of two distinct groups, each speaking a different language. Intermarriage between the two tribes is rare. At Puno, 12,540 feet above sea level, travelers may shift from train to steamers plying big Lake Titicaca.



© National Geographic Society

Finlay by Henry Clay Gipson

Higher Peaks of the Andes Tower above Mountain-top Machu Picchu, Long-lost Citadel of the Incas

A joint expedition of the National Geographic Society and Yale University, under the leadership of Hiram Bingham, uncovered the fortress-city in 1912-1915. Machu Picchu probably was built as a border stronghold to guard the Inca Empire from invasion by forest tribes from the east. Lush vegetation must continually be cleared from the site. Despite ages of crumbling and erosion, much of the forgotten city remains, including skillfully hewn walls, steplike terraces that once were vegetable gardens, and a temple with a remarkable stone sundial (left).

Huancayo Streets Are Bargain Counters Every Sunday

As many as seven thousand Indians troop into town to trade skeins of dyed wool, rugs, blankets, pigs, leather goods, hides, dolls, llamas, pottery, and silverware. Preferred payment is in coca leaves, which they chew for the cocaine.

© National Geographic Society

Kodachromes by Kuhne, Moriaianos

"We Will Sell You Anything—except the Little One"

At the railroad station in Juliaca, Indians display fine rugs, blankets, and gloves of vicuña wool.

© National Geographic Society

Kodachrome by Kühne, [illegible]

Mayors of Neighboring Villages Come to Dignify the Sunday Fair at Pisac

Their staffs of office are inlaid with silver bands. They carry weird-sounding conch-shell horns, which they occasionally blow even during church service. Peruvian Indians wear distinctive ponchos, which indicate their home region.

© National Geographic Society

Kodachrome by Kühne, Merchant

Excited Indians, Talking and Eating Constantly, Make a Big Business of Trade in Pisac Market

Sunday is no day of rest for Peruvian Indians. Into it they crowd churchgoing, marketing, dancing, gossiping, adjustment of inter-village politics, and love affairs.

© National Geographic Society

Photo by Henry Clay Gipson

Massive Stonework of Pisac Overlooks the Rushing Urubamba River

Archeologists believe that Pisac, near Cuzco, was the seat of a proud Inca noble. Like gray sugar cubes, most of the carefully worked ancient stones still lie in place after centuries of attack by man and weather. Modern life in Peru has developed chiefly in the valleys, but the ancient peoples—apparently for safety—crowned the hilltops with their forts and homes. With painstaking labor they terraced the slopes to make narrow irrigated gardens.

Busy Corner—the Cape of Good Hope

Ships Bound for Faraway Battlegrounds Stream Past Capetown, "Tavern of the Seas," and Other Ports of Virile South Africa

By W. Robert Moore

Allied war strategy has rediscovered the sea route around the Cape of Good Hope. Not that it was lost, but today, with the Mediterranean blocked, it is in greater use than at any time since Bartholomew Diaz rounded the Cape and Vasco da Gama pioneered this path to India.*

Ships and more ships cleave the Cape waters in an ever-growing procession. They move men and munitions to battlegrounds in the Middle East, Asia, or Australia and carry raw materials back to British and American arsenals (map, page 203).

Capetown, the "Tavern of the Seas," is as busy as a hotel in wartime Washington, D. C. So, too, are other South African ports serving as vital centers for provisioning and repair.

Capetown Born in a Cabbage Patch

Catering to ships is an old story to Capetown. It was born in a cabbage patch for just that purpose.

In 1652 Jan van Riebeek, a surgeon in the Dutch East India Company, brought a small colony of settlers down here to grow vegetables for scurvy-harried crews of the tiny sailing vessels making the long voyage to the fabulous Orient (Plate III).

For a century and a half following Da Gama's discovery, Portuguese, English, and Dutch ships had paused here for water and to barter with the natives for cattle. Van Riebeek thus fulfilled the need for a permanent victualing center when he planted his first gardens at the base of Table Mountain, in what is now the very center of Capetown.

A single troop-carrying *Queen Mary*, however, would have stripped his modest gardens, depleted his livestock, and still gone away hungry. But today extensive countryside gardens, fishing fleets, and meat producers provide mountainous piles of foodstuffs for the fleets of dirty gray vessels that come and go.

As a sign of the times, I saw a large vineyard that has given up making luxury wines, tossed away its vines, and is now growing army-needed potatoes. Elsewhere, canning plants are busy tinning vegetables and fruits for the boys "up north" in Libia and Egypt.

Wheatfields seasonally wave green or gold on the Cape Province landscape, but to save the precious grain all South Africa eats its "standard loaf" of black bread. The Union is not risking a wheat shortage while shipping space is urgently needed for war supplies.

Though South Africa has a white population of only a little more than two million and had no armament factories until war came, its contribution to the United Nations' cause has been significant.

Within six months after war was declared, howitzers, armored cars, and other munitions were being made in an odd assortment of factories. Mine and railway workshops turned to making guns and bombs. Fortunately, South Africa already had a steel mill and abundant electrical power that could be turned to war production.

In this mobilization of industry a soda factory, for instance, with wide floor space, was made into an assembly plant. A company which specialized in making "tin hats" for miners is now stamping out helmets for soldiers at the front. A match factory produces steel-working lathes. Neon sign makers have turned their hands to fashioning spirit levels.

The Union through its own efforts has provided its volunteer army of more than 163,000 with uniforms, rifles, ammunition, armored cars, and other field equipment. Airplanes and automobile engines are about the only essential items coming from abroad.

"Fairest Cape" Drake Ever Saw

What of the approach to this southern end of Africa?

"This Cape is a most stately thing, and the fairest Cape we saw in the whole circumference of the earth," wrote Sir Francis Drake three and a half centuries ago (Plate II).

After an anxious month out of New York on board a freighter of the American South African Line, any port would have seemed good. But when Table Mountain resolved itself from the haze and loomed higher and higher above the notorious Cape rollers, we knew Drake's feeling. A "stately thing" indeed is this sheer, 3,550-foot, flat-topped bulwark with its flanking Twelve Apostles and other peaks forming Cape Peninsula (pages 204-5, and 207).

* See "Pathfinder of the East" (Vasco da Gama), National Geographic Magazine, November, 1927.

Staff Photographer W. Robert Moore

Careful, Jockey! Don't Bite Your Tongue Too Hard!

The manager of an Oudtshoorn ostrich farm arranged an ostrich derby for the author to photograph. However, with the riders unable to guide them, the birds all dashed off in different directions. This young cock ostrich is about two years old (page 221). Recently, ostrich skin has become popular for making shoes, handbags, and souvenirs.

Dusk darkened the mountain backdrop before Capetown pilots finished guiding us through a curving, mine-protected channel into Table Bay.

We anchored in a full blackout. Dark blobs, indicating boats, lay about us. Over a muffled radio we heard news announcing a ship sinking by a raider on the sea path over which we had just come. Ashore, massed lights of the "Tavern" shone brightly.

Next morning we awoke to find a sou'easter spreading a spectacular cloud tablecloth atop Table Mountain. As the edge of the cloth dipped over the cliff, it whipped in the breeze, frayed, and was blown to oblivion. Napkins of cloud came and went about the top of Devil's Peak. When the wind sent clouds hurtling far down the cliff face we conjured a waterfall in full flood.

But Customs soon put an end to our whimsey, and shortly afterward a careering taxi whirled us from the closely guarded dock gates into crowded Adderley Street, Capetown's main thoroughfare.

Solemn Reminder That This Is War

Hardly had we gone a block when the driver came to an abrupt halt. Other cars stopped. Bicyclists dismounted and pedestrians drew to attention. Every man—white, Malay, and black—bared his head.

"It's our noonday pause," our chauffeur hastily informed us.

Across the city, suddenly grown still, came the bugled notes of "The Last Post." Every day at 12 o'clock, wartime Capetown observes a two-minute silence as it

Staff Photographer B. Anthony Stewart

Early Cape Dutch Architecture Invades Washington, D. C.

This building, with its characteristic gables and half-shuttered windows, serves as the Chancery Annex to the Legation of the Union of South Africa on Massachusetts Avenue. The Minister, Mr. Ralph William Close, stands in the center with several members of the Legation staff.

did also during World War I. Business then resumes its tempo (page 200).

Could Van Riebeek look up Adderley Street today from the position of his statue near the water front, he would blink his eyes in unbelief. The whole amphitheater within the confines of Devil's Peak, Table Mountain, and Lion's Head is chockablock with buildings. Tall insurance offices, shops, a new 14-story post office, and big City Hall flank an open parade where he built his first flimsy fort.

There would be no muddy truck garden in sight, for—shades of his pioneer compatriots! —gardeners are now growing flowers where the colonists sweated hoeing vegetables.

"What? There's a botanical garden out at Kirstenbosch where we grubbed out new fields while keeping watch against hostile natives and marauding wild beasts?" one in fancy can almost hear him exclaim.

"And there's a score of suburban districts about the Peninsula? Three hundred and forty-four thousand people? Impossible!"

Yes, Capetown, with its restaurants, motion-picture houses, fine homes, double-decked trams, and buses, has progressed far since men lived here in crude shelters and ate roasted baboons and hippopotamus meat.

There has also been a striking change in postal facilities. Once its "post boxes" were rough slabs of rock above the beaches. In the 16th and 17th centuries, sea captains who put in here would tuck letters under the rocks and hope that some homeward-bound skipper would take the messages back to Europe.

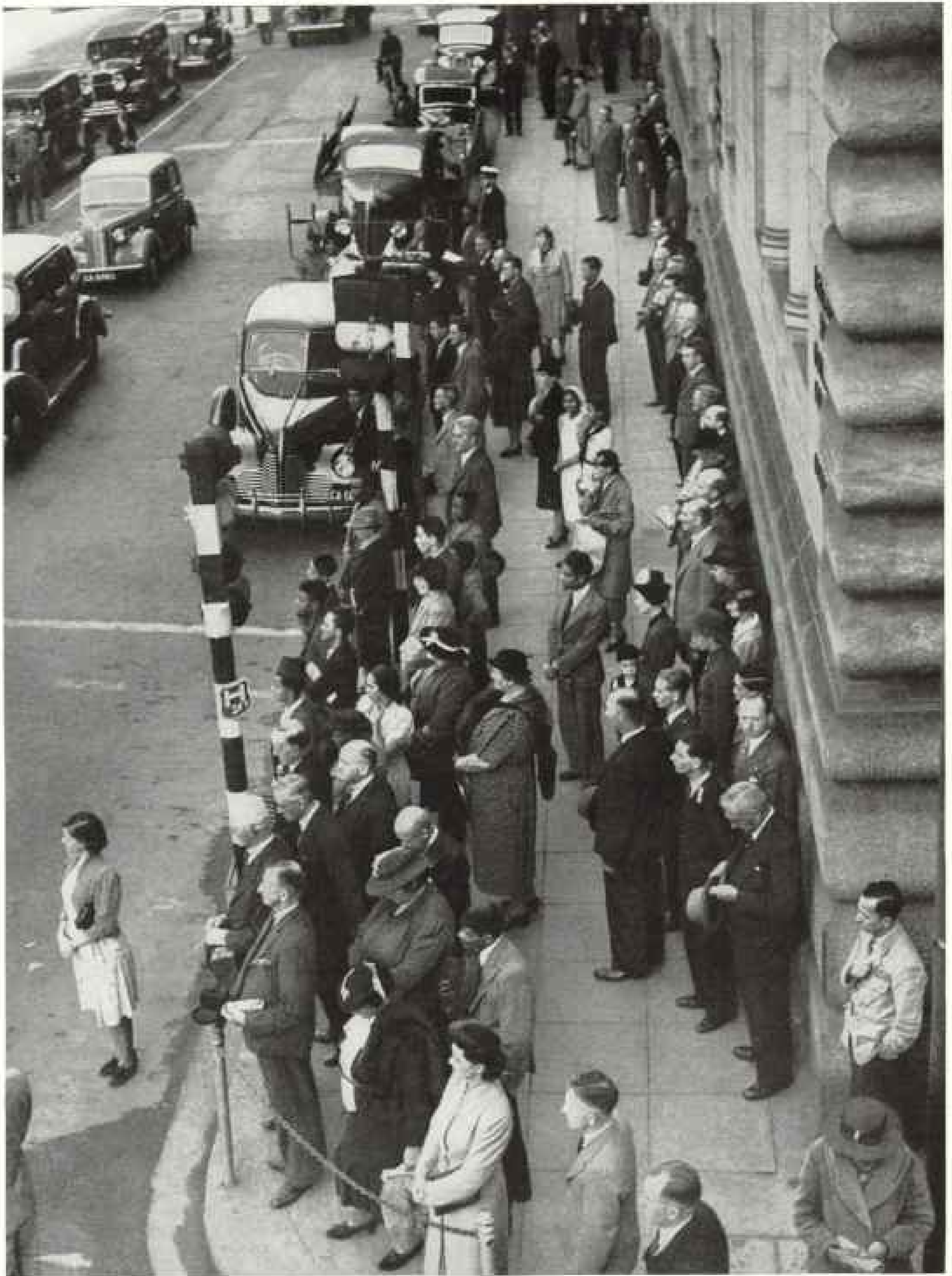
"Heare Under Looke for Letters"

In one of the walls inside the huge granite postal building that Capetown has just completed has been set one of these slabs. Upon it are gouged two crude inscriptions, dated 1622 and 1629, together with the names of masters and vessels and the words "Heare Under Looke for Letters."

Besides its quick lesson in history, the old stone should remind hurrying patrons to be less impatient toward perspiring clerks who now handle the city's weekly mail bag of some 2,500,000 letters and 30,000 parcels.

On the street you see an unusual conglomeration of races. Here are descendants of the British and Dutch who have created this bilingual land. Here are black natives and Cape colored. Here, too, are many red-fezzed Malay men and their veiled womenfolk.

At the corner near the House of Assembly



British Combine

At Midday, Wartime Capetown Observes a Two-minute Pause

Throughout the city, as here on Adderley Street, the main thoroughfare, all vehicular and pedestrian traffic comes to a halt. During World War I South Africa was the first country to observe this daily period of silence, broken only by the bugled notes of "The Last Post" (page 198).

(the Union's House of Parliament), a turbaned Indian snake charmer usually sits entertaining office workers during the noon hour. Others of his kinsmen work in hotels.

Over half of the city's population, however, is of European extraction. You hear them speaking English and Afrikaans. Shop signs and markers on parking places, as well as official papers, are in both languages.

Colorful and numerous are the Malay people. Muezzins daily call more than 30,000 of the faithful to prayer from 30-odd mosques in the city.

The first Malays were brought here in 1652, the year of the settlement of the Cape. Others came from time to time as slaves or as exiles.

In early days the Malays were servants to the Dutch officials. Now they are coopers, tailors, and gardeners (Plate VIII).

When I asked a cabby one night if he was a Malay, I got the reply: "No, I'm a Christian." Later I learned that the term "Malay" has become synonymous with "Moslem," because most of the people have maintained a religious link with Mecca through pilgrimages there. They have also acquired considerable Arab blood.

With Dr. I. D. du Plessis, lecturer in Netherlands and Afrikaans literature at the University of Capetown, I visited some of the mosques and talked with their sheiks, one of whom had spent eight years in Mecca.

We also attended a ceremony in which Malay men sawed at their arms with sharp swords and jabbed skewers into their flesh while an orchestra tom-tommed excitedly. We missed one of the most brilliant of the city's sights, a Malay wedding, since the people were preparing to enter the month-long fast of Ramadan.

Dr. du Plessis became interested in the Malays through his research in old Dutch folk songs. Curiously enough, the Malays, losing their own language and close contact with their homeland, acquired much lore and many folk tunes from the early Dutch settlers. And today, at songfests, weddings, and even for the radio, these musical people sing old Dutch songs in their original form!

Malays Sing of the *Alabama*

One song intrigued me, as well it might. Imagine Malays singing "Daar kom die *Alabama*" (There comes the *Alabama*)!

"It's about the Confederate cruiser *Alabama*. You might call it the *Emden* of your Civil War," explained Dr. du Plessis. "The Malays of the day were much impressed when that famous raider, built in England, chased the Federal *Sea Bride* under full sail toward Capetown. The *Sea Bride* was captured before she could make port, and thousands sat on Signal Hill to watch the prize of war being towed into Table Bay."

The *Alabama* operated around the Cape twice during her two adventurous years of raiding. She ranged from the Atlantic to the China Sea to take toll of more than sixty ships.

"This is not our only American contact," added the doctor. "The American-educated South African Negro minister, Dr. Francis Gow, has trained our colored folk to sing Negro songs of the United States. We hear them at concerts, choral competitions, and at the serenades during the 'Coons' Carnival.'"

At New Year's time a carnival board of the Cape Coons arranges a gay, gaudy celebration for the Capetown colored people. Clad in fantastic costumes, they strut, dance, and make merry in street processions, an official ball, and serenading parties. It's like a Rio de Janeiro carnival in miniature.*

Among the groups you'll find those who call themselves by such names as the "Radio City Coons" and the "Blues Minstrels!"

And don't be surprised, as I was, to see colored folk put on blackface minstrel acts, with faces sooted and lips painted white, and with such songs as "Old Folks at Home," "Old Black Joe," and "Ol' Man River!"

Cape of Storms Becomes Good Hope

During the Cape's upside-down winter months of June, July, and August I looked askance at a publicity slogan, "See Sunny South Africa." Torrents of wind-whipped rain deluged the Peninsula. It was the worst season in living memory.

Surely Bartholomew Diaz had no windier or wetter time when he discovered it in 1488 and called it Cape of Storms. I said as much to a friend one water-soaked evening in late August. With heroic pose he declaimed in the words of King John II of Portugal, "No, rather let it be called Cape of Good Hope!"

Next morning Good Hope it was. During the night the clouds had been whisked away; the sun shone gloriously in an intense blue sky. There was a Neapolitan softness in the air. Springtime was returning.

After a few cautious retreats, it came in full conquest. Flowers began to peep from rock crannies and spread on the hillsides (Plate V). Gold and white daisies started nodding to lavender mesembryanthemums. Acacias flaunted their massed yellow branches at the Cape's popular white "chinkerinchee." Pincushion, yellow, and platter-sized red pro-

* See "Rio Panorama," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, September, 1939.

Staff Photographer W. Robert Moore

It Looks Like Grandmother's Pincushion; Hence Its Name

This red pincushion (*Leucospermum nutans*) belongs to the Protea family, of which there are many different species in the coastal areas of South Africa. Some blooms are as large as a plate. So characteristic of the Cape flora are proteas that they are considered the national flower of the Union.

teas (the South African Union's national flower) added color to the scene.

One week end we hurried northward up the west coast through the green wheatfields of Malmesbury and the orange and naartje (tangerine) groves of Citrusdal. On the mountain range to the east, snow still whitened the high peaks. Driving on past Clanwilliam and Van Rhynsdorp toward Springbok, we came to the heart of Namaqua Land.

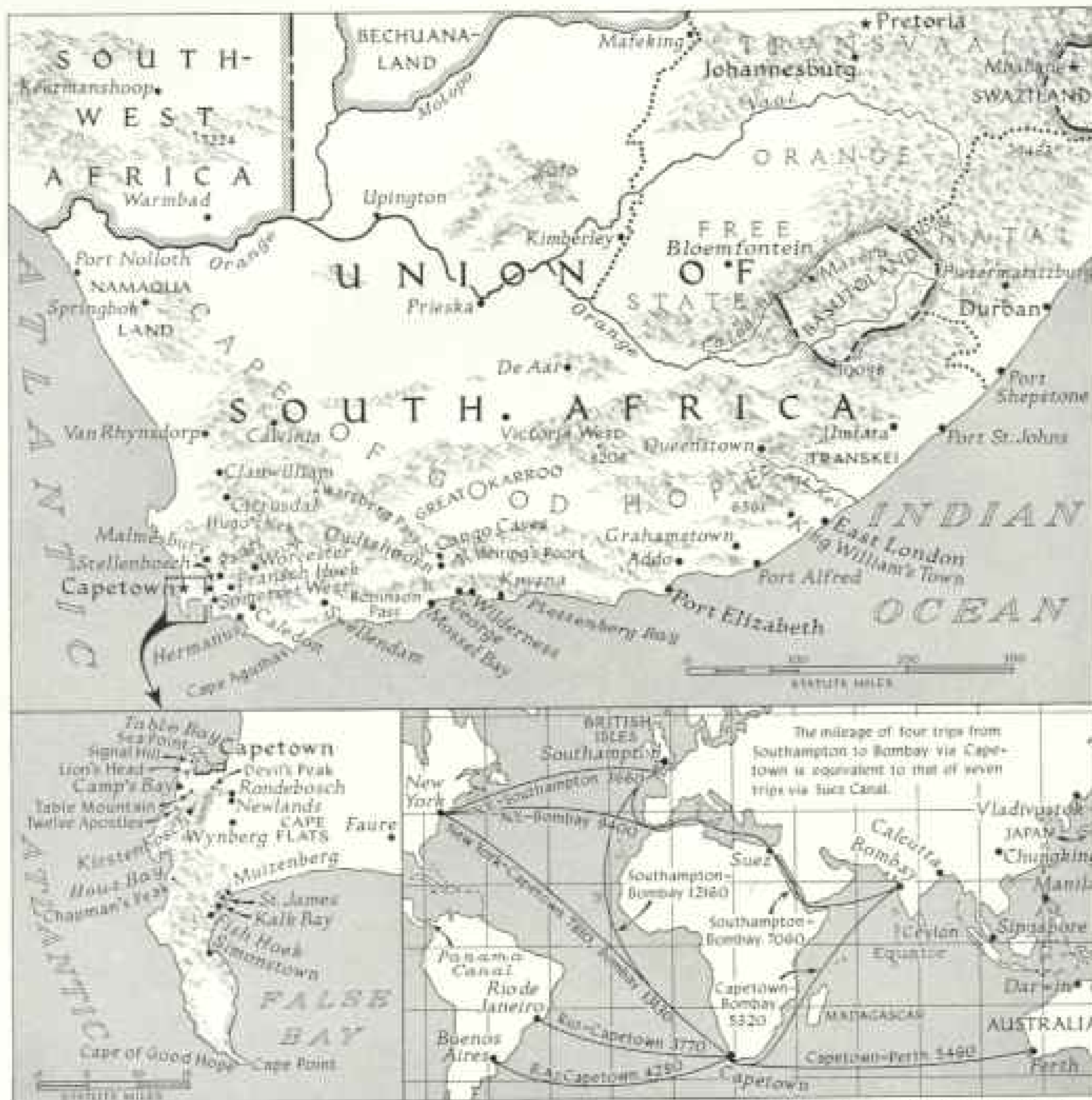
Flowers Turn Desert to Paradise

Eleven months of the year Namaqua Land is a desert. Sometimes for years it lies almost barren. Here sheepherders and a few villagers eke out a slender living. Only rarely is there more than a pitifully small rainfall.

But when adequate rains come, as they did in 1941, the desert lands become a floral paradise. Millions of annuals spring seemingly from nowhere.

We drove mile after mile along roads flanked by dazzling lavender mesembryanthemums and Namaqua Land daisies. Hillsides and vast acres of farmland were solid carpets of color.

The varieties were legion. Gold and orange daisies predominated, though many places were covered with patches of white, blue, bright red, or big flat creamy blossoms keeping their faces always toward the sun.



Drawn by H. E. Eastwood and D. G. Bonns

A Procession of Ships Bound for War Theaters Steams Around Cape of Good Hope

With the Mediterranean blocked, supplies to the war fronts in the Middle East, India, and Australia now travel this long route around Africa. Capetown and Durban are important provisioning centers. From industrial Port Elizabeth's busy factories come armored cars, tires, shoes, and other war necessities.

Other areas were carpeted with little yellow button-shaped *Cotulas* or masses of bright blue *Heliophila*, often miscalled "flax" but actually a member of the cabbage family.

In seemingly almost barren places we found numerous stone plants, some so tiny as to be nearly invisible against the white quartz gravel. Succulents grew lush and green everywhere. From some thick green leaves we could squeeze streams of water.

Capetownians who do not have the opportunity to see this rare spectacular display still can look at dozens of varieties and species of the Namaqua Land flowers brought to the botanical gardens at Kirstenbosch.

Back in Capetown again, I went out to explore the suburban districts and to make the eye-thrilling drive around the mountainous Peninsula.

But first there's Table Mountain, whence you can get a bird's-eye view of the whole countryside. If you like mountain climbing, you can assault the vertical cliff in a forthright manner. In fact, there are numerous routes up to the top, ranging from a lively scramble to decidedly perilous rock climbing. Or you can go, as I did, by aerial cable car. It's easier!

From a high slope above the town the cable car whisks the earth from beneath your feet.

From High in the Air the Camera Captures all of Cape Peninsula

Capetown sprawls in the amphitheater about which rises Devil's Peak (left), flat-topped Table Mountain, and pointed Lion's Head. The extension of the city around the "lion's" crouched body which faces the Atlantic breakers is residential Sea Point. Large suburban towns lie on the Peninsula's neck at left. The white spot at the right edge of Table Mountain and the one below it are the aerial cableway terminals.

L. Kraft

Vasco da Gama, Pioneer of the Route Around the Cape, Would Have Admired this View

Cape of Good Hope, with its farthest finger of land, Cape Point, is 30 miles beyond Capetown. The warm Agulhas Current from the Indian Ocean sweeps into False Bay on the left, making the beach a popular resort. On the other side of the Peninsula (right) Atlantic waters are cold even in summer. The twisting white line seen above the scalloping bays is Marine Drive.

© Bertram F. Jearey

Elephants in Addo National Park Favor Overproduction of Oranges!

Big wild beasts emerge from the forest in the evening to eat their fill of the fruit dumped for them. Because of war restrictions on shipping, South African citrus growers have small outlet for their produce. Quantities of oranges are distributed free to the poorer natives.

You go up, up, up, swinging close toward the vertical barrier. Your ears crackle and the air grows cooler. Capetown spreads and flattens itself about its arc of broad bay. Lion's Head, with Signal Hill forming the rump, sprawls below like a crouching beast.

Here is a fantastic view rivaled only by the harbor of Rio de Janeiro. Rio's Sugar Loaf and Corcovado are like great granite monoliths; Table Mountain, more lofty than either, looks as if titans had fitted together enormous blocks of rock to form a gigantic wall.

Once the car has boosted you to the top of this 3,550-foot observation platform—or did you walk?—you are amid a chaos of weathered boulders, out of whose crannies sprout a few bushes and delicate flowers.

Looking southward you see a succession of scalloping bays, glistening beaches, and a row of peaks that terminate at Cape Point, nearly thirty miles away.

Looking northward beyond Capetown, as you descend again, you can see banks of blue mountains. They are the barriers to the hinterland plateau.

Early Cape Dutch, in their mind's eye, saw peace and prosperity beyond these mountains. There would be no bothersome British there! Thus began the Great Trek in 1836.

Stout burghers with even stouter hearts packed possessions and families in their big lumbering ox wagons and headed inland, as had some of their kinsmen in the 1700's in protest against the Dutch East India Company officials. Between 7,000 and 10,000 persons from all parts of the Cape joined in the trek, which eventually took them to the Transvaal, the Orange Free State, and Natal.

Rhodes Saw from Cape to Cairo

Another man, still later, saw even farther—from the Cape all the way to Cairo! He visualized a chain of British possessions from one end of the continent to the other.

J. F. de Smidt

An Aerial Cable Car Mounts the Dizzy Heights of Table Mountain

From the 3,550-foot crest sharp-pointed Lion's Head and the seaside suburb of Sea Point are dwarfed below. Part of Robben Island appears at upper right. Capetown itself lies in a wide panoramic crescent to the right of this view.

Picture him first as a tall, delicate youth of 18 years, in Africa because of tubercular lungs. At Kimberley, where diamonds have just been discovered, he is digging, dreaming, and, some say, reading the classics. While pumping water and selling ice cream, he is also buying claims from those who are abandoning digging.

At 20 he is wealthy, matriculated at Oxford, and soon again back in Kimberley with "only six months to live." Then, before finally getting his degree at Oxford, he is elected to the Cape Parliament at 27.

"I went down to the Cape Parliament, thinking in my practical way, 'I will go and take the North,'" he said.

And take the North he did—at least he carved out a country that bears his name. He was Cecil John Rhodes; the country, Rhodesia.

Nor was that all. Rhodes was chairman of the De Beers Company, which gained control of South Africa's diamonds. He was interested in gold mines. And for six years he was Prime Minister of the Cape. All the time, however, he was dreaming and scheming and working on his Cape-to-Cairo vision.

Motor out around Devil's Peak and you come soon to Groote Schuur, Rhodes's old home. Groote Schuur means "Great Barn," for here in earlier days was a storehouse for provisions of the Dutch East India Company.

Rhodes was a man of simple personal tastes. In Kimberley he lived for years in a corrugated iron shanty. As business man and Prime Minister he felt his position demanded a suitable place for entertaining. So he bought Groote Schuur, along with some 1,500 acres of mountain land.

Of the house he said to his architect, "I like teak and whitewash . . . I want the big and simple, barbaric if you like" (Plate VIII).

The house, built in Cape Dutch style, has 30 rooms. There are 15 bedrooms and two

baths. One has a huge carved granite tub which looks big enough to scrub an elephant in.

Rhodes willed the house to the Government as a residence for the future Prime Ministers of united South Africa. The Union came eight years after Rhodes died, but it did not include his beloved Rhodesia.

Not far distant, on the pine-covered slope, is the Rhodes Memorial. A large open Doric temple it is, reached by a long flight of granite steps, with bronze lions on the balustrades. The bronze horseman called "Energy," by George Frederick Watts, dominates the lower terrace.

Within the memorial itself is a heroic bust of Rhodes, beneath which are carved these words of Kipling, who stayed more than once at Groote Schuur:

> The immense and brooding Spirit still
> Shall quicken and control.
> Living he was the land, and dead,
> His soul shall be her soul!

Driving through the Groote Schuur estate, a portion of which is now a zoo, we came upon a sign which served notice that anyone found in the Groote Schuur park with a dog, or carrying "gun, dart, catapult, assegai, or any other weapon by which damage may be done to animals or birds" would be prosecuted.

Carrying not a single catapult or assegai, we drove on to the University of Capetown.

Rhodes planned to create a university in the shadow of Table Mountain. It was to draw students from all over the country and thus foster a united South Africa. In the same way he planned a greater world unity by sending South Africans, Americans, and also some Germans to Oxford through scholarships.

He never lived to see the impressive university buildings that extend along the mountainside terraces today, nor the magnificent hospital and medical school built on the estate a little nearer town.

Swinging down through Rondebosch, Newlands, Wynberg, and other suburban districts, we headed south toward Muizenberg on False Bay. Residences of the wealthy nestle among hoary oaks and fragrant pines along the way. In the suburbs, too, live many workaday Capetownians who speed to and from city offices on the fast electric commuting trains.

Amid bright green vineyards on the rolling countryside is also Groot Constantia, a national monument now, but once home of Simon van der Stel, first Governor of the Cape Colony. The house is one of the finest examples of old Dutch architecture, though its characteristic gables were supposed to have been added after Van der Stel built it originally in 1685.

Ever since Van der Stel planted his newly cleared acres to vines, Groot Constantia's wines have been famous. A letter dated 1833, still preserved in the house, authorizes one Mr. Turpin, "Capitaine de Frigate," to select and purchase wines from Groot Constantia for Louis Philippe of France.

In Government hands, the vineyards are now used as a model wine farm. In the cellars I watched men bottling choice vintages from some of the colossal casks.

Muizenberg faces a long sweeping sickle of golden sand, upon which the surf wages unceasing assault. Even in winter one can often see a few hardy souls in the water, for the Agulhas Current is warm. In summer the place is packed. Here is South Africa's Riviera or Waikiki.

On the land slope back of the bathing boxes sprawl red-roofed cottages, chalets, hotels, and a large pavilion. Still there seems lack of room for all who come, except on the beach—that's an arc some 25 miles long!

Near the beach is a small cottage where Rhodes died at the age of 48. A hole was cut in one of its walls in an effort to give him the air that his failing heart made him crave.

There are other beaches at the villages of St. James, Kalk Bay, Fish Hoek, and Simonstown.

One town thinks more of the sea as a battlefield than as a play place. For here is a naval base, busy with patrols and with scarred veterans home for hospitalization in the dockyards. Road barriers and armed guards outside town bar all except those who have specific business there.

Much of the way south of Muizenberg, the road clings to a ledge on the cliffs above the sea. For the last few miles, however, it swings inland and crosses a bleak moorland before ending still short of the two lighthouses on the Cape bluffs. Only the lower light is used, since the other often is shrouded by fog.

Cabo da Boa Esperança! Here, when Diaz and Da Gama finally rounded it, was fulfilled the hope of the landlubber Prince Henry the Navigator.

Africa Doesn't End at Good Hope

Wind-hounded Cape of Good Hope isn't the southernmost end of Africa. Look east and you see land thrust even farther southward. It terminates at Cape Agulhas, 30-odd miles nearer Antarctica.

The Cape fittingly has its ghost mystery ship. Romance and some sober seamen insist that the *Flying Dutchman* is condemned forever to beat hopelessly around the Cape because of the blasphemies uttered by its

captain, Vanderdecken. And woe betide any ship that sees it!

Sir Walter Scott gives one version of the phantom ship; Wagner's opera *Der Fliegende Holländer* gives another. And, should you still be unconvinced, you need only read *The Cruise of H. M. S. Bacchante*, wherein the late King George V, as midshipman, logs the actual sighting of it and the death of the sailor who reported its presence!

We saw not even a fishing boat, so we turned back and rode up the Atlantic side of the Peninsula.

Twisting around headlands and crossing sand flats, we came to the spectacular Marine Drive. Clinging precariously to the red rock walls of Chapman's Peak high above the crashing Atlantic surf, it has few rivals anywhere. Before the road was blasted from virgin rock, even the prehistoric Stone Age man who lived and died in a cave near by would have had a difficult time scrambling around some of the sheer, smooth cliffs. The latter part of the route climbs along beside the Twelve Apostles, past Camp's Bay, near-by Clifton, and Sea Point.

Jack Arnold

Her Cosmetics Attract Men but Ward Off Evil Spirits!

Both men and women among the Xosa natives living in the Transkei territory smear quantities of red and yellow ochre and chalk-white pigment over their faces (page 223). With boys, the entire body is covered with white just before they enter the Abakweta, or manhood ceremonies. Red ochre is also used for coloring clothing and blankets. White markings serve as a charm against disease and evil spirits.

Hout Bay, beside the drive, is as near to you as your favorite restaurant. Often in the cafeteria of the National Geographic Society in Washington, D. C., I had eaten South African "lobsters." Here at Hout Bay I saw boats unloading huge catches. The tails are cut off and then cooked and canned or ice-packed fresh for shipping (Plate IV).

Actually the crustaceans are not true lobsters but sea crawfish, since they do not have big pincers. Commercially, however, they are called rock or Cape spiny lobsters.

In peace years South Africa produced nearly $2,000,000 worth of these shellfish annually. About 50 percent went to Britain. France took much of the canned lobster. One million nine hundred thousand pounds of frozen tails were sent to the United States.

The entire fishing industry normally added almost a five-million-dollar total to the export ledgers of the Union every year.

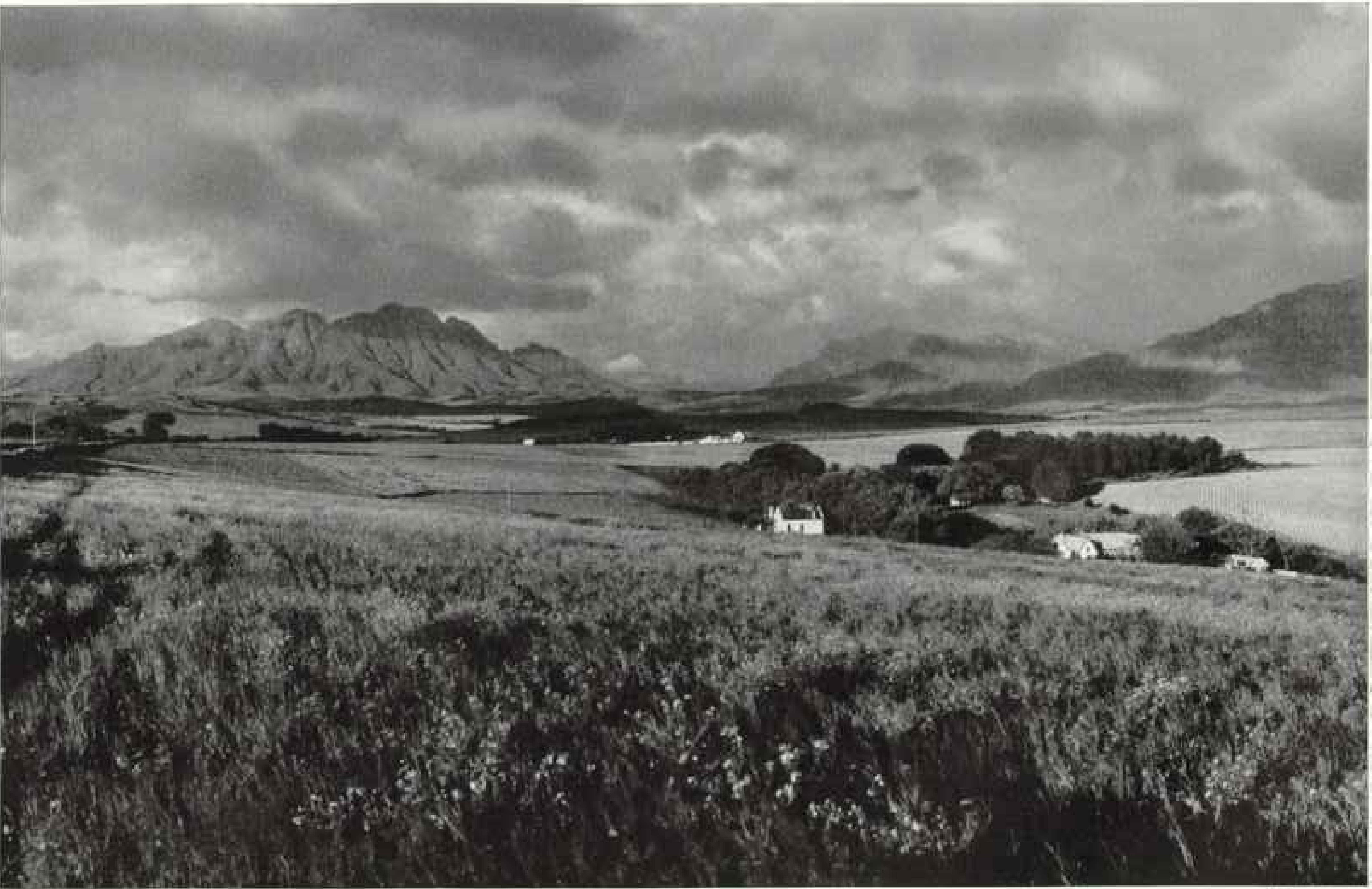
Seeking the Savage Saw-toothed Snoek

One of the most colorful fishing enterprises at the Cape is capture of the "snoek." Every year vast schools of the yard-long, saw-toothed

British Combine

General Smuts Climbs to the Top of Table Mountain for the Annual Service of the Mountain Club

This 3,550-foot climb was made three years ago, just before the war began, when the "grand old man of South Africa" was 69 years old. Now, despite his heavy duties as Prime Minister, Minister of External Affairs, and Commander of the Union Defense Forces, he has made several flying trips north to visit the troops in Libia and Egypt, whom he affectionately refers to as "my boys."



J. P. de Smidt

On Such Rich Valley Lands around Stellenbosch Early Cape Dutch Colonists Carved Their Farms

Today the countryside is covered with wheatfields, vineyards, fruit orchards, and pastures. Storm clouds sweep over the craggy ranges, bringing rain in the south-latitude winter months of June to September. Less than a hundred miles northward from this well-watered area is thirsty plateau land of the Great Karroo.

Thyrsites atun, related to the snake mackerels, come swarming into the bays about the Cape.

Then the rush is on. Every morning the colored and Italian fishermen put out in their boats and drop their lines in the teeming waters. As the fish are pulled in, they are caught under the fisherman's arm and clubbed over the head. Only when a fish is stunned is it possible to approach their savage, poisonous teeth to remove the hook.

Purchasers line the docks to await the return of the boats. Colored women "flek," or gut, the fish with lightning rapidity and flatten them into big slabs. Though some of the snoek are eaten fresh, quantities are preserved by being rubbed with salt and then dried or smoked.

To the Cape colored, this is a staple food, just as cod is to the Portuguese.

So much a feature of Capetown is this fish that a newspaper has a column of "Snoek Town" news. A popular weekly feature on the radio also is a program known as "Snoek Town Calling." It opens with a blast on a fish peddler's horn and specializes in skits satirizing and mimicking personalities who appear in the news at this Tavern of the Seas.

A short time before war began, Capetown had begun an extensive 10-year program of rebuilding the harbor and water-front area. When the scheme is eventually completed, harbor and docks will be vastly expanded within a long rock breakwater.

Redeemed lands will provide space for waterside gardens and for many new structures. Lower Adderley Street is to be widened, and the city will have a fine new railway terminal. It is an ambitious project that will make water-front Capetown worthy of its unsurpassed mountain background.

Orchards and Vineyards in the Valleys

One bright spring morning we started out on a sight-seeing loop in the region of Stellenbosch, Paarl, Fransch Hoek, and Worcester. We wanted a look at this land where history mingles with mountains and vineyards and fruit farms spread rich in the valleys.

At Stellenbosch, Afrikaans culture and university learning luxuriate under wide-spreading oaks. Old colonial Dutch homes emphasize the fact that here is one of the oldest centers of the Cape. Wheatfields and vineyards surround the town and the mountain that fantastically thrusts itself skyward near by.

More vineyards and orchards cover the countryside all around Paarl. Into the wine presses of the big Farmers' Cooperative Winery here seasonally pours wagonload after wagonload of grapes. Millions of gallons of wine are stored in the cellars, as are other millions of gallons of mellowing brandy.

Near Paarl we dropped in for a visit at the fine old Huguenot homestead of De Hoop. The date on its gable is 1809, but the house itself is still older. It is in possession of the descendants of the original owners, and much of the house is unchanged.

"This is the first olive orchard in the country," said its owner, showing me around its extensive gardens. "We've just finished the pressing. We used to do it by hand presses; now we have it done by machinery."

Many other Huguenot homes sprinkle the district. Fransch Hoek once was, and still partially is, a veritable little France, save for its language. Early Hollanders took no chances of allowing a French-speaking colony to be formed when Huguenot refugees, fleeing the persecutions of Louis XIV, settled here in 1688 or when others followed (Plate VI).

Cresting bold mountain passes—there are a dozen on the main roads within 60 miles of Capetown—and dipping into verdant valleys where springtime was bursting buds in peach, pear, plum, and apple orchards, we wandered through Wellington, near Paarl, and Worcester.

Worcester is not old, as Paarl or Stellenbosch measure their age, but it is energetic. Like the psalmist, the farmers of the district look unto the hills whence cometh their help. Water from winter snows and the rains on the peaks is used to irrigate their orchards and vineyards. Here is the center of the dried-fruit industry; the vineyards produce two-thirds of the raisin crop.

High above the town rear the mountains which buttress the uplands to the north. It is a thirsty land, the Great Karroo, that both road and railway reach after a spectacular climb up through the Hex River Pass and Hugo's Nek, but it is the main path north to diamond Kimberley, golden Johannesburg, and administrative Pretoria.

From Capetown we set out again on the Garden Route to Port Elizabeth and the native districts of the Ciskei and Transkei.

Through Somerset West, the Elgin apple district, and over Sir Lowry Pass we drove to flower-embroidered Caledon, and thence down to Hermanus.

200 Pounds of Fish an Hour

Anglers at Hermanus have caught so many fish at times that they have been sent to bed because of lameness! One caught 1,008 pounds of fish in five hours, averaging a 50-pound fish every 15 minutes.

Next we paused at Swellendam to look at

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To Its Settlers of 1820 Port Elizabeth Erected This Lofty Campanile

In the centenary memorial a carillon of 23 bells has since been installed in honor of King George V. This busy industrial port has two automobile assembly plants and factories making shoes, tires, safety glass, and dairy products. Some 400,000 bales of wool are shipped annually from its docks.

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Kodachrome by W. Robert Moore

"This Cape Is a Most Stately Thing, and the Fairest Cape We Saw in the Whole Circumference of the Earth"

Thus wrote Sir Francis Drake of the mountain-piled peninsula, which ends at the Cape of Good Hope about thirty miles from Capetown. The city snuggles at the base of 3,550-foot, flat-topped Table Mountain and extends far around Devil's Peak (left) and Lion's Head.

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Kodachrome by W. Robert Moore

Here, Against the Backdrop of Devil's Peak and Table Mountain, Van Riebeek Planted His First Vegetable Garden in 1652

Atop the war memorial in Capetown, the handclasped figures guiding the horse symbolize the two white peoples in South Africa. The monument is a duplicate of the Union's memorial at Delville Wood in France. Across the gardens stands the Art Gallery; at right are the two towers of the large Capetown synagogue.

Hold Tight for the Fastest Ride on Two Feet!

Having no way to guide this young male ostrich, she can only cling to his flightless wings as he dashes off in any direction he chooses. Ostrich farmers at Oudtshoorn once made huge fortunes from plumes.

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Kodachromes by W. Robert Moore

At Hout Bay, near Capetown, They Land Lobsters by the Ton

The creatures are spiny lobsters, or sea crayfishes. Tails are removed and then cooked, canned, or ice-packed fresh for export. The United States normally buys 1,900,000 pounds of iced tails annually.

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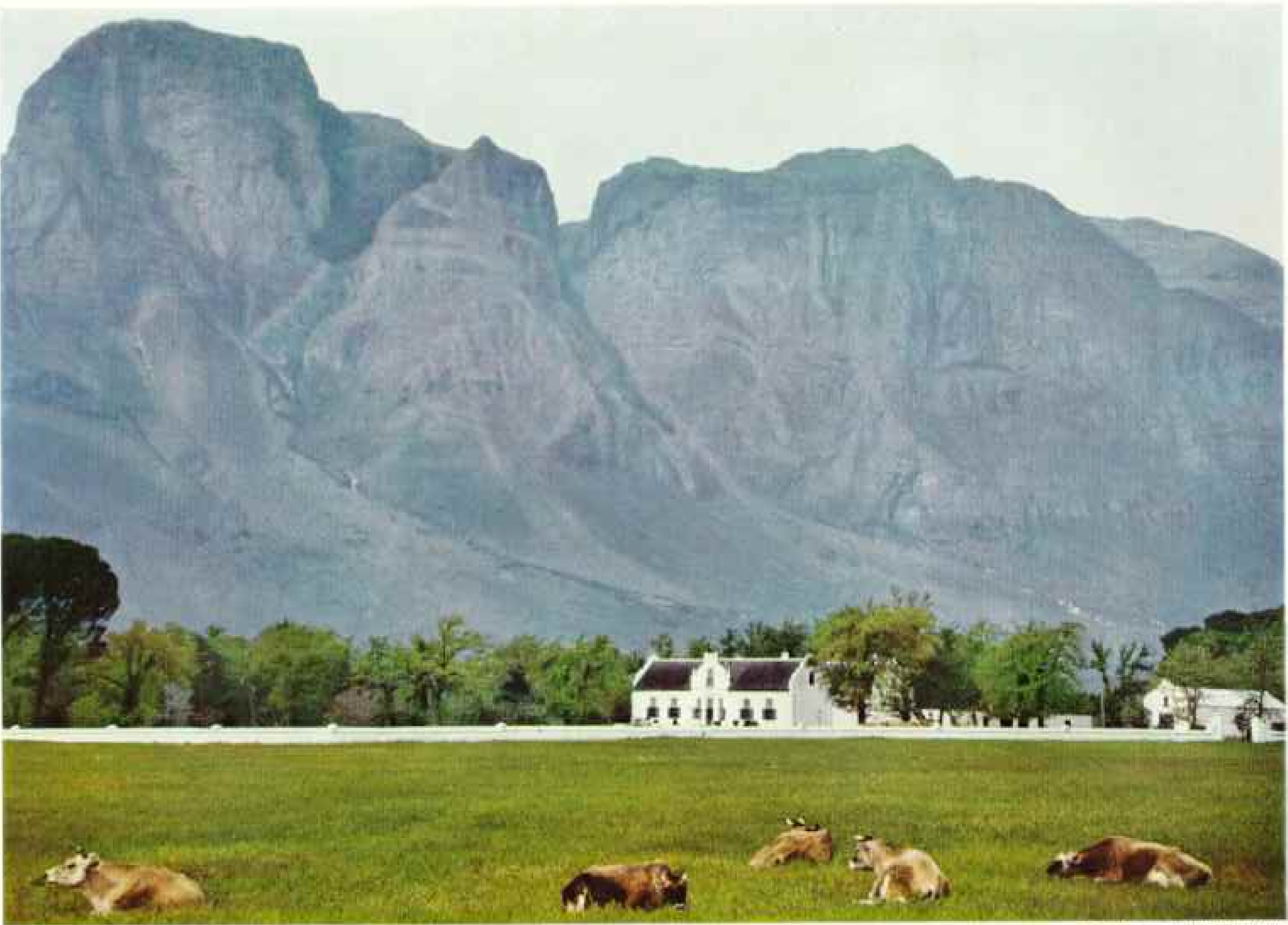
Cape Wild Flowers Emblazon the Gardens at Caledon in September Springtime

Namaqua Land daisies, mesembryanthemums, proteas, and other South African plants are massed on this rocky hillside about a miniature lake. Above the town is a large sanatorium utilizing radioactive waters from several thermal springs. In earlier days, Dutch East India officials sojourned here for their health.



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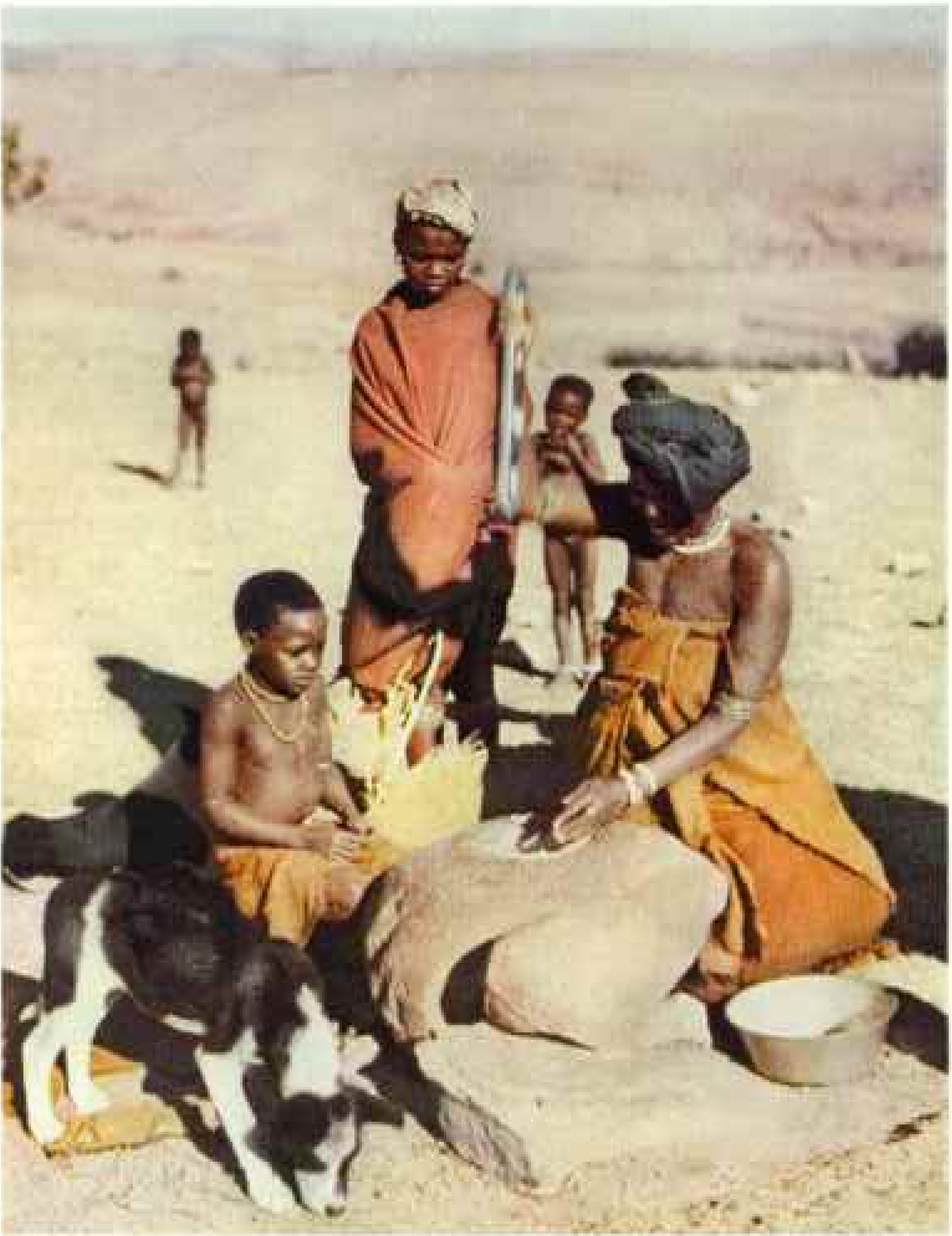
Fine Old Huguenot Homes, Such as Bosch-en-Dal, Dot the Valley Vineyards and Orchards below Rocky Groot Drakenstein



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"Piccanins" Watch Mother Grind the Mealies

A lean and ever-hungry dog wolfs bits that escape from the stone mortar. Corn is the chief food of black natives throughout South Africa. These people live in the native territories of the Transkei, in eastern Cape Province.

Kodachrome by W. Robert Moore

South Africans Call the Transkei "Land of the Red Blanket"

The red-ochre-dyed garb of this native couple explains why. The man carries mealies and other oddments in the bead-decorated hide pouch slung over his shoulder. His turkish-towel turban is sheer swank.

"I Like Teak and Whitewash . . . I Want It Big and Simple, Barbaric if You Like"

Such were the instructions Cecil John Rhodes gave for building Groote Schuur on the slopes of Devil's Peak, near Capetown. He willed the big home to the future Prime Ministers of united South Africa.

© National Geographic Society

Kodachromes by W. Robert Moore

Malay Coopers Make the Barrels for the Big Cape Wineries

Machine products have not replaced this hand trade. In Capetown there are more than 30,000 Malays, many of them descendants of servants brought here by early Dutch East India Company officials.

the old Drostdy, built by the burghers who, in 1795, established the first Boer republic here in protest against the Dutch East India Company.

Rains closed down on us before we reached Mossel Bay. The sea lashed angry waves over the resort's bathing places. Heavy swells kept us from boating out to the seal-thronged island in the bay. If the old sea boot which once served as mailbox to Dutch ships had still been nailed to the "post office" tree, it would have been filled with water!

Rains chased us all the way over Robinson Pass to Oudtshoorn. But they brought a break to the drought on the tobacco and alfalfa fields in the valley.

Oudtshoorn was wealthy once; its influence extended from Paris to Podunk. But when women's hats molted their ostrich plumes, Oudtshoorn suffered a blow from which it has never fully recovered. Between 1906 and 1913, when the ostrich-plume industry was at its height, this district pastured no fewer than 400,000 birds. Now there are probably not more than one-twentieth that number here (Plate IV).

I visited one farm that has about 350 birds.

"We had a growing industry before the war upset things," explained the youthful manager. "Not only was there increasing demand for feathers, but quantities of skins were shipped to the United States to be made up into handbags, shoes, and souvenirs.

Ostrich Egg Equals 25 Hens' Eggs

"The meat is also sold locally, usually as 'springbok biltong,'" he added. "Some farmers are selling their eggs to the Air Force camp. They're excellent when broken down with milk and made into an omelet. One egg, you know, is equivalent to 25 hens' eggs."

Accompanied by natives armed with thorn bushes to ward off the cock birds, we photographed hen ostriches on their nests. The hens are allowed to set on the eggs only when they are still laying (one egg every two days). Then the eggs are transferred to incubators for the rest of the 42-day incubation period.

Only cock birds produce the desired black-and-white plumes, which are cut first when six months old and again at 15 months. The birds live to be thirty years old on the average.

"How about picturing an ostrich derby?" suggested the manager.

The idea sounded good. Native boys mounted their odd steeds, and off they dashed —each bird in a different direction! The boys had no way to guide them, but clung precariously to the wings until bounced off. It wasn't a photo finish! (Page 198.)

From Oudtshoorn we drove north to see the fantastic stalactite formations in Cango Caves, which tunnel the hills for at least two miles. From there we went over the lofty zigzag Zwartberg Pass to the Great Karroo and turned again southward to twist down through Meiring's Poort.

On the seaward side of the mountains aloes and proteas grew; valleys were like vivid green pools. On the northern side the red contorted rocks and plain were bare, save where mesembryanthemums spread their rugs of springtime color.

Meiring's Poort is an awesome gash through the mountain barrier. Its walls—cleft by a river that has to be crossed 32 times—are tortured, twisted, and buckled into fantastic layers. They flame red, as if not yet cooled from creative fires.

It was through this narrow gorge that one group of the voortrekkers passed when they began their historic trek inland.

On a rock beside the road I saw a memorial tablet; it was in commemoration not of the trek but of "Herrie" the elephant. Herrie was a beast that romped gaily in the mind of C. J. Langenhoven, Afrikaans poet, writer, and politician. The elephant was paraded amusingly through juvenile reading books.

This mythical South African "Dumbo," so the story goes, was unwittingly bought at auction from a bankrupt circus, was hitched to an old double-decked tram, and then carried his owner north—in search of the sea! Little wonder, then, that his master didn't know whether he was following history or making it when his odd assemblage rumbled up through the narrow defile that had afforded a gateway through the mountains!

Langenhoven used his flair for humor to advantage in preparing schoolbooks, so that the learning of Afrikaans might be a pleasurable task. From the pen of this one-time Senator also came the words of the South African National Anthem.

Leaving Herrie's ghost to lumber patiently on his northern quest, we sped the 80 miles *south* to the sea! On the hillsides near the smooth, winding highway down Montagu Pass, near George, you see markers indicating the laborious route up which the voortrekkers toiled.

Along the coast around George, the seaside resort of Wilderness, Knysna, and much of the way to Port Elizabeth, are dense forested areas. The contrast is marked, since much of South Africa is open country.

At Knysna we sought out the loggers in the forests and watched men in a factory making the famous stinkwood furniture. Stinkwood, *Ocotea bullata*, is such a prized timber that

Staff Photographer W. Robert Moore

Eyes Front! Steady! It's Easy If You Know How!

To veteran Johannes at the Snake Park in Port Elizabeth handling hooded cobras and other snakes is an old story. Recently, however, he nearly lost his life when bitten by a puff adder while helping extract venom for use in making antivenin. Large quantities of serums are now being prepared for the use of South African soldiers fighting "up north" (opposite page).

the demand for it far exceeds the supply. Early Dutch pieces of furniture made from this wood are much-sought treasures.

Into Plettenberg Bay boats used to come to take on loads of timber. Beacon Island, off a sandspit, also served as a Norwegian whaling station here. One of the old iron kettles in which the whalers used to try oil out of the blubber has become a huge geranium pot in the courtyard of a new resort hotel.

Leaving Plettenberg Bay we raced in sunshine ahead of a rainstorm. It was like a black demon hounding our heels. Five minutes after we arrived in Port Elizabeth the skies dropped a deluge (Plate I).

Commercial Port Elizabeth has variously dubbed itself the Liverpool, Northampton, and Detroit of South Africa. It might also have added Akron.

Here are assembly plants of Ford and General Motors and factories turning out shoes and automobile tires. All are busy in war production.

Linked with steel mills in Pretoria, the assembly plants are building tough armored cars that have won their battle spurs in jungles of Ethiopia and on the desert of Libia. Encased in bulletproof steel, they ride on bulletproof tires made here in Port Elizabeth.

Ambulances, radio cars, mobile workshops, water carriers, and mobile filtration plants are also produced.

In 1939 shoe factories here and in the rest of the Union made only about 4,000 pairs of shoes a month. In three months of combined effort, production was boosted to 80,000 pairs. Not only has South Africa provided all the boots needed for its own soldiers, but it has taken upon itself the task of providing 1,750,000 pairs for use by the Imperial forces.

Port Elizabeth's business goes even farther. It makes such accessories as storage batteries

and shatterproof glass. It sews clothes, cans fruit, makes chocolate and other milk products, and, with East London, ships much of the South African wool and mohair clip.

The wool exchange is "closed for the duration"; the British Government has taken control of more than 400,000 bales stored in its warehouses. In the last open sale before the war, nearly 350,000 bales were auctioned.

Altogether, Port Elizabeth is a town of 110,000 busy people, its population having almost doubled in the past ten years.

Cash for Cobras, Adders, and Pythons

One day I went out to the Snake Park to see veteran black Johannes show how he handles poisonous reptiles (opposite page).

Talking with the director afterward, I found him arranging a country publicity and demonstration campaign for capturing snakes. More of the reptiles are needed for the preparation of antivenins used by the Army.

According to current prices, healthy puff adders and cobras bring up to $1.50 each; smaller snakes are bought by the ounce. Pythons are worth 20 to 60 cents a foot, depending on their size. You can get added pin money by catching scorpions.

"Do you have any yarns like that of the young 'Snake Stealers' Syndicate,'* told in The Geographic by Melville Chater?" I asked.

"You can use it again if you change it from white youngsters to black," he chuckled. "We recently caught three boys clambering into the pens to steal our snakes and then sell them back to us. We got suspicious when they came with some particularly fine specimens!"

Only a few miles north of Port Elizabeth, elephants run wild in Addo Elephant National Park. They are getting a bit pampered, however, by being fed oranges (page 206). Last year two of the huge beasts went down to challenge a train. One is now in the local museum!

Eastward from Addo is scholastic old Grahamstown with large pineapple plantations near by. Colonized in 1820 by the British, Grahamstown today still looks like a small English town. Slender church spires spear the sky above its central square. Educational center of the eastern Cape Province, it has several preparatory schools, colleges for teachers' training and theology, and the Rhodes University College.

The region around here and King William's Town was a series of forts and battlegrounds in the dread Kaffir wars of the last century. Now much land on both sides of the Great Kei River is native reserve.

"Ciskei" (below the Kei) and "Transkei" (beyond the Kei), people call this land. Perhaps it is better known as the "Land of the Red Blanket," because of the ochre-dyed blankets worn by many of the native peoples who live in the round thatched huts that dot the countryside.

White administrators oversee the progress that Fingos, Pondos, Xosas, Tembus, and other Bantu tribespeople are making in their change from savagery and wars to agriculture and self-government (page 209 and Plate VII).

Though they cling to old customs, and youths learn the behavior of men at ceremonies connected with maturity, modern ideas are gained at agricultural and specialized schools.

On miles of rolling, cattle-studded plains and through red-stained canyons, I saw farmers learning contour plowing to reduce soil erosion. Here, too, they are finding the value of fertilizer, reforestation, and of planting instead of broadcasting their grain.

Any slowness of progress stems mainly from the fact that from 40 to 60 percent of the younger men are always away at work in the mines in Johannesburg and elsewhere.

At Umtata, administrative center of the Transkeian territories, is the *Bunga*, or Parliament House, where the native councilors gather to discuss road building, health, franchise of women, and countless other problems.

Sometimes discussions become amusing. On one occasion, years ago, a councilor moved that anyone caught stealing cattle should have one ear removed. Upon second offense he should have the other lopped off.

There was a stir; many objected that it was shameful to suggest such a barbarian practice within the dignified Assembly.

Whites Outnumbered Four to One

Finally the author of the idea announced that he would withdraw the motion, since some of his fellow councilors seemed to be in fear of losing both ears!

South Africa is ever conscious of her native problems. In all South Africa only two million of the ten million inhabitants are white. In Cape Province, which is bigger than Texas, there are some two million natives, and upwards of 800,000 persons of European descent.

After completing our visit on the uplands in this colorful eastern district, we spiraled down to the coast at Port Shepstone.

Here was the beginning of subtropical Natal Province. Our Namaqua Land daisies and the diamond-bearing mouth of the Orange River, border of South West Africa, were some 1,500 motor miles away.

We had rounded Cape of Good Hope.

* See "Under the South African Union," by Melville Chater, National Geographic Magazine, April, 1931.

Toshikichi Miura

A Young "General" and "Admiral" Parade with Their Papas on Empire Foundation Day

They take part in the celebration held February 12, to increase respect for the Emperor. Japanese are taught that the Imperial family traces its ancestry to a King Jimmu, who reigned 2,602 years ago. Research has disproved the story. Parents glorify the military tradition in their children from babyhood.

Unknown Japan

A Portrait of the People Who Make Up One of the Two Most Fanatical Nations in the World

By Willard Price

With Illustrations from Photographs by the Author

JAPAN'S great advantage over us is that she knows us and we do not know her. "Know thine enemy" is the first maxim of war, just as "Know thy neighbor" is the essential of a world at peace.

Japan is the land behind the looking glass. Whenever we have come up before that glass and looked into it we have seen only ourselves—a little reduced, perhaps, because of some imperfection in the mirror or in our vision. The Japanese have been our pupils and adopted our ways. We fancy that we have taught them all they know.

Therefore we see them as being like us—on a smaller scale, of course. And we take it for granted that we can lick a smaller edition of ourselves.

Masters of Deception

The mirror that has baffled and fooled us covers the secret Japan. The Japanese have exerted every effort to keep us from breaking through the looking glass and entering their strange world.

Commodore Perry, in 1853 and 1854, dealt with the Shogun, addressing him as the Emperor, and no one corrected him. An ordinary policeman passed himself off as the Vice-Governor of Uraga. At a glittering reception, two petty officials pretended to be princes of the blood and pompously received the letter Perry had brought from the President of the United States. The regal-looking chair upon which Perry was seated during this audience had been hauled in from a near-by funeral parlor.

Similar attempts were made to befuddle the first American consul to Japan, Townsend Harris. But he stayed longer and succeeded at last in peering around the edge of the mirror. Perhaps no American since has done so well.

The Japanese have never freely admitted foreigners to their homes or their private lives. No matter how cordial the relationship, the visitor has always felt that there was some invisible barrier beyond which he could not go.

Lafcadio Hearn married a Japanese wife, lived in a Japanese home, wrote beautiful and discerning books about the Japanese. But he confessed at last that he did not know them. In his last book, *Japan, An Attempt At Interpretation,* he wrote:

"Long ago the best and dearest Japanese friend I ever had said to me a little before his death: 'When you find, in four or five years more, that you cannot understand the Japanese at all, then you will begin to know something about them.' "

This does not mean that it is no use to try to learn anything about Japan. Many things can be learned without learning all, and every bit of knowledge acquired now will make the war shorter and the peace surer.

Language a Barrier to Understanding

The Japanese language makes understanding difficult. During five years in Japan my wife and I learned to speak some Japanese but never to read or write it, except in the simplified *kana.* This is true of most foreigners. Soon after arrival in Japan I asked the American dean of a college in Tokyo to write a note for me in Japanese. He had worked in Japan for thirty years.

He looked at me in astonishment.

"Why," he said, as if indignant that I should suggest such a thing, "I don't write Japanese. We speak it, but we don't write it."

And he departed to the classroom to give a lecture in Japanese to Japanese students.

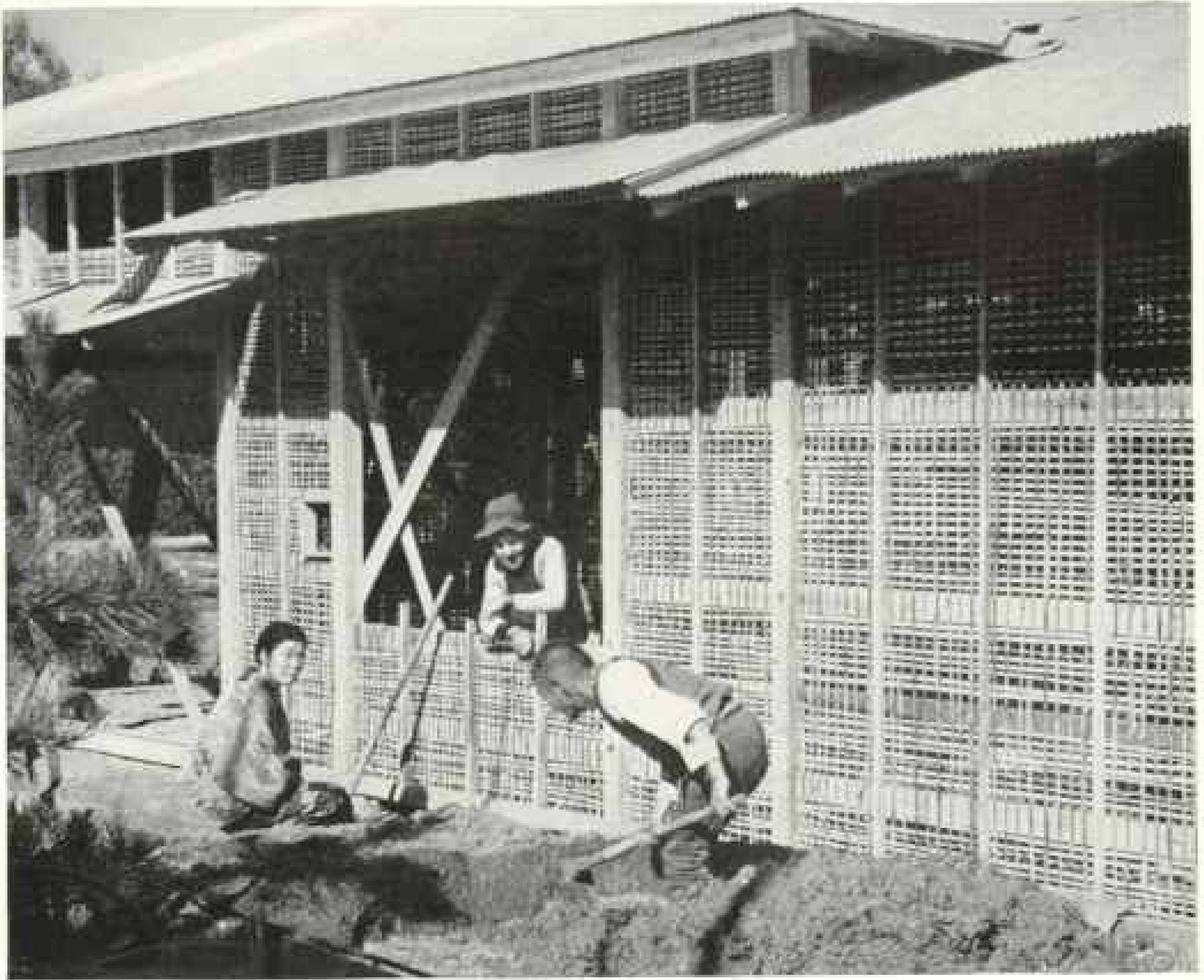
Archibald MacLeish of our Office of Facts and Figures said recently:

"One of the difficulties we are up against is to find people who really have mastered the Japanese tongue and whose loyalty is beyond question, among people of our own race. One of the experts in California came in to see us a while ago, and I asked how many people of our race he knew who had really mastered the Japanese language. He thought a long time, and said that he knew three."

Of course there are more than three persons in the United States who know Japanese. But the number is infinitesimal in comparison with the number of persons in Japan who know English. It is taught in Japan's higher schools.

"Don't they teach Japanese in your schools?" a Japanese student asked me wonderingly. At the time, the question seemed very amusing. The idea of teaching the Japanese language in American schools! But upon reflection it does not seem so funny.

Knowledge of English has been of inesti-



One Reason Why the Japanese Worry About Air Raids

To erect this typical tinderbox home in Totsuka, the builders first put up bamboo latticework for the walls. Here mud is being mixed before it is applied to the framework. After it dries, an outer coating of fine plaster or boards will be added. Paper doors and windows are covered at night with wooden shutters. One incendiary bomb dropped in a group of these flimsy structures would destroy the lot.

mable value to the Japanese in their attempt to milk our civilization dry of everything that might be of use to them.

Stacked in the corner of an Imperial University student's room I saw these books, all in English: *Literary Taste*, by Arnold Bennett; *Twice Told Tales*, by Hawthorne; *Pygmalion*, by Shaw; *Not That It Matters*, by Milne; *Dr. Jekyll and Mr. Hyde*, by Stevenson; *The Playboy of the Western World*, by Synge; *The Essays of Elia*, by Lamb; *Sesame and Lilies*, by Ruskin.

He had read them all.

Besides such books, required in his courses, he had consumed much of Steinbeck, Hemingway, Sinclair Lewis, and Pearl Buck. And his dark-blue school uniform was out at the elbows because he was trying to save enough money to buy a set of American law books.

The youngster in primary school can write a biography of Washington or Edison or Ford. In many a Japanese classroom the only picture on the wall is a portrait of Lincoln.

English Words Borrowed—and Remodeled

The Japanese language has incorporated hundreds of English words. Of course they have been curiously changed in the transition. Long cumbersome endings have been clipped off them, and letters the Japanese tongue cannot pronounce have been omitted.

Thus a talking motion picture becomes a *toki*. Building is *biru*. Apartment is *apato* and department store reduces to *depato*.

Modern girl is *moga*. Modern boy is *mobo*. If a person puts on airs he is "high collar," *haikara*. If he or she has "it," you must pronounce it *itto*.

If you are glad to see a person go, you say that he is *bakku-shan*, a word concocted of "back" and the German "*schön*" and signifying one who looks well from the back.

Alfred T. Palmer

Modern Department Stores Tower in Osaka, Japan's Pittsburgh

This city of 2,500,000 people is the Empire's largest manufacturing and industrial center. Targets for the American air raid in April, 1942, were some of the 4,600 factories and 1,500 bridges over the forty miles of canals and other waterways which crisscross the city.

Western garments have come to Japan, but we should hardly recognize their transformed names. An overcoat becomes an *oba,* handkerchief is *hankechi,* slipper is *surippa,* sweater is *seta,* and white shirt is *waishatsu.*

The Nipponese kitchen has been invaded by *bata,* butter; *keki,* cake; *chikin,* chicken; *kohi,* coffee; and *raisukare,* rice curry. When you look at a restaurant menu and see *boiro ekisu* it may take you some time to deduce that it means boiled eggs.

Young people *dansu,* go dancing; *skeito,* go skating; and expertly discuss *Hariwuddo,* Hollywood. They chew *supiro gomu,* spearmint gum, and drink *miruku seiki,* milk shakes.

Serious-minded people interested in public affairs argue over *defure* and *infure,* deflation and inflation. The scissors are used liberally on such long-winded English words as proletarian, demonstration, agitator, sympathizer, and intelligentsia. They shrink to *puro, demo, agito, shimpa,* and *interi.*

Many orientalized English words have been made so much at home in the Japanese language that most Japanese would raise their eyebrows in surprise if you should tell them that these words had an American or British origin.

So thoroughly have certain Western articles and their names been amalgamated into Japanese life that the average Nipponese does not realize they were ever foreign. Our pleasant hostess at a restaurant dinner ordered two "Japanese" dainties for us, the *omareto* and the *kuroketo.* We oh-ed and ah-ed over them, not having the heart to tell her that we were already familiar with the omelet and the croquette.

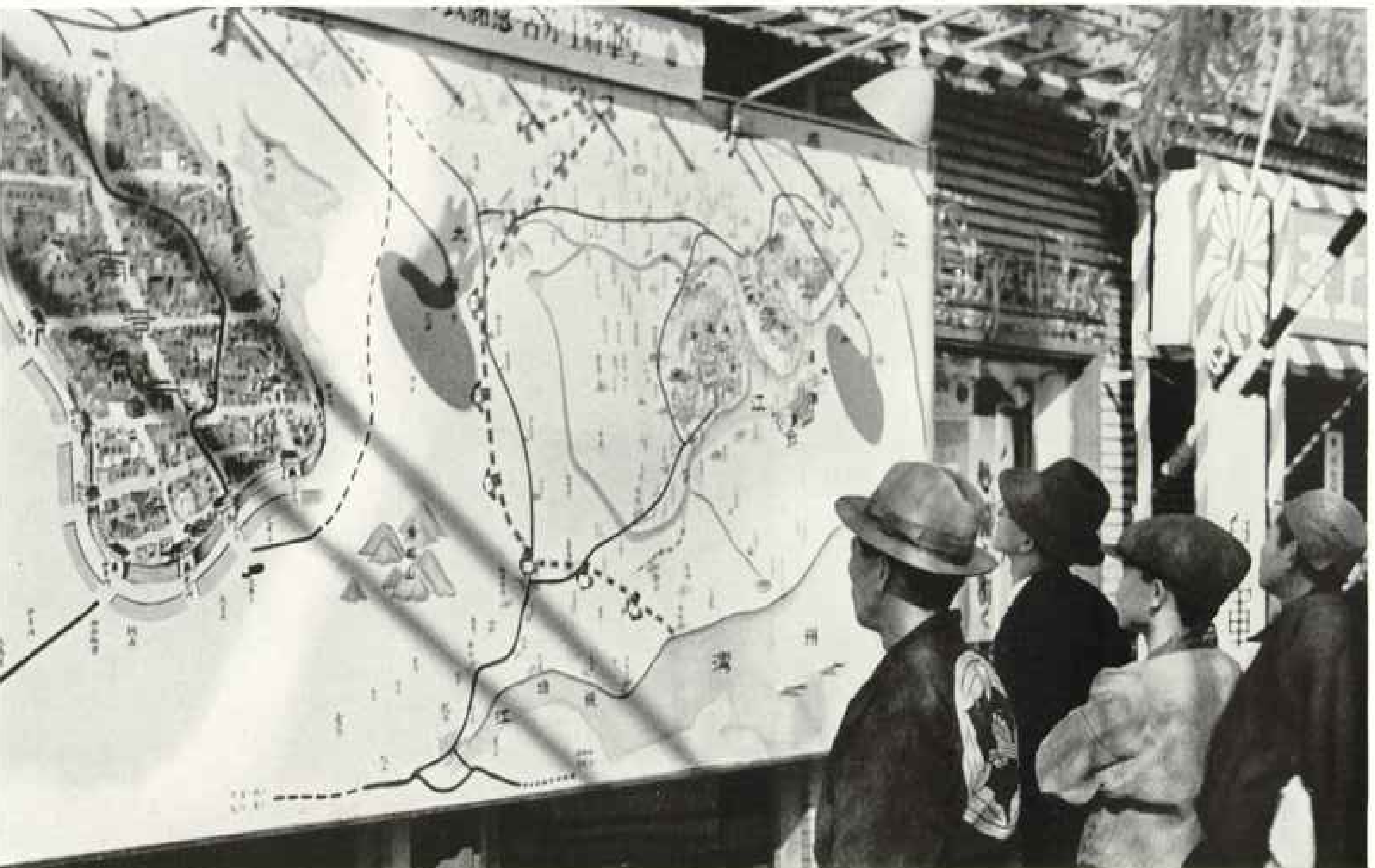
A young guide showing us proudly the wonders of an engineering exhibition asked if we had *moto* and *pompo,* motors and pumps, in our country.

No other nation has so avidly acquired the knowledge of the world. Japan has tried to make up for the two and a half centuries she

Torakichi Miura

Fujisan, Japan's Sacred Mountain, Once Blanketed Tokyo with Six Inches of Ashes

That eruption occurred more than two centuries ago. Faint steam fumes escaping near the top indicate that Fuji may not be permanently dead. To sailors and airmen, the 12,395-foot peak is a landmark, visible 100 miles at sea on a clear day. In foreground, Lake Yamanaka.



On the Ginza, Tokyo's Broadway, Pedestrians Pause to Study a Map Showing Military Progress in China

To them military conquest is a natural Japanese right. Japan's claim to world supremacy is based on utterly fantastic tales of the divine origin of its people. The old Japanese "Book of Genesis," Ko-Ji-Ki, traces the Emperor's line through the mythical Sun Goddess back to three original deities who were born in the Plain of High Heaven and who preceded the gods who created the Japanese islands.

Germaine Kellerman

A Shinto Shrine on Huge Wooden Wheels Balks at Turning a Corner in Kyoto

Sometimes fifty men tug and labor for an hour to swing the temple-on-wheels around a curve in the Gion parade. Shintoism, really ancestor worship, teaches unswerving loyalty to the Emperor. To die for his Emperor means honor and glory for the Japanese soldier and his family (page 251). His ideas about the issues of the war are extremely vague.

was in seclusion, "like a frog in a well," as the Japanese put it. "The frog at the bottom of the well," runs a proverb, "thinks the well a fine stretch of water." And another proverb has it: "The frog in the well knows not the great ocean."

No Longer "a Frog in a Well"

Japan is no longer a frog in a well. She now sees the whole world—and wants it.

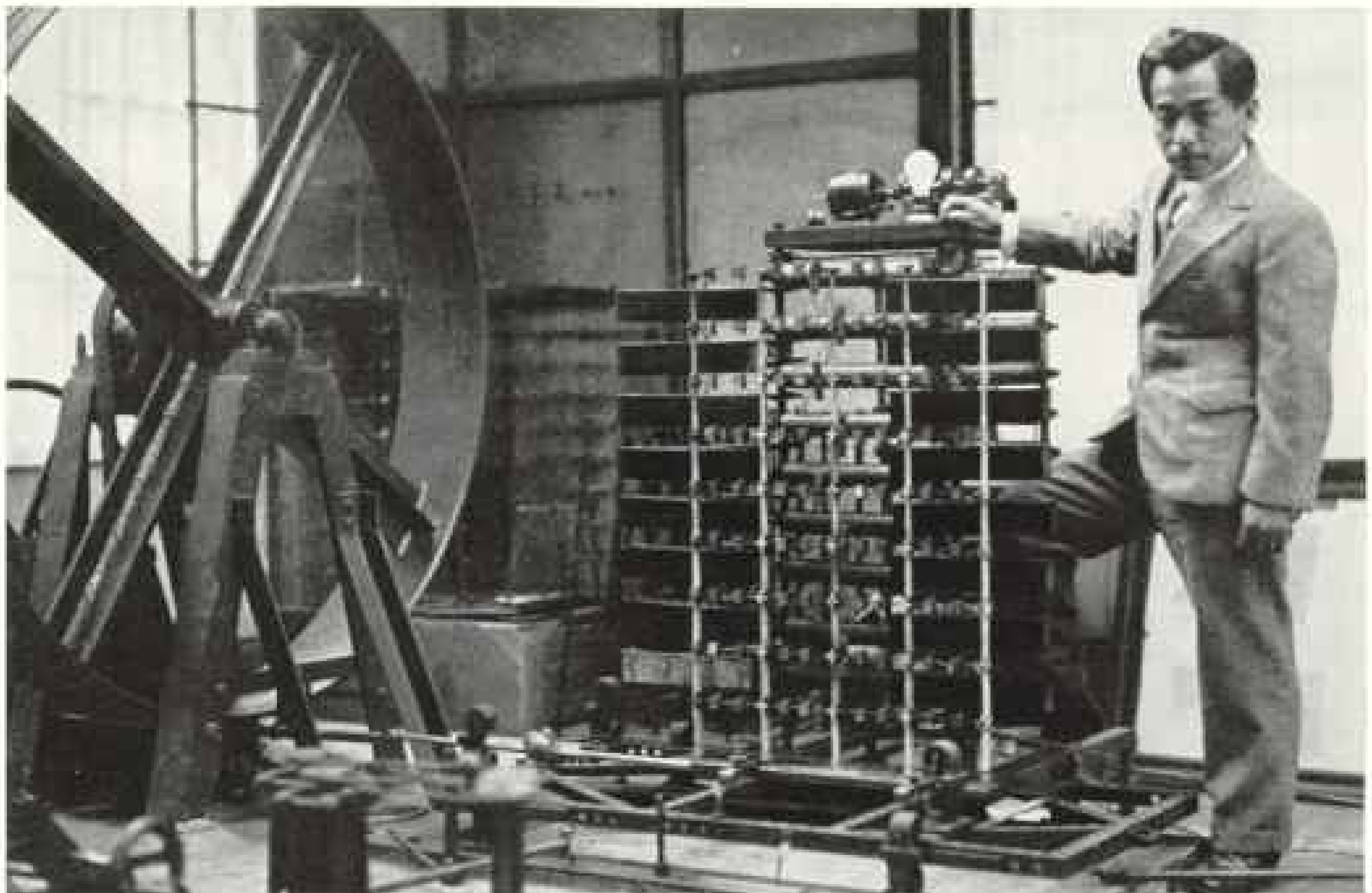
Japan's imitation of our ways seemed harmless enough at first. We were flattered. We were entertained by the mistakes of the "funny little Japs." When they boarded the first train they left their shoes on the platform because they had been taught never to enter a house with their shoes on. They broke the windows by thrusting out their heads, not realizing the nature of glass. It was necessary to paint a white bar across each pane in order to convince them of the presence of something solid. The first store windows bore big labels, "This is glass."

People watched the telegraph lines, trying to see the message travel along the wire. Some said the wire must be hollow; others, that the wire moved. Country people said it was all "Christian deviltry," and mobs tore down

Hamilton from Three Lions

Jap Youngsters Bow before the Sacred Bridge Leading to the Imperial Palace

The public may enter the royal enclosure in the heart of Tokyo, and go this far but no farther.



What Part of a Building Is Most Vulnerable to an Earthquake?

Dr. Taniguchi stands beside his invention, which gives the answer. It is an oscillating model of the skeleton of the Marunouchi Building in Tokyo, equipped with instruments which show the exact amount of strain at every point (page 239). Japan averages four earthquakes a day, one severe earthquake every 30 months, and one disastrous shock every generation.

Alfred T. Palmer

Homing Pigeons Bring War News to This Tokyo Newspaper Building

Although the Tokyo *Asahi* has a circulation of two million and receives dispatches by wireless, cable, telegraph, and telephone, it maintains cotes on the roof for a flock of carrier pigeons. Reporters take the pigeons with them on ships at sea, or to other points from which it is difficult to send stories by ordinary means. The reporters insert their copy in a tube tied to a pigeon's foot and release the bird, which flies back to the editors. Left background, a modern motion-picture theater.

the equipment. The first telephones were charged with spreading cholera from the speaker to the listener.

They put on our clothes incorrectly, appeared in underwear without bothering about trousers, or affected a frock coat with straw hat and breeches.

They blundered when they tried to copy our machines. Their first steamers toppled over, or the boilers blew up, or the captain forgot how to stop his vessel and it kept going until it struck a mudbank.

We got the impression that the Japanese were becoming a reflection, and only a very pale reflection, of ourselves. They were only trailers, followers, stumbling along the path we made. Of course we would always be ahead of them.

And few people yet realize how this early picture of childlike, imitative Japanese has changed. Consider what has happened in Japanese industry.

War on the Industrial Front

Manchester cotton men taught the Japanese how to spin cotton, and sold them looms. Soon Japan was able to make cotton shirts, send them halfway around the world, and sell them in the stores of Manchester for less than shirts made in Manchester.

But that wasn't the worst of it. A Japanese by the name of Toyoda invented a better loom. It would do more with less attention. While in a Lancashire mill one girl could tend eight machines, now in a Japanese mill one girl could tend sixty.

Lancashire stubbornly refused to believe it. It was only when all world markets were flooded with Japanese cottons at prices from a third to a tenth those of Lancashire, and

Go to This Newsreel Theater in Yokohama and See the War—Japanese Version

Admission is 10 sen (about three cents). Although Japan is a major producer, Hollywood films always were popular in the Empire's numerous theaters before the war. Interpreters gave a running explanation of the plot during each showing of an American film, or Japanese words were printed on the edge of the film.

the cotton capital of the globe had definitely moved to Japan, that Lancashire men went to Japan to study the cotton industry.

They took no looms with them this time. Instead, after they had inspected the Japanese mills, they paid a million yen for the license rights to use the Toyoda loom in Lancashire.

By the time the Englishmen got the new looms working, Japanese engineers had begun to improve the design to make their own looms more efficient. Their success is indicated by this amazing fact: before the war stopped trade, Japan could buy raw cotton in India, pay the freight on it to Japan, process it, pay freight back to India, pay an import duty, and sell the goods in India for less than the price of cottons made in India.

To beat Lancashire where manufacturing costs are high is one thing. To beat India where costs are even less than in Japan is another thing, and gives sober warning to the textile industry throughout the world.

Japan has long been first in silk. She has produced more than 70 percent of the world's silk supply. This is not because the silkworm will not do its job in any other country or climate, but because Japan has scientifically bred better silkworms, distributed silkworm eggs adapted to each district, and equipped her mills with the latest machinery.

War Industries "a Bombardier's Dream"

The West searched for a way to get around her and developed "artificial silk," later called rayon. Japan saw the silk industry threatened. But she promptly stole a march on Western competitors by becoming her own competitor. She built rayon plants and was soon exporting more rayon than any other country in the world.

The Japanese development of the jute industry is a remarkable story of scientific research.

In a Hot Spring the Housewife Boils Eggs for Breakfast

Furiously bubbling thermal pools around Beppu spurt out blistering steam. Some of it is captured and diverted into the town's stoves for cooking. Many families do not have stoves, but cook their rice over holes punched in the ground.

You get a vivid idea of Japan's industries by flying from Tokyo to Kobe above the industrial backbone of Japan. Here most of Japan's industries are concentrated. It has been called "a bombardier's dream." The war industries of no other nation are so vulnerable to air attack. Within three hours a fast bomber can cover all of Japan that matters.

But it is a mistake to think that a few incendiary bombs dropped upon Tokyo will cause vast uncontrollable conflagrations. As you look down upon Tokyo from your plane, you see why this is not likely to happen.

Below you lies something like a checkerboard, except that each square is separated from the near-by squares by wide streets or canals. A bomb dropped into one square might speedily burn it, but leave adjacent squares untouched.

This plan did not just happen. After the great earthquake, suggestions of Dr. Charles A. Beard were put into effect, and the city was rezoned and rebuilt in such a way that a fire could not easily do more than local damage.

Anyhow, Tokyo is not the best bet of the bomber. It has many industries, but they are scattered. It is another story in Nagoya, Osaka, and Kobe. Here great munitions plants, steel mills, ironworks, and shipyards are so tightly packed as to give a bomb no chance to miss a vital objective. And the aerial observer is impressed with the fact that all this steaming, belching, pounding confusion of modern industry has been borrowed from the West and developed to its present efficiency in less than eighty years.

Inventive as Well as Imitative

"The Japanese copy everything, invent nothing."

This familiar comment is only half true. The Japanese do copy everything. But they invent as well.

The Imperial Patent Bureau employs eight hundred skilled examiners to handle the hundred thousand patent applications a year. About twenty thousand inventions annually are allowed patents. Industrialists in Europe and America watch Japanese inventions carefully and acquire many of them.

A magnet steel that has revolutionized certain electrical instruments the world over was invented by a Japanese. The rights to manufacture this alloy in Germany were

Japan Goes Back to the Days of Sail to Train Merchant Marine Officers

This quartet studies navigation while perched on the bowsprit of the training ship, *Taisei Maru.*

Staff Photographer W. Robert Moore

This Hard-working Oyster Produced Its Pearl in Eight Years

The gem is imperfect because there is a seam on one side. Only about five percent of such culture pearls are perfect spheres, but many are acceptable for necklaces. A young Japanese noodlemaker devised the process. A bit of mother-of-pearl is inserted in an oyster, which is then returned to the water. The oyster coats the irritating particle with a secretion which hardens, thus building up the pearl (page 240).

Back to Its Second-floor Room Goes a Mat after the Semiannual Beating

Twice a year the Government orders a house cleaning, and this Yokohama store, like other firms and homes, complies with the decree. A policeman will come around next day to inspect.

bought by the Bosch Magneto Company for $300,000.

The inventor of a new electric battery did better. He sold the American patent rights for a million dollars.

We think our typewriter, which turns an alphabet of 26 letters into words, a miracle. Consider, then, the Japanese typewriter, which carries a combination of keys for thousands of characters.

At an Invention Exposition in Tokyo these were some of the devices exhibited: a talking motion-picture projector for home use; a home television outfit; a nondazzling electric light bulb; auto headlights that could be turned in various directions; something to tell you whether an egg is bad without opening it; building material made of waste rice hulls; and a movie camera that would make 60,000 exposures a second—fast enough to photograph the movement of sound waves.

Scientists Constantly at Work

"Japan has learned much from the West; now she feels it her duty to pay back the debt," I was told by Dr. Kinoshita, Director of Research in the Tokyo University of Engineering.

He took me into a dark, mysterious room where nothing was happening. Fantastic apparatus stood silent.

"There are sounds here, but you can't hear them," he said. "We are studying super sonic waves—sounds that cannot be heard because they are too high. But if brought under control they will be of great use in secret signaling."

This is a curious university. Its chief purpose is not to teach the arts but to investigate and invent.

On a pool of water a new buoy was demonstrated to me by its inventor. It far surpassed the buoy with the oil, gas, or even electric lamp. It gave out a fog-piercing light from neon tubes.

But how could neon light be produced far out at sea? By the motion of the waves which generated an electric current. This, in turn, activated the mercury in the tubes and there was light. Such a device has been exhibited at various American expositions.

I was taken through a maze of departments where new inventions were being developed. Here was a researcher working on a synthetic rubber. Another was making a paint that would not peel; another, cement that would not crack. Another was experimenting with an electric organ that could be played without touching it—merely by passing one's hand through the air.

Sliding Doors and Windows Turn a Jap Room into a Sleeping Porch

No screens are used, but a giant mosquito net, often as large as the room itself, protects the sleepers. The author and his wife lived for a year like Japanese. They learned to sleep on a hard floor and to go without tables, chairs, or stoves (page 242). Such a life builds up resistance in the Japanese soldier.

A Firebox in the Floor of the House Keeps Jap Feet Warm in Winter

The *kotatsu* is a large, square opening, half filled with fireproof clay and wood ashes, with a little heap of glowing coals in the middle. Around it, the whole family sleeps on cold winter nights, covered with blankets and quilts. When the embers die, the children stick their feet into the box.

On a Gobi Camel, the Author and Mrs. Price Visit Mihara Volcano

Their mount carries them across the old crater to the rim of the new and active one. On Oshima Island, not far from Tokyo, Mihara is a favorite suicide resort for unhappy Japs, who plunge into its roaring pit.

Passers-by Sew Single Stitches in a "Thousand-Stitch Belt" for a Soldier

The man, standing beneath Tokyo's Thunder Gate, holds out the belt with needle and thread. Here two mothers, carrying their babies on their backs, contribute stitches. When the thousandth stitch has been put on, the belt will be sent to a Jap at the front, in the belief that it will protect him from enemy bullets.

We entered a storeroom that was like a refrigerator.

"You won't want to stay here long," my companion told me. "The temperature is forty degrees below zero."

"But what's the idea?"

"To reproduce the Manchurian winter. You see these materials. They are being tested to learn how they will stand up under climatic conditions such as our colonists find in Manchukuo."

We went out and presently entered another room that was hot and steaming.

"The temperature here is 110° and the relative humidity 85%. This is the Tropics inside four walls. You see, Japan already has outposts in the Tropics—and it may be that some day Japan will be very largely an equatorial nation. Who can tell?" He gave me a sidelong smile.

"At any rate, we must be scientifically ready for that day, if it comes. Therefore we are developing building materials, foods, clothing, medicines, adapted for use in such climates."

Hamilton from Three Lions

One of Japan's Student Army of Mountain Climbers

Favorite pastime of millions of Japs is hiking. Often a student does not return from such an expedition. If he has failed in an examination, or has other scholastic difficulties, he is likely to commit suicide rather than come back to his troubles (page 244).

We went to the Division of Architecture, where experiments were being made in the construction of steel-and-stone buildings that should be both bombproof and earthquakeproof.

"We know that Japan is exposed to attacks from the air," said Dr. Kinoshita. "But if enemy bombardiers ever come over our large cities, they will be surprised at the resistance of our modern buildings" (pages 227, 231).

Japanese First and Scientists Second

"Everyone here," I said, "seems to have one eye on his instruments and the other on international politics."

"We are scientists second," answered Dr. Kinoshita. "First, we are Japanese."

That is the most dangerous aspect of Japanese science. It is science for Japan, not science for the world. Your true scientist is devoted to the extension of human knowledge, regardless of political boundaries. But the Japanese scientist is apt to astonish you by a sudden remark showing his belief in the very unscientific myth of the descent of the Emperor from the Sun Goddess and the right of this heaven-descended one to rule the earth.

War has stimulated invention in Japan.

Lacking metals, the Japanese make radio sets, hinges, door handles, and what not from waste fiber. Lacking felt, they use a substi-

tute made of seaweed and peanut shells. Lacking leather, they process fish skins into leather. Lacking wool, they make it or something like it from soybeans. Lacking phonograph needles of steel, they make them of bamboo. Lacking enough rice to make sake, they brew sake from acorns. Lacking iron for bicycles, they make bicycles of fiber and cardboard. Lacking gasoline, they make automobile motors run on charcoal.

One of the most amazing ingenuities of the Japanese is the cultured pearl. This is in every sense a real and genuine pearl. But it is planned, not accidental. And its cost is, because of the planning, only the merest fraction of the cost of an accidental pearl.

Ordinarily, only one oyster in many hundreds of thousands develops a pearl. It is much easier to find a needle in a haystack than a pearl in an oyster bed. Therefore when one is found it is worth a lot. But if every oyster contained a pearl, the price would drop to a trifle.

This was the dream of a young noodle-maker named Mikimoto. He left his wife in charge of the noodle shop and went to the seashore. He began tinkering with oysters. He knew that when a grain of sand gets inside an oyster's shell, it annoys the oyster, which proceeds to coat the irritating particle with a secretion. This hardens, thus gradually building up a pearl.

If he could put a grain of sand into every oyster . . . He went bankrupt three times before he made it work. Today he is many times a millionaire, and his pearls cover the world (page 235).

Girl Divers on a Pearl Farm

A visit to one of his pearl farms is an interesting experience. You see girl divers plunge to the bottom some twenty feet down to bring up oysters. These are placed in tubs and later taken to the laboratory for their operation. Each shell is opened and a bit of mother-of-pearl inserted. Then the oyster is put back in the bay and left there for perhaps eight years. It takes time, even for an educated oyster, to make a pearl.

I saw oysters that had been working for eight years to cover their troubles with beauty. Some of the pearls were useless. Seven out of ten were excellent and made an ornament for my wife that would have cost $10,000 if fashioned of accidental pearls.

The skill of the Japanese in such arts as water-color painting, lacquer, cloisonné, embroidery, dwarf trees, tray landscapes, and flower arrangement is well known. And the Japanese garden, with its miniature charm and its precisely calculated distances and perspectives, is unlike any other garden in the world.

No, we must not underestimate the creative ability of our present enemy.

It is a pity that this power should not always be directed to the invention of things of beauty and convenience. Today it has become a menace to the world. It is flowing into guns, explosives, airplanes, and warships.

I was arguing with a young Japanese naval officer about the coming Japanese-American conflict, which most Americans living in Japan have foreseen for many years.

"We have a much larger fleet than you," I reminded him.

"But," he answered, "one of our ships is worth two of yours."

I scoffed. "How can that be?"

"Because the Japanese sailor is shorter than the American."

I failed to see any connection.

"You must have eight feet between decks," he said, "so that your tall sailor won't bump his head. We need only six feet between decks, since our sailor stands less than five and a half feet high. The difference between six and eight feet means a space saving of twenty-five percent. Then, too, our sailor doesn't require as much elbowroom."

"Don't his elbows stick out as far?"

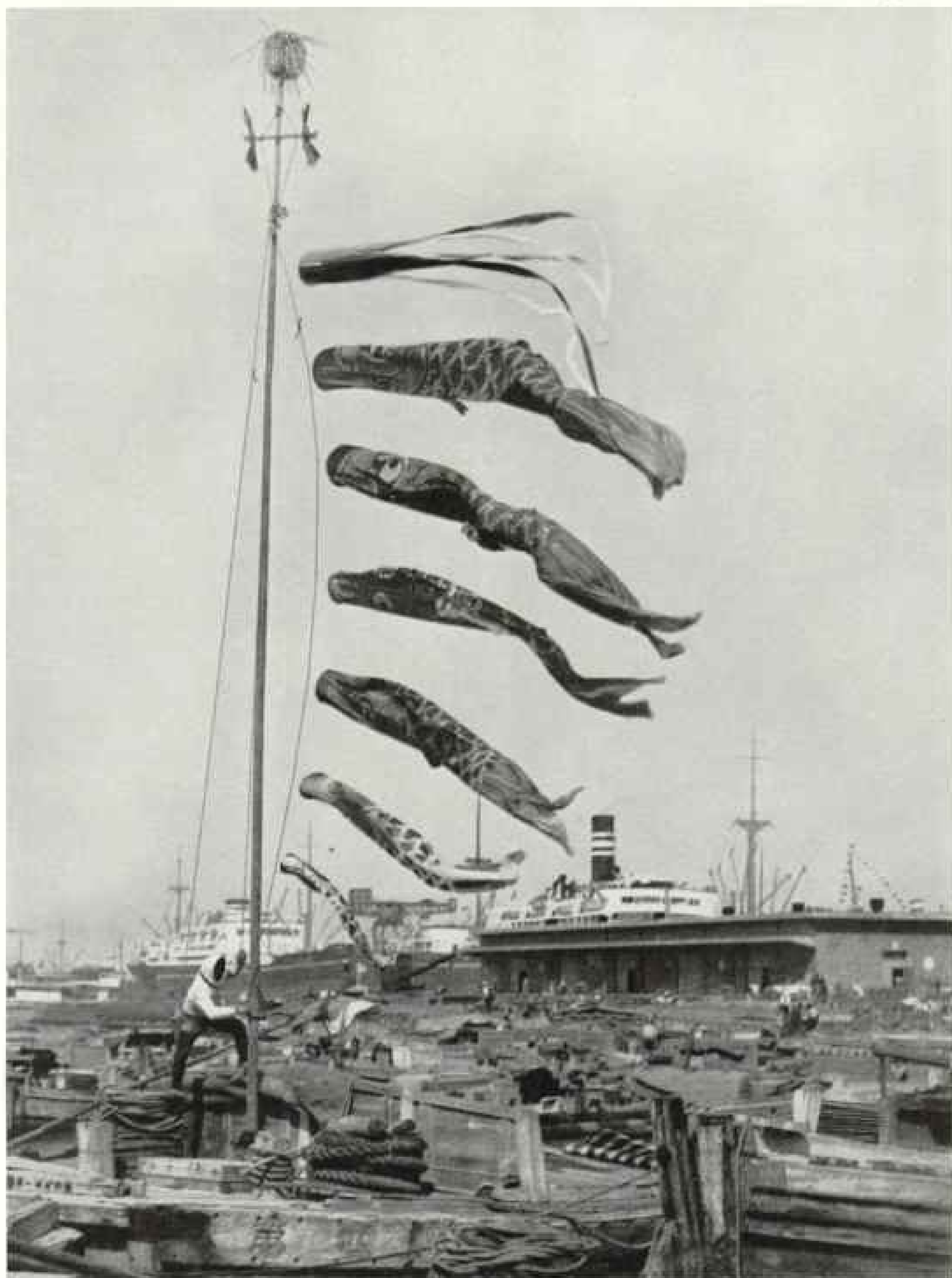
"Perhaps," he laughed, "but he doesn't demand so much space. He's used to being crowded. His home is small. He has never been spoiled by too much comfort. So we can reduce the lateral space also by 25 percent. That makes a saving of 50 percent, which means that we can put twice as many men aboard as you can, or we can give twice as much space to fighting equipment."

This seems to be confirmed by authoritative sources, which state that Japanese cruisers afford "ample evidence of the initiative and ability to cram over two pints into a quart pot."

Sailing in a submarine is no pleasure jaunt. The quarters are cramped, the air is bad, and there is no view. But long voyages are necessary if American submarines are to enter Japanese waters, or vice versa.

The Japanese submarine carries more men than the American, and it is claimed that they can endure the confinement for nine weeks. Doubtless we shall surprise Japan by the endurance of our men. But it is certainly true that not so many of them can be packed into a given space, and that they have more to forget in the way of comfort.

The Japanese airplane has been the surprise of the war thus far. While we enjoy reading the many stories of the superiority of



Torakichi Miura

Balloonlike Paper Carp Swim in the Wind during Boys' Festival

This Tokyo water-front family has seven sons, and a carp streamer is flown for each one. The purpose of the traditional celebration in May is to stress the parents' prayers that their boys may be brave and strong. Bombs from U. S. Army planes wreaked havoc in this crowded harbor during the raid of April 18, 1942.

Ironing Day in Japan Calls for a Board but No Iron

After washing a piece of cloth the housewife spreads it out on the board while it is still damp and lets it dry smooth. The mother, at right, carries her baby strapped to her back.

words of our airmen.

In some cases our planes fly better but do not shoot as well, the Japanese craft being equipped with heavier guns. The cockpits are tiny hencoops. The space is given to fighting equipment.

The Nazis, who taught Japan much of what she knows about aviation, are now learning from Japan. The deadly Japanese torpedoplane has accomplished exploits unparalleled by the Luftwaffe.

American inventive ability and production capacity can, we believe, surmount Japan's air strength. But until that is accomplished, it will not do to discount the military power that has swept like a fire over Asia and subjugated some 400 million people, one fifth of the population of the globe, to the will of Nippon.

I have spoken of endurance as a factor in war. Let us take a look at the Japanese home, for that is where the Japanese soldier is made.

We learned to our own grief how much endurance is required to live in a Japanese house. It builds resistance and fortitude—or sends you to the hospital with lumbago or pneumonia.

Discomforts of a Paper House

Our paper house on the seashore at Hayama was a place of beauty and discomfort. We felt it incumbent upon us to live for at least a year as the people live in order to understand them better. At the end of that time we readmitted to our lives the comforts of bedsteads, tables and chairs, and stoves!

Imagine a cold, damp winter day in a house with paper doors (*shoji*) and no stove but an open firepot or brazier filled with ashes on top of which smolder a few pieces of charcoal.

American planes, we cannot blind ourselves to the fact that Japan has steadily advanced to the gates of India and that she has done it primarily by means of superior air power. Not only has she had more planes, but certain of her craft are apparently as good as anything produced in the United States.

Plane Cockpits Small but Deadly

Writes correspondent Robert R. Morris from the southern Pacific, "The Japanese quickly showed that they had fighter planes comparable to the best we had this side of the 180th meridian."

The Zero, flying 350 miles an hour, carrying two cannon and a couple of machine guns, was a complete "tactical surprise," in the

You cannot feel the warmth unless you fairly hug the fire. The wind whistles in through the cracks between the shoji.

You may, of course, close the outside wooden shutters, but then the room will be as dark as a pocket. And the winter air will still rise through the floor upon which you are sitting. The straw mats, or *tatami*, are very porous, and the boards underneath are loosely laid with cracks between. The house is raised on posts and the wind howls through beneath you and filters up into the room (page 226).

To keep warm you must either go to bed or keep moving. One cannot stay in bed all the time. Therefore the answer is action. I firmly believe that this is one reason for the constant activity of the Japanese. It is far more comfortable to plow and plant in the muddy fields than to sit in the house.

Here Patrons May Buy Meals, Drinks, and Companionship

In this large cafe on Tokyo's Ginza, lonely guests may have a feminine table partner by purchasing two 15-cent tickets. The "round service girl," who strolls from table to table, will stop to chat for one ticket. Some of these entertaining girls, trained to converse and dance, earn as much as $200 a month.

Unfortunately, we had no fields to cultivate. We went on long, vigorous walks of a kind almost forgotten in this automobile age. We developed leg muscles and better lungs.

Even in summer it was not all roses. The house, with its shoji removed so that it became a pavilion open to the breezes, would have been perfectly delightful—if there had been a place to sit, lie, or eat.

Floor Serves as Bed

Our vista of the garden, the valley, Sagami Bay, and Mount Fuji beyond, was marred a bit for lack of an overstuffed chair to view it from. One sat on the floor with the legs crossed in front, or, on formal occasions, cramped back beneath.

There was no support for the back except the backbone—and we had become rather unaccustomed to using our backbones.

Eating was done at an ankle-high table. Sleeping was done on the floor, the night being punctuated with such remarks as "A bit hard, isn't it? How about putting an extra *futon* under us?" and "Oh, for an inner-spring mattress!" (page 237).

The thin-shelled Japanese house responds as quickly to summer heat as to winter cold. It bounces in the frequent earthquakes and it is very likely to collapse in a typhoon.

The more than usually severe typhoon of September 21, 1934, destroyed 105,657 houses by blowing them over or by flooding them with tidal waves, killed nearly 3,000 people and

injured more than 8,000. It ruined 289 schools. It blew trains from bridges. It made rivers run backward, the sea water rushing up them for many miles, then overflowing into the fields to destroy the crops. It spelled a total loss of more than $300,000,000.

Although such visitations are not frequent, every year brings typhoons that fill the house with flying debris, if they do not tear tiles from the roof and wrench off the shutters. Our garden fence had to be restored to an upright position at least three times a year.

Add to the troubles of the householder the difficulty of preparing a meal on a charcoal brazier, the necessity of constantly fighting giant cockroaches, spiders measuring six inches from tip to tip, sturdy rats, and mosquitoes (for there is no screen except over the bed), and you begin to realize the training that the Japanese have had in the school of discomfort.

The result of such discipline is that the Japanese soldier on the field can completely ignore discomforts that would disturb the morale of men used to a higher (and softer!) standard of living.

Thus certain lacks in Japanese civilization actually result in gains in Japanese fighting strength.

Disregard for Human Life

Japan has another lack which works to her advantage. She lacks respect for human life. We believe in living for our country. The Japanese believe in dying for their country.

From childhood up they are taught that the individual is of slight importance. The Christian conception of the worth and dignity of the human being is wanting. Japan has no rugged individualism. She has a rugged collectivism.

Her people like to do things together. They excel in teamwork. Japan has no dictator; she is always group-ruled; her Emperor is a symbol of divinity. If any individual becomes too prominent in the government, he is very liable to be assassinated.

Students study their lessons together. Mechanics in a factory do best when they work together. There is a saying that one Japanese is stupid and two are brilliant. Armies are groups—and that is one reason why the Japanese are good fighters.

Even the Japanese pilot does best when he attacks in formation. Alone, he is rarely a match for the lone United Nations flyer. But he is rarely alone, for air war, as well as sea and land war, is increasingly a mass action.

Suicide is common because a person considers himself of no worth if he cannot keep up with his fellows. We climbed the slopes of the volcano Asama with a group of eight students. On the way down, there were seven. One had plunged into the crater. He had left a note explaining that he could not stand the disgrace of having failed in his examinations.

We climbed Mihara and rode camelback across the old crater to the brink of the present crater (page 238). Steam rises like a gigantic column of incense from this sacred Shinto shrine. Guards are on duty and a high barbwire fence skirts the edge of the roaring pit; yet, in spite of these precautions, there are hundreds of suicides every year.

It is an exaggeration to say that the Japanese soldier courts death. He prefers to live. But it is true that the philosophy of dying has been so thoroughly ingrained that he takes chances at which men with a more wholesome view of the value of life would hesitate.

He has not been taught the prudence of living to "fight again another day." Japanese armies are not trained in the tactics of retreat. They are not expected to retreat.

And the soldier is instructed to commit *hara-kiri* rather than be captured. Naturally, some disobey this grim injunction. Many obey. They know that their relatives will be disgraced if they are taken prisoner, but very proud if their ashes are brought home to be deified at the Yasukuni Shrine where the Emperor himself comes to bow before the spirits of the soldiers who have died for him.

Near-slavery in Nippon's Factories

The same disregard for human life is found in the industrial war. Japanese factories, with the exception of a few beautiful exceptions which are shown to tourists, are run on the theory that it is the work that matters, not the worker.

The swift advance of Japanese industry is not due merely to efficiency, but to low wages, long hours, and conditions approaching slavery. Labor unions have always been timid and now are totally suppressed. The meager labor laws are not enforced. Japan is not working on a 40-hour week, nor a 48-hour week. The 60-hour week is common and the 100-hour week is not unusual.

A great proportion of the workers are girls, since the men have gone to the front. Factory agents are active in the villages, buying up the services of girls.

I walked through a village in Ibaraki with an American farmer-missionary, O. D. Bixler, who had lived there for many years. I remarked that there were no young people.

"The men are fighting," he said, "and the

Germaine Kellerman

Scissor-pickers Gather a Late Crop from a Japanese Tea Field

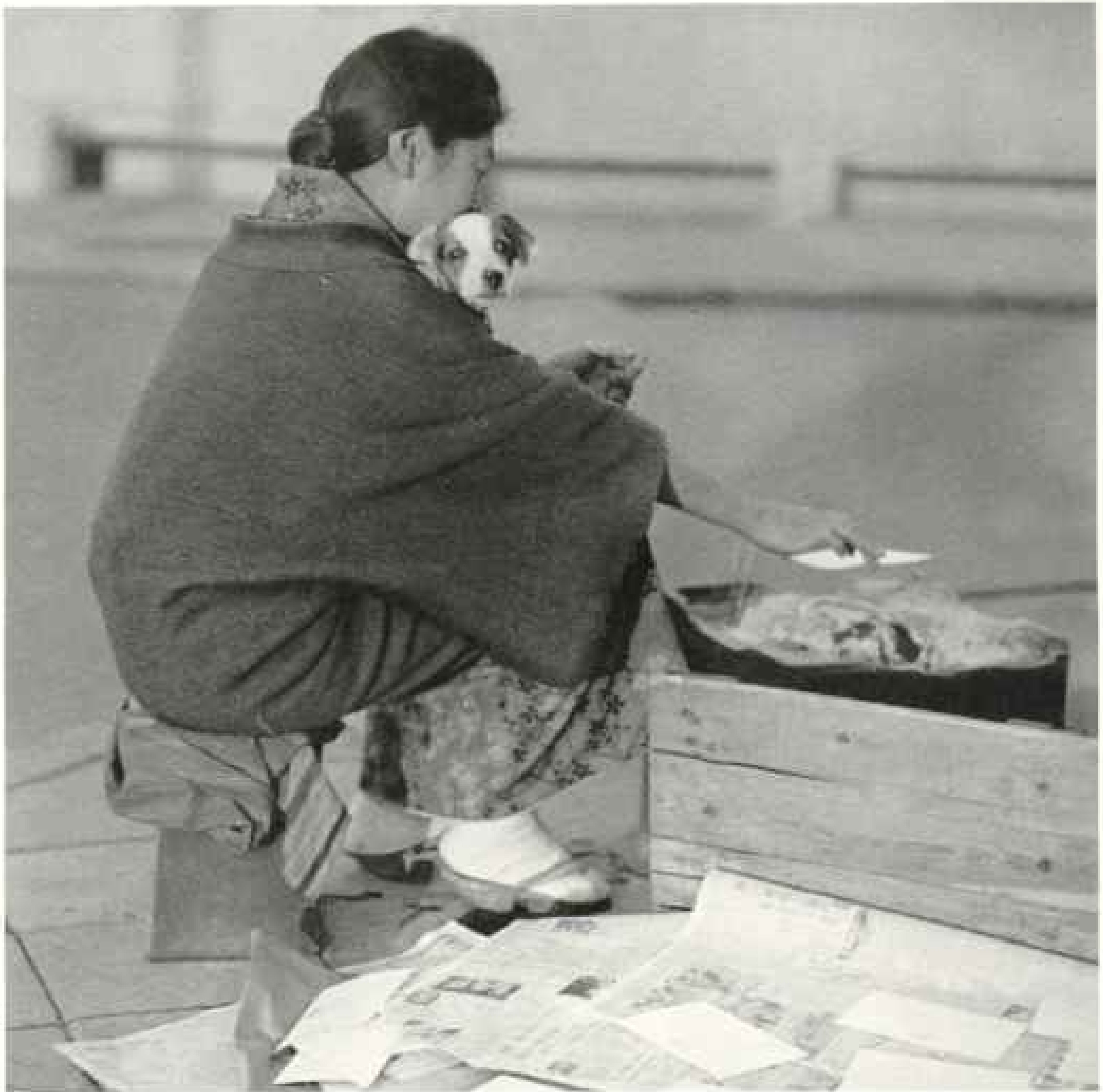
In April or May the first pick is made by hand at Shizuoka. Then the tender leaves at the end of each twig, which yield the finest quality of Japanese green tea, are taken. Later scissor pickings, after the plants have grown again, yield coarser tea. Before the war Japan's only tea customer was the United States.

Gasoline Rationing Is Nothing New to Japan

For five years the fuel has been scarce. The kimono-clad filling-station attendant hopes to have more gasoline soon from the Netherlands Indies.

"Does Anyone Honorably Wish to Dismount?"

The modern Japanese bus girl in a trim uniform preserves the ancient courtesies. To a boarding passenger she must say, "We regret having kept you waiting." When the bus is about to go around a corner, she warns, "We are honorably about to turn. Be careful not to fall." At the end of each run, she wields duster and broom and puts fresh flowers in the vase by the driver's seat.



Over a Charcoal Fire She Bakes Ink on Formal Cards to Imitate Engraving

The ink contains a preparation which causes it to expand under heat, thus giving a raised surface to the lettering. Japanese have a mania for calling cards. Unable to afford engraved ones, they fall back on this cheaper substitute.

girls are in the factories. Here is the office of the village agent. He has his eye on every girl, and when she reaches the age of 14 he goes to her parents. He offers to lend the parents three years' wages in advance for the girl's services. That means a good deal to a family at the edge of starvation.

"The girl may be unwilling, but she sacrifices herself for the welfare of her family. The contract is signed and she is bound for three years.

"The long hours in badly ventilated mills give many of them tuberculosis, which they pass on to others at night as they lie packed side by side on the floor, twelve or more in one small dormitory room with the shutters closed.

"More than 50 percent come back to the village broken in health."

Many Accidents in Factories

The accident rate is abnormally high. That is the fault of both the management and the employee. Machines are not properly guarded, and the worker, like the soldier, does not value his own life highly.

"They don't look on death as we do," William Gorham, American consultant in a large Japanese automobile factory, told me. "They take unnecessary risks. They have been so

impressed with the importance of doing the job that they don't think much about personal safety."

Japan Plays for High Stakes

This will to win, at no matter what cost, is what Japanese militarists are counting on when they say, "A poor nation *can* conquer a rich one." They recall the Russo-Japanese War, when the difference between Japan and Russia was "like the difference between a minnow and a whale"—yet Japan was victorious.

Can they be right? Are we too complacent in our vast riches and strength?

Japan, if she can hold the riches of the Indies, will challenge us in wealth. As for numerical strength, we are 132,000,000 and the Japanese are only 73,000,000. But they control the services of more than 400,000,000 Asiatics in the territories they have conquered. Just as Frenchmen are, willy-nilly, making munitions for Germany, so Asiatic mills, mines, and farms are today working for the benefit of Japan.

The 73,000,000 Japanese bosses plan to be 100,000,000 by 1960. In 1941 the Japanese Cabinet approved a 20-year propagation program "to maintain Japan's leadership in Asia." Women are urged "not to enjoy their own lives only," but to raise up sons for the State.

A standard of five children is set for every family. Bonuses are offered. The people are reminded that Japan's "new order" for eastern Asia means that half the population of the world is to be brought under the guiding hand of the Japanese; hence the need to increase without delay the numbers of the ruling race.

"Whatever Will Advance Japan Is Right"

Another advantage of the Japanese is the lack of scruples. They have a moral code, a strict one. It is, "Whatever will advance Japan is right." This grows out of the conception that Japan and her Emperor are divine and therefore above all other lands and all ordinary standards of right and wrong. If a treaty bars Japan's path, the treaty must be broken.

The Japanese are honest in dealing with each other. No door is locked, yet thefts are rare. Prices in stores are fixed and reasonable. There is not a great deal of bribery and corruption, even in politics. The Japanese respect each other's rights—but foreign nations are fair game.

An American firm may spend twenty years on research, then see its product pirated by a Japanese manufacturer. He will reproduce it faithfully, even to the American maker's trademark. He may patent it in Japan, printing his patent application in some small paper in a remote part of the country where no foreigner is likely to see it. Then the American manufacturer is actually barred from selling his own product in Japan.

A famous hat maker was refused permission to advertise his own name in Japan or sell his hats because a Japanese had registered the name and had thereby taken over the business.

A well-known American bathing suit has been appropriated by Japanese, who manufacture it and sell it under the American name all over Asia.

A French perfume bottle has been reproduced exactly, including the label. The only thing that is different about it is the perfume.

"Genuine Old Scotch Whiskey" is made in Osaka. Matches turned out in a village near Kobe are marked "Made in Sweden." Empty British jam jars bearing a famous label are refilled and sold.

Made in USA—Japan!

A little factory village was dubbed USA because so many things labeled "Made in the U. S. A." were made there.

I bought a can of shoe polish of my favorite brand and discovered too late from the legend printed on the can that I had been cheated. Only one slight error in the printing exposed the counterfeiter. Our Navy got some inadvertent advertising. "U. S. A." had somehow become "U. S. N."

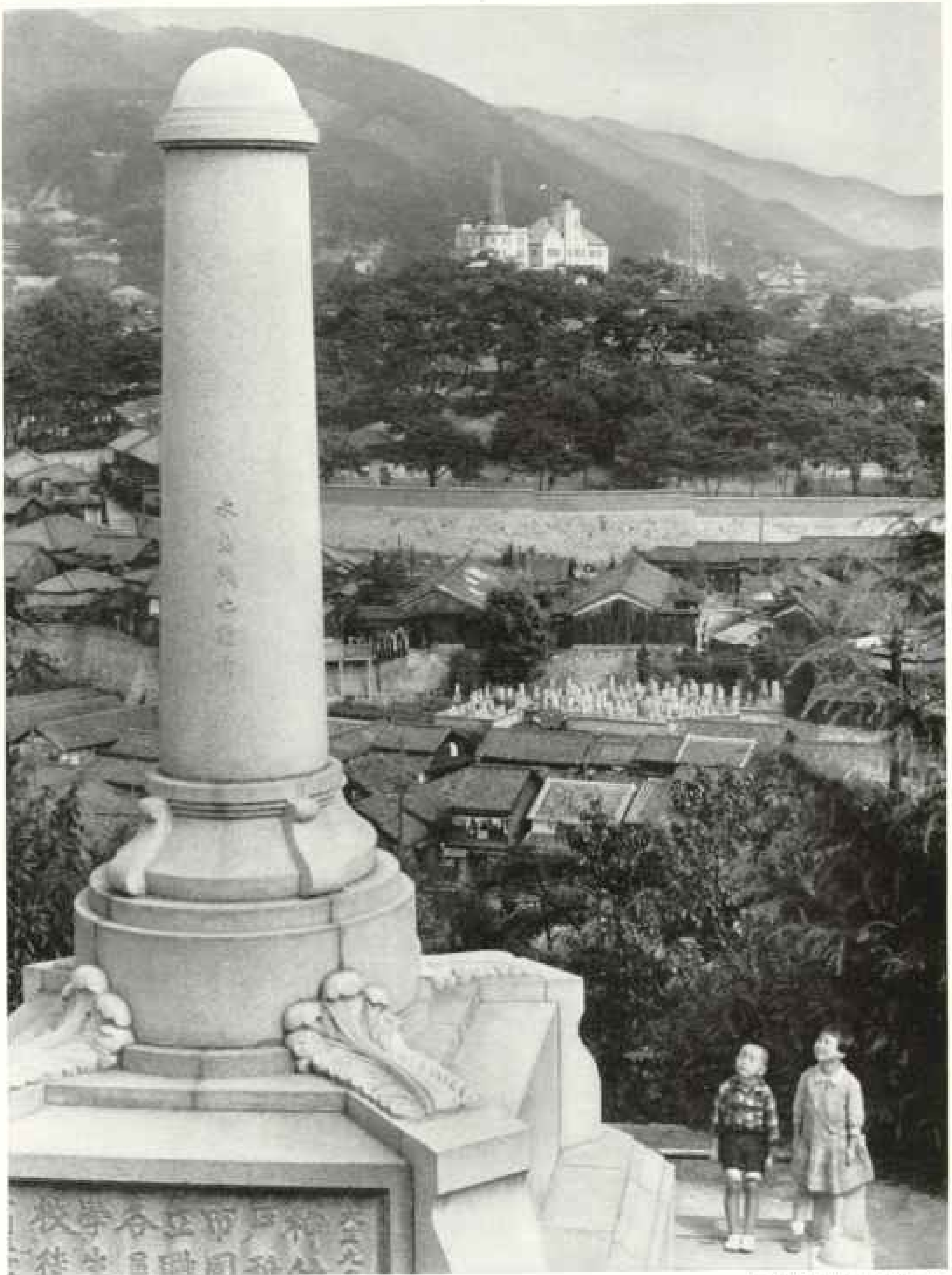
Piracy came closer home when one of my books published in America was translated into Japanese and printed in Japan without benefit of author. I demanded payment without avail, but was richly amused when the Japanese Army, objecting to certain passages in the book, banned its sale, and the pirate publisher was left holding the bag.

Put together sharp practice, exploited labor, and executive ability, and you have a combination that has made Japan formidable both in world trade and in war.

But I lived next to the chief reason why Japan is dangerous. That is the Emperor. Not that he himself is a dangerous man. Far from it.

Within a stone's throw of our house in the fishing village of Hayama was the Emperor's summer palace.

From our upper windows we could look across the roof of the charcoal dealer's store and the roof of the little village post office, then over a high wall studded with sentry



R. Moulin from Ewing Galloway

In Kobe Stands This Tribute in Stone to Another Jap War of Conquest

The Russo-Japanese War memorial, of purely Japanese design, rises on a hillside in Okura Park. In the distance are the buildings of the Imperial Naval Observatory. A walled cemetery stands in center. Kobe, "Queen City of Western Japan," was one of the points bombed by American planes on April 18, 1942.

Masao Horino from Wide World

Boys Costumed as Japan's "47 Ronin" March in a Holiday Parade

The original 47 *ronin* were the principals in a celebrated romance two and a half centuries ago. When their master was insulted in the Shogun's palace, he drew his sword within its sacred walls. For such an act of disrespect he was obliged to commit *hara-kiri* and his 47 faithful retainers were disbanded. True to their military code they avenged their master by killing his detractor. Then all committed hara-kiri at their lord's grave.

boxes, into the palace gardens. The buildings were hardly to be seen in the dense grove of pines. The walled gardens bordered Sagami Bay on one side and faced the village street on the other.

Never did the Son of Heaven come out of the great gate into the street except in his maroon limousine with full military bodyguard, and then only when he was bound for his palace in Tokyo.

He was never permitted the pleasures we enjoyed, of walking through the village, lingering in the odd little shops, following paths into the country across rice paddies and up the hills through a beautiful forest of cryptomeria to flower-covered summits. From here there was a breath-taking view of the sea and the Miura Peninsula, where Commodore Perry had landed on that fateful day in 1853, the smoking island-volcano Mihara, and snow-capped Fujisan (page 228).

"Son of Heaven" Is Army's Prisoner

The Emperor would have enjoyed all this, for he is a gentle soul. But this was not for him. He was, and is, a prisoner of the Army. The militarists have built up the fiction that he is a god, and a god does not move freely among his people.

But the Emperor may come out of his back gate onto the beach and the little grassy point that projects into the sea, and there we often saw him.

When he emerged from the front gate he was *Tenshi*, The Son of Heaven. When he swung open the back gate he was a little man in a floppy straw hat.

Then he did not seem the core of one of the two most dangerous fanatical nationalisms in the world. We watched him playing with his children in the sand, collecting marine specimens for examination in his laboratory (for he is an ardent zoologist), walking with the Empress on the point, swimming with strong, clean strokes in the surf.

Hawking a Royal Sport

He examined his falcons, trained to catch rabbits, geese, and herons. Hawking is exclusively a sport of the imperial household in Japan. It is another of the arts Japan

acquired from ancient China (page 251).

On still evenings he stood moon-gazing, or listening to the drowsy crick-crick of the crickets, or the clear notes of the *uguisu*, Japanese nightingale.

Mouthpiece of the Militarists

He did not seem one to set the world on fire. Yet that is what he has done—or, rather, it has been done in his name. The militarist leaders have used him as the rallying point of Japanese loyalties. It is much easier for their people to be loyal to a person than to a cause. The farm boy who has been made a soldier does not care a rap about conquering India or Australia. The "new order" leaves him cold. But he will die willingly for his Emperor.

When the militarists dream of any new conquests, all they need to say is, "This is the Emperor's wish."

The Emperor is not permitted to speak for himself. Indeed, the royal recluse is not even allowed to have a telephone. He is reported as saying whatever the Army wishes him to say—and the people obey without question.

With a Small Stick the "Takajo" Preens His Goshawk's Feathers

From the falconer's waist hangs a small basket filled with pigeon meat, food for the hawk. Like many other arts, the Japanese acquired falconry from ancient China. The sport is reserved for members of the imperial household.

It is this passionate loyalty of a misguided people that is our greatest peril in the Pacific.

Japan's Achilles' Heel

Along with the danger that we will underrate the fanaticism, will to win, and ability of our enemy is the lesser danger that some of us will go to the other extreme and overrate Japan.

Therefore, let us look for a moment at a few of her weaknesses.

I have already spoken of the vulnerability of her industrial districts to air attack.

But there are more subtle ways in which Japan is vulnerable.

One is that she, too, has made the mistake of underestimating her enemy. She recognizes America's wealth. But she believes that this wealth has sapped the energy of the nation.

Another dangerous delusion of the Japanese militarists is the notion that they cannot lose. They have fought three great wars and won them all.

The progress of this war, too, has encouraged them to believe that they are superhuman and invincible. That fact makes them vulnerable.

Under Cover of Beppu's Hot Sands, Jap Patients Bake Ailments Away

Only heads and toes stick out from the heaps of pulverized volcanic debris. Some of the thousands who come annually to this Japanese Karlsbad take sulphur baths so hot that the water scars their bodies.

Another weakness of the Japanese is their reliance upon rules. It is also their strength, for their success has often been due to careful advance planning of every detail. But when something occurs to upset the program, there is confusion. Hence, the United Nations forces might well consider the wisdom of a policy of never doing the expected.

Another handicap of Japan is her "return to antiquity." She resents having had to borrow so much from the West, and her leaders for some years now have been sedulously reviving feudal notions and customs in an effort to turn Japan's eyes back to her "glorious" past. While Japan marches forward, she looks backward.

Superstitions of olden times are taken from the shelves and polished up. Feudal ethics of servile obedience and bloody vengeance are revived.

No nation can be strong that does not look forward as well as go forward.

Japan Has No Great Religion

A fatal weakness of Japan is that she has no great religion.

The Japanese version of Buddhism is a worn-out fabric of ceremonials. Shinto is Emperor- and ancestor-worship. It teaches nothing except obedience.

The great ethical teachings of such faiths as Christianity, Judaism, Mohammedanism, Confucianism, and Asiatic Buddhism are neglected in Japan. The result is that the Japanese philosophy of life is shallow and unstable.

Cruel and Ruthless in War

Japan's cruelty and ruthlessness in war make her weak. This may seem like a paradox. But it is true that a bully is never safe.

Japan made fine promises to the people of Asia. She would free them from British and Dutch rule. She would establish an "Asia for the Asiatics."

Many took her seriously.

But when their countries were actually overrun by Japanese soldiers who looted their homes, despoiled their women, and fought not only with guns but with such weapons as rape, torture, opium, and prostitution, the brown people's faith in their "saviors" waned.

Frightfulness, which the Japanese believe is necessary to success, is sowing widespread hatred which will some day, soon or late, mean Japan's destruction.

Baja California Wakes Up

By Frederick Simpich

THE possibility that Japan may attack our west coast brings Mexico's peninsular territory of Baja, or Lower, California into the news.

Even before Mexico's declaration of war on June 1, Mexican and American armed forces worked day and night in friendliest co-operation to defend Baja California.

Hung from the very southwest nook of the United States, this long, slim, dragon-shaped peninsula swings some 800 miles down into the Pacific, cut off from the Mexican mainland by the hot, tide-lashed Gulf of California, early known as the Sea of Cortez (map, page 258).

This area joins our own California along a 140-mile frontier that stretches from the Pacific Ocean to the turbulent Colorado. Millions of Americans have swarmed across the border to visit the races, bullfights, casinos and cafes, curio and perfume shops of Tijuana, Agua Caliente, and Mexicali. Yet the peninsula as a whole is one of the wildest, least-known regions in all of inhabited North America.

You may venture for days along many stretches of its hostile, empty coasts, and see never a human being—only gulls, cormorants, pelicans, seals, whales, and myriad fish.

Spain knew this peninsula centuries before there was any Hollywood or San Francisco in our own California. Cortez explored its tip, and put in at what is now La Paz in 1535. From here the padres pressed north to settle "Alta," or Upper, California, which first Spaniards and then Mexicans owned and ruled until it went under the American flag after the treaty of 1848.

Two Californias Face a Common Foe

Now, facing a common foe from across the Pacific, we see the two Californias again united in arms with petty frontier frictions forgotten.

"We have the men and the courage," a Mexican Army officer told me. "With the aid of guns and planes from your Uncle Sam, we'll guarantee to keep any Jap from ever getting a foothold in Baja California.

"In fact, we've already started cleaning house. All Japs who used to fish and farm here—and draw maps—have vanished. Fishermen fled under their own power, and we've packed the farmers off to inland camps, just as you're doing farther north."

Disguised as fishermen and gardeners, Japanese spies for years have thoroughly explored and mapped the whole long, lonely coastline of this peninsula, from magnificent Magdalena Bay around to the Colorado River Delta at the head of the Gulf.

Mexico knows this, as do our own consuls, border-patrol men, and customs inspectors. Mexico also knows how easily enemy submarines could use these deep, safe harbors, and how easily, unless she were alert, enemy planes might use many peninsula desert flats as natural airports.

That is why former President Lázaro Cárdenas, now commander in chief of Mexican forces, set up headquarters in a town on the peninsula's west coast.

He moved his troops through the United States to reach this exposed territory more quickly, and is now co-operating with United States air forces in constant joint patrol of the peninsula, whose northern border lies in the very shadow of our great Navy and Army bases at San Diego.*

That is why, too, you see high-ranking Mexican and American Army, Navy, and consular officers now in frequent conference at border points, and elsewhere in Baja California.

People Dwell beside the Fresh Waters

When you look at this vast peninsula's 2,000 miles of undefended coastlines, with Magdalena Bay alone big enough to shelter all the navies of the world, you can see what tempting terrain it is for would-be Japanese invaders.

Yet what an empty world! Even its map is misleading. Many of its place names are not towns at all, but merely ruins of missions, ghost towns, abandoned mines, lone ranch houses, deserted fishing camps, and rare wayside waterholes.

Though Baja California is almost as large as Florida, its population is less than two persons per square mile, and they are found only in the few spots where there is fresh water. Many small towns there are, of course, and a few limited areas where abundant crops are grown; of these, more later.

You can drive through scenic cow country from the border south to Ensenada, which is 80 miles by road below San Diego, California; likewise, you can ride east and west between the border towns of Tijuana and

* See "San Diego Can't Believe It," by Frederick Simpich, National Geographic Magazine, January, 1942.

Wide World

Snappy Mexican Marines Line up for Inspection "Somewhere in Baja California"

Eagle-eyed Major F. Migoni is looking them over. In their white caps and trim blue uniforms, chins up and backs straight, they reflect Mexican youth at its best.

Mexicali, over easy mountain grades, but houses are few and far between. Road building, and the stringing of telephone lines and well digging, are among the Army's first and most pressing jobs.

No railroad, and not even a good all-season dirt road, runs the whole length of the peninsula. Following faint traces of a so-called "Royal Road" scratched through the rocks and cactus by the padres 200 years ago, Philip Townsend Hanna of the Automobile Club of Southern California drove his car from Tijuana clear down to Cape San Lucas and made a road map.

Few other motorists have driven the "road's" full length, though some unknown runaways ditched a yellow cab away down there in the wilds, all its identifying numbers filed off. For nearly the whole distance, after you cross the valley below Ensenada, the rough, sandy trail winds through a dry wilderness until it reaches San Ignacio.

Seen as a whole, the land is a realm of weird plant life, of lizards, snakes, bighorn sheep, pumas, foxes, kangaroo rats, and hydrophobia skunks—a veritable paradise for the naturalist, as so vividly painted by Edward W. Nelson, when he explored here years ago.*

Time and again, for 400 years, persistent man has sought to conquer this dry, unfriendly wilderness, usually to meet defeat.

In 1847, during the War with Mexico, New York volunteers landed at La Paz, where Lieut. E. Gould Buffum wrote: "The climate is equal to that of Italy or Persia. . . . It is eternal summer." Pearl divers, he said, carried sharp sticks with which to gouge loose the oystershells and fight off sharks.

Later, by the Treaty of Guadalupe-Hidalgo, 1848, the United States restored the peninsula to Mexico.

"Nicaragua Walker" and Robinson Crusoe Came Here

Again, in 1853, the adventurer William Walker, later known as "Nicaragua Walker" because of his invasion of that country, enlisted a crew of freebooters at San Francisco, and landed at La Paz. By proclamation he set up what he called the "Republic of Lower California and Sonora," and tried to form a new southern slave State for annexation to our Union. But the Mexicans drove out this "gray-eyed man of destiny."

Even "Robinson Crusoe" came here! The English ship that rescued Alexander Selkirk

* See "Land of Drought and Desert," by E. W. Nelson, NATIONAL GEOGRAPHIC MAGAZINE, May, 1911.

© Harris and Ewing for Bobby Burns

Grim Mexican Fighters Ride United States Railways to Duty in Baja California

Since no railroads connect the Mexican mainland with Baja California, transit was provided by Uncle Sam, who has with Mexico a common interest in West Coast defenses. French-type helmets give these infantrymen a European appearance.

from his island anchored later just south of La Paz, where it lay in wait to loot a galleon bound from the Orient for Acapulco.

Concessions for pearl fishing, mining, and land colonizing have been granted variously to Russian, English, French, and American adventurers. Among these was the ill-fated Flores, Hale & Co. undertaking. It was granted millions of acres about Magdalena Bay. For a time its settlers harvested the orchilla plant, for dye making, until drouths and the advent of chemical dyes ruined the industry.

Near San Quintin, too, an English colonization group built a hotel, a short railroad, sowed vast fields of wheat, and operated a flour mill. But again years of drouth came, and the colony broke up. Only one elderly Englishwoman remains. She owns the historic Hattie Hamilton Ranch, a popular haven for fishermen and hunters. All the old company buildings have fallen into decay.

One west coast settlement of colonists from New York became so distressed that the United States Navy sent a relief ship to the rescue.

Agrarian reform laws, fruits of the Carranza revolution, broke up many other land settlement enterprises, including the vast cotton plantations below Mexicali, formerly owned by Los Angeles men.

Once the great Circle Bar Ranch, with headquarters at Ojos Negros, east of Ensenada, ran thousands of cattle and exported them to the United States. First English and then Americans owned it. Now it has been expropriated, divided among agrarian colonists from the Mexican mainland, and the vast herds of cattle have vanished.

Ensenada Had a Gold Rush

Gold seekers early gave Ensenada a lively boom, remindful of California gold rush days. That was about 50 years ago. Treasure hunters swarmed, trudging inland to the El Alamo diggings, many pushing their effects on wheelbarrows. Then Ensenada had an American newspaper, gambling halls, and served imported ham and eggs at $2.50 a plate.

Now El Alamo is a ghost town. Its once busy mining population is vanished. Empty shacks, abandoned shafts, and rusty machinery hint at forgotten prosperity. But Ensenada is bustling with wartime energy; its main street is gay with the noise of music halls, enchilada cafes, and curio stores.

All Year Club of Southern California by M. H. Montgomery

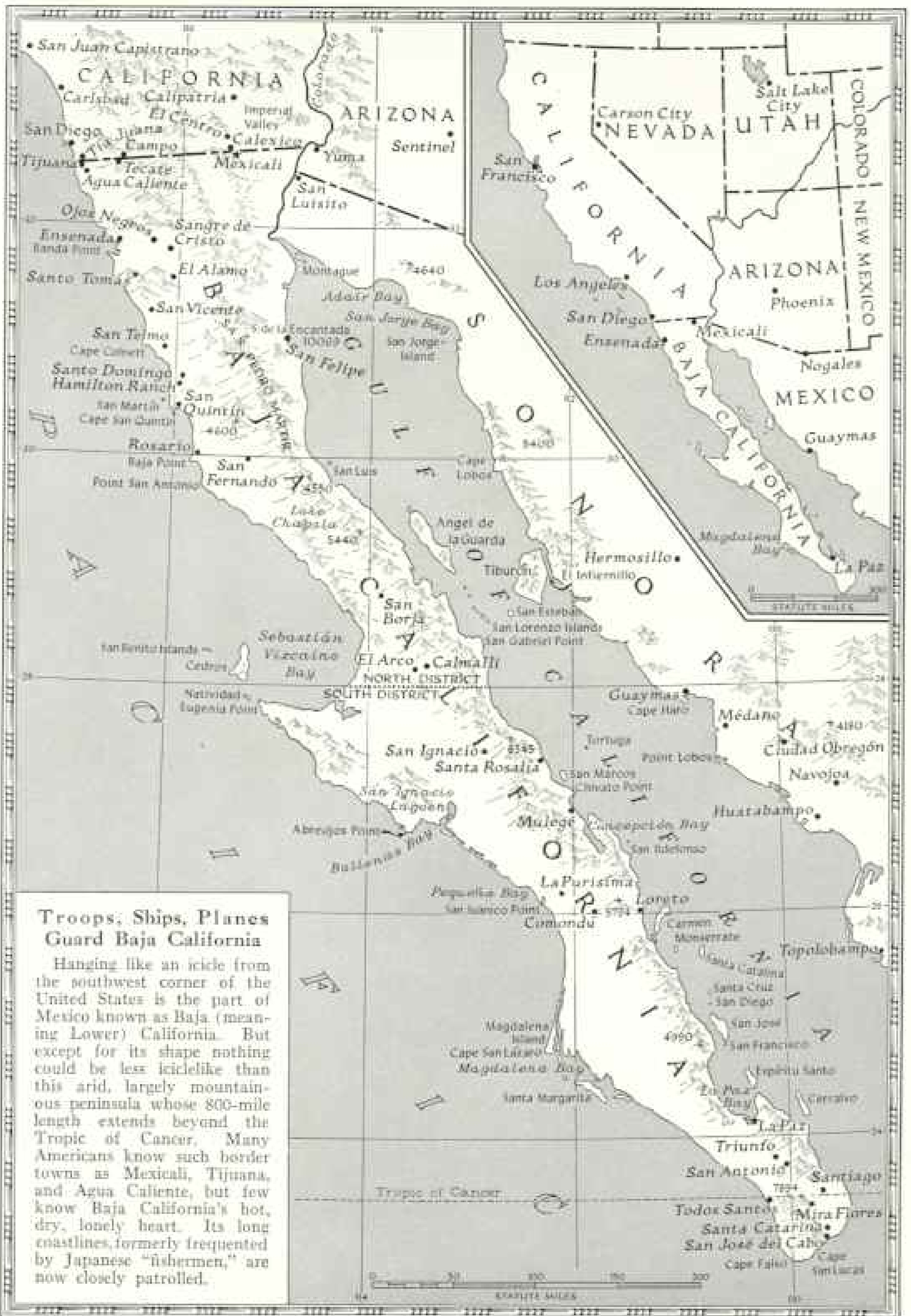
"South of the Border" by a Few Feet—Mexicali, Mexico, in the Foreground and Calexico, California, Beyond

These twin border towns got their musical names by mixing syllables from the words "Mexico" and "California." Here customs and immigration officers, Mexican and American, control traffic across the International Line.

From All Year Club of Southern California by M. H. Montgomery

School Children of the Mexico-California Border Stage a "Coast Defense" Parade at Calexico, California

War brings a closer bond of friendship between border cities. This kinship was highlighted at Calexico's annual Desert Cavalcade in April, 1942, when Mexicali dropped its Mardi Gras celebration to join in the pageant on the American side. Many of these Calexico children in the 1941 event are of Mexican parentage.



Troops, Ships, Planes Guard Baja California

Hanging like an icicle from the southwest corner of the United States is the part of Mexico known as Baja (meaning Lower) California. But except for its shape nothing could be less iciclelike than this arid, largely mountainous peninsula whose 800-mile length extends beyond the Tropic of Cancer. Many Americans know such border towns as Mexicali, Tijuana, and Agua Caliente, but few know Baja California's hot, dry, lonely heart. Its long coastlines, formerly frequented by Japanese "fishermen," are now closely patrolled.

George Lindsay

Creeping Devil Cactus Appears To Be Crawling Like a Huge Hairy Caterpillar

Look how each plant lifts up its head, as a snake or a big worm might do! Dying at the tail and growing at the head, this evil-looking cactus actually moves forward year by year.

Richest enterprise in town is the big fish-packing plant built by General Abelardo L. Rodriguez, former governor of the North District. To insure ample oil to pack his fish, Rodriguez set out olive groves. To get still more oil, he is distributing thousands of young trees to peons who live in areas where these trees may grow. To make them grow faster, he soaks his cuttings in a mysterious chemical mixture developed at the California Institute of Technology in Pasadena.

I saw Ensenada first in 1911, when Philander C. Knox, then Secretary of State, named me American consul to Lower California. The last "American invasion" was then in full blast. Bands of I.W.W. filibusters from Upper California had swarmed in, seeking to set up a socialistic republic. Mexican troops had mowed them down.

I was sent to "observe and report," and was supposed to stay only a few weeks. But the turbulence of the Mexican Revolution was spreading. So I buried some of my errant countrymen whose bodies still lay in the fields, and later went over to the mainland. For five years I followed the Revolution, riding on troop trains with Carranza, Obregón, Villa—learning much of this romantic Aztec land below the Rio Grande.

No part of it holds more of sheer human interest than does Baja California.

Until Jap invasion threats showed us this peninsula's strategic value, it had been important to most Americans only as a playground for filibusters, sport fishermen, and naturalists.

Yachts of Hollywood stars, of famous sportsmen, of picture-making and book-writing expeditions have long cruised these waters.

Choosing Your Fish—with an Empty Hook!

Gulf of California fishing is among the world's most exciting, most incredible. Sail out from Guaymas, on the Sonora shore, any fine morning and watch for flocks of diving birds. That means they're after little fish chased to the top by big ones. Hasten to that spot, and you see the ocean foaming—lashed by acres of big, hungry fish (p. 264).

At such times I have seen Mexicans stand on the stern of a launch, holding only 10 or 15 feet of stout line fitted with an empty hook. They toss the hook straight into the open mouth of the particular pursuing fish they choose, and he grabs it.

"Not you!" they may say to an unsavory *toro*. "But you over there—you juicy Spanish mackerel, or you tasty big yellowtail!"

Dick Whittington

Ensenada, Summer Capital of the North District of Baja California, Claims One of the World's Most Salubrious Climates

Here the 20-mile crescent beach of the Napleslike Todos Santos Bay stretches south to fertile, pepper-growing Maneadero Valley. Jack Dempsey built the large, white missionlike structure originally as a resort hotel and casino. In normal times the yachts of Hollywood stars often anchor at Ensenada; south of the town, in the valley, American duck hunters from California maintain a comfortable lodge, built conveniently near the duck blinds.

Official Photograph U. S. Navy

Lieutenant General John L. De Witt, Commanding Uncle Sam's Fourth Army and Western Defense, Reviews Crack Mexican Infantry at Agua Caliente, Baja California, Mexico

At left, taking the salute, is Lieutenant General De Witt. Next, in white uniform coat, is General Lázaro Cárdenas, former President of Mexico; next, Lieutenant Colonel Modesto Rodriguez, liaison officer for the United States with the Mexican Army, and then Brigadier General Juan Felipe Rico Islaz, Commander of the Second Military Zone, Baja California.

Laurence M. Huey

Baja California's Generally Barren, Empty, and Hostile Terrain Is Dramatically Painted in This View of San Felipe Bay

San Felipe "town," on the waters of the Gulf, a mere huddle of huts at lower left, exists only to handle colossal catches of fish often made here. Hauled north by truck, they cross the line at Mexicali, Mexico, and Calexico, California, below sea level in Imperial Valley.

Laurence M. Huey

Hung Out to Dry, Like a Week's Wash, Fresh Meat Soon Cures in This Arid, Sunshiny Climate

Jerked beef, known here as "carne seco," is widely eaten. Hard as oak, "jerkie" is beaten into bits and stewed with potatoes, onions, and chili.

From Frederick Simpich

Vanishing Seri Indians of Tiburón Island Live with Dogs in Rude Shelters, Their Women's Faces Painted with Guano

Jake Miller

A Nimble Lumberjack, Jumping from One Fish's Back to the Next, Might Almost Walk on Top of This School

Countless millions of fish swarm in the turbulent waters of the Gulf of California. These voracious sea trout are so excited chasing sardines that they pay no attention to people wading among them. The man is grabbing them by the gills and throwing them out on the bank. Hundreds of the sardines actually jumped out on the beach and were devoured by gulls.

Laurence M. Huey

Wallowing through Deep Sands to Reach the Empty Shores of Magdalena Bay, One of the Finest Natural Harbors on the Pacific

To the writer a Mexican driver once defined a road as "tracks on the ground." Here is a fair example of the tough going every motorist encounters between Ensenada and the southern tip of the Peninsula, about 800 miles, as the crow flies, from the International Line. Actual distance by "road" is more than 1,000 miles.

And thus they hook the very one they want—like roping calves in a corral!

Devil fish, so big and dangerous that even the Official Sailing Directions mention them, lurk in dark caves about the rocky shores.

Giant manta rays are a terror to pearl divers. One day, at a range of only 20 feet, I fired six buckshot charges from a pump gun into a giant ray, but never stopped him.

Once a whaleboat crew from the British gunboat *Shearwater* harpooned a big ray. Frantically the "limeys" pulled at their oars, but in vain. Straight out to sea, farther and faster, the monster was dragging them. Seeing their plight, the *Shearwater* upped her mudhook and steamed to their rescue.

Fishing lately in Magdalena Bay, Randolph Leigh, Virginia sportsman and writer, harpooned and landed a manta ray that weighed 3,800 pounds! One giant I saw leaped clear of the sea, then bounced along in prodigious jumps, like a plane making a bad landing.

Adventures of a Naturalist

"I have made 23 field trips down that peninsula in the past 19 years," said Laurence Huey, Curator of Birds and Mammals at the San Diego Natural History Museum. "From a scientific standpoint, I think the peninsula is about cleaned up. Scientists have nearly everything named and classified. But with what strange sights and adventures!

"One day I was digging out a gopher when two Indians came up.

" 'What do you dig for?' they asked.

" 'Gophers,' I explained.

" 'That's false,' they said. 'Americans don't eat gophers. You're digging for gold!'

"Labor-saving methods can be applied even to gopher-catching, we learned from a Mexican boy at Rosario," continued Mr. Huey.

"I offered him 5 cents each to dig me 25 gophers, but he didn't dig. He took a live one, tied a string to its hind foot, and let it run down into a likely hole. Immediately the string tightened and began to jerk violently; the boy slowly pulled on his string, and out came our captive animal, holding another with his teeth!

"I left the boy taking more prisoners in this odd way, and went to set some rattraps. When I got back, he had caught the 25 gophers. But he had put them, all alive, into a 5-gallon oil can, where they had fought and bit so furiously that not one was worth skinning. So we had to start all over."

"What other kinds of animals did you trap?" I asked.

"Anything from mice and kangaroo rats to badgers and coyotes," said Mr. Huey.

"For mice and rats we'd bait with birdseed and oatmeal. But our bait was often stolen by crickets, beetles, and even by centipedes before the mice got to it.

"Ants and rattlesnakes would come, too, and eat our captive mice and rats. So we'd often get up in the night with lanterns and retrieve our catch before some enemy stole it.

"Mice are cannibals. If they come upon a brother dead in a trap, they'll eat him. But ants are worse. Swarms would attack our captive mice, leaving nothing but bones and hair.

"Kit foxes and coyotes would steal rats, traps, and all. Near one kit fox's den I found 36 mousetraps which it had stolen from some other naturalist's trap line!

Quail Gut Bait for Wild Cats

"For wild cats we baited with quail guts. One morning we found two young wild cats sitting at the top of an old telephone pole, where coyotes must have chased them. When my partner shook the pole, they jumped down at me, spitting and clawing.

"Often I'd set my flash camera near a baited trap, so sneaking, nocturnal coyotes could take their own pictures. One fellow got so scared when the 'gun' fired that he jumped right into the middle of a big cholla cactus and just about ruined himself."

"What would the peons say when they saw you trapping or sitting in your tent working on your skinning board?"

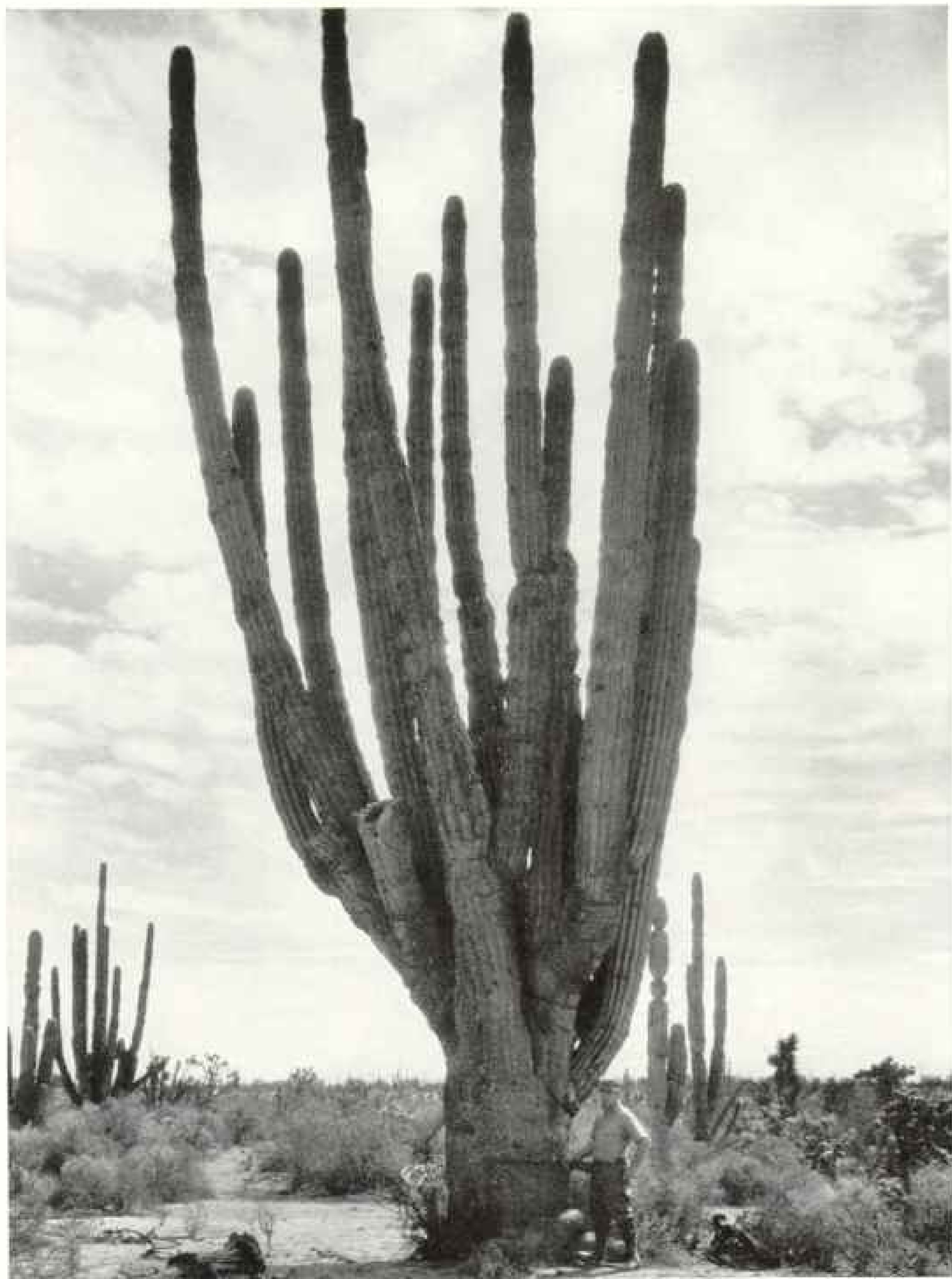
"They thought us just plain crazy," said Mr. Huey. "They kept asking what these tiny animal skins were worth. When we handled lizards, they'd jump back because they're mortally afraid of the harmless little gecko. They were astounded, too, when my partner would let live tarantulas crawl up his naked arms.

"Certain small skunks, known to them as *malas zorrillas,* they say are deadly to man or beast because they carry hydrophobia. Personally, I don't know. You hear tales of people and horses dying from such skunk bites. But I did see a horse whose nose was swollen up like a football from a rattlesnake bite.

"One time we skinned some coyotes in camp. Swarms of fleas hopped from these dead coyotes into our blankets—so many fleas, in fact, that we had to move camp. Mexicans thought this a big joke."

"In your long explorations here," I asked Mr. Huey, "what was perhaps the strangest sight of all?"

"That happened over on the Gulf," he said, "where that famous bore wave runs so high.



Laurence M. Huey

You Can Judge the Size of This Cactus by Comparison with the Man Standing under It

His 12-gauge shotgun reaches barely halfway across the tree's trunk. Such cardons have been known to reach 60 feet. Mexicans lash the limbs together with rawhide and use them for rafters in huts. Woodpeckers, owls, and often ospreys nest in these giant cacti.

Laurence M. Huey

For Some 200 Years San Ignacio Mission Has Withstood the Ravages of Sun and Desert Winds

Standing well down toward the peninsula's tip, this edifice is one of the few Baja California missions which have not fallen into complete ruin. In Spanish times a string of missions, each about a day's mule ride from the next, stretched clear up to the Golden Gate. Sugar cane, and date palms introduced by the padres, grow about San Ignacio.

It was up towards the Colorado Delta, where the tide rises and falls 25 or 30 feet with amazing swiftness.

"Then, as the waters fell, a big school of sea trout chased a horde of sardines towards shore. The little fish, by hundreds, actually jumped through the receding big wave and landed on the mud.

"Almost instantly gulls swooped down and gobbled up the sardines as they still flopped helpless on the flats."

"Sea-bass" Shipped North and East

At the "port" of San Felipe (p. 262) which again is a geographic name but not much of a town, desert and marine life strangely meet.

Big fish named *totuava* frequent these waters. Chinese at first caught them for their swim bladders, from which they made soup, throwing away the rest of the fish.

Americans and Mexicans, seeing this waste, brought trucks south over the desert from Mexicali, bought these huge fish for a few cents each, and soon built up a good trade. Nicknamed "sea-bass" for market selling, some of this fairly good fish is shipped east as far as Mississippi Valley points.

Makers of dog and cat food have also figured in ventures here. At first they worked on the wild burros, selling their by-product also to the fox farms and to the soap and glycerine people.

As burros grew scarcer, they took after the seals. With a floating factory they chased these amphibians from rock to rock, all around the peninsula, boiling their meat for dog food, selling their hides for leather, destroying whole herds.

Japanese marauders, till Mexicans drove them off, in the same way ravaged and

almost ruined the shrimp and abalone grounds.

Pearl fishing, from early Spanish times, was a busy trade around La Paz. The King got his percentage, and you hear tales of poor Indian divers who found fine pearls and quit work for life. For years an English concern held a pearling concession here. Now the Mexican unions control it, using modern diving bells.

Vitamins from Shark Livers

Today, however, the pearl market is dull; most diving gear is stored, and the divers, like many market fishermen, are after sharks.

Men used to hate the evil shark. Long thought worthless, for years this wicked predator pushed his dorsal fin arrogantly about the fishing grounds. Sport fishermen detested him. He not only scared the fish away, but if you'd hooked a fine bass, or a mackerel, likely as not a loitering shark would bite your prize catch half in two before you could haul it aboard.

Today the shark ranks in value far above edible fish. Discovery that its liver, like cod liver, yields an oil rich in vitamins has completely upset the long, leisurely way of life among these market fishermen.

From one day's lucky haul of sharks a man may earn as much as he could at a month of fishing for bass, mackerel, etc. Hauled up from the Gulf coast about San Felipe, truckloads of shark livers cross the International Line at Mexicali for shipment to Los Angeles. Sealed in 5-gallon gasoline cans, these livers, when unpacked for customs inspection, smell much less sweet than violets.

Sneaking beef and burro livers into the cans, along with the precious shark organs, some crooks sought to defraud buyers, till Mexican police caught up with them.

Birds by the Millions

Movement of bird life here is phenomenal. In migration seasons unbroken streams of ducks, geese, and curlews pass down this peninsula, which lies on their line of flight to mainland Mexico and points south.

More spectacular, however, is the incredible population of cormorants. In league-long lines, low over the water, they fly at dawn out to their feeding grounds; then towards sunset they swarm back again. Unless you've seen this infinite host, you can't believe its magnitude.

Some people here eat gull and tern eggs. To avoid gathering eggs that have begun to hatch, you see Mexican nest robbers resort to a dubious trick. They first chase all birds off their nests. Then they smash every egg in sight. After this egg-breaking spree they retire to rest; soon returning birds are hard at work again laying more eggs. These the market egg hunters collect for sale as "strictly fresh."

Some Gulf islands, such as San Jorge Island, are literally strewn with nests. In places you can hardly walk without stepping into a nest or stumbling over awkward, half-naked young birds.

Gulls, too, are egg thieves. If you scare away nesting cormorants, terns, and pelicans, you will see hungry gulls boldly swoop in to grab and gobble up their next-door neighbor's eggs—fresh or otherwise—before the rightful owner ventures back to cover them. Voracious gulls even swallow the young of other birds, gulping them head first.

Few Mines Are Developed

Minerals abound, but few deposits have been largely worked. Placer mining once yielded rich dust and nuggets in the foothills of Sierra San Pedro Martir. Stamp mills were worked profitably for years in El Alamo country.

Old El Triunfo Mine, near La Paz, was once richly operated by an American company. Now its crumbling brick stacks are smokeless, its workers' quarters empty; its old mills wrecked as scrap iron and sold to Japan.

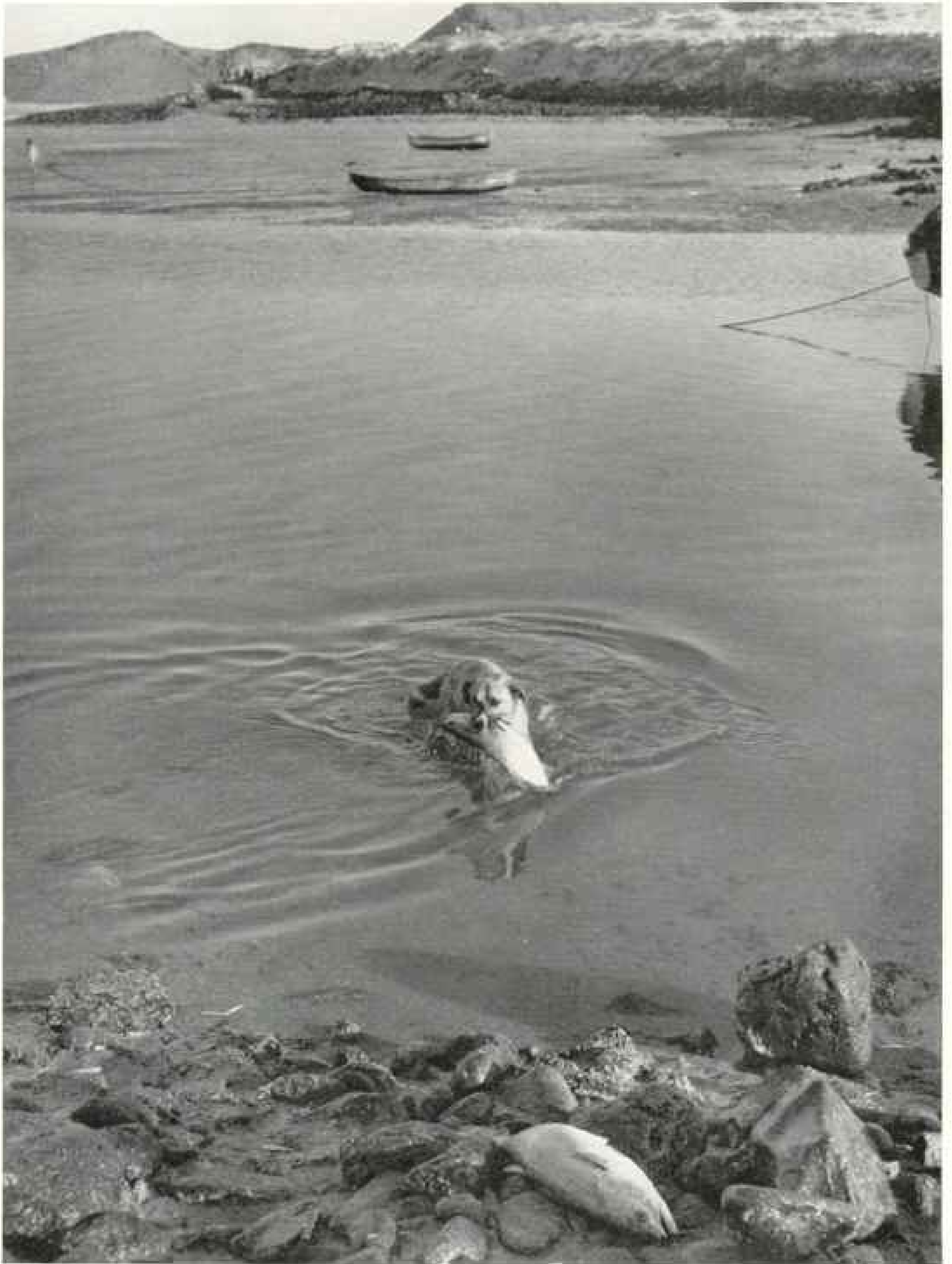
Around San Antonio, below La Paz, and El Arco, near Calmalli in the North District, modest gold mining still goes on. Ore comes in on burros to small mills run by gas engines. This lone activity is all that keeps San Antonio alive.

One great copper mine flourishes, but the censors have requested us not to give its name or location.

Sulphur used to be mined south of Mexicali, below the mud volcano field. These small volcanic cones, formed from mud that is forever bubbling, give off clouds of steam on cool winter mornings. All about them stretch waste regions incredibly desolate, avoided even by coyotes.

Like Cocos Island, Baja California is full of "lost treasure" stories. You hear of mysterious men who came by night and took hidden pots of gold from the old walls of abandoned missions.

"When I was camped at San Fernando," said Laurence Huey, "two strangers came digging in the old mission ruins. When they struck human bones where the altar had stood, superstitious fear drove them off. Around San Borja Mission, named for the notorious Borgia family, are a number of pits dug by treasure hunters."



Laurence M. Huey

This Dog Jumped into the Sea and Caught Fish after Fish

"As long as the school was near shore," said Laurence Huey, "he would go in, grab a fish by the head, and carry it ashore. . . . He had more fun than anybody." Fish abound in the Gulf of California, known to early Spaniards as the Sea of Cortez. Sometimes they are so numerous that they lash the surface to foam (pp. 259, 264).

Getting enough to eat keeps peons on the move. Beef, turtles, fish, and bird eggs are much eaten. Sugar, flour, and coffee are scarce.

"For a whole week," says Huey, "I watched two men sweat and grunt to chop down a big bee tree in Sierra San Pedro Martir. When it fell, they swore in disgust, for they got only a quart of honey! Some such honey, made from agave bloom, is delicious.

"This agave plant is a desert restaurant for bees, orioles, hummingbirds, etc. From one blooming agave I shook a gill of pure nectar."

Carne seco, or beef cut into strips and dried in the sun, is a popular food. To eke out their supply, for years the people slew the graceful bighorn sheep (*Ovis canadensis*) in large numbers. About one small mining camp I once counted 32 pairs of horns.

One way to shoot this proud sheep is to wait, toward sundown, at the mountain water holes.

Another way is more exciting. In the mating season you simply hide near where a herd is feeding, and take a rock and pound it on another rock. That is to imitate a buck's challenge; for, when he feels warlike, he climbs up on a ledge and stamps his forefeet. Therefore, when one of the herd hears the stalker imitating such a challenge by pounding, he comes proudly forth to accept combat, and gets shot.

For years many big-game hunters came in quest of these magnificent animals. Happily, a game law now prevents their threatened extermination.

The Way to Eat a Beef Head

Meat is sometimes so scarce that people eat even the beef heads. Here is how. When they butcher a beef, they take the head and wrap it in a damp gunny sack.

Then they dig a hole, line it with stones, and burn mesquite roots till the hole is full of live coals. Dumped in and covered with earth, the head is left to bake for 24 hours.

Taken out then, the whole head—including eyeballs, tongue, brain, and cheeks—makes for peons a savory feast.

Some fine range lands still support a few cattle in the North District, but expropriation has cut up once big ranchos.

Cattle raising in the South District is limited because of water shortage. Fair forage grows in season on a strip reaching east from Magdalena Bay. Water is here, if you dig for it, and cattle are often watered from barrels sunk in the bottoms of dry washes. But in drouth years herds decline.

Tanning and fine leatherwork are done at La Paz. Male calves are not castrated; bull hides, natives insist, make stouter leather than steer hides.

Big springs gush from mountain sides north of San José del Cabo, which stands near Cape San Lucas, most southerly tip of land. Here, as in a few other favored small southern valleys, modest cane fields flourish. Brown sugar, or *pinoche*, is made. It is molded into shapely cakes in an odd way. When the molasses is boiled thick in big kettles, it is poured into holes bored in a mesquite log, and thus molded.

Lumber for houses is nearly all imported. Big bull pines grow, especially on Sierra San Pedro Martir, whose Encantada peak rises to 10,069 feet. But no roads, no sawmills exist.

Cactus Cut for Rafters

Some Mexicans cut the giant cactus, lash the pieces together, and use them as rafters.

These *cardons*, some rising to 60 feet, are among the world's highest (page 267). Bases of big ones are three feet in diameter. Weight must be enormous. About holes drilled by woodpeckers an odd, stiff juice exudes and forms a cement. Near the sea, ospreys build nests in these cacti; hawks nest here, too, and other birds use second-hand woodpecker nests.

Interesting to botanists is the elephant tree, used here in tanning to give leather a bright cinnamon color. It has an abnormally fat, big-bellied trunk, but has only short, thin branches. It burns with almost a smokeless fire, leaving little ash.

Creeping cactus, which crawls across the fields by dying behind and growing in front, and resembles a huge, hideous, hairy caterpillar with uplifted head, adds to the hostile landscape's weird aspect (page 259).

Then there's the candlewood (*Idria columnaris*) that grows between Rosario and San Ignacio. It is the only species in the genus. Useless except for emergency weaving into feeble fences or wattled hut walls, it also is interesting to botanists because it is one of those desert plants that store water and sprout leaves in the wet season, and shed in dry weather. Mexicans call it *cirio*, and it grows very tall.

A rubber plant (*Pedilanthus macrocarpus*), which is unlike the guayule, occurs here and carries quite a latex content. It is thickest in true desert regions, but nothing has been done with it commercially. At a Yuma experimental station the United States Government is trying it out.

Such hordes of week-end race fans swarm

Laurence M. Huey

Giant Jaws of Stone Give This Huge Formation Its Name of Alligator Rock

The monsterlike boulder is a natural curiosity near Lake Hansen in the foothills of the Sierra Juárez, about 40 miles below the United States border. This woodland area 50 miles due east of Ensenada is a haven for ducks, pigeons, and quail.

Hulbert Burroughs

Circus Men Might Recruit Fancy Steppers from Mexico's Frolicking Herds of Wild Burros

These black beauties hit a 25-mile gait as the cameraman chased them with his car. Thousands have been butchered to make canned dog food. Indians prefer them to beef. The writer helped eat one during the Carranza revolution, but he wouldn't swap one Kansas City T-bone for all the burro meat in Mexico. This herd is galloping over the snow-white bed of dry Lake Chapala, in Baja California. Look how the little one seeks safety in the middle of the herd!

Charles Shelton

Mosquitoes Were So Thick That These Campers Veiled Themselves Like Arab Women

Their plan saved them from many bites while getting breakfast, but it takes skill to drink coffee or eat a fried egg through a net! Photographer Shelton is camped here at Cape Colnett, but even in the mountains, around water holes, mosquitoes are a pest.

across the line at Tijuana to bet on the bangtails that sometimes a jam is two or three hours getting past the immigration and customs barriers.

Famous Agua Caliente track lies southeast of the old border town of Tijuana (long spelled Tia Juana and meaning Aunt Jane).

During its wide-open years, more millions changed hands here at Agua Caliente Casino than anywhere else in Mexico. The sky was the limit, and concessionaires made fabulous fortunes on every game from craps and roulette to poker and "21." In the luxurious hotel, toilet seats were set with pearl, and for gay Hollywood parties a glittering dinner set of solid gold was used.

Since a new government suppressed the gorgeous casino, such extravagance has waned, but the ponies still run.

Most Indians left in the peninsula live now about the Santa Catarina Mission and Sangre de Cristo village. Where the early padres baptized thousands, now only dozens are seen.

Nearly all the old missions are now abandoned and falling into ruins, except San Ignacio (page 268) and one or two others.

Despite this, however, and the absence of priests, people by dozens still flock to some of the ruins on church feast days and bring their dead to be buried in holy ground.

Every town has its play-by-ear musicians. Often their harps and guitars are homemade.

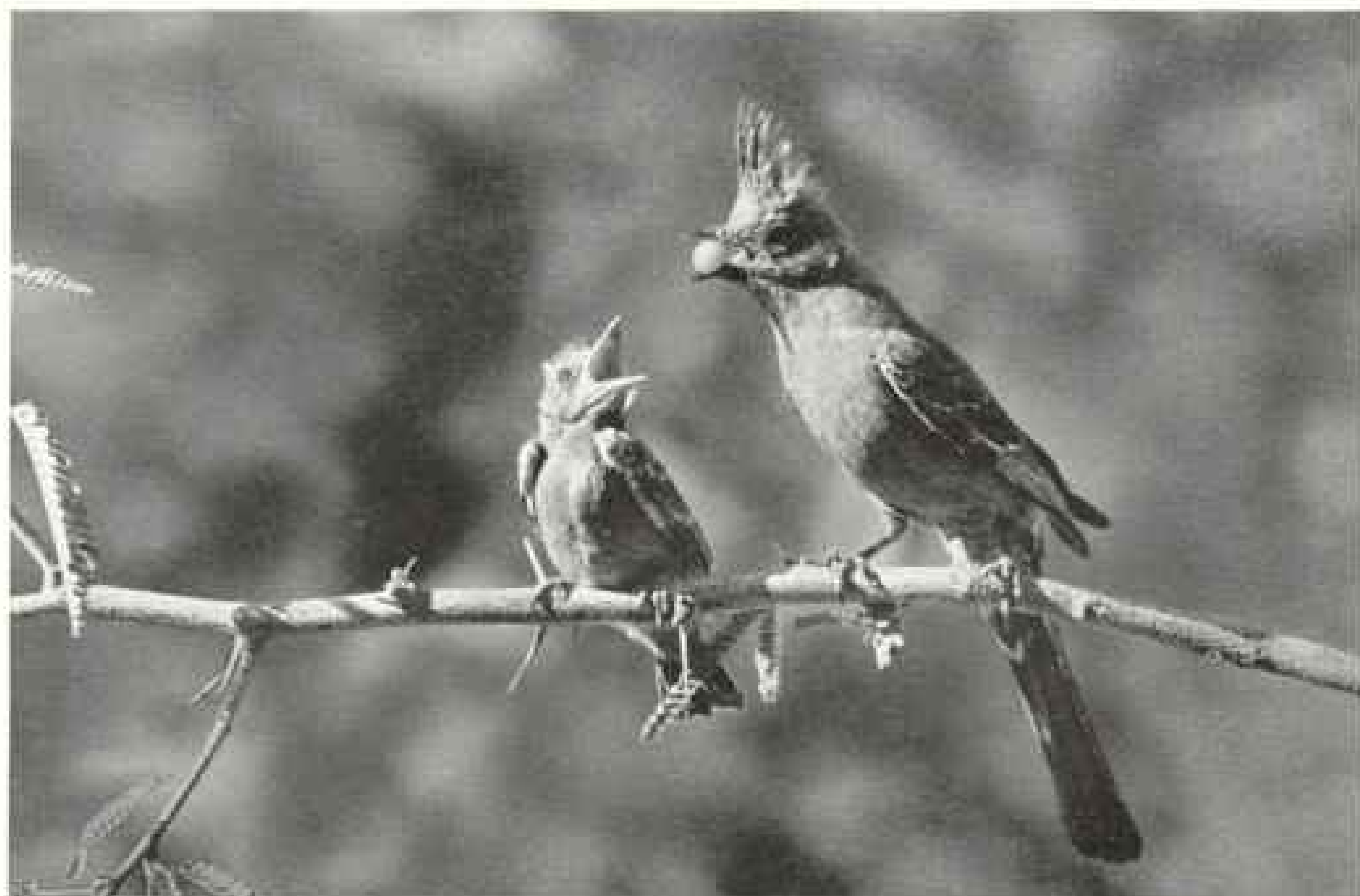
Old Auto Tires Make Shoes

Many peons wear sandals cut from castoff automobile tires. "Truck tires make the best ones," one man testified. "These I wear were cut from old Ford truck tires two-and-a-half years ago, and they're still good."

Few, indeed, are local industries. La Paz tans good leather. Mexicali, with cottonseed oil, makes good laundry soap on a big scale and exports it to mainland Mexico. Her cotton she used to export to Japan. Now it goes to mills near Mexico City.

Tecate, southwest of the American border town of Campo, where we keep cavalry, runs a small vegetable oil mill. Why, nobody knows, because it has to import copra from the South Sea. There's a brewery, too, and the big fish cannery at Ensenada, and that's about all.

But don't forget onyx marble! Earliest Jesuits said it was here, and it is. Big blocks of it, which ring like a bell when struck, are cut from the earth south of San Quintin.



Laurence M. Huey

"Open Your Mouth Wide, and I'll Give You a Juicy Red Squaw Berry!"

This phainopepla, or silky flycatcher, likes mistletoe berries also. Most clumps of that parasitic growth are started on desert trees from seed scattered by these birds, who thus plant their own food crop.

In San Diego, California, at the shops of the Southwest Onyx and Marble Company, you see these big blocks being slowly sawed into shapes that make inkstands, paperweights, cups, bowls, and other beautiful things. It takes 10 days to saw through a three-ton block.

A $10,000 Bathtub of Onyx

One workman at the quarries carved a beautiful figure of a dove from a delicately shaded onyx block. To gratify one Cleopatralike whim a bathtub was cut from one magnificent chunk of onyx, then set with gold fixtures and sold for $10,000!

Jewel-like in its shades and light reflections, onyx marble may well be Baja California's most beautiful product. The monumental Peace Memorial in St. Paul is of this Mexican onyx. Feature of the 55-ton group is the majestic figure of the Indian god.

So it goes, in this strange, mysterious land of contrasts. Indian statuary, carved from pure, glistening onyx, and savage Seri Indians feasting on the raw, hot bowels of bony coyotes; mink-and-ermine-clad Hollywood glamour girls betting on border-town races, while Cocapah squaws 100 miles away hide their nakedness in girdles of grass.

At a military post a 50-piece Army band plays the march from *Aïda*, while over on Tiburón a Seri boy makes "music" scratching the edge of a dried deerskin with a notched stick.

Peons drive pack burros 10 miles in a long day, while American Army scouting planes wing the 800-mile length of the whole peninsula in three or four hours.

American pigboats and destroyers now scour the seas for Japanese where once Cavendish, Drake in his *Golden Hind*, and other sea rovers lurked in wait to plunder treasure-laden Manila galleons.

Always a romantic land of high adventure, this Baja California still makes history.

Notice of change of address for your National Geographic Magazine *should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your October number, the Society should be notified of your new address not later than September first.*

The People's Fight Against Slavery

By Hon. Henry A. Wallace

The Vice President of the United States

The following address by the Vice President of the United States is of such unusual interest and importance that it is here made available in full to the 1,165,000 members of the National Geographic Society. It was delivered at a dinner of the Free World Association at the Hotel Commodore, New York City, on May 8, 1942.—Editor.

WE, WHO in a formal or an informal way represent most of the free peoples of the world, are met here tonight in the interests of the millions in all the nations who have freedom in their souls.

To my mind, this meeting has just one purpose—to let those millions in other countries know that here in the United States are 130,000,000 men, women, and children who are in this war to the finish.

Our American people are utterly resolved to go on until they can strike the relentless blows that will assure a complete victory, and with it win a new day for the lovers of freedom everywhere on this earth.

This is a fight between a slave world and a free world. Just as the United States in 1862 could not remain half slave and half free, so in 1942 the world must make its decision for a complete victory one way or the other.

Freedom for the Common Man

As we begin the final stages of this fight to the death between the free world and the slave world it is worth while to refresh our minds about the march of freedom for the common man.

The idea of freedom—the freedom that we in the United States know and love so well—is derived from the Bible, with its extraordinary emphasis on the dignity of the individual.

Democracy is the only true political expression of Christianity.

The prophets of the Old Testament were the first to preach social justice.

But that which was sensed by the prophets many centuries before Christ was not given complete and powerful political expression until our Nation was formed as a Federal Union a century and a half ago. Even then the march of the common people had just begun.

Most of them did not yet know how to read and write.

There were no public schools to which all children could go.

Men and women cannot be really free until they have plenty to eat and time and ability to read and think and talk things over.

Down the years the people of the United States have moved steadily forward in the practice of democracy.

Through universal education they now can read and write and form opinions of their own.

They have learned and are still learning the art of production; that is, how to make a living.

They have learned and are still learning the art of self-government.

If we were to measure freedom by standards of nutrition, education, and self-government, we might rank the United States and certain nations of western Europe very high. But this would not be fair to other nations where education has become widespread only in the last twenty years.

In many nations a generation ago nine out of ten of the people could not read or write.

Russia, for example, was changed from an illiterate to a literate nation within one generation, and in the process Russia's appreciation of freedom was enormously enhanced.

In China the increase during the past thirty years in the ability of the people to read and write has been matched by their increased interest in real liberty.

Everywhere reading and writing are accompanied by industrial progress, and industrial progress sooner or later inevitably brings a strong labor movement.

From a long-time and fundamental point of view, there are no backward peoples which are lacking in mechanical sense. Russians, Chinese, and the Indians both of India and the Americas all learn to read and write and operate machines just as well as your children and my children.

Everywhere the common people are on the march.

Thousands of them are learning to read and write, learning to think together, learning to use tools.

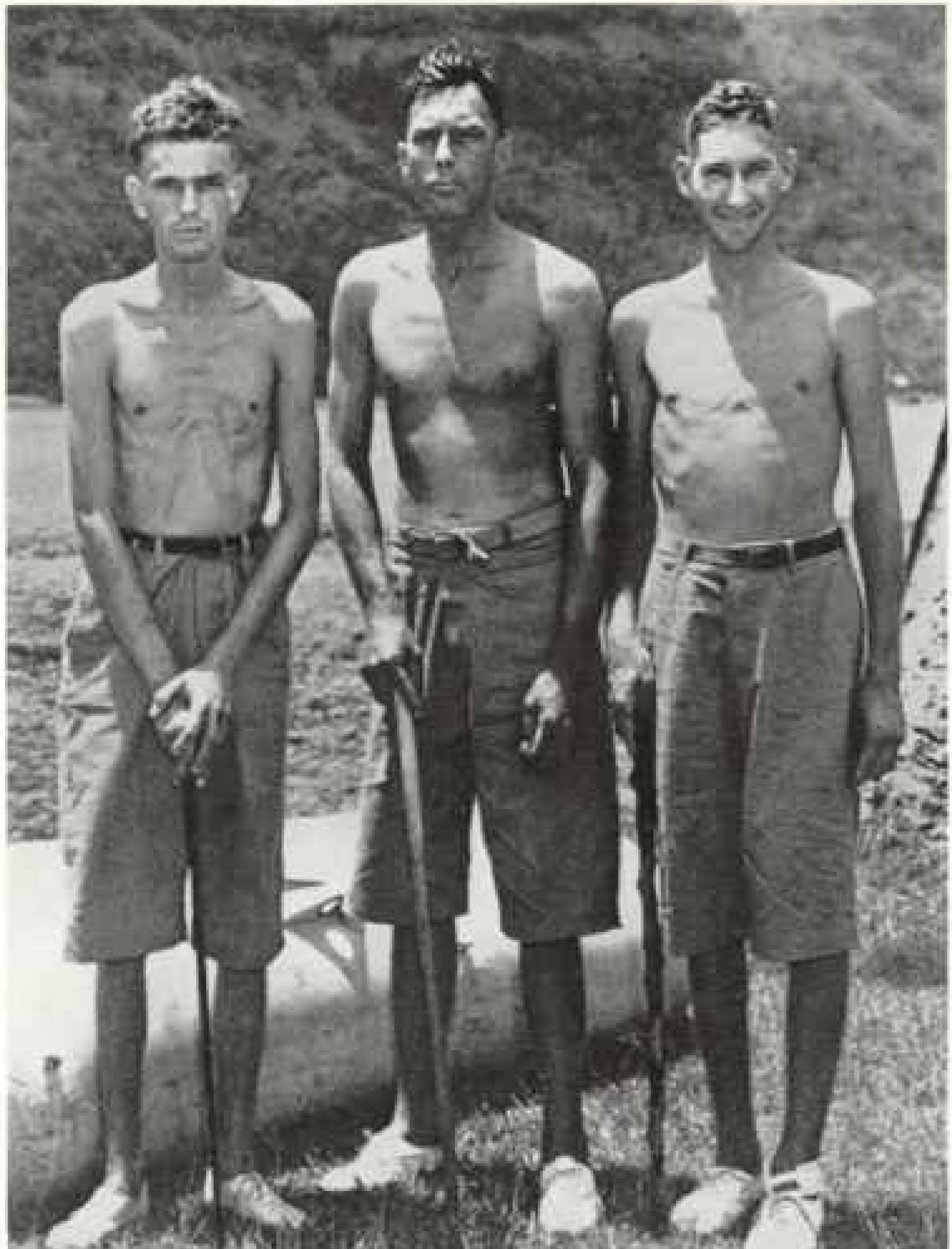
These people are learning to think and work together in labor movements, some of which may be extreme or impractical at first, but which eventually will settle down to serve effectively the interests of the common man.

When the freedom-loving people march—

when the farmers have an opportunity to buy land at reasonable prices and to sell the produce of their land through their own organizations, when workers have the opportunity to form unions and bargain through them collectively, and when the children of all the people have an opportunity to attend schools which teach them truths of the real world in which they live—when these opportunities are open to everyone, then the world moves straight ahead.

But in countries where the ability to read and write has been recently acquired or where the people have had no long experience in governing themselves on the basis of their own thinking, it is easy for demagogues to arise and prostitute the mind of the common man to their own base ends.

Such a demagogue may get financial help from some person of wealth who is unaware of what the end result will be. With this backing the demagogue may dominate the minds of the people, and, from whatever degree of freedom they have, lead them backward into slavery.



Official Photograph U. S. Navy

"In Spite of Their Suffering and Weakness, They Stood Like Men"

Thus Vice President Wallace referred to Ordnanceman Anthony J. Pastula (left), Aviation Chief Machinist's Mate Harold F. Dixon, pilot (center), and Radioman Gene D. Aldrich (page 280). This photograph was made on a South Pacific island when the trio staggered ashore after a 34-day battle against the sea in an 8-by-4-foot rubber life raft. The men were the crew of a U. S. Navy torpedoplane which sank in mid-Pacific on January 16, 1942. Without food, and armed only with a pocketknife and pistol, they lived on the raw flesh of fish and birds. With the knife, Aldrich stabbed an occasional fish, and once a shark. When a young tern alighted on the stern of the boat, Dixon stealthily seized it by a leg. Once they shot an albatross. Rains yielded a meager water supply. Dixon plotted a course by the sun and stars toward islands some 500 miles away. He improvised a sea anchor from a piece of rope and his pneumatic life jacket, to control the course of the drifting boat. When an unfavorable wind blew from the southwest, he tossed the anchor overboard to check the speed. When the breeze shifted to northeast, he pulled the anchor aboard again to gain full speed ahead.

Herr Thyssen, the wealthy German steel man, little realized what he was doing when he gave Hitler enough money to enable him to play on the minds of the German people.

The demagogue is the curse of the modern world, and of all the demagogues, the worst are those financed by well-meaning wealthy men who sincerely believe that their wealth is likely to be safer if they can hire men with political "it" to change the signposts and lure the people back into slavery of the most degraded kind.

Unfortunately for the wealthy men who finance movements of this sort, as well as for

the people themselves, the successful demagogue is a powerful genie who, when once let out of his bottle, refuses to obey anyone's command.

As long as his spell holds, he defies God himself, and Satan is turned loose upon the world.

Through the leaders of the Nazi revolution, Satan now is trying to lead the common man of the whole world back into slavery and darkness. For the stark truth is that the violence preached by the Nazis is the devil's own religion of darkness.

So also is the doctrine that one race or one class is by heredity superior and that all other races or classes are supposed to be slaves.

The belief in one Satan-inspired fuehrer, with his Quislings, his Lavals, and his Mussolinis—his gauleiters in every nation in the world—is the last and ultimate darkness. Is there any hell hotter than that of being a Quisling, unless it is that of being a Laval or a Mussolini?

In a twisted sense, there is something almost great in the figure of the supreme devil operating through a human form, in a Hitler who has the daring to spit straight into the eye of God and man.

But the Nazi system has a heroic position for only one leader. By definition only one person is allowed to retain full sovereignty over his own soul.

All the rest are stooges—they are stooges who have been mentally and politically degraded, and who feel that they can get square with the world only by mentally and politically degrading other people. These stooges are really psychopathic cases. Satan has turned loose upon us the insane.

Milestones in Freedom's March

The march of freedom of the past 150 years has been a long-drawn-out people's revolution.

In this great revolution of the people there were the American Revolution of 1775, the French Revolution of 1792, the Latin-American revolutions of the Bolivarian era, the German Revolution of 1848, and the Russian Revolution of 1918.

Each spoke for the common man in terms of blood on the battlefield. Some went to excess. But the significant thing is that the people groped their way to the light. More of them learned to think and work together.

The people's revolution aims at peace and not at violence, but if the rights of the common man are attacked, it unleashes the ferocity of a she-bear who has lost a cub.

When the Nazi psychologists tell their master Hitler that we in the United States may be able to produce hundreds of thousands of planes, but that we have no will to fight, they are only fooling themselves and him.

The truth is that when the rights of the American people are transgressed, as those rights have been transgressed, the American people will fight with a relentless fury which will drive the ancient Teutonic gods back cowering into their caves. The Götterdämmerung has come for Odin and his crew.

The people are on the march toward even fuller freedom than the most fortunate peoples of the earth have hitherto enjoyed. No Nazi counter-revolution will stop it. The common man will smoke the Hitler stooges out into the open in the United States, in Latin America, and in India. He will destroy their influence.

No Lavals, no Mussolinis will be tolerated in a free world.

Four Freedoms—and Four Duties

The people, in their millennial and revolutionary march toward manifesting here on earth the dignity that is in every human soul, hold as their credo the "four freedoms" enunciated by President Roosevelt in his message to Congress on January 6, 1941.

These "four freedoms" are the very core of the revolution for which the United Nations have taken their stand.

We who live in the United States may think there is nothing very revolutionary about freedom of religion, freedom of expression, and freedom from the fear of secret police.

But when we begin to think about the significance of freedom from want for the average man, then we know that the revolution of the past 150 years has not been completed, either here in the United States or in any other nation in the world. We know that this revolution cannot stop until freedom from want has actually been attained.

And now, as we move forward toward realizing the "four freedoms" of this people's revolution, I would like to speak about four duties. It is my belief that every freedom, every right, every privilege has its price, its corresponding duty without which it cannot be enjoyed.

The four duties of the people's revolution, as I see them today, are these:

1. The duty to produce to the limit.
2. The duty to transport as rapidly as possible to the field of battle.
3. The duty to fight with all that is in us.
4. The duty to build a peace—just, charitable, and enduring.

The fourth duty is that which inspires the other three.

We failed in our job after World War No. 1. We did not know how to go about it to build an enduring world-wide peace.

We did not have the nerve to follow through and prevent Germany from rearming. We did not insist that she "learn war no more."

We did not build a peace treaty on the fundamental doctrine of the people's revolution.

We did not strive wholeheartedly to create a world where there could be freedom from want for all the peoples.

But by our very errors we learned much, and after this war we shall be in a position to utilize our knowledge in building a world which is economically, politically, and, I hope, spiritually sound.

Modern science, which is a by-product and an essential part of the people's revolution, has made it technologically possible to see that all of the people of the world get enough to eat.

Half in fun and half seriously, I said the other day to Madame Litvinov: "The object of this war is to make sure that everybody in the world has the privilege of drinking a quart of milk a day."

She replied: "Yes; even half a pint."

The peace must mean a better standard of living for the common man, not merely in the United States and England but also in India, Russia, China, and Latin America—not merely in the United Nations but also in Germany and Italy and Japan.

Century of the Common Man

Some have spoken of the "American century."

I say that the century on which we are entering—the century which will come out of this war—can be and must be the century of the common man.

Perhaps it will be America's opportunity to suggest the freedoms and duties by which the common man must live. Everywhere the common man must learn to build his own industries with his own hands in a practical fashion.

Everywhere the common man must learn to increase his productivity so that he and his children can eventually pay to the world community all that they have received.

No nation will have the God-given right to exploit other nations.

Older nations will have the privilege to help younger nations get started on the path to industrialization, but there must be neither military nor economic imperialism. The methods of the nineteenth century will not work in the people's century which is now about to begin.

India, China, and Latin America have a tremendous stake in the people's century. As their masses learn to read and write, and as they become productive mechanics, their standard of living will double and treble. Modern science, when devoted wholeheartedly to the general welfare, has in it potentialities of which we do not yet dream.

And modern science must be released from German slavery. International cartels that serve corporate greed and the German will to power must go. Cartels in the peace to come must be subjected to international control for the common man, as well as being under adequate control by the respective home governments.

In this way, we can prevent the Germans from again building a war machine while we sleep. With international monopoly pools under control, it will be possible for inventions to serve all the people instead of only the few.

Yes, and when the time of peace comes, the citizen will again have a duty, the supreme duty of sacrificing the lesser interest for the greater interest of the general welfare.

Those who write the peace must think of the whole world. There can be no privileged peoples. We ourselves in the United States are no more a master race than the Nazis.

And we cannot perpetuate economic warfare without planting the seeds of military warfare. We must use our power at the peace table to build an economic peace that is just, charitable, and enduring.

If we really believe that we are fighting for a people's peace, all the rest becomes easy. Production, yes—it will be easy to get production without either strikes or sabotage, production with the wholehearted cooperation between willing arms and keen brains; enthusiasm, zip, energy geared to the tempo of keeping at it everlastingly day after day.

Hitler knows as well as those of us who sit in on the War Production Board meetings that we here in the United States are winning the battle of production. He knows that both labor and business in the United States are doing a most remarkable job and that his only hope is to crash through to a complete victory some time during the next six months.

And then there is the task of transportation to the line of battle by truck, by railroad car, by ship, by plane. We shall joyously deny ourselves so that our transportation system is improved by at least 30 percent.

I need say little about the duty to fight. Some people declare, and Hitler believes, that the American people have grown soft in the last generation.

Hitler agents continually preach in South

America that we are cowards, unable to use, like the "brave" German soldiers, the weapons of modern war.

It is true that American youth hates war with a holy hatred. But because of that fact and because Hitler and the German people stand as the very symbol of war, we shall fight with a tireless enthusiasm until war and the possibility of war have been removed from this planet.

We shall cleanse the plague spot of Europe, which is Hitler's Germany, and with it the hellhole of Asia—Japan.

The American people have always had guts and always will have.

You know the story of Bomber Pilot Dixon and Radioman Gene Aldrich and Ordnanceman Tony Pastula—the story which Americans will be telling their children for generations to illustrate man's ability to master any fate (page 277).

These men lived for 34 days on the open sea in a rubber life raft, 8 feet by 4 feet, with no food but that which they took from the sea and the air with one pocketknife and a pistol.

And yet they lived it through and came at last to the beach of an island they did not know.

In spite of their suffering and weakness, they stood like men, with no weapon left to protect themselves, and no shoes on their feet or clothes on their backs, and walked in military file because, they said, "If there were Japs, we didn't want to be crawling."

1942 a Year of Crisis

The American fighting men, and all the fighting men of the United Nations, will need to summon all their courage during the next few months.

I am convinced that the summer and fall of 1942 will be a time of supreme crisis for us all. Hitler, like the prize fighter who realizes he is on the verge of being knocked out, is gathering all his remaining forces for one last desperate blow. There is abject fear in the heart of the madman and a growing discontent among his people as he prepares for his last all-out offensive.

We may be sure that Hitler and Japan will cooperate to do the unexpected—perhaps an attack by Japan against Alaska and our northwest coast at a time when German transport planes will be shuttled across from Dakar to furnish leadership and stiffening to a German uprising in Latin America. In any event, the psychological and sabotage offensive in the United States and Latin America will be timed to coincide with, or anticipate by a few weeks, the height of the military offensive.

We must be especially prepared to stifle the fifth columnists in the United States who will try to sabotage not merely our war-material plants, but even more important, our minds.

We must be prepared for the worst kind of fifth-column work in Latin America, much of it operating through the agency of governments with which the United States at present is at peace.

When I say this, I recognize that the peoples, both of Latin America and of the nations supporting the agencies through which the fifth columnists work, are overwhelmingly on the side of the democracies.

We must expect the offensive against us on the military, propaganda, and sabotage fronts, both in the United States and in Latin America, to reach its apex some time during the next few months. The convulsive efforts of the dying madman will be so great that some of us may be deceived into thinking that the situation is bad at a time when it is really getting better.

But in the case of most of us, the events of the next few months, disturbing though they may be, will only increase our will to bring about complete victory in this war of liberation.

Prepared in spirit, we cannot be surprised. Psychological terrorism will fall flat.

As we nerve ourselves for the supreme effort in this hemisphere, we must not forget the sublime heroism of the oppressed in Europe and Asia, whether it be in the mountains of Yugoslavia, the factories of Czechoslovakia and France, the farms of Poland, Denmark, Holland, and Belgium, among the seamen of Norway, or in the occupied areas of China and the Dutch East Indies.

Everywhere the soul of man is letting the tyrant know that slavery of the body does not end resistance.

There can be no half measures. North, South, East, West, and Middle West—the will of the American people is for complete victory.

No compromise with Satan is possible. We shall not rest until all the victims under the Nazi yoke are freed. We shall fight for a complete peace as well as a complete victory.

The people's revolution is on the march, and the devil and all his angels cannot prevail against it. They cannot prevail, for on the side of the people is the Lord.

"He giveth power to the faint; and to them that have no might He increaseth strength . . . .

"They that wait upon the Lord shall mount up with wings as eagles; they shall run, and not be weary; they shall walk and not faint."

Strong in the strength of the Lord, we who fight in the people's cause will never stop until that cause is won.

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In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

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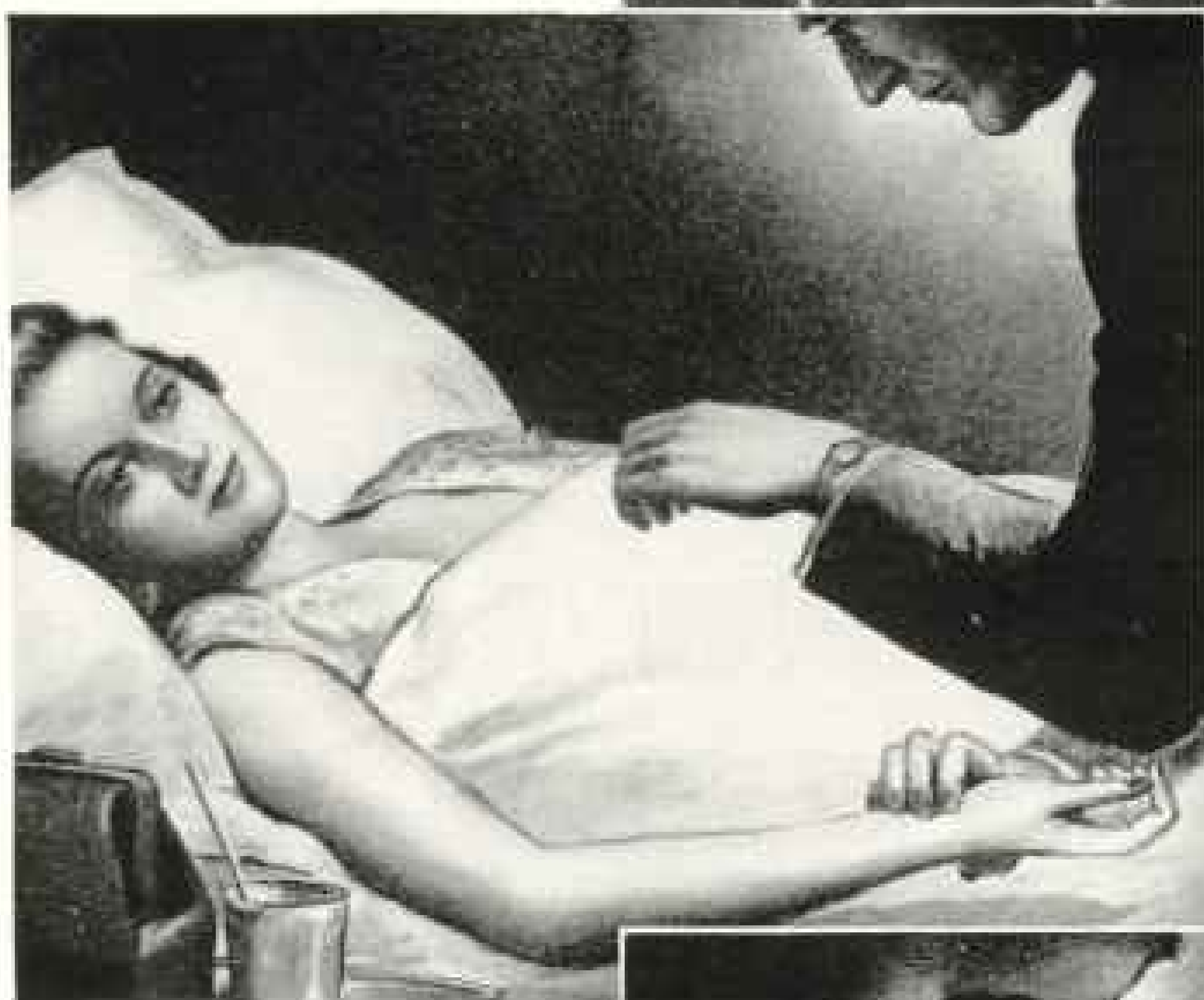

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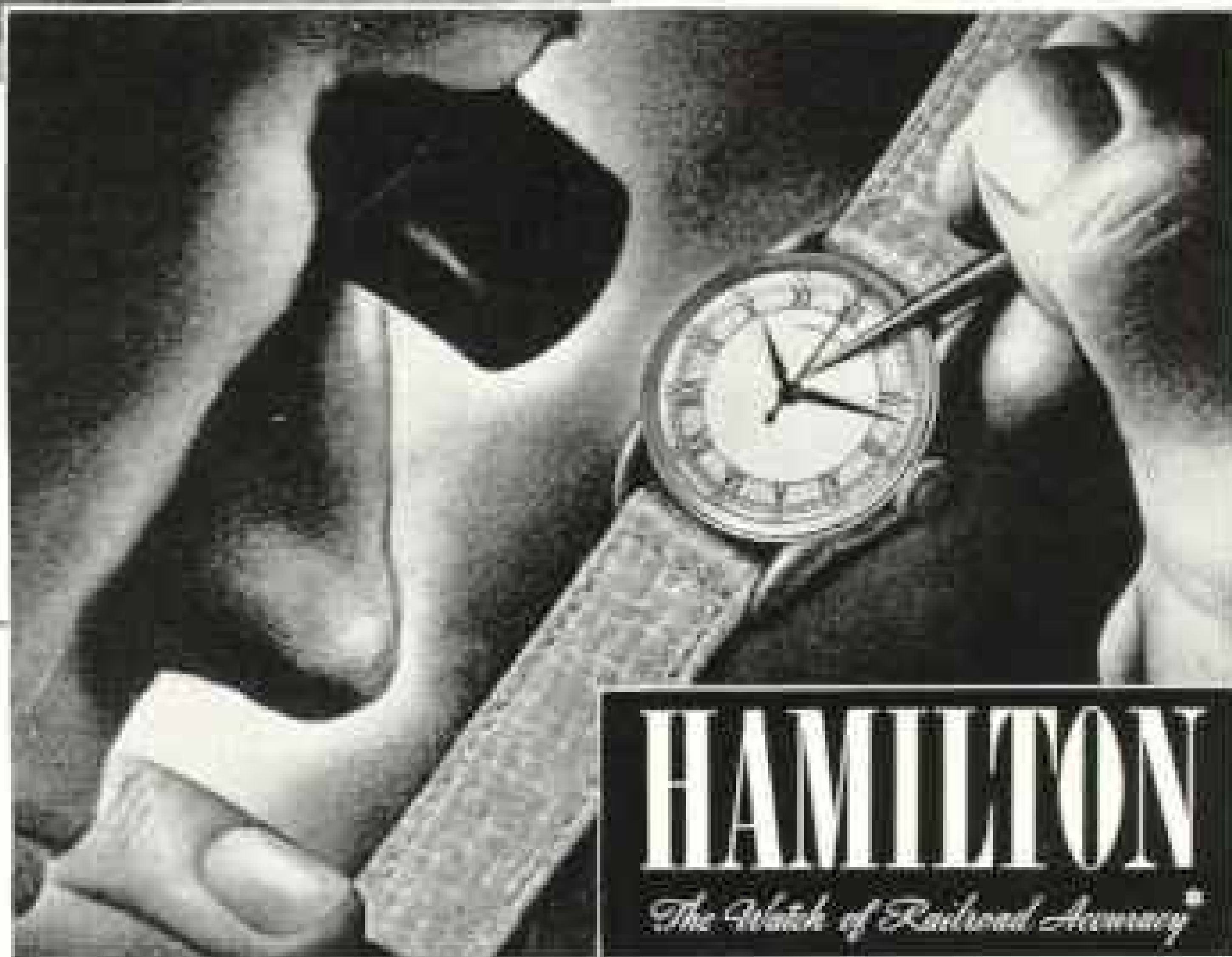

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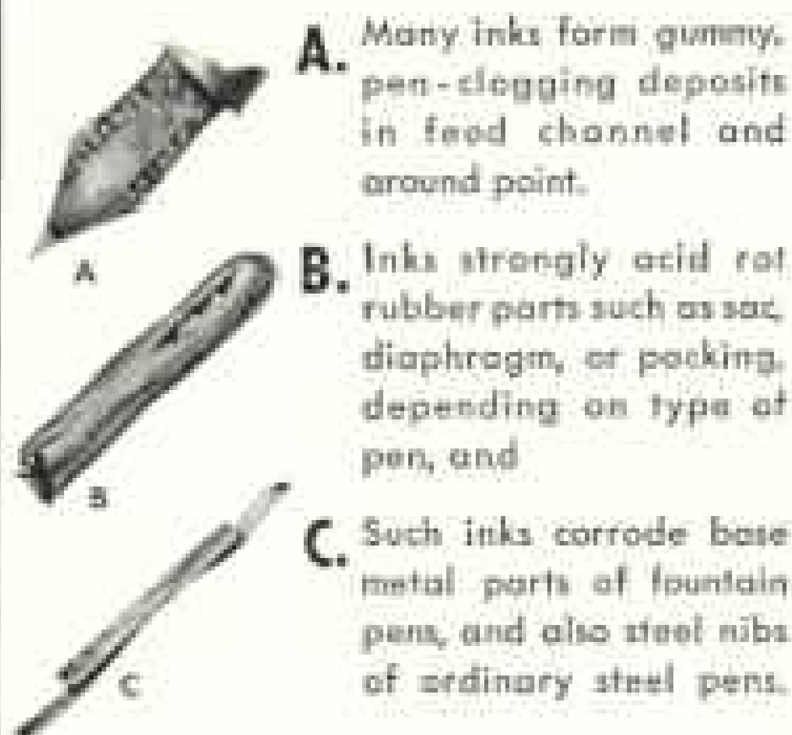

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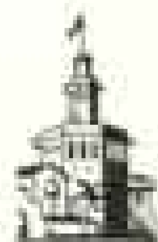

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SARGENT COLLEGE of Physical Education of Boston University. 4-yr. degree course for women, health, physical ed., recreation. Approved (Am. Med. Assoc.) physiotherapy major. Modern dorms. 5 mos. camp in N. H. 63rd yr. *Catalog.* **Nelson S. Walke, Ph.D., Dean, 50 Everett St., Cambridge, Mass.**

First Aid to wartime food budgets

SOME HINTS TO HELP YOU KEEP FOOD COSTS DOWN

1. PLAN AHEAD!

It is best to make up menus for several days ahead, remembering that *what* you eat is as important as *how much* you eat. The essential foods for a balanced diet should be included first, then whatever extras your budget allows. Latest market news is often carried in newspapers and radio broadcasts. It helps you plan meals around the foods in good supply at moderate prices. Leftovers should be included, too. When you bake, fuel may be conserved by cooking a second baked dish at the same time—for example, a dessert or some food for the next meal. Buy what you need and can use, but do not hoard. There is plenty of food.

2. BUY WISELY!

The most expensive foods are not always the most nutritious. Less expensive cuts of meat and smaller sizes of fruits are as high in food value, and frequently as good-tasting, as fancier ones. Foods in season are usually cheaper. Larger sizes of canned and packaged foods are generally more economical. Information on labels enables you to compare values. Evaporated milk and most kinds of cheese supply the same food elements as fresh milk, and sometimes enjoy a price advantage. Canned fruits and vegetables may be used interchangeably with fresh. Beef, lamb and pork livers are as nutritious as calves' liver. Cereals and bread should be whole grain, or enriched.

3. COOK WITH IMAGINATION!

Higher wartime food prices are a challenge to our ability as cooks. *Good cooking* can make masterpieces out of the humblest foods; *poor cooking* can ruin even the best foods. Many ordinary dishes can be made most attractive with just the right seasonings, sauces *and imagination!* Cook books and magazines suggest new and interesting ways of preparing foods. Don't waste anything! Trimmings and bones from meat and fowl, and outside leaves of vegetables, may be added to soups. The water from vegetables is good for soups and stews. The tendency is to *overcook* most foods. This wastes fuel and harms food values.

OTHER HINTS: Home canning can save money, when vegetables and fruits are available in good quantity at low prices. A home garden is excellent—if you have the space, the good soil, the time and knowledge necessary for success. *Every* farm family should have a home garden. Wild berries and wild greens sometimes are available—your state department of agriculture may issue a pamphlet on wild greens.

Metropolitan will send you a free booklet, 82-N, "Three Meals a Day," containing directions for budgeting your food money to best advantage.

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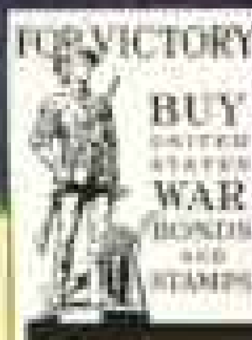

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STEEL—the strong man of America—is not by nature a Samson. Muscle must be developed by adding ferro-alloys which remove strength-stealing impurities and give extra qualities before the steel is tough enough to play its part in today's fast-moving world.

One of the most important of these alloys is ferro-manganese. Used as a scavenger in nearly all grades of steel, it removes oxygen and minimizes the harmful effects of sulphur. With the addition of manganese, hot steel can be rolled without cracking.

Cleansing is not the only role that manganese plays in the giants' game of steelmaking. In alloying amounts, manganese refines the structure of steel, thus giving it extra strength and ductility. As increasing amounts of manganese are added, exceptional properties are obtained. For instance, a steel containing 13 per cent manganese withstands the tough torture of jagged rock on steam shovel jaws.

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The progress made by Electro Metallurgical Company in the manufacture and use of ferro-alloys and in the development of alloy steels has been greatly facilitated by metallurgical research in the laboratories of Electro Metallurgical Company and Union Carbide Company; by the advances in electrical furnace electrodes and techniques of National Carbon Company, Inc.; and by the broad experience in the production, fabrication, and treatment of metals of Haynes Stellite Company and The Linde Air Products Company. All of these companies are Units of Union Carbide and Carbon Corporation.

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8-42

They brought the Stratosphere back alive

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