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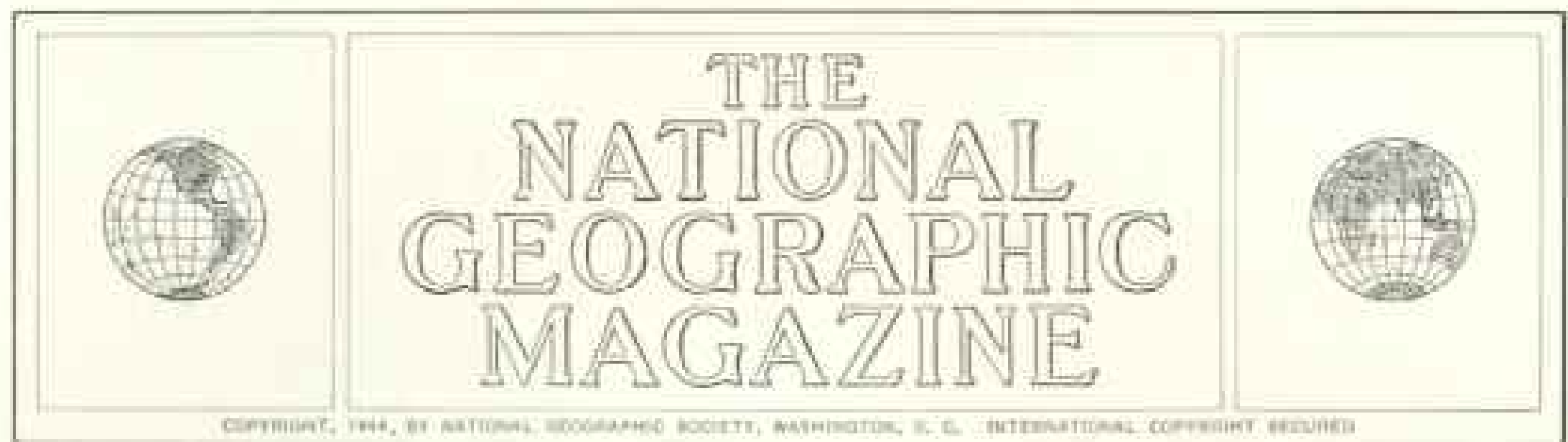
Behind the Lines in Italy
With 20 Illustrations

Macon Reed, Jr.

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Landing Craft for Invasion

BY MELVILLE BELL GROSVENOR

YOUR soldier son, was he one of the first to land at Salerno? Or did he leapfrog up the New Guinea coast to take the Japanese by surprise at Hollandia?

Your husband, your brother, your boy friend—even your father—was he one of those gallant Marines who swarmed ashore on Kwajalein or Eniwetok in the Marshalls?

If so, he was put ashore by the men who man the landing craft of the Amphibious Force of the U. S. Navy and Coast Guard.

His huge tanks, artillery, trucks, ammunition and supplies—even his hospital staff and nurses—all were landed by the assorted craft of this important new branch of the Navy.

Like huge whales casting up thousands of Jonahs, LSTs, LCI(L)s, and LCTs and myriad small craft nose ashore and disgorge from jawlike bows the divisions and materiel that are winning battles everywhere.

Xerxes drove his Persian hordes across the Hellespont on galley bridges to attack Greece. William the Conqueror ferried his Normans across the English Channel in boats to invade the British Isles. Even the Japs have used small barges in this war. But no power has yet employed landing ships and craft on the grand scale that we are using them today.

As I write, fleets of these landing vessels jam British harbors and rivers, poised for "D" Day, ready to swarm across to "Fortress Europe," ferrying our invasion forces.

For six weeks I have been the guest of the Alligator Navy, as "Amphibs" call their outfit. Officers and men put me through a rigid course, just as they would any "boot," from knot tying to beaching.

I sat in on training classes; talked with veterans of Europe and the Pacific; bounced around in an LCI(L) in the Atlantic; and rode the ramp of a charging LST.

"It's a strange Navy, this new Amphibious Force," an old-timer told me. "All my life I have been taught to keep my ship off the reefs. Now I must steer full speed through the surf and hit the beach like a charging bull. What's more, I must keep her pinned there solidly, so the Army and its tanks can swarm ashore. Then I back off quickly and scam out of there."

No wonder Amphibs affectionately refer to their branch as the "Ambiguous Navy."

Amphibs Trained at Solomons Island

"Where do you train the thousands of officers and men needed for landing craft? Are they put aboard commissioned ships, or do they go to school first?" I asked.

"Come down to Solomons Island, on the Patuxent, and we'll show you," he replied. "You know, the Marines who took Guadalcanal in the Solomon Islands trained at Solomons Island, Maryland! And the landing crews who put them ashore learned the know-how on the Chesapeake, too."

So on a cold, blustery day I reported "aboard" the Amphibious Training Base at Solomons, Maryland. Comdr. Neill Phillips, USN, the training officer and a veteran of 22 months fighting Japs in the Pacific, was just leaving his office to welcome a new class of officers.

"Come along," he said, "and we'll put you through the works."

Along with 300 young officers, whose gold stripes still glistened, we filed into a big frame hall.

"Gentlemen, you have come here straight from civilian life and are being plunged into the center of a great historic event. Never before has a warring power developed amphibious operations—that is, the landing of an



U. S. Coast Guard, Official

Down the Ramp and through the Surf Goes a Half-drowned Jeep at Cape Gloucester

Marines must work fast, for Jap snipers still are active in the trees of this New Britain beachhead. LSTs (Landing Ship, Tank) bumped hard on an offshore sand bar coming in for this landing, yet Coast Guard and Navy skippers drove their ships in at full speed on schedule. The man on the bow door is taking a short cut from the forecastle to the ramp.

army from boats on an enemy's shore—to the extent the United Nations are doing today.

"Wherever the war takes us, whether it be the coasts of Europe or the Japanese islands, we must have landing craft—tens of thousands of them—to put our troops on the beaches and keep them there.

"This is *our* secret weapon!

"To man these vessels we shall need 140,000 new officers and men in the next six months. Think of that! There were only 90,000 in the whole Navy a few years ago.

"Just as we build landing craft on assembly lines, so we must train you men by mass production.

"But you do have one advantage. Because this amphib game is so new, you stand on an equal footing with us old-timers. We know very little more about it than you do. You have a chance to grow up with this child prodigy of the Navy."

Afterwards, Commander Phillips showed us

through big school buildings which buzzed with Navy talk and men filing to and from classes. I watched officers learning to tie knots and read signals, studying seamanship and navigation. Sailors fresh from farm and city were being taught to wire splice.

"Some day, knowing how to splice wire may save them from an ugly situation," the instructor said. "Towlines and stern anchor cables frequently part at awkward moments."

In one room a group was calling out the nicknames of Jap planes as the instructor flashed pictures on a screen.

"Flash drill in aircraft recognition is vital," the lieutenant said. "Officers and men must recognize planes instantly or they may shoot down friends or let enemies get away. We stress particularly six United States carrier planes.

"We begin by flashing pictures for 1/10 of a second and work up gradually to 1/75. Men impress the image on the mind and call



U. S. Marine Corps, Official

Up "The Slot" Two LSTs Steam, Bound for Rendova, Central Solomons

Soon these Marines are to land their heavy guns and equipment on Rendova and blast the Japanese on Munda Point. The chimneylike ventilators draw carbon-monoxide fumes from the tank deck below when tanks warm up and chug off the ship. Months of preparation went into the plans for this campaign. "The Slot" is the sailors' name for the narrow northwest passage through the Solomon Islands.

out 'Zeke' for Jap Zero, 'Janice' for JU 88, or 'Mike' for Messerschmitt 109E faster than you can say Jack Robinson.

"Also, we instruct the officers and men in dark adjustment. They must wear red goggles or remain in the dark 20 minutes to a half hour before going on night watch, so they'll have cats' eyes. We teach them how to scan, or keep the eyes moving constantly to spot objects in the darkness."

On one big field I saw two lines of sailors throwing ropes as if trying to lasso each other.

"That's our mooring school where we teach the deck forces to heave lines," the officer in charge explained. "The field is laid out like a dummy ship approaching a dummy dock. The wooden posts you see represent bits on a ship and bollards on a dock to which the ship's lines are made fast."

I watched sailors on the "ship" throw heaving lines across the dusty "water." Men on the "dock" pulled them in, dragging across

big mooring hawsers which they carefully made fast to the posts.

In machine shops officers and sailors of the engineering department were busy tearing down and assembling every kind of amphibious motor and engine.

"We repair all our training craft here," my guide said. "In that way engineers learn practical lessons which will stand them in good stead later."

"Most of our machinists were automobile or boat mechanics in civil life. That young ensign in coveralls was engineer of a tuna-fishing boat on the west coast. This man took care of Diesels on a streamliner. He is invaluable."

On a bank overlooking the harbor, a black tank belched fire and smoke. Three rain-coated figures held a long hose, its nozzle spraying an umbrella of white mist. Above the roar of burning oil, the officer in charge was shouting, "Keep low! Use the spray as



U. S. Coast Guard, Official

U. S. Troops Go over the Side into Assault Boats for the Bougainville Landing

Manned by a Coast Guard crew and filled with battle-equipped Marines, one LCVP (Landing Craft, Vehicle and Personnel) has just got under way, headed for the rendezvous circle. Following a schedule like a railroad timetable, this boat and others will charge the beach in waves (page 8). The 36-foot craft, designed by Andrew J. Higgins and made of wood, is armored on the sides and has a steel ramp. In the background two larger LCMs (Landing Craft, Mechanized) with grill ramps, stand by for tanks or vehicles.

a shield from the flames. Move in slowly, heads down."

Gradually the white fog smothered the fire as easily as snuffing a candle.

Walking past the docks, we saw lines of green- and gray-clad landing craft, each kind with different lettering.

"Won't you explain the alphabet names for landing craft?"

Alphabet Names Tell Landing Craft Uses

"That's simple," he said. "The letters describe what the vessels are designed to do. For instance, LST stands for Landing Ship, Tank. An LST is a large ocean-going ship which carries tanks and vehicles across the seas and lands them ready for action" (p. 2).

Veterans have many pet names for LSTs, depending upon the frame of mind. On the way over, Large Slow Target and Long Slow Trip are popular, but after "dishing it out" proud crewmen call them Last Stop Tokyo.

"There is also the new LSD, a Landing Ship, Dock, which can transport and repair landing craft in its 'stomach,'" my guide continued. "It is a big ship, 457 feet long (p. 17).

"Still in the hush-hush stage is the new LSM (Landing Ship, Medium) combining features of the LST, LCI(L), and LCT(6). It's much faster than the older designs and will carry tanks and vehicles."

"But what about the LCs? Most landing craft names begin with those letters," I asked.

"That's easy! 'L' of course stands for Landing and 'C' for Craft. When we speak of a craft or boat in the Navy, we refer to a vessel small enough to be carried by a ship.

"'I' stands for Infantry and '(L)' for Large. LCI(L)s are built as troop carriers, but in recent landings some have served as gunboats, clearing beaches for the infantry. They can ferry 200 foot soldiers long distances, feed them, and put them ashore (page 7).

"'T' refers to tanks. So LCTs are motorized barges capable of landing a number of tanks and several small vehicles. We have two LCT types, Mark V (page 30), and Mark VI (page 29).

"LCMs are small landing craft for ferrying mechanized equipment. They can carry one large tank and are fast. Big troop transports use them to ferry troops and cargo ashore (opposite).

"Those small boats over there with the ramps—the LCVPs and LCP(R)s—are vehicle and personnel carriers. They are used as ships' boats on LSTs and for landing troops too (opposite and page 8).

"There are several other small craft. LCRs are rubber landing rafts (page 9). LCCs, or

control craft, guide assault boats to the desired beaches. LCS(S)s are small support boats firing rockets and machine guns (page 6). The Amphibious Force also has several seagoing vehicles. Among them are the LVT, Landing Vehicle, Tracked, developed by the Marines (page 11), and the 'Duck,' a big truck of the Army's which navigates on land or water (page 26).

"After all, the best way to learn the uses of these vessels is to cruise on them. Report aboard LCT 309 at 7 a.m. tomorrow."

Sitting next to me that night in the officers' mess was a young LCT group commander who had three Bronze Stars on his African theater ribbon. Lt. (j. g.) Hugh D. Allen was a veteran of the Tunisia, Sicily, and Salerno campaigns. He was one of the first to take an LCT(5) to the Mediterranean region. Now he is back at Solomons, teaching new officers how to handle LCTs.

"How did you get your craft overseas?" I asked.

"After my training at Solomons in the fall of 1942, I reported aboard a Liberty ship with my crew in New York," he said. "We found our brand-new LCT broken up into three sections and lashed down on deck.

"When we got to Casablanca, these chunks were lowered over the side and my crew and I bolted them together in 24 hours. Mind you, we had never tackled such a job except in textbooks, but we managed to get the 960 bolts in their proper places and nuts turned down snugly. To our surprise our little craft chugged off as nicely as you please and held together perfectly."

Turning to another lieutenant, Allen said, "Coen, tell us about how you stocked your LCT at Casablanca."

"Sure," Lt. (j. g.) R. P. Coen replied. "After we had put our boat together, we fueled and then went out to a wrecked ship at the harbor entrance. As we came alongside, big swells bobbed us up and down and forward and back. We were scared, for we had made only three practice landings at Solomons.

"While salvage men dumped jeeps, guns, trucks, and everything else on our deck, a couple of our men went aboard to pick up anything useful. We completely stocked our craft with silverware, crockery, and fancy rations from this sunken transport. LCTs were not as fully equipped then as they are now, and this salvaged food came in handy."

LCTs Won Spurs in North Africa

"For an ensign, duty as an LCT skipper is the best in the Navy," Lieutenant Allen interjected. "He has all the responsibilities and



U. S. Coast Guard Official

This Is What the Enemy Sees When the First Wave Hits the Beach

From the bow of an LCS(S) (Landing Craft, Support, Small), the combat photographer looks back at assault boats, or LCVPs, speeding shoreward, loaded with troops. Accompanied by shelling, strafing, and bombing with live ammunition, these maneuvers on the eastern United States coast simulate invasion. In battle, the men crouch down behind the armored visor and fire rockets from the covered projector at right. Cruisers in the distance cover the landing with shellfire.

privileges of a commanding officer. His only trouble is in obtaining extras for his crew. An ensign hasn't enough gold braid!

"After a few days Coen and I headed north for Gibraltar and then, bucking terrific head seas, we steamed down the Mediterranean to Oran," Allen continued. "I shall never forget how my LCT acted in those big seas. Her bow would rise on a wave and then slam down with a mighty wham on the next one. From the bridge I could see the deck undulate like a caterpillar. Our crew had never been to sea before, yet they handled the ship like old salts.

"About this time Ensign Jesse Anderson, an LCT friend, drew the first enemy blood for our craft and won our first Silver Star. While coasting along North Africa, a big German JU 88 swooped over and dropped a bomb while the crew was at breakfast. Fortunately it missed by 200 feet.

"By the time the plane had come around for a second run, the cook and a gunner had manned the 20 mms. and opened fire. At first the bullets went wide, but then they got on and plastered the plane. It caught fire and crashed in the mountains. Later the Army brought down a section for the LCT boys.

"During the Tunisian campaign our LCTs ferried tanks and supplies along the African coast for the Army, and so we played a part in the final victory at Cape Bon.

"My LCT landed at Licata, Sicily, early in the morning of July 10. Our job was to ferry tanks, troops, and supplies ashore from big transports. On the trips back we carried Italian and German prisoners. Once we had 225 of them on deck. They were docile and glad to be out of the fight.

"For a few cigarettes they would hand over their helmets, rifles, and other trinkets to our men. The civilian crewmen of some of the big ships, wanting trophies to take home, would buy them at fabulous prices. Many sailors made handsome profits in this quick turnover of enemy souvenirs.

"After a day or so we ran short of supplies, but we soon fixed that! Transports were anxious to unload and head for home. We soon got on to this and worked it to our benefit. Coming out from shore, I would sidle up to a fat transport and wait for a hail.

"'LCT No. 15, can you unload us?'

"'What have you got to eat?' I would yell back.



U. K. Nye, Official

LCI(L) 335 Passes the Ammunition by Bucket Brigade at Rendova

This doughty little craft, commanded by Lt. John R. Powers, ran "The Slot" more than 20 times, carrying troops and Seabees in the New Georgia and Bougainville drives (page 22). Clearly shown are the two ramps and the hornlike catheads which hoist the gangways in and out. Unloaded, the LCI(L)s (Landing Craft, Infantry, Large) wind in their stern anchors and back out, like the one in right background. Capture of Rendova played a big part in the taking of the air strip on Munda Point, close by.



U. S. Coast Guard, Official

Beneath Bagama Volcano Assault Boats Circle in Empress Augusta Bay Awaiting Their Turn to Storm the Beaches

During the charge, helmeted Marines in green- and brown-sploched suits crouched down behind the armored sides of the LCVs. As the boats landed, ramps dropped and Marines poured out, quickly getting under cover. Then they "make-believed," or crawled on hands and knees, through the jungle to capture the Bougainville air strip. Jap snipers were hiding in the trees and strafing planes tried to break through our air cover (page 24).



U. S. Coast Guard, official

Salvage Crews Come to the Rescue of an LCVP Broached on the Wave-lashed, Black-sand Beach of Bougainville.

Broaching, or swinging broadside to the breakers, is the terror of all Amphibious men. Washed up farther and farther by the waves, stranded craft are "chuck soup" for the enemy. Besides, the beach is blocked and time schedules are disrupted. (page 70).



U. S. Marine Corps, official

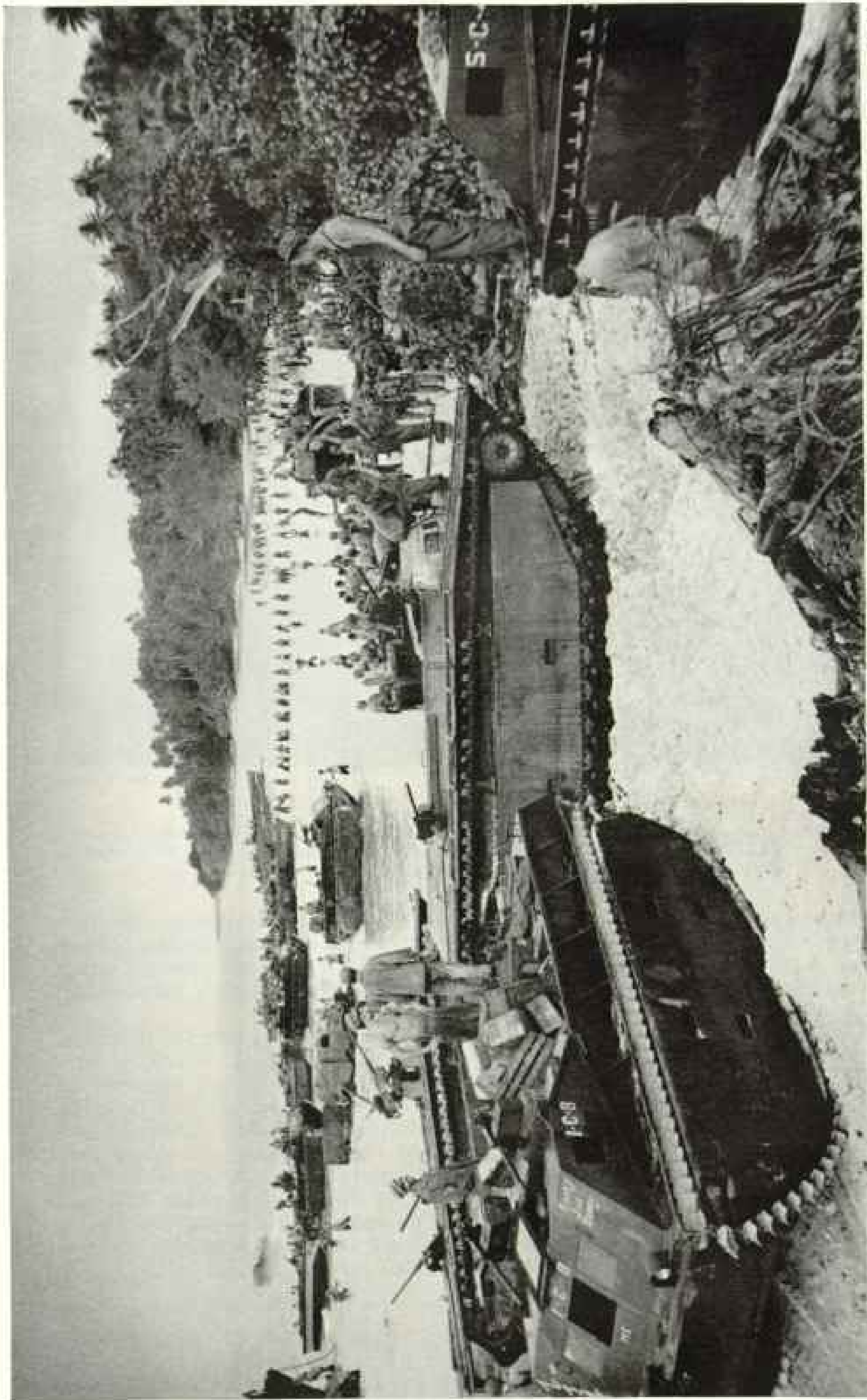
Across Tarawa's Treacherous Shelf, Tired Marines Tow Wounded Heroes on an LCR (Rubber Landing Craft)



P. B. Stry, (MPOA)

A Ship-to-shore Operation Is Clearly Shown in This Dramatic Air View of the Invasion of Eniwetok

First, the battleships at top shelled and strafed the atoll. Then LCSs charged in, blasting the beaches with rockets. Behind them came the first waves of LVTs (Landing Vehicles, Tracked), which crawled up the beaches carrying Marines and infantry (right center). Next, successive waves of assault craft poured in. When the beachhead was secure, 1st LSTs waddled in, landing tanks and cargo. Boats in center have started back to the transports for another load.



U. S. Navy, official

In This Perfectly Executed Amphibious Operation, Marines Captured Emirau in Less Than Four Hours on March 19, 1944

LSTs at sea spawned these "Alligators" (LVTs, left) and "Water Buffaloes" (LVTs, center), like guppies giving birth to young. After they had swum ashore and delivered their cargo, the amphibious tractors, or "Amtracs," returned and crawled up the tongue-like ramps into their mother ships' "stomachs." In the distance, a shore party bucket brigade passes boxes from stranded craft. At left a truck and trailer roll ashore from the bow ramp of an LCT. Emirau, a nine-mile-long arrowhead island in the Saint Matthias Group, provides the Allies with a valuable air and sea base less than 700 miles south of Truk.



U. S. Coast Guard, Official

It's Written on Their Faces! They Took Eniwetok in Six Hours

Tired and grimy, Coast Guard men and Marines come back to their transport in an LCVP after wiping out the Jap defenders of Engebi Island. Here they show off their Jap flag and shout, "The Rising Sun has set on Eniwetok!" When the sea is rough men must be nimble in climbing out of bobbing boats.

"We could spare a couple sacks of potatoes," he'd reply. Of course, I'd cuss under my breath and move on to the next ship. Her captain would tempt us with some frozen beef or new phonograph records, and then we would go right alongside and begin loading. Sometimes the skipper would invite me aboard for a shower and a good feed. Our crews were well taken care of, too.

"Approaching Salerno, we passed in the distance the Isle of Capri. We didn't realize that big German Tiger tanks were lined up on a camouflaged road, waiting for us to get in close. All hell broke loose when they opened fire. An 88-mm. shell struck the turret of a Sherman tank on the deck right below me and blew it to pieces.

"Our flag was split by shrapnel. The quartermaster replaced it with an old one and then sat down and calmly sewed it up.

"I certainly was proud of my men during those hectic eight days when our LCT was

bombed, strafed, and shelled daily. Shuttling between transport and beach, we often spotted a familiar LCT number and gave our friends a passing hail. Surprising how few casualties our landing craft had.

"After our troops had enlarged their foothold at Agropoli, south of Salerno, we went visiting ashore, while the Army unloaded our LCT. One Italian farm family I remember was particularly hospitable. They fed us a wonderful chicken dinner and served local wine. They assured us that they did not make the wine by trampling the grapes with their feet! We ate so much we got dopey. The old man and woman made us take a nap on the family's big bed."

A Day with the LCTs and Rocket Boats

Next morning I was at the dock early. Dozens of LCTs were bustling with life. Engines were coughing. Gray smoke hovered over the tightly packed craft.

I felt a deeper respect for these homely craft after the tales I'd heard the night before of their prowess in battle. To think that in a few weeks these same crews would be steering their own LCTs onto enemy beaches through bomb and shell.

The latest LCT is a rectangular, flat-bottomed barge, 105 feet long and 32-foot beam. It has "tunnels" for three propellers in the stern and deckhouses for the crew, one on each side (page 29). Forward a big ramp, upended, serves as a blunt bow. Lowered, it becomes a loading platform for vehicles and cargo.

The natural way to board an LCT, of course, is by the ramp, but when she is tied up at a dock one must climb awkwardly over the side. She boasts no fancy gangways or ladders; she is purely a utility craft.

"Welcome aboard," the skipper greeted as I jumped down to the tank deck. "I am glad you picked today. The rockettes are going to perform."

"Rockettes? What are they? LCT mascots?"

"Lord, no! They are the men who man the rocket, or support, boats. These Buck Rogerses in Navy uniforms prefer to be called rocketeers."

The skipper backed our LCT out and headed down the congested channel. Other LCTs and LCIs were getting under way too, but our captain skillfully threaded his way through the congestion.

"You handle your LCT like an expert. How long have you had command?" I asked.

"Just one week today, sir. I graduated from Midshipmen's School at Northwestern U. last month."

"But you must have had small-boat experience in civilian life?"

"No, sir. Before the war I taught high school in Missouri. I had never seen a boat before I joined the Navy. In two weeks I proceed to New Orleans with this crew to pick up a new LCT and then go overseas."

It was unbelievable, but typical of every other Amphibious craft I rode. Skippering these boats seems no more difficult to an alert American youngster than driving a car back home or riding a motorcycle.

Forming column on other LCTs, we snaked down the tricky channel to the Chesapeake, passing Solomons. In peacetime this village is famous as a fishing town and yachtsman's rendezvous. Now the liberty invasions of hundreds of blue-clad men from the Amphibious Training Base and their families all but swallow the little town.

It was a cold, snappy day and our rocketeers roughhoused to keep warm. They were a

jolly, tough bunch. Among them were a few veterans of Sicily and Italy. Knots of youngsters surrounded these men, listening to yarns about rocket boats in action.

As we neared the target beach, 12 small LCS(S)s passed us. They looked like ordinary gray speedboats with armored wheelhouses and steel windshields (page 6). Each had a projector, or framework, on either side for nesting rockets.

The leader came alongside and Lt. Homer Tolivaia, the rocket instructor, shouted, "Jump in but watch the ice on deck. The spray is freezing." Wearing life jackets, we clambered aboard the slippery, bobbing craft.

As we chugged off, the loaders carefully lifted bomblike rockets over the armored shields at the sides and placed them in the racks. They seemed as pleased as if they were setting up skyrocketes for the Fourth of July. Only these rockets carried lethal fragmentation shells instead of American flags or toy paratroopers.

Playing "follow-the-leader," three LCS(S)s sped along behind us. On signal, we wheeled together and headed for the target. The lieutenant cautioned everyone to crouch down beneath the wheelhouse.

"Fire One!" he called. Instantly the rocketeer closed the switch and the rocket went off with a loud "whoosh!" There was no other noise, but a cloud of acrid smoke engulfed the boat.

Looking up, we could see the rocket wobbling and hurtling to the beach.

"Floats with the greatest of ease!" a loader commented. It struck with a dull "crump" about 100 yards short of the beach.

"That was a ranging shot," the lieutenant explained. A few seconds later he gave the order, "Fire Two—Fire Three!" Again our rockets went off with a whoosh. Sister craft fired at the same time and the shells smothered the beach around the target.

Rockets Used at Fort McHenry in 1814

"Are these the rocket boats we read about in the news from Europe and the Pacific?" I asked.

"Yes, these same boats helped clear the way for our troops at Sicily. They went in with the first waves of landing craft and cleared the beaches of machine-gun nests and strong points. It is a cheap and easy method of getting concentrated fire power. Each boat can fire in a few seconds a salvo of 24 rockets. Newer and larger support boats fire many more. Probably these men will spearhead the big invasions of Europe or the Pacific."

Rockets are nothing new. Remember the



U. S. Navy, Official

From Wide-swing Jaws of an LST Pour German Prisoners from Italy

LSTs carry many strange cargoes. On the trip to the battle front they transport everything from donkeys and tanks to artillery, soldiers, and supplies. Returning, they bring out prisoners and wounded. Here a bareheaded Nazi officer leads off a group of prisoners. American soldiers with Tommy guns at the ready watch every move (page 24).

line, "And the rocket's red glare," in "The Star-Spangled Banner"? The British used Congreve war rockets in the attack on Fort Mchenry in 1814. Francis Scott Key referred to their red trail when he wrote the National Anthem.

Back on the LCT the crew took me down to their messroom and plied me with coffee with plenty of milk and sugar. The tiny galley had an oil-fire range and family-type icebox. The two officers and 12-man crew ate at the single table, but at different servings. Informality suggested life on a yacht with a Navy tang.

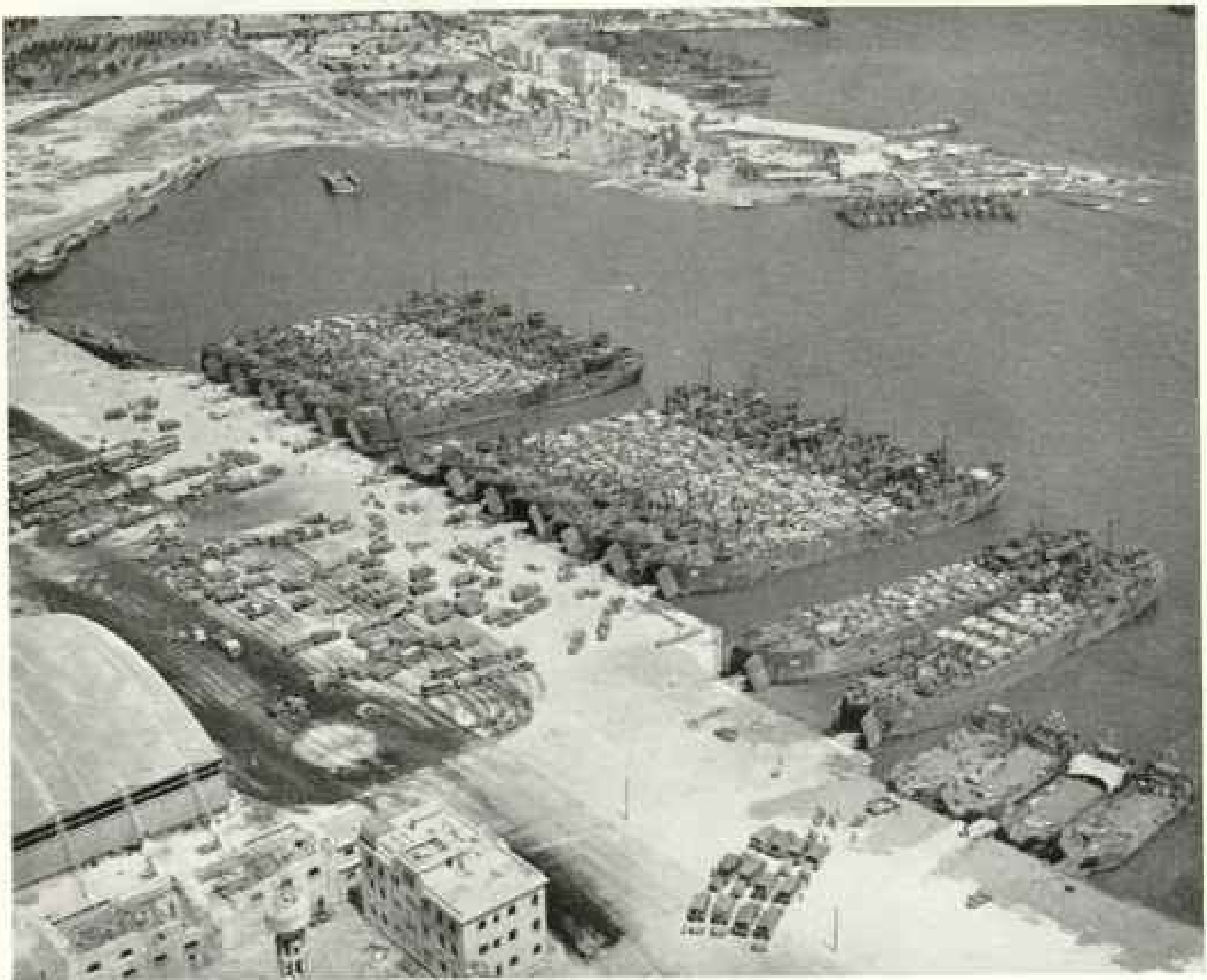
"Cookie can't read a word," a boatswain's mate said. "He is a swell cook, but he runs to peas and tomatoes because he recognizes the pictures on the cans!"

Up from a hatch in the deck popped a grinning machinist's mate, like a jack-in-the-box. "Come down and see our glory hole," he invited.

Following him down the rathole, I found myself stooping in a low compartment not five feet high, painted snow-white. A whining, roaring Diesel hogged most of the space. Its high-pitched noise was earsplitting. I could not hear a word my gesticulating guide said as he conducted me through the nooks and crannies of the engine room and tried to tell me what the many varicolored ballast valves, pumps, and auxiliary engines were for.

Opening watertight doors, he took me through the other engine rooms, miniatures of the first. The temperature was high. Working conditions for the engineers must be trying, especially in the Tropics. Yet my machinist-mate guide said he wouldn't change places with the signalman up in the icy cold of the bridge for anything.

Climbing up the ladder from the starboard engine room, I found myself in the ship's head, or washroom. The captain and crew all use



U. S. Navy, Official

A Flotilla of 14 Big LSTs Loads a Mechanized Division at Bizerte

Bound for Sicily, gasoline trucks, jeeps, tanks, and every conceivable weapon pour up the ramps and through the open bows of the big ships. Elevators take the lighter vehicles to the main deck. Skippers always put the Army's mobile antiaircraft topside so that the guns will give added protection. Most vehicles back on so they will run off headfirst. Least important go aboard early so they will be the last off. One skipper of the four LCT(5)s (right) has rigged an awning for shade.

this small room with its washbasins, hand-pumped toilets, shower, and laundry tub.

Going forward through a watertight door, I entered a living compartment for the crew and captain. Only a curtain separated the quarters. Double-deck bunks served for the sailors and for the captain and his executive officer. The captain's only conveniences were a table-desk, a small ship's safe, and a campstool for a chair.

LCT Lands Army Tanks in Surf

It was bitterly cold and blowing hard the day the LCTs took me out to see beaching and landing Army tanks in the surf. Our little craft jumped around and yawed from side to side as she drove into the wind. When waves struck her blunt bow, the ramp clanked and rattled, spray flew, and she shimmied from bow to stern.

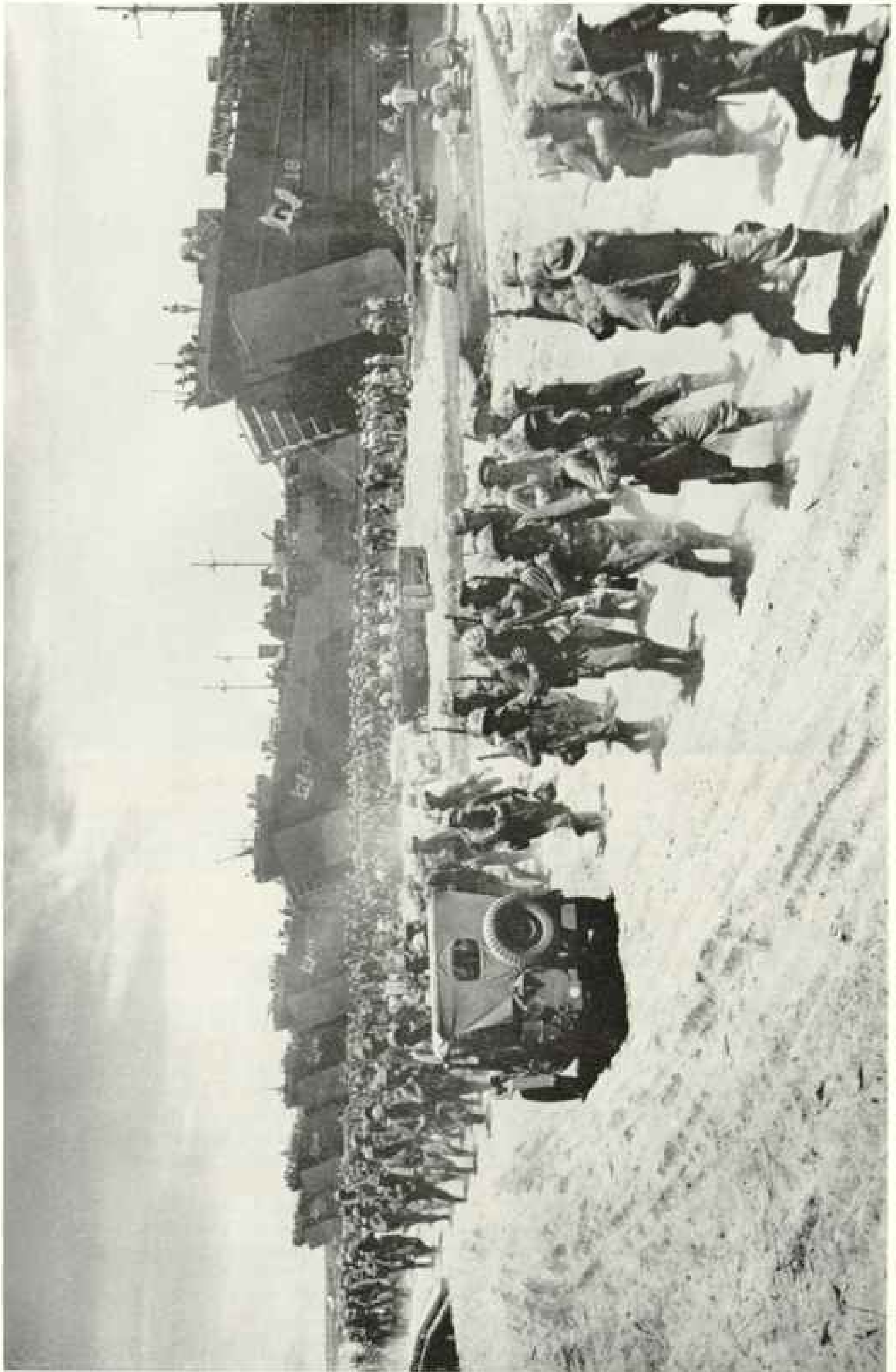
We paralleled the beach in single file. On signal from the flagship, we turned and headed for the big rollers crashing on the sands.

About 100 yards off, the skipper ordered the stern anchor let go, and the cable whined as it ran out behind us. Just before we hit, he stopped the engines and the ship coasted in, ramming the beach with a jar which nearly threw me off the bridge. A following sea smacked our flat stern and spouted green water and foam over the bridge, wetting us thoroughly.

Instantly the skipper sang into the voice tube, "All engines ahead two-thirds, rudders amidship. Keep a strain on the stern anchor."

Above the roar, he shouted to me, "Engines hold her against the beach, anchor keeps her stern to the seas."

"Lower the ramp," the skipper called next, and our bow dropped to the beach. Quick



U. S. Coast Guard, Official

In the Hot Midday Sun of Cape Sudest, New Guinea, Marines Swarm Aboard LSTs for the Invasion of New Britain

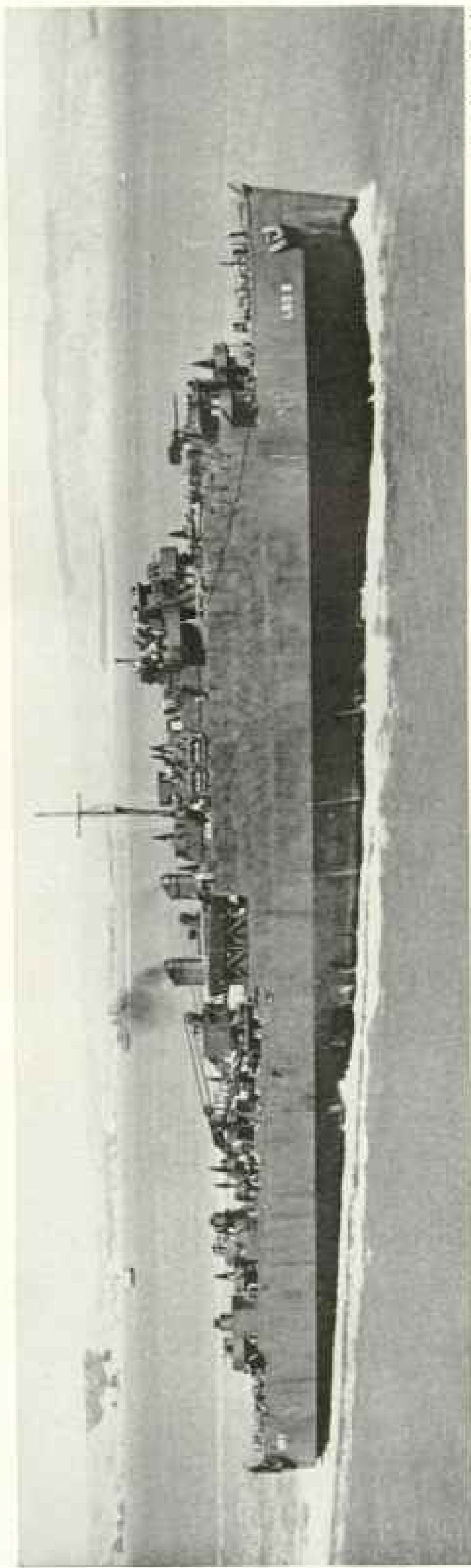
Two days later these same men in jungle "zoot suits" landed through the surf of Cape Gloucester (page 25). It took only 40 minutes for 800 men to pile up the ramp of each fully loaded LST. Antiaircraft gunners, standing by now, will soon be shooting down Jap bombers. Men sit on a broken-down Duck in center.



Mitelle Bell-Greener

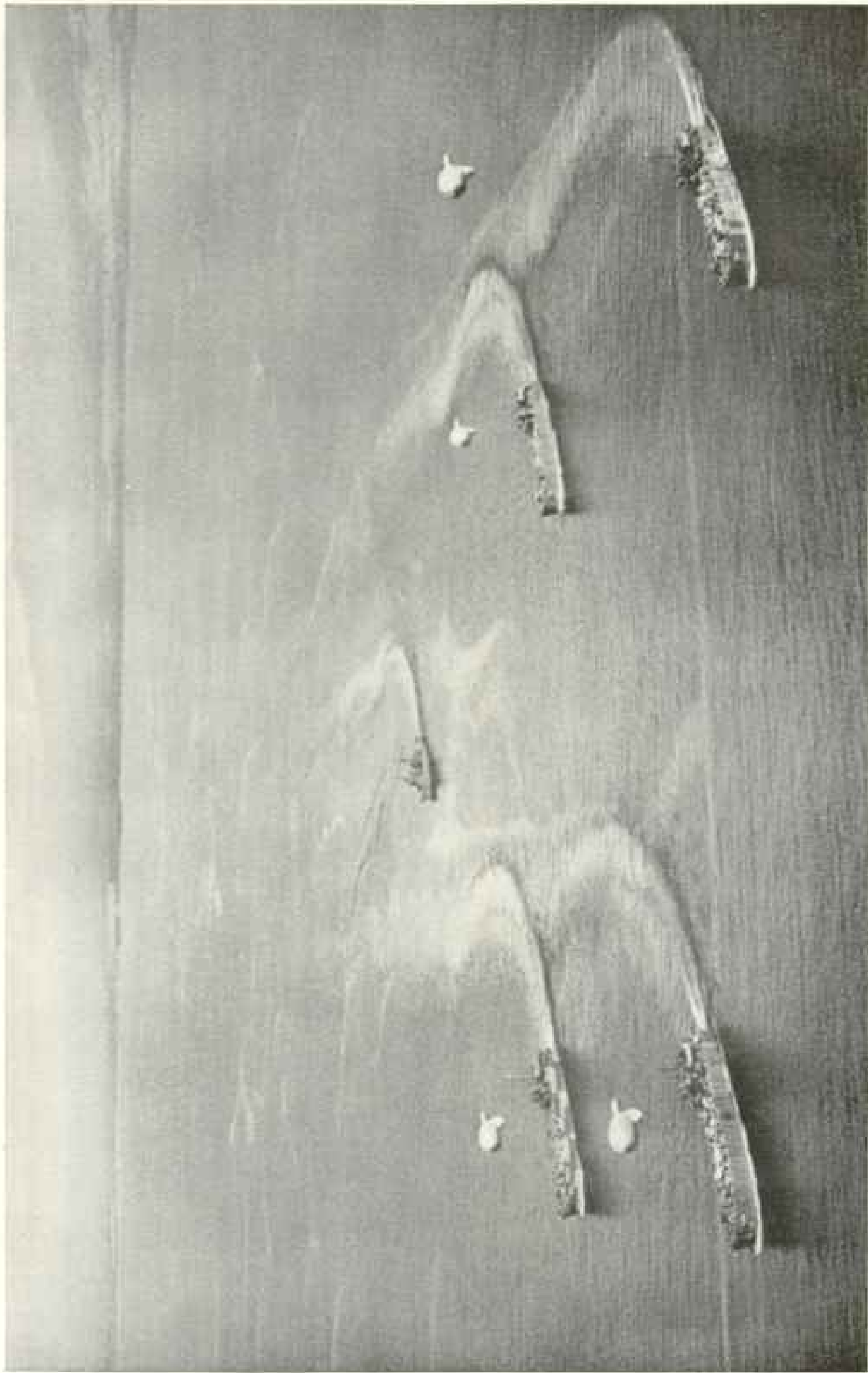
Though LCI(L)s May Roll and Pitch in Atlantic Swells, They Are Excellent Sea Bouts

The sea is moderate here, yet they kick up a fuss as they plow through the water and smack their flat bottoms on the waves. From a distance the LCI(L) looks like a surfaced submarine (page 21). At night, the brilliant phosphorescent glow of spray and wakes clearly outlined the craft.



E. S. Noy, Official

Newest Addition to the Amphibious Fleet, LSD (Landing Ship, Dock) Hides Many Surprises for Our Enemies Across the Seas



U. S. Navy, official

Each Towing a Barrage Balloon and Zigzagging, Heavily Loaded LSTs Head for the Green Islands, North of Bougainville

In this landing on February 15, 1944, American and New Zealand forces drew tighter the steel noose which is choking off thousands of Japanese marooned on Bougainville, Buka, and other islands to the south. General Douglas MacArthur said occupation of the Green Islands "completes the campaign for the Solomon Islands." Skippers claim balloons are a wonderful help to LSTs, because Jap planes cannot fly low over the convoy but must nibble at the flanks where AA guns can pick them off.



U. S. Marine Corps, Official

On This LST's Return from a Landing, Its Empty Tank Deck Became a Hospital for Wounded Marines

Big ventilators make the cargo space cool and airy. A "Green Dragon" has a sick bay in the far recesses of the tank deck; her officers' wardroom serves as operating room. Here, normally, the crew play games and dry clothes (page 24). Chains along the sides lash tanks securely to lugs in the deck.



U. S. Coast Guard, Official

Bow Pressed Against Black Sands, an LST Disgorges Men, Tanks, Trucks, into the Jungle

At dawn December 26, 1943, naval and airplane bombardment cleared the Cape Gloucester beachhead, knocking down trees and smashing pillboxes. Support boats (LCSs) firing rockets blasted remaining strong points and led the assault craft carrying Marines. Successive waves of LCI(L)s and LSTs brought in more "leathernecks," infantry, and heavy equipment. Elevator in center, fully loaded, is about to descend. Overhead, American fighters brought down Jap bombers, which fell around the beached ships.

as a flash the big Sherman tanks on the deck below came to life and chugged off, dipping and clattering down the ramp. Up the beach they tore, plowing furrows in the sand.

Suddenly the skipper pointed to the LCT next to us. A big wave had caught her and spun her around broadside to the waves. "She is broached. Now we are in for trouble," he said. "Her stern anchor failed to hold when she tried to pull off. She is helpless and we'll have to tow her off" (page 9).

Quickly our captain backed his ship out, the anchor winch winding in furiously. Big seas splashed over the stern.

We moved over directly behind the broached LCT, dropped our anchor again, and drifted slowly in. With much difficulty a hawser

was passed from our craft and secured. Then, our engines at full astern, we gradually pulled the stranded craft off.

Broaching is one of the nightmares of all landing craft, large and small. Big waves hit them broadside, washing them higher and higher up the beach. Stranding on enemy beaches throws a monkey wrench into landing operations. Successive waves of assault boats are slowed and time schedules upset.

LCI(L) Resembles Surfaced Submarine

For a week I cruised with the LCI(L)s, those doughty little craft that land our infantry on enemy beaches. We shoved off from Solomons at dawn, our seven LCIs (short for LCI(L)s) steaming in column. Quickly each

picked up a creamy bow wave as she plowed coffee-colored Chesapeake Bay.

"Whenever you see a little ship with a big bow wave and white wake streaming astern, you know it's an LCI," Lt. Comdr. Archibald M. Holmes, USNR, our group commander, said. "From a distance she may look like a submarine with conning tower amidships, high forecastle, and cutaway stern (page 17). On dark nights we must be snappy with our recognition signals. Convoy escorts might mistake us for a U-boat."

Close inspection, however, quickly dispels the sub illusion. In niches on either side of the bow the LCI carries a long flat ramp, or gangway, which can be shoved out forward and dropped when beaching.

Standing down the Bay, our task unit maneuvered like big battleships in formation. The commander would send snapping flags to the yardarm and our LCIs would turn ships right, form fancy echelons, or reverse course.

Sometimes they practiced picking up mail or transferring men. One LCI ran alongside another. As the two vessels kissed, a sack of mail was passed or a sailor stepped over the side.

"How do you like the way our captains and crews handle the LCIs?" the commander asked. "Each is manned by two training crews, regular complements standing by as instructors. Not a trainee, except officers, has been here longer than six weeks. When the cruise is over, they pick up LCIs of their own at the shipyards."

As a matter of fact, not a man on the flagship, including the group commander, was in the Navy two years ago. Most of them had been in less than four months.

The new officers took frequent bearings on lighthouses and buoys, tracking our course. Sometimes their "fixes" would put us on Maryland's Eastern Shore! But they would try again and soon have us on our course.

"Where are the sailors on that LCI?" I inquired as a jungle-green LCI passed us on a turn. "I see only officers on deck."

"She is manned by officers. There are no enlisted men on board except the ship's regular crew. You see that officer on the bow, cold spray flying over him? He's the lookout. Others are at the wheel and signal hoists. After this cruise, they will be assigned new crews and then train with their men as units."

"Sound 'general quarters,'" our training captain called as the signal flags came down on the run. Instantly sailors dashed forward and aft to man the guns. "Surface target practice with the 20-mms.," he explained.

Filing past a floating target, each ship in

turn opened fire. Tracers from our midship gun plastered the target in short, quick bursts. Our trainee captain, excited as a kid, shouted, "That's my squirrel shooter from Georgia. Boy, can he shoot!"

"He's a sharpshooter," replied the commander, "but what about number 5? He hasn't hit the target yet. His tracers are all over the place."

"That's my cook. He can't shoot, but he certainly can make mince pie, and that's *his* job."

With the commander as my guide, I wandered all through our little troopship. It's remarkable how much living space has been squeezed into that 157-foot, flat-bottomed hull. She has a deckhouse amidships, with a big recreation room for the crew. Here the men eat, play games, and write letters. Life jackets, helmets, and gas masks line the walls and are stuffed between the overhead beams. On one side are three small cabins for the ship's officers and the Army officers when they are aboard. The tiny wardroom, model galley, and washrooms complete the deckhouse.

Down below, an LCI(L) is divided into four big troop spaces, jammed with triple-deck bunks for 200 soldiers. On this cruise trainees occupied these quarters, officers and men sleeping side by side.

Eight six-cylinder Diesels, arranged in banks of quads, drive her two propellers.

"Our engines pull like teams of four horses," the engineer said. "If one breaks down, we can cut it out and run the others faster. Even one engine will drive the ship. While they whine in a high-pitched scream down here, you can't hear an LCI when she moves slowly.

"Many an LCI has sneaked in to a hostile beach in the darkness, unseen and unheard, until her troops jumped the enemy on shore. LCIs are ideal for leapfrogging up coasts and atoll jumping. They should be called 'ghost ships.'"

On her stern, low to the water, a big barrel-like smoke generator belches white clouds when a screen is needed. Here, too, is the powerful anchor winch, which pulls the craft off the beach in retracting.

The Charge of the LCIs

Next morning I stood high in the conning tower to watch surf beaching. Our LCI rolled and yawed in the Atlantic swells. Dead ahead huge white breakers roared up Virginia Beach. To the right and left other LCIs were charging headlong for the shore.

Are the captains mad, I thought to myself. Don't they realize that this beach is a graveyard of the Atlantic? Countless ships have

been wrecked here, caught helpless on just such a lee shore. Those waves piling up on the yellow sands have rolled unmolested 3,400 miles from Spain.

Yet relentlessly on and on they rushed, bound for that maelstrom of foam.

One hundred yards out the captain let go the stern anchor and our cable snaked out astern. With a sudden shock our craft struck the beach, her bow lifting and riding up on the sand. Surf piled up under her stern and roared past her sides. Out rattled the ramps, and a sailor or two ran down to the beach and back.

"I have beached some 200 times, but I still wince every time I land in surf," the captain commented. "All my instincts tell me to turn around. Yet I must keep on, as there is no changing my mind once I start in. It's vital, too, to get that anchor out at the right instant. If I let go too soon, I run out of cable and hang from the anchor in the breakers. With too little scope, I can't use the hook to pull off when retracting."

I glanced at the other beaching LCIs. Sailors were grabbing life lines and waving their white hats at the girls on the beach. Women and children scurried out of the way as the gray steeds came galloping in.

Surprisingly, our vessel rested quietly, her stern pointing out to sea. Big waves lifted her up and down in a rocking, hobbyhorse motion.

"When the Army is with us, here's where they go ashore," the group commander said. "Carrying all their gear—helmets, rifles, packs, and gas masks—they pile from the troop spaces and run down the ramps and up the beach.

"Oftentimes we can't get in all the way. Then the soldiers must jump off the ramps in water up to their hips. If they fall, they jump up quickly and keep going, soaked from head to foot. All ashore, we retract and go back for another load."

Sailors in the bows hauled in the two ramps. The anchor engine on our fantail whined. Gradually we pulled off the beach. Well clear, our propellers took hold and we headed out, the waves rolling us down as we made the turn.

Off to Sea in a Little LCI

Again and again the ships beached, giving our two training crews thorough practice. Chief fault was a tendency to approach slowly and cautiously. Then the captain would shout, "Give her full ahead, man! Keep her moving. If you don't, the waves will take charge and you'll broach."

Beaching finished, our LCIs headed out to sea in column behind the flagship. Plowing along, the blunt bows seemed to push the whole blue ocean before them, kicking up the usual foam.

Everywhere we looked we could spot tiny Coast Guard patrol craft poking around looking for U-boats. Now and then a big silvery blimp would glide down and look us over.

Well out to sea, a Navy torpedo plane flew over, towing a big red sleeve. Our guns spit tracers and bullets into the blue sky. Most of our shots were below and behind, a common fault of beginners firing at airplane targets.

Around the table after supper in the cozy wardroom the officer instructors spun yarns about their experiences with LCIs overseas.

Lt. John R. Powers, USNR, formerly a social worker in Cincinnati, told of the adventures of LCI(L) 335, typical of all such craft in the South Pacific.

After training at Solomons, Maryland, he commissioned his craft in November, 1942, and set sail for the Pacific, one of the first LCIs to go out. After traversing the Panama Canal, he steamed in convoy nonstop across to the Society Islands, thence by way of several South Pacific bases to New Caledonia.

335's first brush with the Japanese was in the New Georgia push. At dawn she steamed into a small cove on Vangunu Island to land jungle fighters through terrific surf. Her bow stuck into the green forest. Big rollers lifted the ramps and made it difficult for the soldiers hurrying ashore. Backing out, the skipper could hear the infantry shooting in the woods.

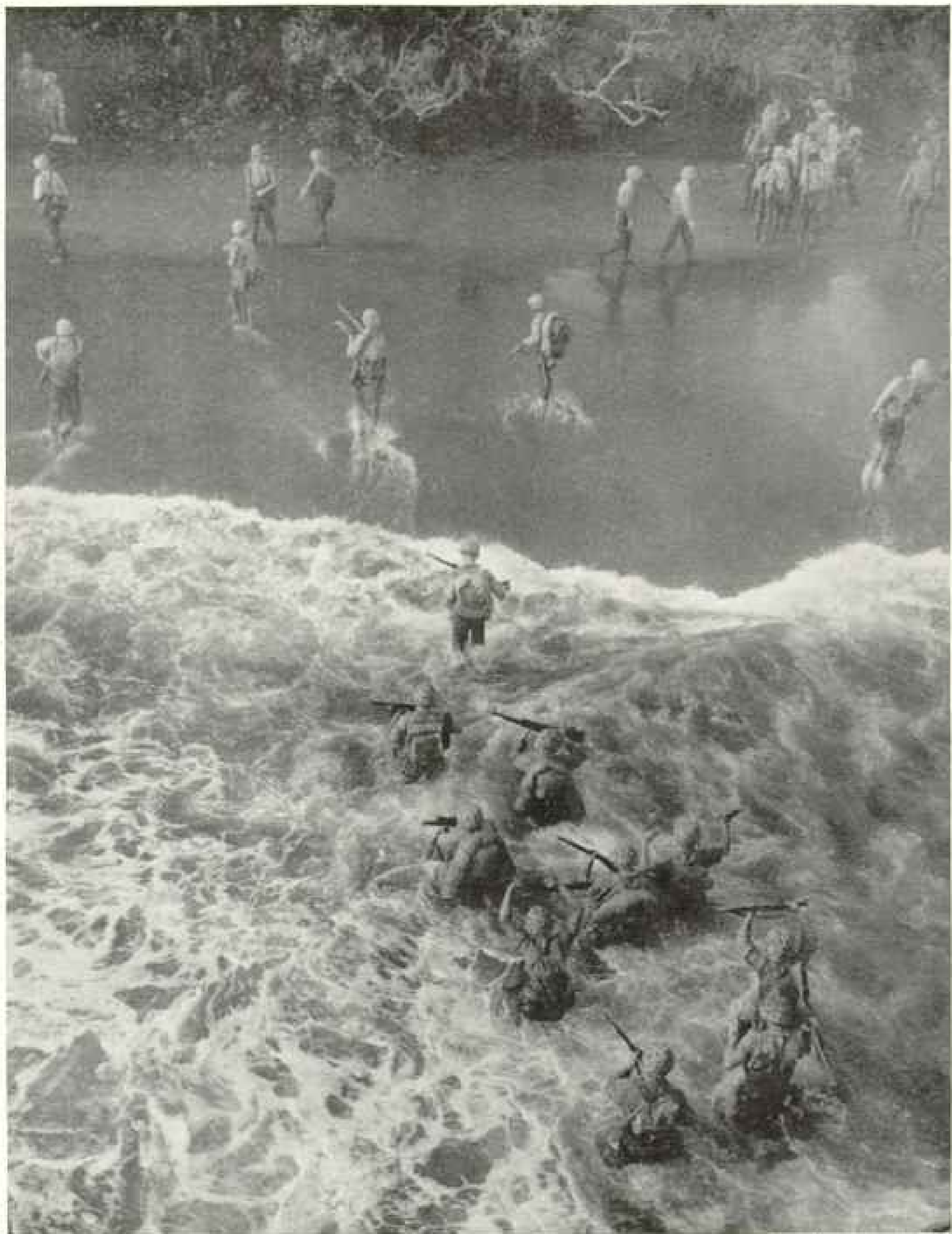
"Did you draw any fire from the shore?" I asked him.

"No. But the surf was so vicious—10-foot waves—that I would hardly have noticed it, anyway.

"We went back to our base in the Russells, loaded again, and on the Fourth of July landed infantry and Seabees at Rendova," he continued (page 7).

"I shall never forget the fireworks that day. Sixteen Mitsubishi bombers came over and dropped their bombs just after we had retracted. In fact, the bomb pattern fell on the exact spot where we had been beached a few moments before. It was a good old Fourth-of-July celebration. Planes fell all around us. Our fighters got most of them.

"We played around close to shore, keeping as inconspicuous as possible until the sky cleared. LCIs are so small and inoffensive-looking that the enemy rarely bothers them. All the time I was more worried about the reefs than the falling bombs and AA fragments.



U. S. Marine Corps Official

Holding Their Guns High, Marines Dash Ashore through the New Britain Surf

Breakers rolled right over the green-clad veterans of Guadalcanal as they jumped off the ramps of the LSTs. At times only their guns and hands could be seen above the surface. Yet onward they charged into the jungle to take the Japanese by surprise and capture an important air strip on Cape Gloucester. American losses were light. This landing helped seal Dampier Strait between New Britain and New Guinea. Such sandy beaches are ideal for landing vessels. But rocks, coral heads, and artificial hazards are dangerous, rip out bottoms.

"LCI 335 served as a ferry for troops and Seabees to Munda and took New Zealanders to the Treasury Islands. Altogether, she ran 'The Slot' through the length of the Solomons some 20 times, carrying thousands of troops (page 3). She took reinforcements to Empress Augusta Bay, Bougainville. There we fought the surf again. Hanging around offshore, we watched the battle and Bagana Volcano belching smoke and cinders—Nature's accompaniment to the drama going on in the jungle below (page 8).

"Standing up The Slot in November, we passed two little 'yippy' boats chugging along, loaded with Thanksgiving turkeys for our forces at Bougainville. The little YPs (converted yachts) were all alone, so they joined our convoy."

"Did many of your crew get malaria?" I asked Lieutenant Powers.

"We were exceedingly lucky; only three came down with it in our LCI flotilla," he replied. "Mosquitoes were well controlled at our base on Florida Island. Besides, LCIs usually anchor several hundred yards offshore, and malarial mosquitoes don't fly far. We sprayed our ship regularly. The only time we were really bothered by mosquitoes was when we landed soldiers at dusk or dawn."*

"What sort of food did you have?"

"We ran out of fresh supplies during the month we were at Rendova. We got along on the ship's dry stores, mostly luncheon meat. Once we went ashore and shot two wild bulls. The meat was fresh but very tough."

"Did you carry many wounded?"

"No, LCIs are not equipped for carrying stretcher cases. But we did bring out many walking wounded and fatigue cases."

Next morning when I hit the deck the ship was rolling and tossing like mad. Snug in my bunk, I had felt no motion. After breakfast I reeled down the corridor and climbed the ladders to the conning tower. The wind was not blowing too hard nor were the seas excessive, yet our LCI bounced around like a Toonerville trolley. Her bow would run up on a wave and come down with a smack on the next one. She shook like a dog (page 17).

LST—a Floating Tunnel

Back at our anchorage, the commander signaled an order to "nest up." We dropped our stern anchor—LCIs often moor by the stern—and the other craft ranged up alongside. A slight swell was running and the little ships rolled and bumped in comradely fashion. Officers and men were elated that training was done and soon they would be masters of their own LCIs.

Take a section of New York's Holland Tunnel. Put a bow and stern on it. Give it engines, propellers, and rudders. Add a bridge for the captain and you have an LST, or Landing Ship, Tank.

Of course you would have to add a few details such as a big ramp and bow doors which swing open like a garage, surround this floating tunnel with living compartments for the crew, and cover it like a porcupine with bristling AA guns.

But essentially that's the picture I got when I stood in the mammoth, white gleaming tank deck of an LST. Even the terrific roar and foul smell of a tunnel are there when huge ventilators suck out gases and big Sherman tanks whine and clank down the ramp (p. 19).

"Here's the natural place to begin a tour of an LST," said the Coast Guard skipper. "The tank deck is her reason for being. Around it centers the life of the ship.

"Here the men dry their laundry, play ping-pong and basketball, toss baseballs, rough-house, and do much of the ship's work," he explained. "When not carrying tanks and trucks, this vast space may be piled high with Army supplies, gas drums, telephone poles, ammunition—in fact, anything an army in the field may need. LSTs have even carried horses and mules. One skipper I know ferried a thousand Nazi prisoners across the Mediterranean" (page 14).

Scurrying up and down the tank deck, men were busily stacking and carrying boxes of dry stores, like a parade of leaf-cutter ants. As I watched, a little truck, like a cross between a jeep and an elevator, picked up a stack of canned peaches and whisked them down the deck, depositing them in front of a storeroom door.

"That's our Handy Andy," the skipper explained. "It saves many man-hours of work. All our men have to do is to stack the boxes and Handy Andy does the rest."

Every operation on an LST speeds loading and off-loading. If the enemy is bombing, strafing, and shelling the ship, she must be got off the beach in a hurry. Imagine completely unloading a big cargo ship in 45 minutes! Yet that's not unusual for an LST when she starts her tanks and trucks rolling down her ramp.

"Come forward and see the bow doors and ramp," the skipper said.

As we approached, the bow began to open like a secret door. Noiselessly, with no one

* See "Saboteur Mosquitoes," by Harry H. Stage, and "Life Story of the Mosquito," by Graham Fairchild, in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1944.



U. S. Navy, Official

A Sailor's Home Is His Bunk

On it he keeps his hammock, mattress, blankets, and many of his belongings. In addition, he has a small locker for his clothes and trinkets. While the crew space is crowded on an LST, living conditions are as good as on a big man-of-war. Triple-deck bunks fold up during daytime to make room for mess tables and recreation. Soldiers live in narrow compartments on either side of the tank deck and have their own toilets, mess tables, and bunks.

apparently operating it, the ramp swung down on its hinge until it stuck straight out in front of the ship, like a giant's mighty tongue. Flanking it, jawlike doors yawned open.

"How did you drop the ramp so magically?" I asked the skipper.

Pointing to a glass window high in a corner of the tank deck, he said, "An electrician, posted in that cubbyhole, operates the bow doors and ramp. All the machinery is inside. That's the reason you hear little noise."

From time immemorial sailors have been trying to keep the hulls of their vessels watertight. Here was a skipper deliberately opening a great hole in his ship at the touch of a button!

"How do you keep water from leaking in?" I asked.

"The bow doors only streamline the hull, giving the ship a sharp prow," he explained.

"When closed, spray splashes through the cracks of the doors, but the ship is sealed by the ramp and rubber gaskets."

We climbed ladders to the ramp-control room. "When unloading tanks we station a traffic officer here," the skipper said. "Looking through the window, he controls the tanks with signals—red, amber, green. When he receives word that the ship is firmly beached, he flashes a green light and the tanks roar off the ship, clanking as they go and splashing through the water up to the beach. If a jam occurs ashore, he flashes the amber and then the red, stopping the procession."

Traffic in this nautical garage is all one way. There is no turning around. So loading an LST is like running a motion picture backwards.

Drivers need eyes in the back of their heads, for tanks and trucks must back up the



U. S. Navy, Official

No Drill This! A Nazi Shell Just Misses Army Ducks at Anzio

Here its giant geyser plumes up between columns of amphibious trucks. One loaded with box cargo is just crawling out. Spray and fragments from the blast fly over it. Empty Duck at left is about to shed its land role and become a boat like the others heading for transports offshore. Behind the fountain an LCT off-loads from her lowered ramp. Battered by the constant German fire, work-horse LCTs have played a vital role shuttling supplies to this Italian beachhead (page 12).

ramp and into the ship's cavernous depths. Yet LSTs have been loaded with some 80 vehicles in an hour and 34 minutes. And that includes time to chain the tanks to slots in the deck.

It is ticklish business if the vehicles are bound for the upper deck. Then they must back up a second steep ramp just inside the bow. Older ships use an elevator, but this is much too slow.

Walking aft, we passed through narrow troop spaces fitted with folding pipe berths and lockers. On swinging stools sailors were eating "chow" as if at a drugstore counter. Their cafeteria-style trays were piled with bowls of vegetable soup, roast beef, mashed potatoes and gravy, creamed cauliflower, bread and big chunks of butter, and coffee.

"We can serve 300 men—sailors and soldiers—quickly and efficiently," the captain said.

Farther aft we came to a large compartment filled with triple bunks, lockers, and tables (page 25). Living quarters for the crew and troops surround the tank deck like a big horseshoe.

LST Shoots Down Six Jap Planes at Vella Lavella

The main deck was cluttered with chimney-like ventilators, cargo hatches, winches, hawsers, antiaircraft guns, tubs, and much other equipment (page 3).

An LST can put up a terrific antiaircraft screen with her many guns. Six Jap planes in one day were bagged by an LST at Vella Lavella in the Solomons last August. Not bad for a squat, sluggish ferry that many consider "easy meat" for airplanes.

Taking up much of the deck were great wooden timbers, which appeared to be a ship's launching ways.



U. S. Navy, Official

Pontoon Bridges Caught the Germans by Surprise at Licata, Sicily

As this beach slopes gradually and big landing vessels can't get in close, the Germans felt it secure and left it lightly protected. But they reckoned without the Seabees, who developed these 175-foot steel pontoons. Hung from the sides of an LST, they are dropped near the beachhead and towed alongside. When the ship hits the shoal at full speed and stops, lines are cut and the pontoons float to shore under their own momentum. Here several are connected in tandem, forming a bridge from ramp to beach.

"When we go overseas we will carry an LCT on that cradle," the captain explained. "A crane will pick up the 108-foot craft as it would a toy and gently rest it on the ways. We will secure it firmly with chains and cables and then stow other landing craft on its tank deck. First, a 50-foot LCM will go in, and inside of that a 36-foot LCVP" (page 30).

"But how do you launch that pyramid of landing craft?" I inquired.

"That's a ticklish job," he replied. "At the advanced base a crane lifts out the small boats and the chains are removed. When all is ready, we heel the big mother ship down and pull the wooden wedges. The LCT slides sideways gracefully down the ways and drops into the sea. A big fountain splashes up between the two, acting as a sort of cushion. It's really very simple, and the two vessels never scrape their sides."

"Amazing! Does the LCT have to be docked to prepare her for sea?"

"No. Her crew pile aboard, start her engines, and off she chugs. She may come around immediately to the bow of her mother ship and take on tanks and cargo from the ramp. The whole maneuver is done as smoothly as a white swan launches her little cygnets from her back."

During lunch in the wardroom several officers who had commanded LSTs in the Mediterranean swapped yarns about their ships.

For the Sicily landings, a cargo of donkeys was stabled on the main deck of an LST. Tanks and vehicles crammed her tank deck. That LST became a donkey transport and tank ship all in one!

Lt. H. R. Fleck, USNR, commanding No. 386, told how his ship happened to be the first LST to land at Salerno. "Approach-



U. S. Navy, Official

Over the Side and Down the Rope Net Climb Salerno-bound Soldiers

Three or four usually go over together, lifting left legs first, placing feet on rungs, and gripping vertical strands with their hands so the man above will not step on their fingers. They are taught to keep step so they will not bump and slow the descent. Each carries his pack jammed with rations, Garand rifle, and water canteen. Overhead flies the transport's guardian barrage balloon.

ing the beach, we struck a mine which blew out 50 feet of our bottom and part of the starboard side, including a troop space. Naturally, I thought my ship would sink and headed for the nearest beach ahead of schedule. The Navy gave me a Silver Star for that, but I was only trying to save my ship!"

"Were you under fire?" I asked.

"Yes, while we landed tanks German 88-mm's shelled us for two hours until we retracted. We steamed under our own power, with that hole in our bottom, some 950 miles to Bizerte and thence to Oran. That's an LST for you. You can't sink them!"

"After the Sicily campaign, five LCTs were returning to Palermo," he continued. "Leap-frogging up the north coast, they had landed tanks at vital points behind the enemy. Now they were coming back to port battered, dirty, and tired. The flagship signaled them to pass close aboard for Admiral's inspection. The LCT boys were worried but obeyed orders. As they passed the big cruiser, the band played and all hands, including the Admiral, saluted the little LCTs."

To show how an LST gets around, I quote a letter from Lt. Charles M. Brookfield, who wrote that fascinating article for the *GEOGRAPHIC* about finding a 17th-century British "Fourth Rate" wrecked on a Florida reef.* Lieutenant Brookfield now commands U. S. Coast Guard LST 21, which he calls *Blackjack Maru*.

LST "Blackjack Maru" Fought in Three Theaters

"During the past six months," he wrote in February, 1944, "the ten LSTs of our group, of which *Blackjack Maru* is flagship, have cruised over 25,000 miles, operating in all three theaters of war. We have earned two Bronze Stars on our ribbons, visited eight countries, four continents, and sailed through seven different seas. That's a record for flat-bottom 'dishpans' designed primarily for ramming the beach.

"Our crew claims this ship was the first in

* See "Cannon on Florida Reefs Solve Mystery of Sunken Ship," by Charles M. Brookfield, *NATIONAL GEOGRAPHIC MAGAZINE*, December, 1941.



U. S. Navy Official

Down the Mississippi Come Six LCTs Built Far from the Sea on Rivers and Lakes

Ferry crews bring the Landing Craft, Tank downstream to New Orleans, where they are lifted aboard LSTs and sent overseas (page 30). This is the newest type, called Mark VI by the Navy. Hundreds of 327-foot LSTs, too, are built inland, many sailing 2,000 miles from Pittsburgh down the Ohio and Mississippi.

history to cross the Atlantic going sideways! LSTs have such high freeboard and shallow draft that the wind blows them off the course. Our navigator computed the leeway, as in sailing-ship days, and then plotted a 'crabbing' course.

"During the Italian invasion *Blackjack Maru* and a British LST loaded two motorized Canadian regiments for the east coast of Italy. Our ship had 71 vehicles aboard, nearly half of them General Sherman tanks—a very heavy load.

"When I showed their brigadier to a room, he brushed aside my apologies for his three roommates with the statement, 'Last night I slept on the floor!' There is always much camaraderie between the ship's crew and the Army. This is due largely to the commissary department, which serves the best possible meals to our guests. Of course there is some confusion over Navy terms, but by the end of the trip the soldiers refer to the 'deck' and 'ladder' instead of 'floor' and 'stairs.'

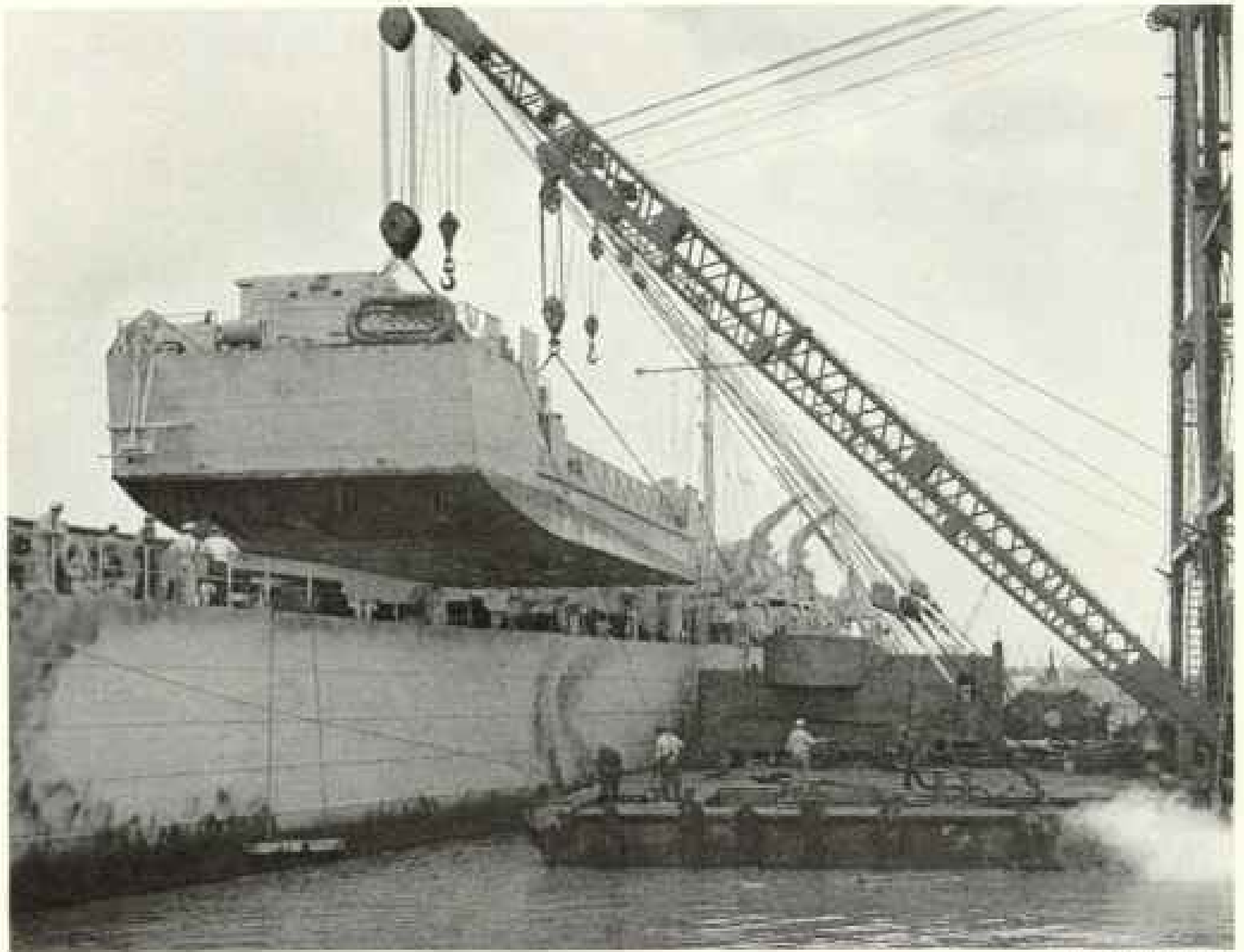
"Off Barletta we were ordered to Manfredonia, just captured by Commandos. For safety's sake we sneaked along close to shore,

our shallow draft making this possible. As we nosed in between the break-waters, I momentarily expected an explosion from a mine. Ships in the harbor with only masts and funnels above water were not reassuring.

"Keeping away from deeper parts of the harbor where mines might be, we let go our stern anchor, nosed up to the sea wall, and opened the bow doors. Commandos gathered around to watch the Shermans clatter down the ramp.

"The British 8th Army's drive through Italy was supported by these tanks, which took the enemy by surprise. We learned later that one of them captured a German general while he slept!

"Our 75th beaching took place in Jap-disputed territory. Our orders were to land 30-ton tanks at night on a beach too shallow for us. To overcome this difficulty, we ran up as far as possible at high water, waited for the tide to fall, off-loaded at low water so that the tanks wouldn't drown, and got out when the tide came in. If the Japs had spotted us 'monumented' on the beach, unable to move, we would have been 'duck soup.'



U. S. Navy, Official

A 112-ton LCT Is Hoisted Aboard a Mother Ship to Ride Pickaback to Battle

It will rest safely on timber launching ways, chained securely to the deck. When the LST reaches the front she will roll herself over by ballasting and slide the smaller craft into the sea with a mighty splash (page 27). This is the Mark V-type LCT, with deckhouse across the stern.

"We claim that *Blackjack Maru* and a sister ship are the first U. S. naval vessels ever to fly the Stars and Stripes in an offensive operation in Indian waters. The scene of action is probably the most remote from our shores in this or any U. S. war."

In the afternoon our 327-foot LST plodded out for beaching. Can this 2,160-ton ship really run itself aground, I wondered. Yet, like the other landing craft, she headed straight for the beach full speed.

"If you really want to get a thrill out of beaching," the captain said, "go down and climb out on the ramp."

Down many ladders and winding passages I hurried to the tank deck. Just as I arrived, the big ramp opened, mysteriously as ever.

Dead ahead I could see the beach with the tree-clad bank beyond. Wind whistled through the opening. Gingerly I climbed out on the 23-foot ramp to its tip and looked down at the ship's bow, a bone in its teeth. The waves roared like a waterfall.

"Hang on!" an officer shouted with cupped

hands. And it was lucky he did, for just then the ship hit the beach and I nearly fell off. Looking back over my shoulder, I saw the tremendous monster coming down on me, its huge mouth gaping as if to swallow me. I could see 208 feet down its gullet, the tank deck.

The ship rode up the beach for about 30 feet before stopping. Sand piled around her cutwater. A tidal wave rolled up, inundating the beach.

Retracting was much the same for the big tank ship as for smaller craft. Going astern with her engines and winching in her anchor, she gradually backed off.

Leaving the ship, Lieutenant Fleck bade me goodbye with these prophetic words: "There is not a single place on earth where we can invade enemy soil without crossing water or landing on a hostile shore. Airplanes and warships clear the way, but landing craft—*only landing craft*—take our armies to the enemy."

"Happy beachings!" I waved.

Britain Fights in the Fields

BY FRANCIS A. FLOOD

THE KENT County farmer, who has farmed for three years within range of Hitler's guns across the Strait of Dover, looks up from his plowing, sees the flash, counts 70 seconds, sees the shell land in his field—and keeps on plowing.*

"I'd think you'd feel like quitting," I told one farmer after we had counted 53 bomb craters in his fields. He had fenced off some of the holes and farmed around them. He had filled others and farmed over them. It meant extra work either way for his limited labor supply.

"Quit?" His answer was instinctive. "Why, we won the battle of this farm."

Won it?

I looked at his blacked-out barn, at his corrals where he has done his chores for four years in total darkness without even carrying a lantern.

Tank traps and Home-Guard trenches cut his fields into small patches with point rows and short turns. They were dotted with poles stuck in the ground every few rods to keep invasion planes from landing, and he had to farm around them by the hundreds. His cows were scattered in different pens, by order of his county committee, to prevent his herd from being wiped out by one bomb hit.

"Sure, we won the battle of this farm. I produced more food here this year than I did before the war.

"Besides, figure it out. It cost Hitler more to make those 53 bombs and deliver 'em over here on my farm than the farm is worth. He can't win that way."

Perils of Planting Wheat

A damaged wheat drill stood in a field.

"Yes, they hit us when we were planting this wheat. Killed two horses and cut up the driver and smashed my drill."

We walked over the field toward the scar at one end. "But I fixed the drill in a blacked-out barn that night and finished planting the field next day. Wheat looks good, too, doesn't it? Yes, things like that are a nuisance, but we can't let them interfere, you know. No, that scar there is not where they hit my drill; that's what's left of a Stuka.

"You see, the RAF fields are so thick around here." He grinned. "We just farm the strips between the landing fields. When Jerry misses the airfields he hits our farms, and that doesn't do so much damage. So our farms here serve just to catch the bombs.

"And then when we produce more food than we did before the war besides, that's licking him twice in the same place. Won this battle? Why, man, it's right here that we won this war!"

Churchill gave the British farmers their assignment as a war task force when he made his historic challenge after Dunkirk. Then Britain stood alone against the Axis, and invasion seemed inevitable: "We shall fight on beaches, landing grounds, in fields, in streets, and on the hills. We shall never surrender."

The British farmers' 70-percent increase in food production above their prewar level, in the face of their wartime farming difficulties, is their answer to Churchill's challenge to fight in the fields.

Farmers Rank with War Heroes

There are many in England today who rate British farmers along with the RAF, "the Rats of Tobruk," and the veterans of Montgomery's Eighth Army as the real heroes of this war. The story of their fight in the fields is an important chapter in the history of the war.

Over 120,000 bombs, in addition to incendiaries, were dropped by the Germans in Kent and Sussex Counties alone in one year.† I was on a Sussex farm from which the owner told me he had hauled 500 incendiaries in cartloads one morning. German planes shot down on Kent and Sussex farms have been numbered by the hundreds.

"But here on the White Cliffs of Dover (page 58), of course, farm production must have fallen off since the war began," I said to the Kent County Farm Committee chairman. "You've lost land to airfields, tank-manuever grounds, army camps, and fortifications. You've been bombed from the air and shelled from the guns across the Strait. You're short of labor. You're short of machinery and fertilizers. But how much has it fallen off?"

The county chairman looked up the figures. "In 1930 this County had 250,000 acres under the plow. By 1942 it was more than 380,000."

In total, wartime Britain has increased its plowed acres by more than 50 percent above the prewar level and its food production by

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Dover, Front-line Town of Britain's Siege," by Harvey Klemmer, January, 1944, and "Charm Spots along England's Harassed Coast," 16 illustrations, August, 1940.

† See "Penn Country in Sussex," by Col. P. T. Eiberton, NATIONAL GEOGRAPHIC MAGAZINE, July, 1935.



British Coveralls

An English Coverall Girl Repairs a Tractor Made in Waterloo, Iowa

Despite farm-machinery shortages at home, America finds it economical to lend-lease tractors to its ally. Since a tractor delivered in Britain produces a minimum of ten times its own weight in food, it saves precious cargo space. Acre for acre, British farmers now have more tractors than Americans.

70 percent, calorie basis.* When the farmer's son left the tractor for a fighter plane, the farmer's daughter kept the tractor going on the farm. And those dim lights creeping slowly across the field by night are the farmer himself keeping the tractor going in the black-out for the extra acres. Special tractor lights have been designed for the purpose with a limited downward range. (See above and p. 63.)

Land is farmed that had never been plowed before—land so rough that it costs more to produce the food than the food is worth, but not more than the food plus shipping is worth. Today parks are potato fields, and golf courses are in wheat. They farm road strips and school grounds, reclaimed marshland and rough hillsides.

English farmers have upset their old established rotation systems by taking land out of grass and putting it into crops earlier than long-time sound farming practice permits, thus overdrawing on their checking account of soil fertility, spending fertility in the emergency faster than they make deposit.

Mussolini, in several years of peace, reclaimed some 200,000 acres of the Pontine Marshes and put them into production.† During one wartime winter, at the height of

the Battle of Britain—when one of every five homes in all Britain was being destroyed or damaged by bombs—the English reclaimed 150,000 acres of similar marshland and put them into food production.

An Amazing Agricultural Output

I had two questions to ask when I learned of England's increase in food production since the war began, and I was surprised at the answers.

First, supposing that this "nation of shopkeepers" does fight in its precious little fields, of what importance is Britain as a farming country, anyway? If they increased their production so much, could they have been farming efficiently before the war?

Second, how have British farmers overcome wartime difficulties?

Britain's prewar agriculture was greater than that of any of its Dominions except Canada, in terms of people engaged and value

* See "Blood, Toil, Tears, and Sweat," by Harvey Klemmer, in the NATIONAL GEOGRAPHIC MAGAZINE, August, 1942.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Redemption of the Pontine Marshes," August, 1954, and "Story and Legends of the Pontine Marshes," April, 1924.

America Fights on the Farms

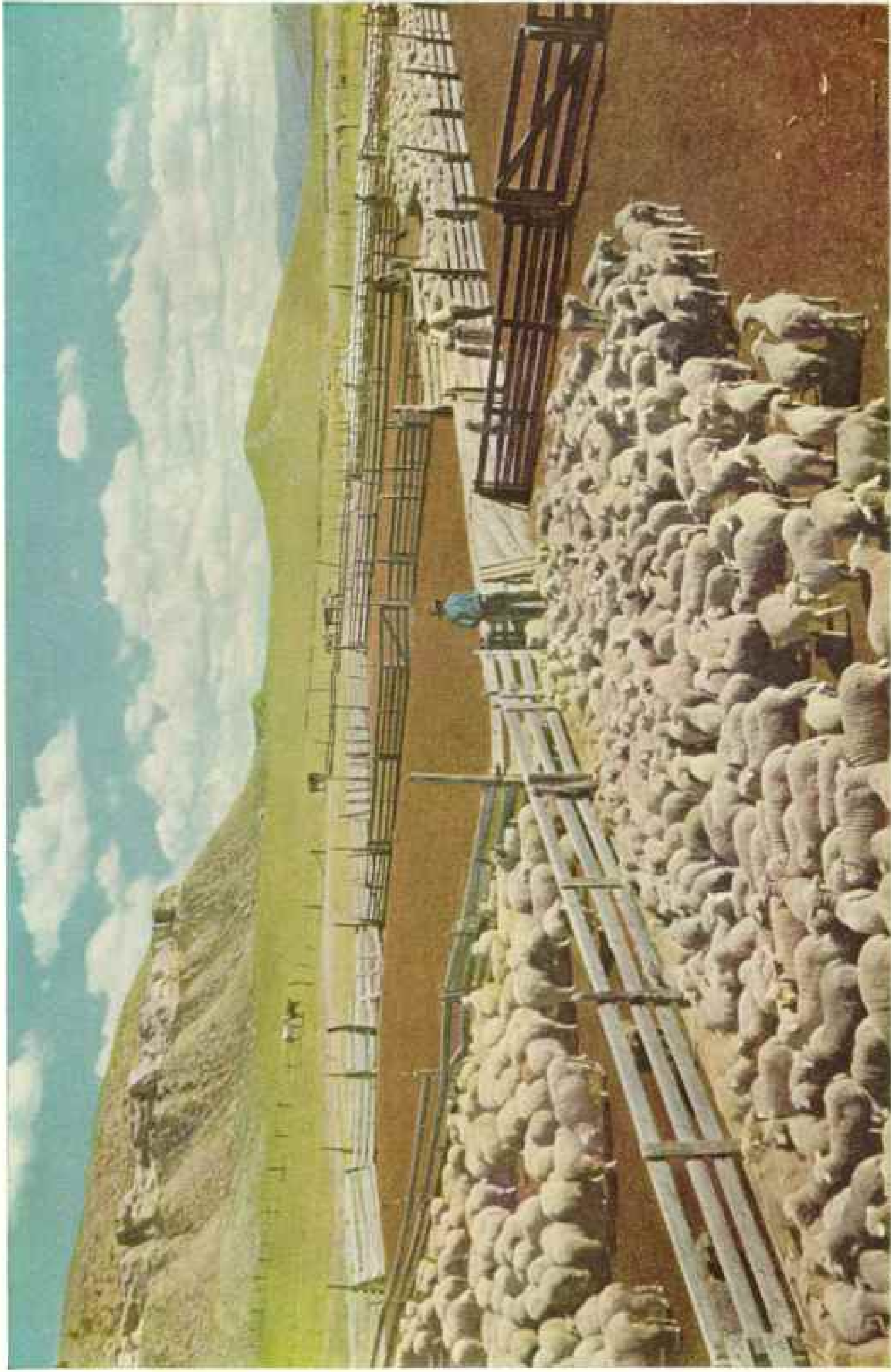


© National Geographic Society

Kodachrome O. W. Lee, Jr. Lee

By Pooling Their Talents, Herder, Horse, and Dog Form the Perfect Sheep Team

At lambing time a skilled herder is indispensable; he can diagnose a sheep's health at a glance. In almost any other profession this weather-beaten Montanan would have retired. Now it is wartime, and he works harder than ever. His intelligent dog is the picture of devotion.

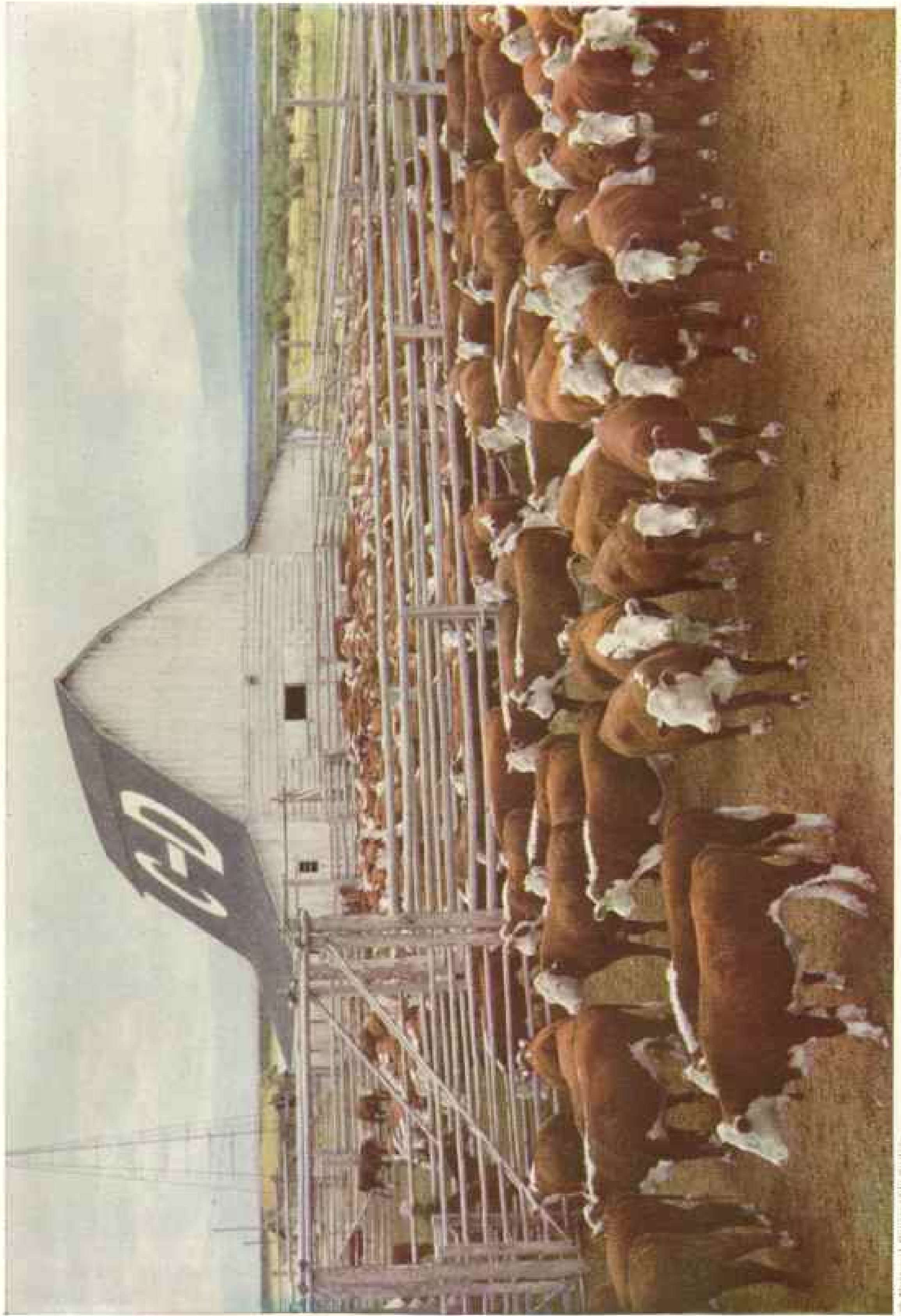


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Illustration by Charles J. Beaton

Wyoming Sheep, Penned for Spring Shearing, Contribute Their Old Clothes to the Nation's Growing Stock Pile of Wool

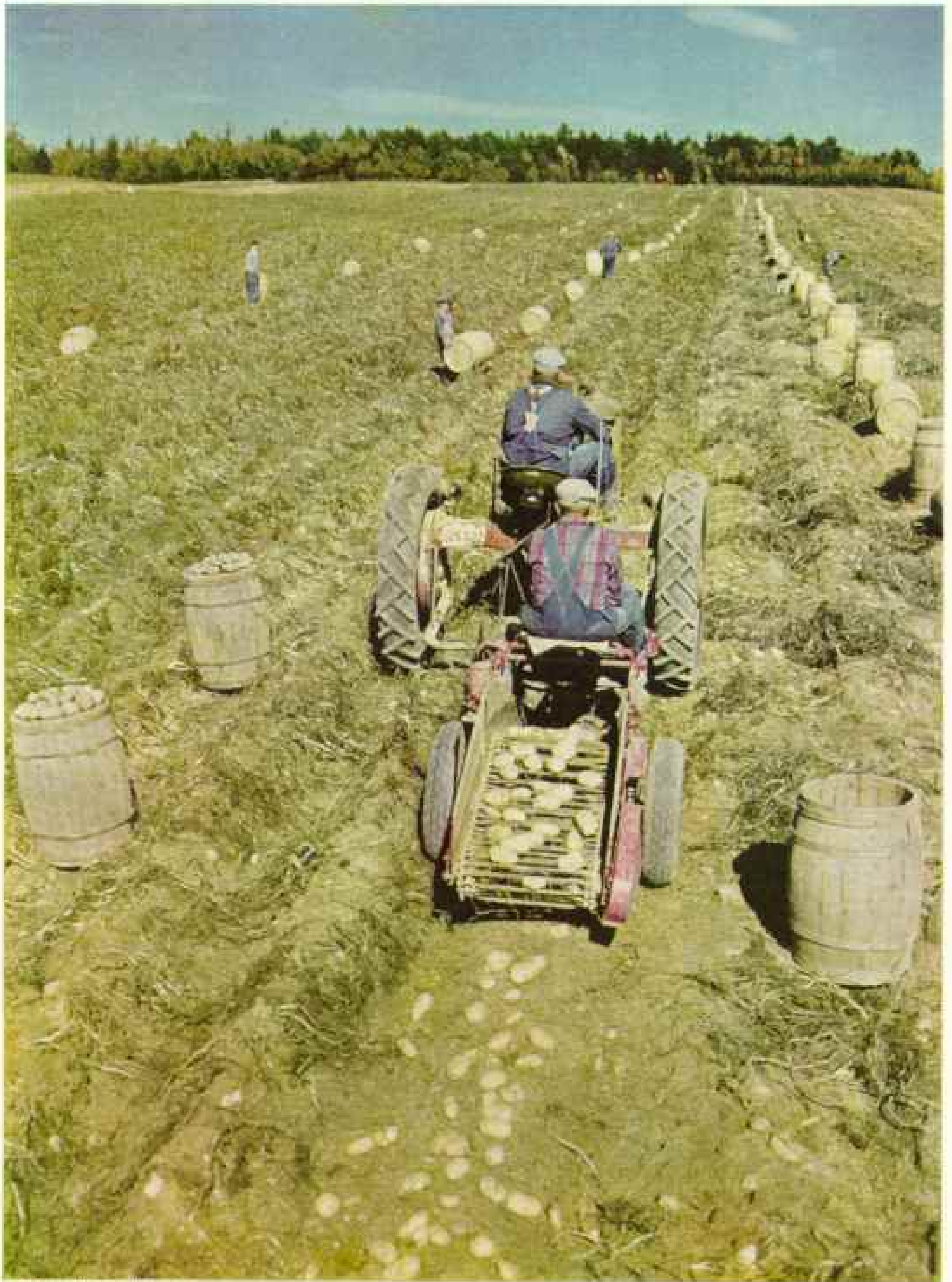
Texas and Wyoming are the leading wool States. Their herds, providing fleece to line airmen's jackets, play a part in bombing the Axis. At the cutting gate a ranch hand separates hardy Rambouillet-Merino ewes from their lambs. Each ewe will yield about nine pounds of wool.



© National Geographic Society

Counting These Montana Hereford Steers, Wartime American Has a Record-breaking 80 Million Head of Cattle

Production G. W. L. Jr. Ltd



© National Geographic Society

Endashume by George H. Hill

To Fill the Nation's Potato Bin, Maine Men and Machines Dug a Record Crop in 1943

To gather its 355 bushels to the acre, the State enlisted the help of soldiers, Boy Scouts, city women, Canadians, and Jamaicans. A war-burdened railroad carried its largest harvest-time load. Notwithstanding, potatoes were still left over. These the farmers warehoused, saving the crop with smaller losses than normal.

America Fights on the Farms



Largest Hog Population in Our History Includes These Hungry Arizona Hampshires

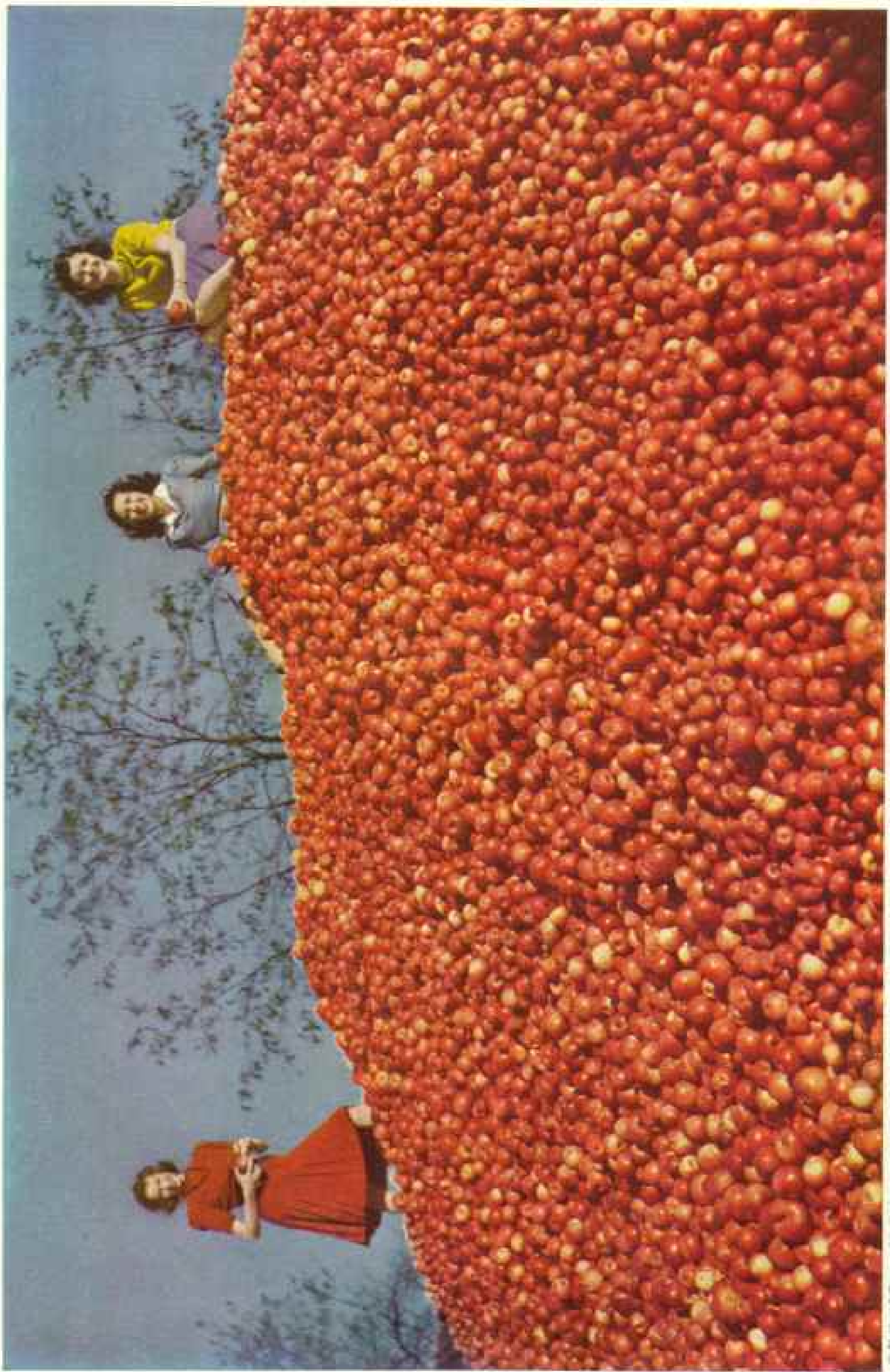
As compared with the ten-year average, 52 million head, the Nation in January, 1944, counted 84 million. Mass marketing presented tremendous problems; packing houses overflowed. Hogs are not food alone; glycerine from their fat makes explosives. Dobbin has no fear of pigs; his face is twisted by the bit's command, "Whoa!" His master, using a feeder, does not waste grain (below).



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Kodachrome U. S. D. A.

A Farmer Shows the Wasteful Way to Feed Hogs: Corn Trampled into the Ground Is Lost



© National Geographic Society

Reproduction by A. D. Hall for Roberts

Autumn's Mountain of York Imperials Is the Sequel to Spring's Apple Blossom Festival at Winchester, Virginia

In peacetime thousands of visitors see Frederick County's 700,000 trees in bloom. That part of the crop not eaten fresh is processed into vinegar, jelly, apple butter, and dried fruit. In 1943 the United States' commercial apple crop, normally 1.73 million bushels, fell to 88 million.



© National Geographic Society

Photographs by J. Ingher Hillbert

Without Tears a Farmerette Trims New York Onions

She works near Florida, capital of one of the Empire State's rich onion-producing sections. Here deep muck of a drained swamp stretches for miles like a soft rug. See "Black Acres," November, 1941, NATIONAL GEOGRAPHIC MAGAZINE.



Photographs by H. Anthony Stewart

Wartime's Patriotic Chickens Are Superproducers

In 1918 the average American hen laid 86 eggs. In 1943 she laid 111, thanks to better breeding, care, and feeding. These incubator chicks are representatives of Arkansas' large broiler industry.



Kodachrome by Alfred T. Palmer

A Michigan Youth Hefts the Corn That Turns the Wheels of World War II

In 1943 American farmers produced three billion bushels of corn. They turned it into lard, bacon, and ham; poultry and eggs; beef, shoe leather, milk, and cheese; nitrostarch for explosives, and a hundred other things. One acre in every four cultivated in the United States is corn. Its value last year exceeded that of wheat, cotton and cottonseed, sorghum, barley, and rye combined.



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Kodachrome U. S. D. A.

Junior and Old Prince Cultivate Grandpa's Bean Patch in Maryland

America Fights on the Farms



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Reproduction by Alfred T. Palmer

Miss Manpower of 1944 Wears the Vanished Farm Hand's Pants

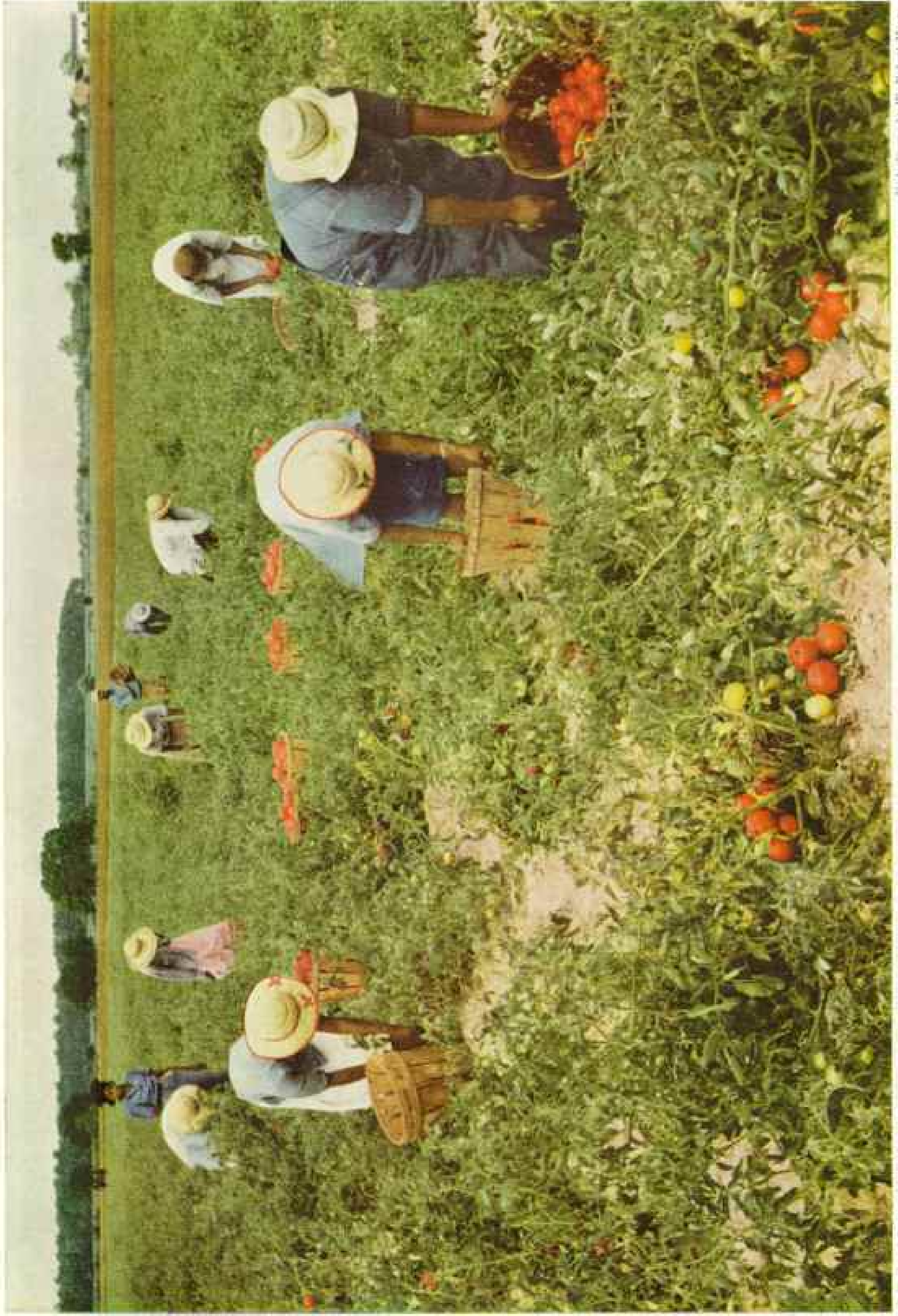
At harvest-time crisis she and millions of sisters pick berries, fruits, and vegetables. She irrigates, milks, works in canneries, does everything but pull the plow. If she is a city girl, she devotes her vacation to the soil. If she is a farm woman, she toils longer than ever. She feeds America.



© National Geographic Society

Illustration by J. W. McMurry

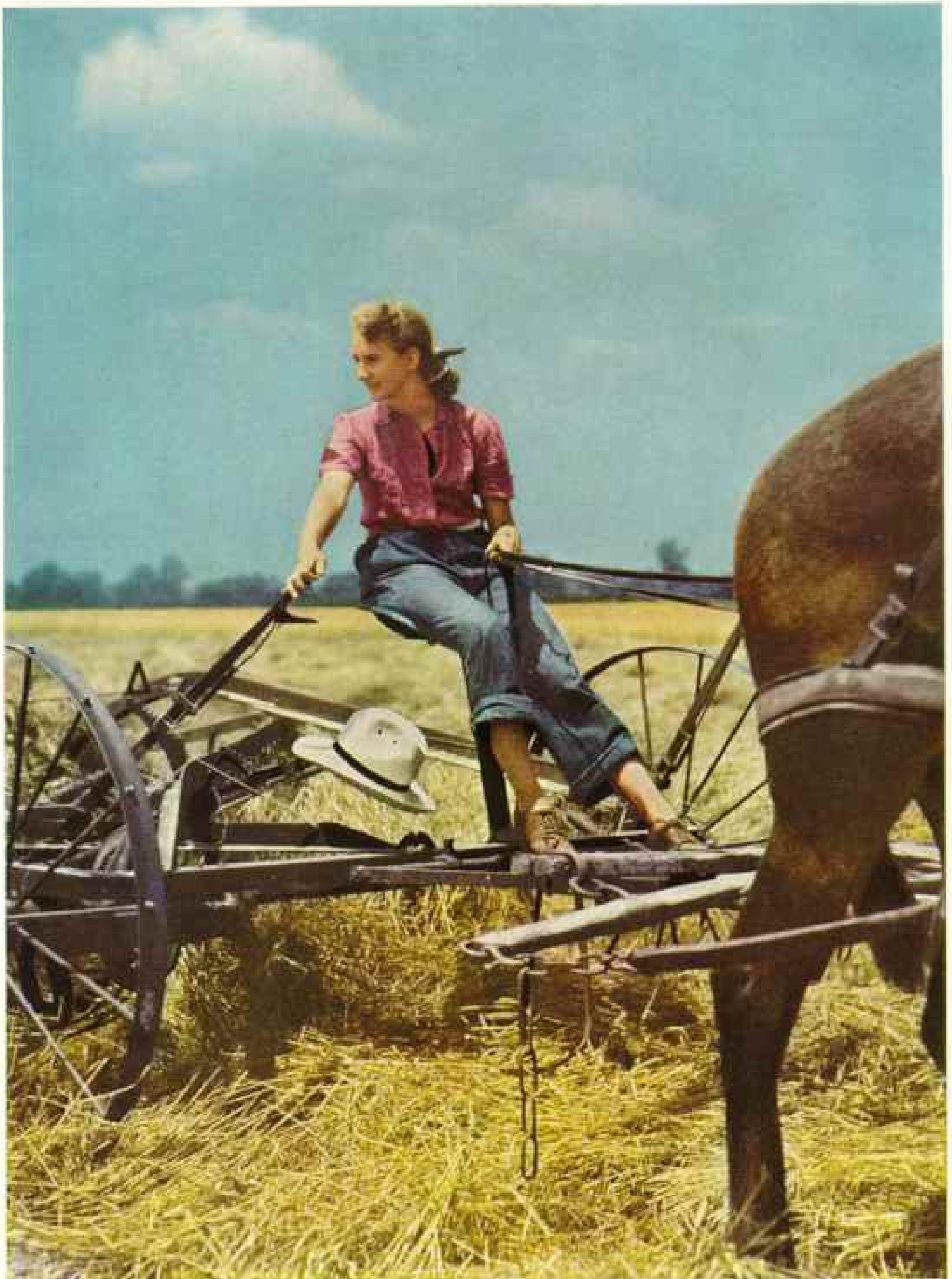
This Is the Missouri Home of a Soldier of the Soil, One of America's Six Million Farms Doing History's Biggest Food-producing Job



© National Geographic Society

Photographed by W. Robert Moore

For War Needs, the Tomato Has Yielded a Record Two-year Pack. Women Harvest the Crop on Maryland's Eastern Shore



© National Geographic Society

Wichita, Kan., U. S. D. A.

Beauty and the Mule Rake Hay Dried by an Ohio Sun

Typical of thousands, she is a college girl home on vacation leave to do the chores left by the farm hand gone to factory or war. She understands tractors and other farm machinery fully as well as she does draft animals, cows, hogs, and chickens.



Illustration by Walter J. Dill

A Barnyard Foraging Party Finds a Sorghum Windfall at the Silo

Into the cutter go stalk and grain. Chopped up, they are blown to the top of the silo. Tamped down, they ferment, or "cook." As a winter feed, silage retains most of the green crop's values.

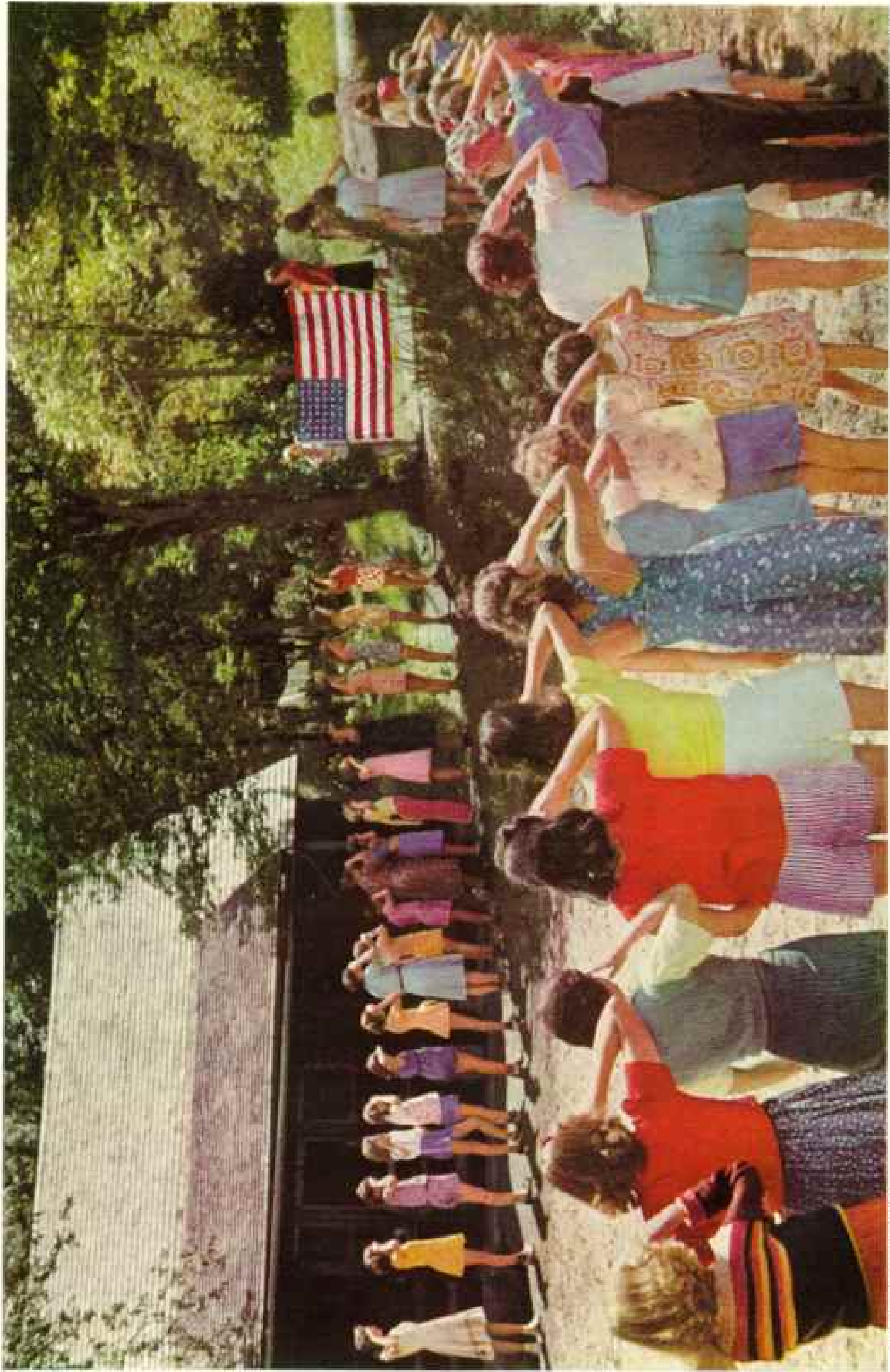


© National Geographic Society

Illustration U. S. D. A.

Father of a Two Billion-dollar Wartime Enterprise Is the American Rooster

So efficient a producer is his family that their product is not rationed. With dehydrated eggs, his womenfolk help to sustain our Allies and our troops abroad. These Marylanders examine the points of a White Leghorn.



© National Geographic Society

Washington D. C. U. S. A.

Girls of a Maryland 4-H Club Pledge "Head, Heart, Hands, and Health" to "Feed a Fighter or More in 1944"

In their Victory plots last year, America's 1,700,000 organized junior farmers produced enough food to supply a million fighting men. In addition, they gathered scrap and sold war bonds. Said President Roosevelt: "They have set a pattern for good citizen action."



© National Geographic Society

Kochmann U. B. D. A.

New York's Black Earth Yields Palest Celery to Match the Table Linen's Ivory and Enhance the Radish's Scarlet

These workers sort and box the celery as they cut it. The crop will be washed at the shipping point. Green celery, containing more vitamins than the bleached variety, has been classified by the Government as a wartime semi-essential.



Kodachrome U. S. D. A.

Washington Harvests Synthetic Rubber, Smokeless Powder, and Bread

Converted to industrial alcohol, wheat is a war weapon of a hundred shapes. Less bulky foods have largely displaced the grain which America shipped to Europe in 1914-18 by the millions of bushels. Today's annual domestic requirements for alcohol and feed alone are as large as our wheat exports during any two years in the last conflict. In this war the staff of life is vitamin-enriched.



© National Geographic Society

Kodachrome by Maxwell Owen Williams

Besides Potatoes, Idaho Grows Golden Oats and Merry Playmates



School Lets out When a Record Potato Crop Calls for Young Hands

Almost doubling normal production, equal to twice that of Maine and Idaho combined, wartime Britain grows as many potatoes as all the United States in the average peacetime year. Under reverse Lend-Lease, fresh homegrown vegetables are shared with American Army messes.

of output, and in some rare years it even exceeded that of Canada. The value of its output per man was above that of Denmark or the Netherlands.

Compare it with an area of the same size in the United States, Iowa and Indiana, two of our champion farm States. Combined, these two States are slightly larger in area than Britain. The value of the total farm production of prewar Britain's 400,000 farms slightly exceeded that of the 400,000 farms in Iowa and Indiana.

Britain's farmers produced more total beef than those two great livestock States combined, and 60 percent as much meat, even including pork. They milked more cows, produced more eggs, more sheep and wool, twice as much hay, more wheat, two-thirds as much oats and barley, and substantially more fruit and vegetables and potatoes.

No, Britain did not produce more corn than Iowa; it couldn't do that! But the last year before the war, Britain produced 14 million tons of root crops for livestock feed, compared with Iowa's 13 million tons of corn.

Prewar Britain had more cattle than Iowa and Indiana combined; more than Texas, a cattle country three times its size.

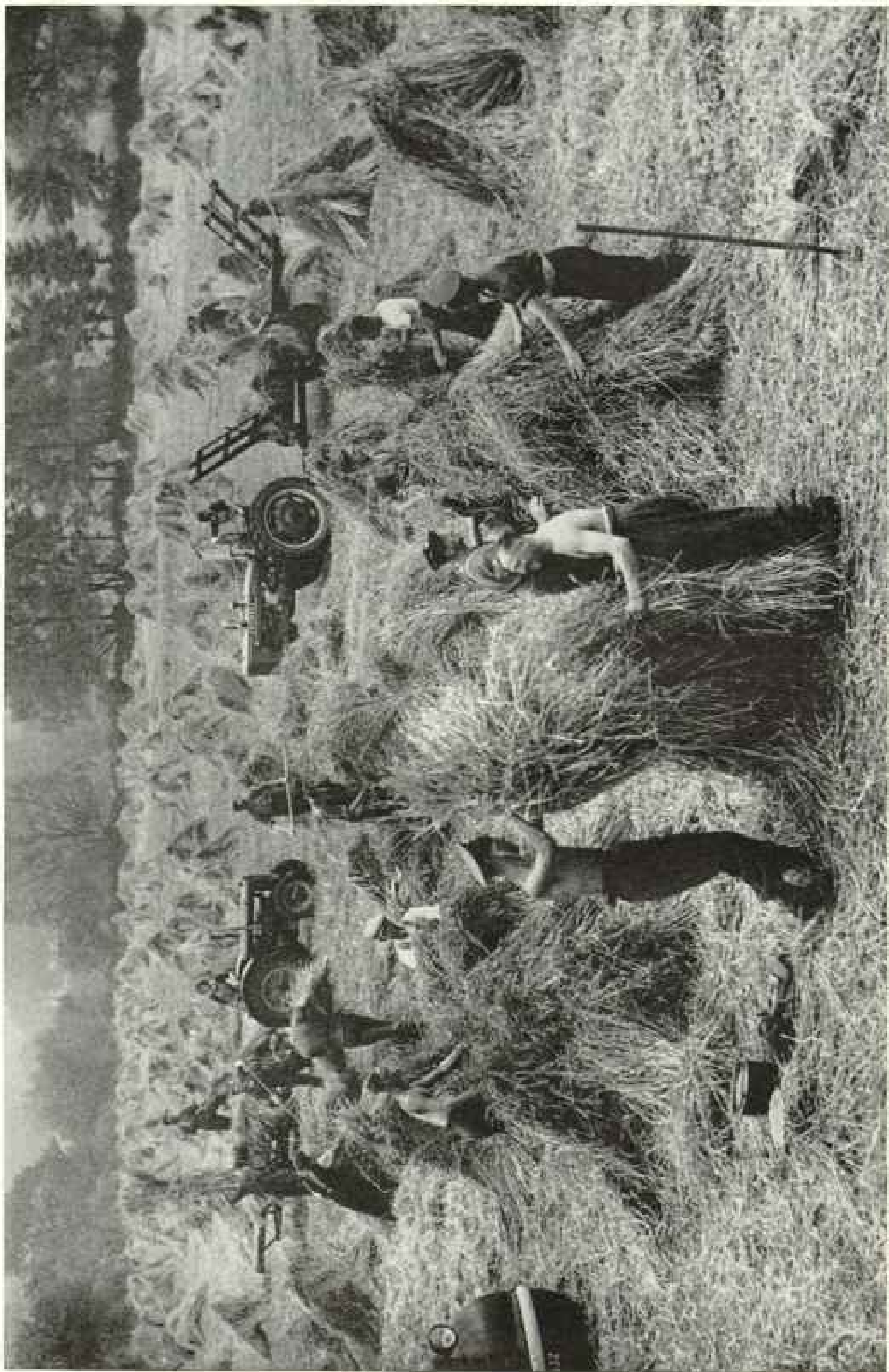
Britain had half as many sheep as the whole United States, and produced more wool than both our first and second wool States, Texas and Wyoming, combined (page 55).

This versatile nation produced more milk than Wisconsin, our No. 1 dairy State; more vegetables than California, our first vegetable State; and more sugar beets than either California or Colorado, our two leading sugar beet States.

Then Britain topped it off by producing twice as many potatoes as Maine and Idaho combined, our first two potato States. She has nearly doubled that production since the war began, to equal the normal potato production of the whole United States.

High Yields per Acre

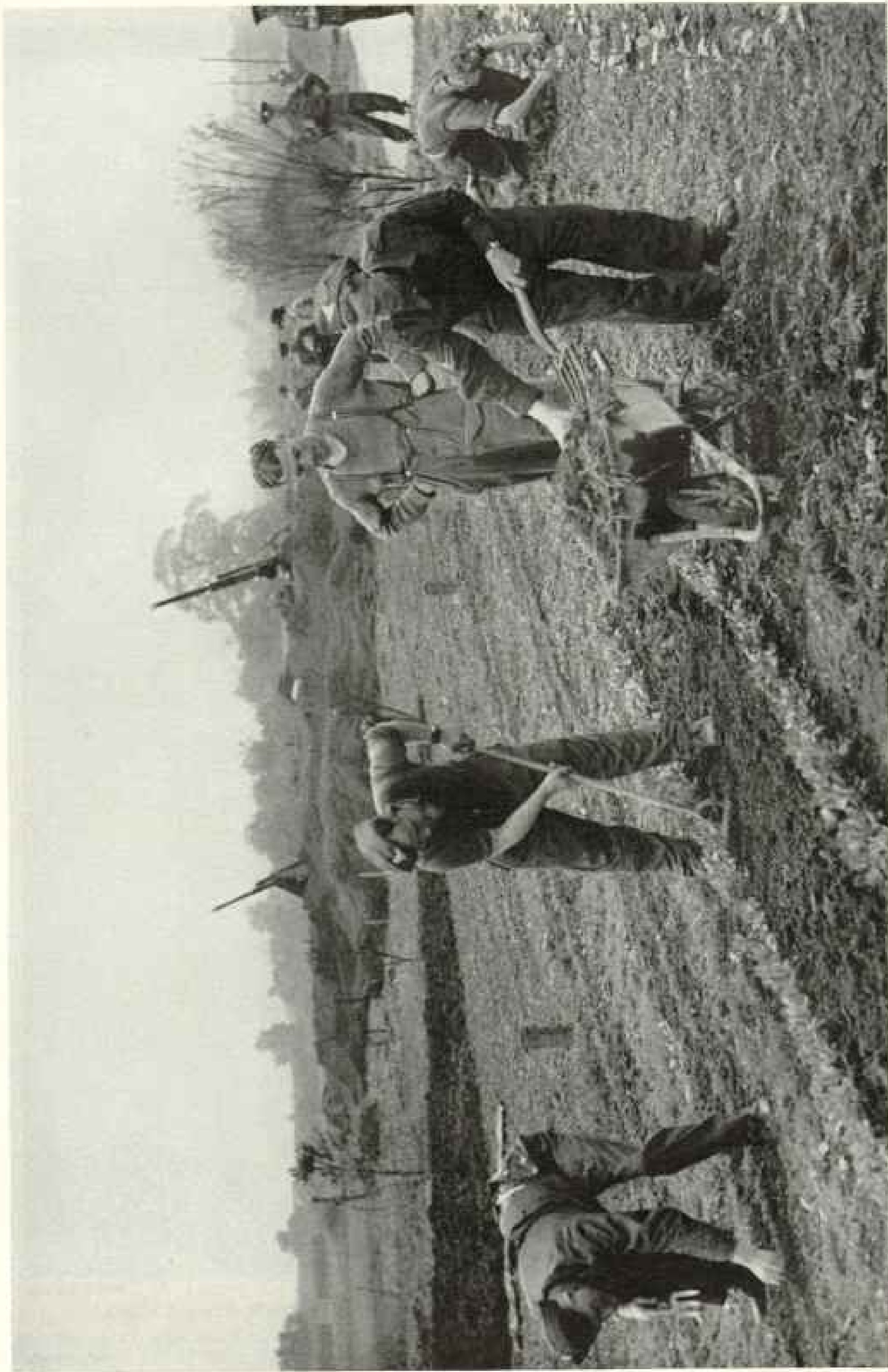
Greater average yields per acre are a part of the answer. For instance, the average wheat yield for the United States in 1942 was at our all-time peak of almost 20 bushels per acre. Our best-yielding wheat State was Washington, with a State-average yield of 30 bushels per acre, followed by Oregon with 27.5. Britain's was 37. There were some higher-yielding local areas both in the United States and in Britain.



Reid/Corbis

Grenadier Guards, Whose Predecessors Whipped Napoleon's Best at Waterloo, Help Win the Battle of the Soil

On special duty at an east Surrey farm, they receive only army pay; the farmer provides liquid refreshment and makes a payment to the regiment. American and Canadian troops and even Italian prisoners have given similar help. Invasion year brought warning that army assignments to the fields must cease.



British Doublet

Men Who Harvest Raiders from the Sky Cultivate Crops Right up to Their Guns' Camouflage Nets

Antiaircraft men are serious gardeners, acting on expert advice, but shifting of batteries handicaps production. By day they perform as farmers; by night they rattle the countryside's nerves with their firing (page 61). Lately, flak barrages fired by rocket guns have proved even more disturbing than shells.



British Conditions

Imagine the Squeal as Porky Gets a Dose of Medicine at Land Army College!

More than 100,000 amateur pig raisers enthusiastically try to fill the gap caused by farmers' 59-percent cut in hog production. Banded in 4,000 clubs, they include policemen, actresses, retired generals, M.P.'s, clergymen, and publicans. Tending sties on blitzed sites, they convert scraps into 150 million breakfasts a year (page 63).

But that production wasn't enough for their 47 million people. Even Iowa and Indiana can't feed nearly a third of the people of the United States. Britain had to import about half its meat, nearly three-fourths of its cheese and sugar, and an even larger share of its fruits and cereals and fats. Roughly two-thirds of all the food eaten in Britain was imported.

But imported food depends on two things: a source of supply and shipping. With the war England lost much of both. Continental Europe had been a major source of supply of England's bacon, eggs, evaporated milk, butter, fruit, and fish. Almost overnight, with the occupation of Europe by the Axis, most of that supply was shut off.

At the same time, shipping disappeared; it was sunk, blockaded, or converted to naval purposes. The ships that remained were busy bringing in more munitions and less food, carrying troops and supplies to the Middle East. All were slowed down by convoy movements, damaged docks, longer routes.

England was up against it. David Lloyd George had said, "The other war was decided by shortages of food." The people remembered how near they had come to the bottom of the barrel in the other war. Two things were necessary. One was to eat less, and England has been on rigid food rationing for four years. The other was to produce more, whether they thought they could or not.

From Deer and Rabbits to Potatoes

They drove me past the estate of the Earl of S——, in Scotland. The old Earl had had some bad advice and had refused to plow up a deer park on his castle grounds. The land had last been plowed 61 years before. The Earl had said, "It wasn't needed in the last war, and I won't plow it now."

The county farm committee moved in. They killed 15 tons of rabbits. They concentrated the Earl's Japanese deer and his purely ornamental Highland cattle into one forested corner. They plowed 327 acres of his park and put it in oats and potatoes. They paid the Earl an appraised rental.

"This knoll is where the Earl used to sit to shoot partridges as they were driven past him," they told me. "Now this knoll you're standing on is a full mile of potato trench, 4½ feet wide. There is a ton of potatoes for each eight feet, and they were all grown on this park land."

At a near-by castle one of the most beautifully landscaped approaches that I have ever seen, mellowed by generations of beautifying, was plowed and farmed right up to

the knob on the castle door. When they plow the golf courses in Scotland, they have gone all out for war.

I visited a farm in Somerset. It had not been properly fertilized. Its pastures were weedy, its drains were out of repair, and more of it could have been plowed.

The farmer was beset with the wartime difficulties of getting labor and machinery. But the philosophy of England at war is that a farmer's land has no more right to be idle than has his son or daughter of military age. It is not a private matter.

So the county committee took over. They hired two Land Army girls and one man and were finishing sowing the last of 374 acres of wheat the day I was there. The farmer will get his rent, and England will get more food.

In Kent County six members of the county committee had made over a thousand personal visits to farms that were not producing to the maximum, and 50,000 acres have been shifted from the control of those who did not farm those acres efficiently.

Domesday Book Still a Farming Guide

Official surveyors, assisted by 6,000 volunteer farmers, covered every field on 300,000 farms of over five acres, and recorded in detail the condition of every farm, its equipment, its crops, its livestock, its possibilities.

This survey brought up to date the farm study made nearly 900 years ago by William the Conqueror, when the Anglo-Saxon Chronicle of that time reported: "The King had a very large meeting and a very deep consultation with his council about this land and how it could be farmed out. The investigations were recorded in a book called the *Domesday Book*."

Incidentally, so well did the Conqueror's surveyors do their job that in some cases facsimile pages of the original *Domesday Book* were used as a guide. This detailed report of 300,000 farms is a blueprint to make sure that each farm does its part in the war effort.

From that study a farm plan was made for each farmer. In most cases he followed instructions. If he refused, the county committee had the authority to operate the land itself or turn it over to a tenant who would conform.

In practice, according to the chairman of the West Sussex Committee, drastic action is not taken except as a last resort, which is not often. Where advice is not accepted readily, detailed orders are given as to cultivation by certain dates, and the orders are policed by the district officers.



British Empire Council

Five of the 80,000 Land Army Girls Eat a Picnic Lunch in a Bombed Farmhouse

Two saleswomen, two domestics, and a waitress typify the city women saving the day on undermanned farms. Known as the "Cinderella Service," the Land Army includes rat catchers and forestry's "lumberjills." Their Government trains and uniforms the girls; farmers pay and board them. It takes patriotism to endure the shortage of hot baths and peacetime beauty aids (pages 32, 52, 56, 60, 64).

"Sure, the committee sometimes makes mistakes. They made one here with me," one farmer confided. "They made me put that hillside in turnips, when it was all wrong. But I went along with them because they made my neighbor down there plant a 15-acre pasture in oats, as he jolly well should have done a year ago."

Hopefully I called on the neighbor. "Yes, as a rule the committee is all right," he said. "They see their duty and do it. It's hard for them sometimes. They made a neighbor of mine up there put a hillside in turnips when he wouldn't have done it on his own, and it was a plain case."

"So, even though they made me put in 15 acres of oats over there—and you can see for yourself it was a mistake—I cooperated, anyway, because on the whole they do the best thing for the country. The total production shows that, you see."

Spend a few days visiting English farms with a county committeeman. It is hard to get around the country any other way, because there is no gasoline except for strictly essential driving. You learn what the farmers are up against as you hear the county committeemen giving them advice and directions.

Sandbags and Stirrup Pumps for Grain Stacks

When you notice the poles stuck in the ground every few rods in every level field, to keep enemy planes from landing, you wonder how much in damages a farmer would claim from a power company in peacetime for that many poles across his field to farm around. Add these obstacles to the bomb craters, tank traps, and Home-Guard trenches that cut up the fields.

Even the grain stacks are scattered over



© "Illustrated" from Black Star

Hand-dipped, British Sheep Send a Few Fine Woolens to America Even in War

The American drives his flock into a vat and lets it swim out. Normally, Britain raises half as many sheep as the United States. War has cut production one-fifth. Sheep pay little attention to bombings.

the fields, for better protection against incendiaries, but requiring more work. Sandbags and stirrup pumps at each grain stack are required by the county committee, which also requires that the stacks be correctly topped.

"Seems as if the county committee not only tells you what to do but how to do it," I suggested to a farmer whose regulation-topped stacks were scattered according to pattern, just as his cows were scattered in different pens at night.

"Why not?" he bristled. "They tell my son in the Army what to do and how to do it, too, and neither of us wants to let the other down."

Practical Farmers Supervise Crops

These committeemen are appointed by the Minister of Agriculture. They are established farmers in their communities, respected by their neighbors on the basis of their record as farmers. They serve without pay.

"Might as well serve without pay," one of

them told me, "because we are paying such a high income tax on what little we make as farmers that we would have to give back most of our pay, anyway."

To be appointed a county committeeman, a farmer is probably successful enough as a farmer to be in the EPT group, which pays 100 percent excess-profits tax, and pay would do him no good.

The committeemen direct their neighbor farmers to increase production of specified crops and cut down on other crops, to plow certain fields of grass, to clear out ditches, to apply fertilizers, to plant this field in one crop and that one in another, to reduce the numbers of beef cattle, hogs, sheep, and poultry, and to increase the number of dairy cows. Cattle breeders and feeders are ordered to become dairymen, whether they want to change or not, and stockmen are ordered to become farmers.

At the May farm in Kent County Mr. May apologized for his grade dairy herd. "Had



© The Times

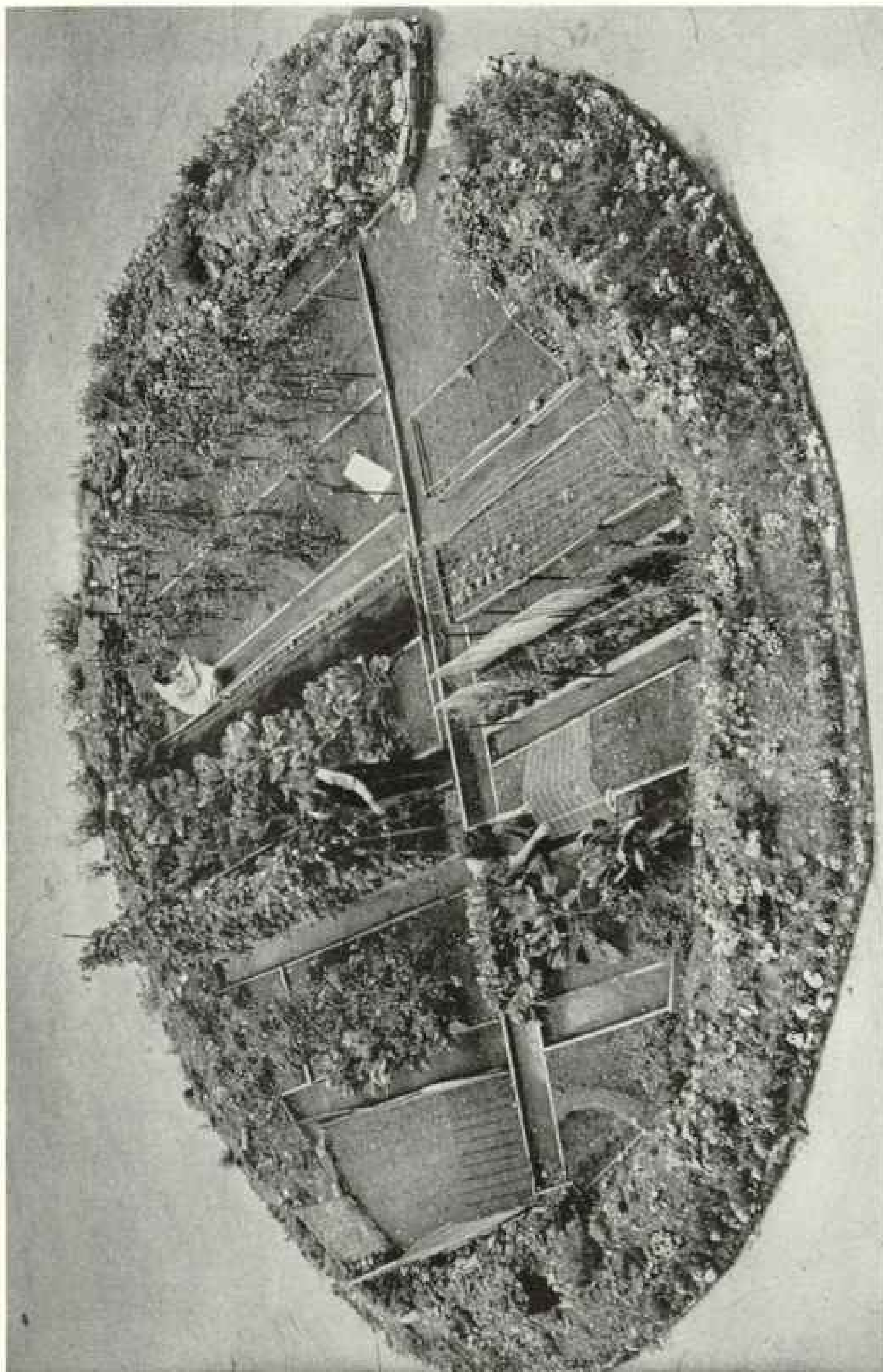
Isle of Wight Farmers Do Their Winter Plowing during a Rare Spell of English Channel Sunshine

Peacetime's vacationists loved to hike along the chalk cliffs. Today Freshwater Bay is a prohibited area, closed to all but military visitors.



British Information Service

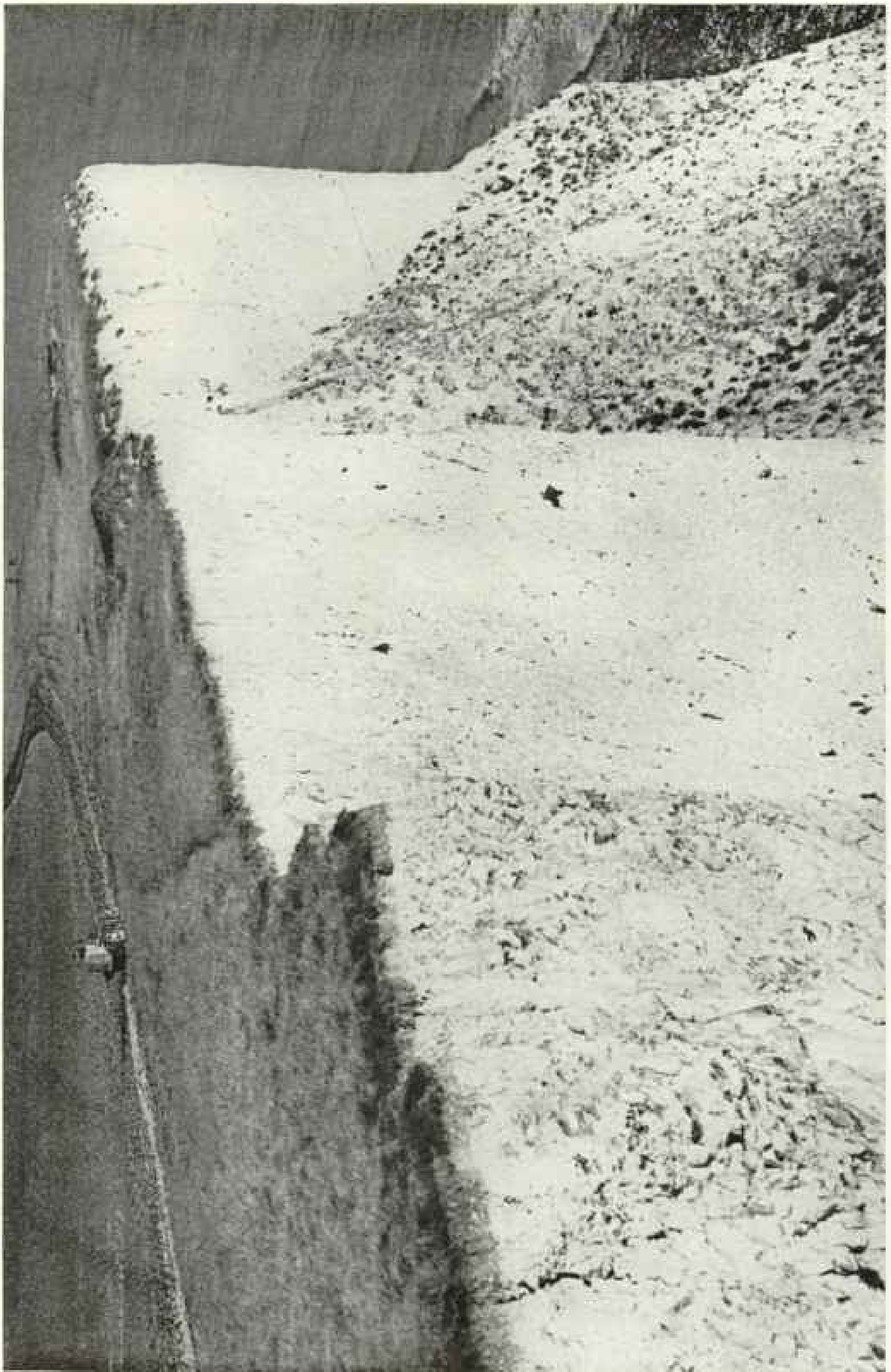
Women Working This Sussex Tract, Unplowed for 20 Years, Helped Produce Some 30 Bushels of Wheat to the Acre



British Information Bureau

By Blasting Garden Space in Westminster Cathedral's Court, a German Bomb Increased London's Food Supply

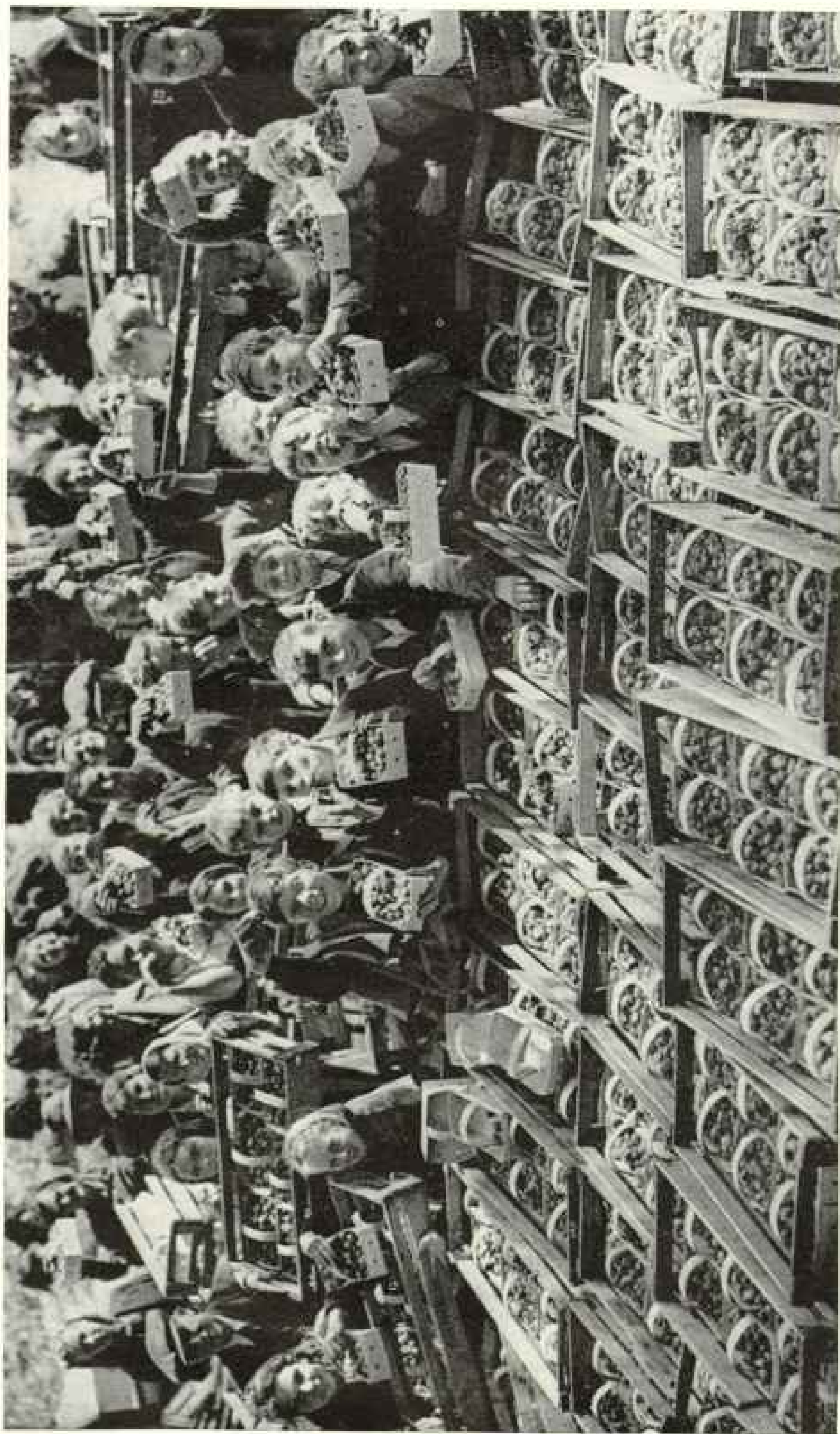
Six million families, representing about three of every five Britons, are "victory diggers." Their crops take the strain off ships and railroads. Croydon, a London suburb of 233,000 population, produces enough food to provide 20,000 meals a day in canteen restaurants.



(British Museum Collection)

Indifferent to German Cross-channel Guns 70 Seconds Away, a Kent County Man Plows to the Rim of the White Cliffs

Neither bomb nor shell nor threat of rocket can stop the Kent farmers. Despite land gifts to the armed forces, they have increased plowed acreage one-quarter (page 33). So beloved by poets, the cave-pitted cliffs provide bomb shelters; their limestone forms calcium-rich soil.



British Fruitline

Holiday's Youthful Harvesters Display the Strawberries They Didn't Eat

Daily during planting and harvest seasons there is a children's crusade from city to farm. Schools may release pupils over 12 for 20 half-days yearly to help in the country. In 1943, some 68,000 city boys and girls attended a thousand summer harvest camps. The Ministry of Agriculture met part of their expenses.

a purebred herd before the war. But I scattered them on different farms over the country, so that one hit wouldn't wipe out the herd."

"But you're still farming here?"

"Sure, I'll stay and farm with my family, but I wouldn't risk my purebred herd here. Too many years of breeding back of them. We'll need that foundation stock after the war." But May was still milking cows, a good herd of grades.

Town Girls Learn Farming

May admitted that at first he and his neighbors had insisted that only skilled labor would do on a good dairy farm.

"I suppose your United States dairy farmers agree that you can't use green help in a dairy. Well, we have learned to use any help we can get. I have had mostly girls, Women's Land Army. They are recruited only from the city, because farm girls are frozen on the farm, anyway. You'd be surprised. They do all right. You couldn't have made me believe it before, but we learned."

Careful, skilled dairying is important in England where feed for cows is so scarce that it is rationed—sold only against coupons, just as food and gasoline and clothing are rationed—and where both cows and milk are as valuable as they are in England.

May was milking a big herd, 35 high-producing cows, but all the work connected with the herd and with the barns, all the feeding and the care of the cows and the milk and the equipment, was done by Land Army girls—town girls only a few months before.

"Dairying is especially complicated now," May said, "what with feed rationing at one end of the game and strict controls on selling the milk at the other end. If we thought dairying was skilled in peacetime, it's a lot more so now. And there are so many other complications. Every night, after milking, the girls have to put a few cows in this pen, a few in that paddock over there, a few in that pen, and a few in yonder shed, so that we don't lose the herd with one hit.

"And all that in the blackout, without even carrying a lantern. But these city girls do the job all right. Sure, I was surprised, but they do."

Since England is farther north than Maine, the winter nights are long, and most of the morning and evening milking and the chores are done in darkness.

But May is milking a few more cows than he did before the war, in spite of it all. "You see," he explained, "a cow doesn't always give quite so much milk after a bad night of bomb-

ing or after some air battles at low level over their heads by day. So we make that up by milking more cows.

Hardships of "Coupon Farming"

"But this 'coupon farming' is about the worst of all the nuisances, unless it's the blackout. You see, you get so many coupons for proteins and so many for concentrates, according to the number of cows you've got and the amount of milk you sell. Well, I don't mind when they ration me and the kids for what we eat, but I sure hate to feed my cows that way.

"I go to the committee and say, 'Look here, my cows can't keep up their production on these coupons.' The committeemen know it, of course. But they remind me there is only so much feed in the country, and that is my share, and they're sorry, and I'll have to get along. And since it is my share, I guess we get along somehow. Anyway, dairy production is keeping up."

Coupon farming is especially difficult for beef cattle and hog feeders. A farmer is issued feed coupons according to his prewar production. He is allowed to feed to his own stock only a certain proportion of the grain raised on his farm, and must sell the rest at a fixed price.

The RAF had taken over a part of the next farm we visited, and the committeeman and the farmer and I were challenged by an armed sentry as we entered his own lane. An AA battery was camouflaged beside the dairy barn only a few hundred feet from the house, with 11 men on duty day and night.

"And when they go into action, as they have so many nights, there is no sleep for any of us. Makes it hard to keep help."

Ways Animals React to Bombings

He showed me the remains of two German planes shot down near his house. He had to travel two miles to reach a 13-acre turnip field on his farm which the airfield had isolated, and he admitted that "this war is something of a nuisance."

"I had to give up horses entirely, for tractors. You see, you're out in the field with a team, and there's an air battle over your head. You jump off to crawl under the wagon, and the horses get scared and run away, and there you are. I haven't got a horse on the place now, except one that broke his leg when he ran into a tank trap.

"Funny thing about the different animals. Hogs don't mind the bombings much. Horses get scared. Dogs, of course, react the same as you do; if you're scared, they know it and



British Combine

From 5,000-Horsepower Bomber to One-horse Cultivator Is but a Step for the RAF

Britain's air force, which has withdrawn so much cultivated land for runways, makes a repayment to the nation's food bank. In nine months, crews at this station grew 160 tons of food on 25 acres of odd corners.

crawl under the table with you. My cats have had miscarriages after a bad raid. Cows sometimes give less milk after a bad night of bombing, but otherwise are surprisingly indifferent.

"I was in a pasture 12 minutes after a bombing had killed some cows and injured others, but right there in the same pasture the rest of the cows were lying about, contentedly chewing their cuds. Sheep are similarly indifferent to bombing (page 55).

"People are different. You can't tell about them. My son in the RAF was home on leave last week and was in the kitchen with his sister when a raid came over. Jerry drops his bombs in sticks of six, and you can tell when they have all exploded.

"Well, the boy dived under the table on the first one and kept kicking around, but his sister just counted them off, '—4—5—6. There, now, that will be the lot. Come on out now, Eddy.'"

The Mayor of Coventry told me of the re-

action of an old woman who had been bombed out twice during the succession of raids on that city.

The raids were still going on, and he had asked her if the shock and the terror and the noise kept her from getting a little sleep. When she told him she always slept soundly enough, he asked her how she managed.

"Oh, at night when I get ready for bed I put on my nightgown and turn down my bed and then I kneel down and say my prayers, and then I take a wee sip of whiskey. Then I get into bed and pull up the covers and say 'To hell with Hitler' and sleep like a top!"

But British farmers have other difficulties that are less apparent but more real as problems to overcome. One is the shortage of farm labor. Another is the scarcity of farm machinery and equipment, and shortages of feed and fertilizer. Another is the problem of farm prices, which haunts the farm scene in Britain as it does everywhere.



H. H. G. G. G.

London Firemen, Heroes of the Blitz, Garden a Property They Could not Save

So far as it can, London grows its own. Parks and street margins, as well as bombed-out lots, are given to spade and rake. Big lawns are a rarity. Gardeners who grew peacetime's roses have turned to vegetables. Bombs left plenty of bricks for walling in the soil. St. Paul's looms in the distance.



New York Times

Blackout Light Beamed Down, an American Tractor Plows through the Long Hampshire Night

At spring-planting crisis, labor-saving tractors save even more important time. To keep machines running, schoolboys often relieve drivers at lunch hour. So essential to the plowing up of some six million acres of grasslands, Britain's main tractor factories did not convert to weapon-making.

The hog farmer is an example. First, after having raised hogs all his life perhaps, he is required to reduce his operations and cut down his herd. Total hog numbers have been reduced by 59 percent of prewar figures to save feed for more efficient direct human consumption (page 52).

He is required to raise feed according to the number of hogs he keeps. He must sell a certain percentage of the feed he raises on his own farm. He must buy his feed supplements against coupons issued by his county committee. He may butcher for his own use only according to the regulations.

Finally, when his hogs are ready for slaughter he must notify the county committee, which will specify the date when he must sell them and the market where he must deliver them, at a fixed price.

Then he pays an income tax which quickly reaches the 50-percent level.

More Acres; Less Machinery

The limited supply of farm machinery is in greater demand than usual because of the limited labor supply and the marked increase in acres now under cultivation. The prob-

lem is met by making every implement, every plow and tractor and drill, serve to its maximum efficiency. It is rationed by the county committee.

The farmer who can show that he needs it most, who can use it to better advantage than any of his neighbors, is allowed to buy an available tractor or other implement, and then is required to share it with his neighbors under the direction of the county committee (page 52).

For maximum efficiency many county committees own and operate tractors on a contract basis. The county committee of Northumberland County owns and operates 500 tractors. The farmers would prefer to own these tractors themselves, but the tractors are kept working more hours a year when shared under county-committee control.

For farm labor, the British farmer has fallen back on women, old men and children, war prisoners, and on long hours for himself and his family. I remember the old Scotsman who told me that his wife had followed him in the wheat field last fall and bound grain bundles by hand behind his scythe for the first time in 46 years.



British Canisters

Grandmothers Do Their Bit at Mobile Canning Units

Pressure-cooking trucks presented by the British War Relief Society of America go from town to town preserving perishables. Sold to retailers, the stocks form an important item in the nation's food reserve.

During the potato-harvest season in Scotland the Dundee schools closed and the city bus drivers donated their one day off each week to transport the children to and from the farms. And a Dundee citizen going to his barber for a shave found his face red under his whiskers when he saw this sign on the door of the shop: "Closed. Out picking up potatoes. Why aren't you?"

British farmers realize today that the Women's Land Army saved the day. Out from the cities came the stenographers, shop-girls, beauty-parlor operators, and college students, to join up for the duration, to become regular hired men. They were given a short training course, a work uniform, and a job (pages 52, 54).

Tests have shown that in many kinds of farm work these women are equal or superior to men and inferior in others, and, when possible, assignments are now made accordingly. Success required co-operation by the farmer as well as the girl, and since the demand was great enough in England the farmer did his part. There are upwards of 80,000 Land Army girls on Britain's 400,000 farms.

"Ask Me Another!"

The first WLA girl I visited made her attitude very plain. She was digging postholes in the rain. She was 21, the daughter of a banker in the next county. She had stepped out of college to enlist as a hired man on the farm for the duration.

"Why did you sign up for this kind of work?" I asked her. "I believe that is a reasonable question."

"Sure, that is a reasonable question," she answered. "So I'll ask you one. Why not?" And she kept on digging postholes in the rain.

Perhaps a simple light remark by Lady De La Warr illustrates the English farmer's instinctive attitude. We had spent Sunday tramping in an English rain over the Sussex farm of the son of the family after which our State of Delaware was named.

They showed me the crater left by a bomb that had landed just across the fence from where most of his dairy herd had been penned one night. The crater was too big to fill up and farm over, as so many on his farm had been, and was temporarily fenced off. A few weeds were growing on its sides.

Lady De La Warr immediately plodded off through the rain to bring her goat and tie it inside the fence. "My goat and I can make

a little cheese out of those weeds if each of us does her part," she said.

They wouldn't give the goat any of their rationed dairy-cow feed. Like most English farmers, Lady De La Warr would not serve on her own table any more than the regular rationed allowance of food, such as two eggs a month, or two ounces of butter a week; hence, whatever cheese the lady and the goat could make out of weeds in a bomb crater was welcome.

After getting off to school in the morning two small boys, evacuees from London she was caring for, Lady De La Warr was working 50 hours a week supervising Land Army girls in her county. She had worked as a dairy hand in the other war.

When I suggested to this farmer's wife that, along with her regular turn at fire watching on the roof at night, she was doing her part in the war, she reminded me that her 18-year-old son, then training in the RAF, was the one who was making the real contribution. This boy has since been missing in action.

That is the instinctive philosophy of the British farmer as he fights in the fields to increase food production, let the bombs fall where they may.*

* For additional articles on England in the NATIONAL GEOGRAPHIC MAGAZINE, see: "Everyday Life in War-time England," April, 1941, and "Rural Britain Carries On," October, 1941, both by Harvey Klemmer; "Lend-Lease Is a Two-way Benefit," by Francis Flood, June, 1943; "British Commonwealth of Nations," by Eric Underwood, April, 1943; "Winchester, England's Early Capital," by Frederick Simpich, January, 1941; "Britain Just Before the Storm," by Amos Burg, August, 1940; "Time and Tide on the Thames," by Frederick Simpich, February, 1939; "Cathedrals of England," by Norman Wilkinson, December, 1939;



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Under the Blitz, a Helmet Is for Eggs as Well as for Heads

That this Kentish housewife's home was bombed did not matter so much; her coops were spared! About a million British families convert their scraps to eggs. Neighbors raise hens cooperatively.

"Visits to the Old Inns of England," by Harold Donaldson Eberlein, March, 1931; "Down Devon Lanes," May, 1929, and "Char-a-Bancs in Cornwall," December, 1924, both by Herbert Corey; "Great Britain on Parade," August, 1935, "Pilgrims Still Stop at Plymouth," July, 1938, "How Warwick (Castle) Was Photographed in Color," July, 1936, and "Informal Salute to the English Lakes," April, 1936, all by Maynard Owen Williams; "England's Sun Trap Isle of Wight," by J. R. Hildebrand, January, 1935; "Within the Halls of Cambridge (University)," by Philip Broad, September, 1936; "Oxford (University), Mother of Anglo-Saxon Learning," by E. John Long, November, 1929; "Garden Isles of Scilly," by W. Robert Moore, December, 1935; "Southampton—Gateway to London," by Stanley Toogood, January, 1940. Many other richly illustrated articles on British Isles places where American forces now are quartered are listed in the Cumulative Index to the NATIONAL GEOGRAPHIC MAGAZINE.

THE GEOGRAPHIC'S New Map of Germany and Its Approaches

With a Review of The Society's Maps of Europe

BY GILBERT GROSVENOR

President, National Geographic Society

A NEW ten-color Map Supplement of "Germany and Its Approaches" distributed with this issue of the NATIONAL GEOGRAPHIC MAGAZINE adds a timely chapter to the National Geographic Society's series of maps showing the fateful history of Europe from the time of the peace conferences of 1919-1920 to the invasion of 1944.

Members who have retained their ten general maps of Europe, from that of August, 1914, and now receive this revealing chart of July, 1944, have a complete running account of the surging politics and racial rivalry from the beginning of World War I to the big drive of World War II (page 68).

A study of these ten large ten-color maps shows how fickle have been Europe's boundaries in the last three decades and how changeable the sovereignty over many areas.

The current map embraces Hitler's vaunted "Fortress Europe," comprising the Reich homeland and the fringe of conquered and enslaved peoples around prewar Germany.* It shows the approaches to Germany in detail, with numerous names that are springing to new prominence and deep meaning in the United Nations' assault.

More Names to the Square Inch

The chart is printed on a sheet 33½ by 26½ inches. It contains 8,286 place names, more names per square inch than ever before shown on any GEOGRAPHIC map. The scale of 31.57 miles to an inch is larger than any heretofore used on a GEOGRAPHIC map of continental Europe.

This map takes in Copenhagen on the north; the French coast as far as Le Havre and embarkation points in England on the west; industrial cities of northern Italy on the south; reaches out to East Prussia on the northeast; and on the southeast includes nearly all of Hungary and Yugoslavia south to Belgrade.†

A unique feature of our new map is the showing in detail of the elaborate network of military highways built since Hitler came into power.

Construction of this series of highways radiating from Berlin began in 1933 and speeded up during the war. The project called

for 8,500 miles of these remarkable roads, which resemble the Pennsylvania Turnpike between Pittsburgh and Harrisburg. Many of them have been completed.

Connecting links reach out from Berlin to Düsseldorf on the west, Munich on the south, Breslau on the east, and Stettin on the northeast. One 560-mile section cuts across the country from the Baltic Sea to the Alps—that is, from Stettin to Salzburg by way of Berlin.

Highways, Railroads, Canals Shown

These double-lane speedways, marked by double red lines, by-pass cities and towns. No grade crossings slow up traffic. There are hundreds of overpasses and underpasses. No traffic lights cut down speed. Streams of trucks move swiftly over the entire system.

A single heavy red line shows the new Alpine Highway, built ostensibly as a scenic route but now serving as a major military road stretching from Berchtesgaden, near Salzburg, to the Lake of Constance (Boden See).

The map also shows Germany's amazing network of canals. Most important is the Rhine River system, which before the war carried more than half of Germany's inland-borne water traffic.

The country's elaborate railroad system is depicted in detail.

Thus the map enables the 1,250,000 members of the National Geographic Society to follow all transportation systems—highway, canal, and rail—which feed supplies to the Nazi armies. Nearly every place on all three systems is a potential bombing target.

Already your Society has contributed much detailed information garnered through the years to the Army and Navy for bombing

*Members may obtain additional copies of the new "Map of Germany and Its Approaches" (and of all other maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in United States and Possessions, 50¢ each, on paper; \$1 on linen; Index, 25¢. Outside of United States and Possessions, 75¢ on paper; \$1.25 on linen (*postal regulations generally prohibit mailing linen maps outside of Western Hemisphere*); Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.

†For a map of all Europe, see "Map of Europe and Near East," with 9,133 place names, supplement to the NATIONAL GEOGRAPHIC MAGAZINE, June, 1943.

operations and invasion planning. Now it is summarized on this new map so that members can follow the events of the invasion.

Newspapers Adopt NATIONAL GEOGRAPHIC Spelling of Place Names

On April 8, 1944, the three principal American press associations—the Associated Press, the United Press, and the International News Service—announced that they would follow the National Geographic Society's spelling of place names in reporting the war. One or more of these press associations serve practically all of the more than 1,800 daily newspapers in the United States (page 69).

Their ruling means that all newspaper readers will hereafter be relieved of the confusion of varied and haphazard spelling which often made the places mentioned in dispatches difficult to identify.

Thousands of places lead double lives in the atlas. Many cities and other places in European news recently have been spelled two ways, and one spelling gives little clue to the other. Examples:

Bratislava (Slovakia) also is Pressburg; Brno (Moravia) is Brünn; Bydgoszcz (Poland) is Bromberg; Cheb (Bohemia) is Eger; Cernăuți (Romania) is Czernowitz; České Budějovice (Bohemia) is Budweis; Kassa (Hungary) is Košice; Lwów (Poland) is Lemberg; Plzeň (Bohemia) is Pilsen; Poznań (Poland) is Posen; Roumania, Rumania; Sopron (Hungary) is Ödenburg; Tczew (Poland) is Dirschau; and Toruń (Poland) also is Thorn.

Recently names of Russian towns have been spelled as many as four different ways in different papers on the same day. Also, some newspapers have spelled the same names differently on successive days.*

The new procedure applies not only to Europe but also to the Pacific war zone and to all other action areas.

The formal action of the three press associations has been followed by requests from hundreds of newspapers for your Society's maps and indexes so that in their editorial and news columns they may follow the same style as that used in the press-association dispatches.

GEOGRAPHIC Maps Use Official National Spellings of Place Names

Press associations and newspapers adopted National Geographic Society nomenclature because your Society long ago pioneered in adopting the policy of spelling names of cities and towns and also rivers, seas, mountains, harbors, etc., the way they are spelled officially in the countries where they are located.†

Intense national feeling over place names grew out of the new sovereignties and boundaries created after World War I.

The Polish people, for example, insisted that their capital be called by their own name for that ancient city, Warszawa, instead of by the anglicized Warsaw; Estonians demanded Tallinn instead of Reval; the Russians, Leningrad instead of St. Petersburg or Petrograd.

Americans would be amazed to receive mail from foreign countries addressed to Nueva York, Filadelfia, Salzseestadt, or Waszyngton, rather than to New York, Philadelphia, Salt Lake City, or Washington.

On the 26 National Geographic Society maps of the continents and oceans appear 60,000 different place names. Members who have kept these maps and their indexes and the NATIONAL GEOGRAPHIC MAGAZINE articles describing the maps have accumulated the world's most up-to-date atlas and gazetteer.

Newspapers turn to their files of The Society's maps and indexes because in them are found the great majority of names mentioned in dispatches.

Press associations made 78 exceptions to the general rule of following official spellings of foreign place names. These exceptions are substantially those which the NATIONAL GEOGRAPHIC MAGAZINE itself makes in its own text pages.

In these cases the official spelling is shown on National Geographic Society maps and the anglicized and other well-known spellings are indicated in parentheses. The exceptions are made because the anglicized names have wide acceptance through popular usage, and therefore are more familiar to Americans than the official designations of these places in their own countries. However, in addressing letters even to these places which are excepted, the official national spellings should be used.

The place names which will be anglicized, and their official designations which still are useful in consulting many foreign maps and for addressing mail, follow:

Algiers, Alger; Antioch, Antakya; Antwerp, Antwerpen; Athens, Athina; Sea of Azov, Azovskoe More; Belgrade, Beograd; Black Forest, Schwarz Wald; Blue Nile River, El Bahr el Azraq; Bonin Islands, Ogasawara Gunto; Bosphorus, Karadeniz Boğazi; Brest Litovsk, Brześć nad Bugiem; Brunswick, Braunschweig; Brussels, Bruxelles; Bucharest, București; Cape Horn, Cabo de Hornos; Caucasus

* For an explanation of the National Geographic Society's system of spelling the Russian, Turkish, Czech, etc., names, consult The Society's Index to the 1929 edition of its "New Map of Europe and the Near East."

† See "Society's New Map of Europe," by Gilbert Grosvenor, NATIONAL GEOGRAPHIC MAGAZINE, December, 1929.

Mountains, Bolshoi Kavkaz; Cologne, Köln; Lake Constance, Bodensee; Copenhagen, København; Corfu, Kérkyra; Corinth, Kórinthos; Corsica, Corse; Crete, Krètè; Crimea, Krim; Damascus, Damas; Danube River,* Dardanelles, Çanakkale Boğazi; Dead River, Nahr el Mifjir; Dead Sea, Bahret Lut; Devil's Island, Ile du Diable; Dublin, Baile Atha Cliath; East Cape, Mys Dezineva; Euphrates River, Euphrate (Syria), Frat or Firat (Turkey); Faeroes, Færøerne; Florence, Firenze; Formosa, Taiwan; Geneva, Genève; Genoa, Genova; The Hague, 's Gravenhage; Harbin, Pinkiang; Havana, Habana; Hook of Holland, Hoek van Holland; Korea, Chosen; Kurile Islands, Chishima Retto; Limerick, Luimneach; Gulf of Lions, Golfe du Lion; Lisbon, Lisboa; Marcus Island, Minami Tori Shima; Mexico City, México, Distrito Federal; Milan, Milano; Moscow, Moskva; Mozambique, Moçambique; Mukden, Shenyang; Munich, München; Nansei Islands, Ryukyu Retto; Naples, Napoli; New Siberian Islands, Novo Sibirskie Ostrova; North Cape, Nordkapp; Mount Olympus, Olympos; Port Arthur, Ryojun; Prague, Praha or Prag; Rhodes, Rodi; Gulf of Riga, Rigas Jūras Līcis; Rome, Roma; Salonika, Thessalonikè; Sardinia, Sardegna; Sicily, Sicilia; Mount Sinai, Gebel Mūsa; Sofia, Sofiya; Sparta, Spártè; Tiber River, Fiume Tevere; Turin, Torino; Tyre, Sour; Venice, Venezia; Mount Vesuvius, Vesuvio; Vienna, Wien; Warsaw, Warszawa; White Sea, Beloe More.

Key to Foreign Names for Physical Features

In many countries words descriptive of physical features (islands, capes, mountains, etc.), are frequently used as part of the geographic name, thus:

<i>Ostrov</i> Graham Bell (Russian)	Graham Bell <i>Island</i>
<i>Chichi Jima</i> (Japanese)	<i>Chichi Island</i>
<i>Ben Lomond</i> (Scottish)	<i>Mount Lomond</i>
<i>Böhmer Wald</i> (German)	<i>Böhmer, or Bohemian, Forest</i>
<i>Poluostrov</i> Kamchatka (Russian)	<i>Kamchatka Peninsula</i>
<i>Musa Dagh</i> (Turkish)	<i>Musa Mountain</i>
<i>Erz Gebirge</i> (German)	<i>Erz or Ore Mountains</i>
<i>Matterhorn</i> (German)	<i>Matter Peak</i>
<i>Bakony Hegység</i> (Hungarian)	<i>Bakony Mountains</i>
<i>Samarica Planina</i> (Yugoslavian)	<i>Samarica Mountains or Plateau</i>
<i>Lyso Góry</i> (Polish)	<i>Lyso Mountains</i>
<i>Hsingan Shan</i> (Chinese)	<i>Hsingan Mountains</i>
<i>Nanga Parbat</i> (Hindustani)	<i>Nanga or Bare Mountain</i>
<i>Fuji-san</i> (Japanese)	<i>Mount Fuji</i>
<i>Ozero Ilmen</i> (Russian)	<i>Lake Ilmen</i>
<i>IJssel Meer</i> (Dutch)	<i>IJssel Lake</i>
<i>Tuz Gölü</i> (Turkish)	<i>Tuz Lake</i>
<i>Hammarjön</i> (Swedish)	<i>The Hammar Lake</i>
<i>Lago di Garda</i> (Italian)	<i>Lake of Garda</i>
<i>Chosen Kaiyo</i> (Japanese)	<i>Chosen Strait</i>
<i>Vatna Jökull</i> (Icelandic)	<i>Vatna Glacier</i>
<i>Setesdal</i> (Norwegian)	<i>Setes Valley</i>
<i>Marmara Denizi</i> (Turkish)	<i>Sea of Marmara</i>

Official Spellings Frequently Change

On the new "Map of Germany and Its Approaches," as on many other NATIONAL GEO-

GRAPHIC maps, is a list giving English translations for foreign-language names of rivers, seas, harbors, mountains, etc.

Comparison of various editions of GEOGRAPHIC maps and indexes shows occasional changes in spelling and sometimes complete changes in place names. These differences mean that countries have officially changed the spelling themselves, or that they have officially renamed places. Invariably such action follows transfers of territory from one country to another.

For example, Memel was taken from Germany after the First World War and given to Lithuania, which renamed it Klaipėda. Now it is under German rule again, and the name of Memel has been restored.

In Alsace-Lorraine, under German rule, the "o" in Strasbourg was dropped and an "s" added. When these provinces were restored to France after World War I, the French lost no time in dropping an "s" and putting the "o" back into Strasbourg.

One battleground in Flanders became famous in World War I as Ypres, although overseas soldiers never quite mastered the pronunciation and called it "Wipers." Since the town is in that part of Belgium dominated by Flemish-speaking people, the populace resented the French spelling of Ypres almost as much as they were amused at the soldier-boy pronunciation. Officially, therefore, that historic spot is known by its Flemish name of Ieper. Again, Flemish influence insists on Antwerpen instead of the French designation, Anvers, or the anglicized version, Antwerp.

The National Geographic Society's series of ten large ten-color European maps since the beginning of World War I follows:

"Central Europe and the New Balkan States," August, 1914. This map shows the changed boundaries resulting from the bloody wars of 1912 and 1913 in which Bulgaria, Serbia, Montenegro, Romania, Greece, and Turkey took part. The status of these countries prior to this conflict was shown in "Countries Bordering the Mediterranean Sea," NATIONAL GEOGRAPHIC MAGAZINE map supplement, January, 1912.

"Europe and Adjoining Portions of Africa and Asia," July, 1915. Shows boundaries at beginning of World War I.

"Races of Europe and Adjoining Portions of Asia and Africa," December, 1918. With a graphic 94-page illustrated description of

* The Danube River is excepted because its spelling changes as it flows through or forms boundaries of various countries, as follows: Donau, Germany; Duna, Hungary; Duna, Slovakia; Dunav, Bulgaria and Yugoslavia; and Dunărea, Romania.



Press Association

Associated Press Staff Men at New York Headquarters Check War News Names on a NATIONAL GEOGRAPHIC Map of Asia

Left to right are Harold (Hal) V. Boyle, war correspondent who covered the Cassino battle front; Glenn Bahb, foreign editor; Richard McMurray, war editor; and Preston L. Grover, chief of bureau in India and China. Bahb holds a sheaf of "flimsies," thin sheets on which news bulletins are typed; McMurray consults the NATIONAL GEOGRAPHIC Index to the Asia Map. The Associated Press, United Press, and International News Service—three major American press associations—announced April 8, 1944, that henceforth their spelling of place names in world news dispatches will conform to the National Geographic Society's style of spelling (p. 67).

the polyglot peoples mapped, by Edwin A. Grosvenor.

"Europe, Showing Countries as Established by the Peace Conference at Paris," February, 1921.

"Europe and the Near East," December, 1929.

"Europe and the Mediterranean," April, 1938.

"Central Europe and the Mediterranean" (as of September 1, 1939), October, 1939.

"Europe and the Near East" (as of April 1, 1940), May, 1940; "Europe and the Near East" (as of September 1, 1939), June, 1943, and "Germany and Its Approaches," July, 1944.

Other supplement maps in this period showing European areas were: "Theater of War

in Europe, Africa, and Western Asia," July, 1942; "Asia and Adjacent Areas," December, 1942; and the British Isles, June, 1937.

These maps record the weather-vane changes of European nationalities and boundaries in the past 32 years. They show that a political map is far from static. They constitute an indispensable and unique reference source for historians and students.

Every NATIONAL GEOGRAPHIC map supplement bears the date of issue, so the map reader may know to what year and month its information refers. This practice enhances the historical value of the maps and also avoids assumption that maps are current when they have been superseded by more recent supplements.

Records of these successive changes are of

vital interest now, because further alterations of the political face of Europe are inevitable after the end of World War II.

Map of Europe after Versailles Treaty

The map "Europe, Showing Countries as Established by the Peace Conference at Paris," in the NATIONAL GEOGRAPHIC MAGAZINE of February, 1921, recorded new nations and partitioned nations, and revealed that some countries, such as Serbia and Montenegro, had disappeared as separate sovereignties.

It sketched in the tentative boundaries—some of them modified later—under the terms of the Versailles Treaty with Germany, the Treaty of Trianon with Hungary, the Treaty of Saint Germain with Austria, the Treaty of Neuilly with Bulgaria, and the Treaty of Sèvres with Turkey.

This map showed the greatest reapportionment of European territory in modern times, as follows:

Finland, no longer a Grand Duchy of Russia, became a new state. The Republic declared its independence on December 6, 1917.

Estonia, Latvia, and Lithuania, no longer Baltic provinces of Russia, became independent states. Frontiers were in dispute when the 1921 map went to press and were indicated in general as "undecided boundaries."

Poland emerged as a reborn state, made by carving a slice of territory as big as Colorado out of Russia; another, the size of Maine, out of Austria; a third, the size of the combined areas of Massachusetts and Vermont, out of Germany; and a fragmentary fourth out of Hungary.

A Free City of Danzig, 754 square miles of West Prussia's territory, was set up under protection of the League of Nations. Poland formed with Danzig a single customs union, which was to assure Poland of port facilities and a free outlet to the Baltic Sea through the Polish Corridor.

The empire of Austria-Hungary disappeared from the map.

Czechoslovakia was set up as a new state, carved out of Austria (the provinces of Bohemia, Moravia, and Silesia); Hungary (the provinces of Slovakia and Carpathian Ruthenia); and Germany (a small fragment).

Romania doubled in size and population. This member of the Allies in World War I received Transylvania from Hungary; Bessarabia from Russia; and Bukovina from Austria. Russia has never recognized Romania's claim to Bessarabia.

Yugoslavia was established as a new state. When the 1921 GEOGRAPHIC map went to press, some of the boundaries of Yugoslavia could be shown only tentatively. Serbia and Montenegro, members of the Allies in World War I, became parts of the new nation. Also included were the Hungarian crownlands of Croatia and Slavonia; the Austrian kingdom and crownland of Dalmatia; and Bosnia and Hercegovina, former imperial territory of Austria-Hungary. It was in the Bosnian town of Sarajevo that Archduke Francis Ferdinand of Austria and his wife were assassinated on June 28, 1914 (St. Vitus Day of the

Orthodox Church), thus touching off the spark in the Balkans which flamed into World War I.

Italy, one of the Allies in World War I, acquired the Trentino (southern Tyrol) and Trieste from Austria; Fiume from Hungary; and the island of Castellrosso, in the Mediterranean, from Turkey.

Greece acquired western Thrace from Bulgaria; and miscellaneous islands in the Aegean from Turkey. The Dodecanese, occupied by Italy since 1912, were renounced by Turkey in favor of Italy. By a separate agreement between Greece and Italy, the islands were to be transferred to Greece. The agreement was never fulfilled.

Denmark acquired part of Schleswig from Germany.

Belgium acquired Malmédy and Eupen from Germany.

Austria acquired Burgenland, an area of 1,550 square miles, from Hungary. This is the only instance in Europe in which one of the defeated Central Powers received any territory under the peace treaties.

Alsace and Lorraine were restored to France from Germany.

1929 Map Showed Frontier Settlements

The map "Europe and the Near East," issued in the December, 1929, NATIONAL GEOGRAPHIC MAGAZINE, showed further territorial transfers and final demarcation of frontiers, as follows:

Settlement by Russia and Finland of the boundaries in the disputed Petsamo District, in which 4,100 square miles of Russia's Archangel Province were ceded to Finland. This was one of the provisions of the Treaty of Dorpat, signed in October, 1920. These boundaries are in dispute again and will figure in any settlement of the present war between Finland and Soviet Russia.

Final demarcation of boundaries between Russia and Estonia, Latvia, and Lithuania, under treaties signed in 1920.

In spite of Russia's ceding the Wilno (Vilna) region to Lithuania, Polish troops seized the area. A plebiscite held in 1922 ended in Poland's favor. Lithuania has never relinquished its claim to this territory.

Partitioning of Upper Silesia, following a plebiscite held in 1921, under terms of the Versailles Treaty. Most of the territory was divided between Germany and Poland, with Czechoslovakia getting a fragment.

Placing of Eastern Galicia under Polish administration by the Treaty of Riga (1920).

Awarding of the disputed north Epirus region to Albania in 1921 at the Conference of Ambassadors in Paris, which refused to recognize Greek claims.

Formal recognition of the acquisition of Rhodes and the Dodecanese by Italy, under the Treaty of Lausanne (1923).

Dominion status for Ireland under the name of the Irish Free State in 1921 and settlement of the boundary between the Irish Free State and Northern Ireland in 1925.

The map "Europe and the Mediterranean," pub-

lished in the April, 1938, NATIONAL GEOGRAPHIC MAGAZINE, showed territorial seizures by Germany under Hitler's rule, as follows:

Nazi Gains Shown on 1938 Map

Incorporation of Austria into the Third Reich. (On March 12, 1938, lithographic presses were turning out The Society's new map at top speed when the Editor ordered "Stop the presses." On that day, Hitler marched into Austria. Map plates were brought up to date. A substantial percentage of The Society's members and all those who subsequently purchased additional copies of the map received charts showing Austria as a part of Germany.)

Restoration of the Saar Basin to Germany. Administered by the League of Nations for 15 years, the people of this region expressed their wish to return to German rule in a plebiscite held in January, 1935.

Appearance of Ireland as a sovereign independent state. A new constitution was approved by its people on July 1, 1937. Six months later it became effective. Official name of the country was changed to Eire.

Again Many Place Names Changed

The map "Central Europe and the Mediterranean," published in the October, 1939, GEOGRAPHIC, showed that the ceding of the Hatay Republic by France to Turkey in June, 1939, increased the area of that country by nearly 2,000 square miles. This Republic, formerly part of the Levant States, was administered by France under a League of Nations mandate.

The change from French to Turkish administration also made necessary new place names. Antioch, scene of St. Paul's first ministry, is now Antakya, and Alexandretta is Iskenderon.

That part of the U. S. S. R. shown on the map represented an entirely new selection of place names, based on the new Soviet Atlas and new official Soviet maps. In the Ukraine, in the neighborhood of Stalino, appeared such new and important names as Makeevka, Ordzhonikidze, Gorlovka, and Sergo.

Limiting the new map to Central Europe increased the scale to permit, within the area charted, 1,207 names which did not appear on the Europe map published in April, 1938. Also, the names of 173 places here shown had been officially changed in the 18 months following the previous Europe map.

Albania, wearing the map yellow of Italy, reflected its new political status in the renaming of Santi Quaranta, changed to Porto Edda to honor the daughter of Premier Mussolini. Many new place names appeared in Libia as the result of Italian colonization. Marconi and D'Annunzio were among them.

1940 Map Discloses Boundary Dislocations

The map "Europe and the Near East" (as of April 1, 1940), issued in the May, 1940, NATIONAL GEOGRAPHIC MAGAZINE, ranks high in historical importance, since it records an era of boundary

dislocations thrust upon Europe by Hitler just before and after the outbreak of World War II, as follows:

Incorporation of the Sudetenland and other border areas of Czechoslovakia into the German Reich under the terms of the Munich Agreement, less than seven months after the absorption of Austria.

Granting of autonomy by Czechoslovakia to Slovakia and Ruthenia (Carpatho-Ukraine).

Acquisition by Poland from Czechoslovakia of several districts, including Teschen.

An "independent" Slovakia. On March 14, 1939, this Czech province declared its independence and four days later, by treaty, became a protectorate of Germany. On March 16, 1939, Hitler declared by decree that Czechoslovakia had ceased to exist, creating a protectorate over the provinces of Bohemia and Moravia.

Award to Hungary of parts of dismembered Czechoslovakia, including sections of Ruthenia and southern Slovakia. At the time of Germany's seizure of Moravia and Bohemia, Hungary invaded the Carpatho-Ukraine and incorporated that province into its own territory.

Surrender of Memelland by Lithuania to Germany March 22, 1939.

Incorporation of Danzig into Germany by decree, September 1, 1939.

(The United States, Great Britain, and Russia did not recognize all of these new political boundaries, but as no military action was taken, the boundaries thus declared by Germany became of importance to the radio commentator, historian, and geographer who wanted records of the altered situation. Even though they did not approve of the German dictation, they wanted a map showing the four ways in which Germany had divided Czechoslovakia.)

Nazi annexation of all former German territory ceded to Poland by the Treaty of Versailles, following the Nazi invasion of Poland on September 1, 1939.

Setting up of a Nazi Government General area beyond that, to form a buffer state between the Reich and Russia.

Incorporation of Polish White Russia and Ukraine into the Soviet Union. Russia invaded eastern Poland on September 17, 1939, and, less than two weeks later, signed a treaty with Germany fixing a boundary between the two countries.

Transfer of the Wilno district, seized by Russia from Poland, to Lithuania.

Spread of Conflict Reflected in 1943 Map

Cession by Finland to Russia of the Karelian Isthmus, all of the islands in Vünpuri Bay, various islands in the Gulf of Finland, and certain other areas along the Russian-Finnish border, under the treaty of March, 1940.

Today this 1940 edition of the Map of Europe, showing the German-Russian partition of Poland in September, 1939, and the Russo-Finnish settlement, is used constantly by students, military strategists, and others.

The map "Europe and the Near East," pub-

lished in the June, 1943, NATIONAL GEOGRAPHIC MAGAZINE, showed the boundary status in Europe as of September 1, 1939, the day Germany invaded Poland.

When Germany and Finland attacked Russia, in June, 1941, the boundary agreements of 1939 and 1940 were nullified.

Historians recognize September 1, 1939, as a date which marks a critical new era in world history; hence your Society has clearly recorded the international boundaries as they then existed. On all GEOGRAPHIC maps thereafter issued, including the new "Map of Germany and Its Approaches," the student will find printed plainly the statement, "International boundaries as of September 1, 1939."

Czechoslovakia does not appear on these wartime National Geographic Society maps because the dismemberment of Czechoslovakia had occurred before that date. When World War II started, there was no such place as Czechoslovakia. Only Slovakia remained as a separate political unit. Bohemia and Moravia were swallowed up and had become an integral part of Germany six months before World War II started.

A map can only chart boundaries and political units as they are. The Czechoslovakian Government-in-Exile is recognized by the United States, Great Britain, and Russia. High officials of these three nations have expressed the hope that this gallant country will be reestablished after the war.

The "Map of Germany and Its Approaches" carries a red overprint showing the boundaries of Europe as they existed on January 1, 1938, before the annexation of Austria by Germany and the dismemberment of Czechoslovakia, thus giving it added value for the student of political or military history.

Current War Areas in Detail

In the past 18 months, 73 black-and-white maps have appeared in the pages of the NATIONAL GEOGRAPHIC MAGAZINE to amplify the information contained in the 10-color Supplement Maps. They show additional names because they usually chart smaller areas on larger scale, and they locate every place mentioned in the articles they accompany.

In 1943 and the first six months of 1944,

these 73 maps contained 15,024 place names.

Because of their wealth of local detail and the new information contained in them, these maps, as well as the large 10-color Supplement Maps, are widely used by Army and Navy schools in their orientation courses.

The two-page map of the Alaska Highway (February, 1943) was the first one published to show this vital military road in detail, together with its connecting highways.

A two-page map of central and northern Italy (December, 1943) enables members to follow the Fifth Army's campaign in detail, from the landing at Salerno to the fighting north through Naples and Cassino, and at the Anzio beachhead.

Strategic Isles of the Pacific

A two-page detailed charting of the strategic isles of the Pacific (April, 1944) enables members to follow American action on such remote land patches as Kwajalein, Eniwetok, Truk, Saipan, Ponape, and others.

The Society's cartographers have worked out ways of making separate drawings for various features shown. Superimposing these drawings on the printing plate gives the effect of several tones. Thus in the map of the Japanese bases each inset was made from three drawings: one for names and shorelines; another for mountains; and a third for reefs.

In the June, 1944, issue a map of Burma and eastern India shows the area where General Stilwell is pushing the Ledo Road to connect with the Burma Road. Also charted are Imphal, Manipur, and Kohima, Indian strongholds attacked by the Japanese in their drive toward the Bengal-Assam Railway.

Every geographic name mentioned in every GEOGRAPHIC article may be located by a NATIONAL GEOGRAPHIC map.

The Society's progressive series of 10-color charts of Asia, Africa, Antarctica, North America, Central and South America, the United States, and of the Atlantic, Pacific, Indian, and Arctic Oceans are all outstanding achievements in research and design.

INDEX FOR JANUARY-JUNE, 1944, VOLUME READY

Index for Volume LXXXV (January-June, 1944) of the NATIONAL GEOGRAPHIC MAGAZINE will be mailed upon request to members who bind their copies as works of reference.

Indians of Our Western Plains

BY MATTHEW W. STIRLING

Chief, Bureau of American Ethnology, Smithsonian Institution

TWO MAJOR features of American geography helped tie together the Indians of our Western Plains.* One is the vast, rolling, and relatively treeless prairie which today forms a distinctive region of the United States, even after the white man's settlement and cultivation of its rich resources. The other factor, in aboriginal times, was the heavy dependence of the Indian tribes upon the buffalo for subsistence.

From the broad Mississippi to the massive Rocky Mountains, and from Texas to Saskatchewan stretches a tremendous area of level or rolling grassy prairie. Treeless, except for the river bottoms and other occasional small stretches, it contains some of the finest agricultural land in the world.

In early postglacial times, big herds of camels, small horses, and gigantic elephants grazed in the same region as the bison (page 77).† Before the coming of the whites, the heavy sod covering furnished abundant grazing for vast herds of buffalo, elk, and antelope.

Most of this territory was virtually unknown until the beginning of the last century. It was acquired by the United States through the Louisiana Purchase.

The heart of the prairie land is the drainage of the Missouri. When the Lewis and Clark Expedition was dispatched by Thomas Jefferson to explore this mighty river, at the beginning of the last century, the farsighted President gave special instructions to the explorers to learn all they could about the Indian tribes of the region (page 102).

Early Indian Farmers Become Hunters

The picture of human occupation of the Great Plains during the centuries immediately preceding the discovery of America by Europeans is obscure. We do know, however, that various agricultural peoples encroached on the Plains from the south and from the northeastern Woodlands. As they moved into the open prairies, they saw the buffalo herds, and the possibility of augmenting their food supply by hunting became obvious.

* This is the third in a series of authoritative articles on the American Indian, illustrated with paintings which are the result of careful study and extensive research. See, in *THE NATIONAL GEOGRAPHIC MAGAZINE*, "America's First Settlers, the Indians," November, 1937, and "Indian Tribes of Pueblo Land," November, 1940, both by Matthew W. Stirling.

† See "Parade of Life Through the Ages," by Charles R. Knight, *NATIONAL GEOGRAPHIC MAGAZINE*, February, 1942.

Gradually most of them began to leave their permanent villages during the hunting season to follow the buffalo. They returned from these excursions with supplies of dried meat and quantities of hides.

Between 1650 and 1750 the Spaniards came in from the south and brought the horse. It was probably then that some of the Indians abandoned agriculture entirely and became nomadic hunters.

This roving equestrian life seemed to engender a warlike spirit. It was not long before the western tribes, expanding their hunting territory, began to press back upon the more peaceful earth-lodge farmers, forcing them farther and farther toward the east.

When the great period of white westward expansion began, about the middle of the last century, the colorful warlike existence of the mounted Plains nomads was at its full flower.

These were the Indians encountered by the early trappers and explorers on their way to the Rockies, by the Mormons on their trek to Great Salt Lake, and by the covered-wagon trains of the emigrants to Oregon and the gold rush to California (Plate XIV).

Nomad Life Passed with the Buffalo

The inexorable pressure of the whites, resulting in the establishment of military posts, seizure of territory, the building of railways, and the destruction of the buffalo, spelled the doom of one of the most colorful periods of aboriginal America.

The end of the buffalo herds meant the end of the nomadic culture developed around them.

Gradually forced to adopt a way of life as a Government ward in reservations, the Plains Indian accepted his fate reluctantly, contesting every step of his further constriction. Like a caged panther, his unused muscles grew soft and his eyes glowed with the memory of the freedom of a day which even he came to realize was forever gone.

With the passing of the hunt and the war-path, the rich ceremonies built around them lose their meaning. The people yet living, who were part of the old life, still are stirred by the old emotions, but the young folks, raised in a new type of world, find themselves between two cultures.

The Plains Indian was tall and well built. Especially among the Northern and High



Statue © Chicago Natural History Museum

Blackfoot Study in Bronze

This lifesize statue is one masterpiece in Malvina Hoffman's famous Races of Mankind exhibit at the Chicago Natural History Museum. The pose represents the Indian warrior telling, in sign language, of a successful hunt (page 73).

Plains groups, aquiline noses were a prominent feature. Good musculature and a powerful physique, obvious assets in warfare and hunting, were admired in the men. Considering their multiple origins, the physical types were more uniform than might be expected.

The Plains Indians were even more vain of their personal appearance than were most other American Indians, although every group had its dandies who were laughed at by the hardier male members of the tribe.

Particularly in early times, body painting was practiced. Red, yellow, and black were favorite colors. Tattooing was especially elaborate among the southern groups.

Much care was given to dressing the hair. In the north, men usually arranged their locks in two braids; in the south men and women usually wore their hair loose over the shoulders.

A number of the southern tribes cropped the sides of the head. The Hidatsa, Mandan, Arikara, and Assiniboin allowed a forelock to hang down over the nose. The Crows caused their forelocks to stand stiffly erect.

The women in the Plains generally parted their hair in the middle, gathering it into two braids. Older women let it hang at the sides of the head.

Regalia Glamorized Warfare

Love of costume was well illustrated in war regalia. A group of Plains warriors, bronzed and painted, naked save for breechcloth, weapons, and ornaments, riding at full gallop with bodies low to their horses' withers, eagle feathers flying, war bonnets undulating in the breeze, and the terrifying war cry ringing across the prairie, presented a brave and vivid scene. The Indians were fully conscious of their spectacular appearance. Large war parties often made displays of themselves before their enemies.

I have talked with old warriors and seen the reminiscent gleam come into their fading eyes upon describing old encounters. They spoke with undisguised admiration of the picture made by their fully accoutered foes as they charged past on their mounts. Brilliant uniforms and martial music of bygone European troops never did more to glamorize warfare than the feathers, paint, and war cries of the Plains Indian.

In keeping with the varied origins of Plains tribes, a number of languages were spoken. Most prominent linguistic stock is the Siouan, dialects of which are spoken by the Mandan, Hidatsa, Assiniboin, Crow, Dakota, Iowa, Kansas, Osage, Omaha, Oto, and Ponca.

Languages belonging to Algonkin stock are

the Cree, Plains Chippewa, Gros Ventre, Blackfeet, Cheyenne, and Arapaho.

The Arikara, the Pawnee, the Caddo, and the Wichita speak Caddoan dialects.

On the western High Plains the Shoshonean stock is represented by the Northern and Wind River Shoshoni, the Bannock, the Ute, and the Comanche. The Athapascan stock contains, on the Plains, the Sarsi and the Kiowa-Apache.

Kiowa and Nez Percé belong to two different groups. The Siouan languages seem to have impinged on the Plains from the east, the Algonkin from the north, the Shoshonean from the west, and the Caddo from the south.

"Basic Indian" Was Sign Language

Perhaps as a result of this linguistic diversity, combined with nomadic habits, the Indians of the Plains developed the most effective sign language ever devised. By graceful signs and gestures made with the fingers and hands they communicated with one another as fluently as by oral speech.

So realistic were the gestures and so adept the sign talkers of the Plains that even the uninitiated, with very little practice, could follow the trend of this unique manual conversation. Sign language became of great use to the early white trappers and traders, and later to American military men.

The majority of the tribes we consider most typical moved into the Plains in quite recent times, many of them after 1700. In that year, for example, the Cheyenne and Arapaho were farmers living in permanent villages in the region of Minnesota.

The Dakota, living still farther east in the Woodlands, were feeling strong pressure from the Chippewa behind them, who had been given firearms by the French.

Driven by the Chippewa, the Dakota forced the Cheyenne and Arapaho westward across the Missouri and finally to the base of the Rockies. The Dakota themselves, and some of the Chippewa, moved out into the Plains.

Similar pressures from the region of the Ohio River forced other Woodland tribes onto the Plains. The expanding settlement of the whites along the Atlantic seaboard set up a pressure impetus which traveled from tribe to tribe until they reached three-quarters of the way across the continent.

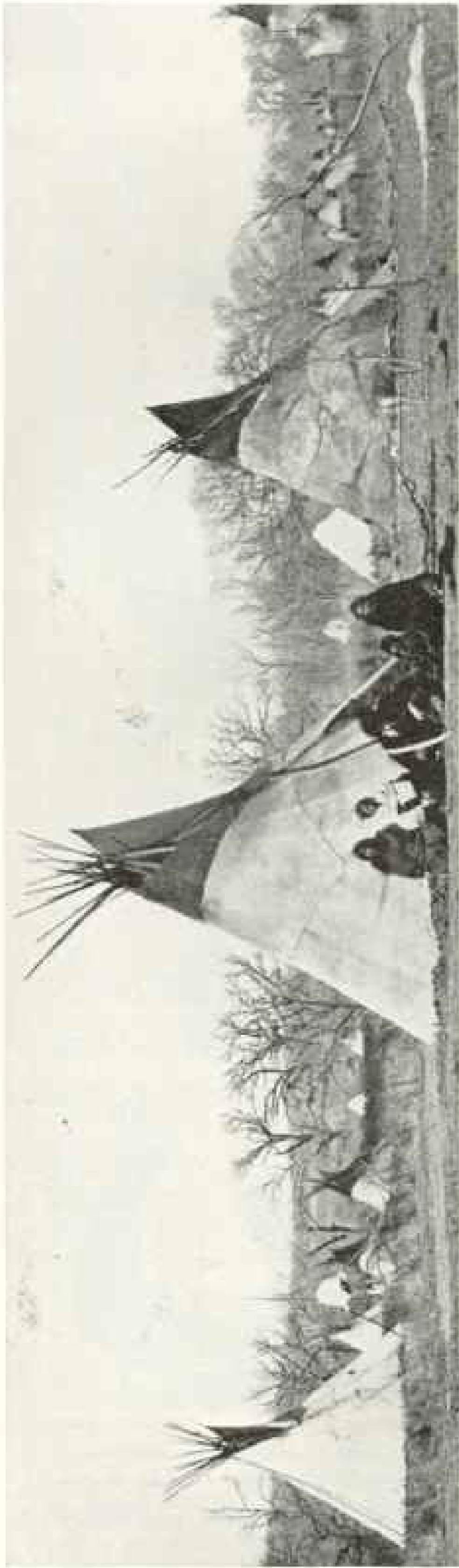
The northern and eastern sections of the Plains, especially, were populated from these causes. The tribes of the southern Plains, such as the Wichita and Pawnee, seem to have occupied their lands for a much longer time, tribal territories remaining much as they were when first visited by Coronado.



T. Benjamin Frost

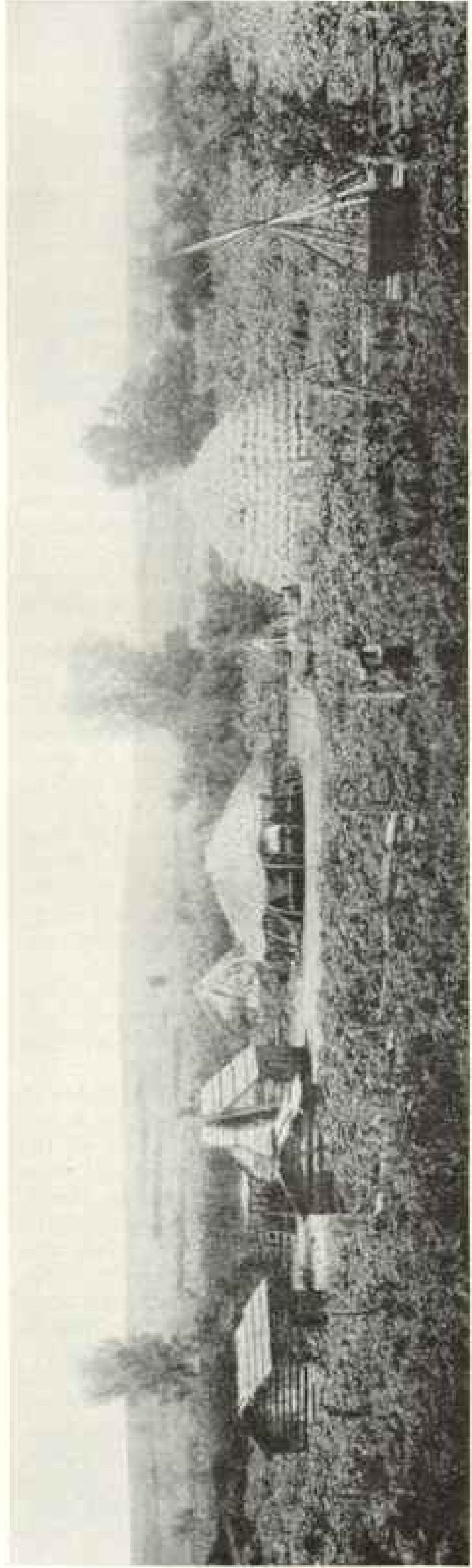
Sign Language of the Plains Indians

These tribes developed this novel system of communication. Later, it helped the white traders to talk to the Indians. The late Maj. Gen. Hugh L. Scott demonstrates four positions. From top to bottom: "I see," "friend," "right there," and "an elk."



Finest Horsemen of the Plains Were the Comanche, Nomad Warriors and Buffalo Hunters

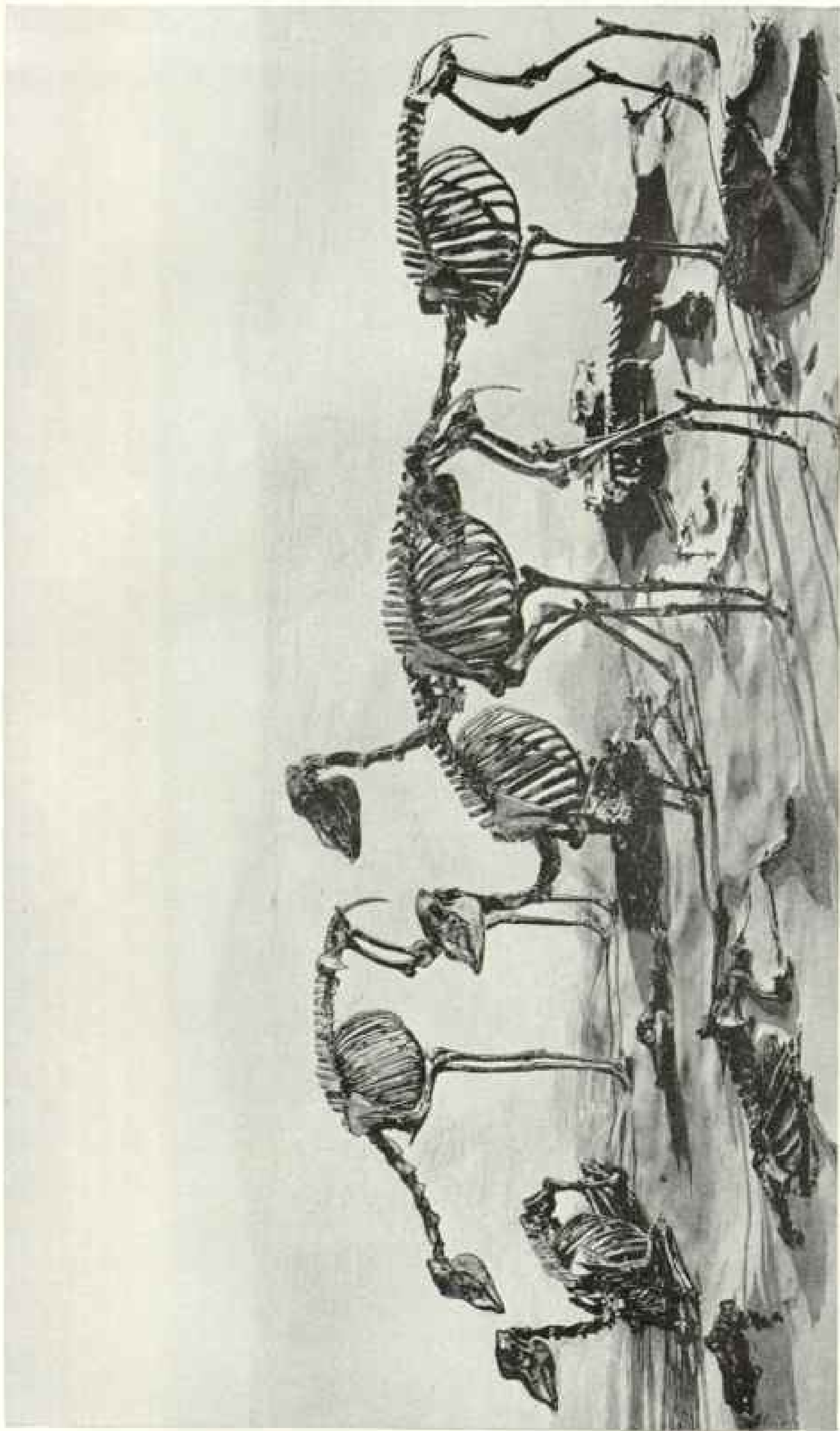
Once they ranged from the Platte River south into Mexico. This photograph of a Comanche skin-tent village was made between 1868 and 1872 (page 79).



Remains of American Ethnology

Log Cabins and Rail Fences, Copied from Pioneer Whites, Merge with Grass Lodges in a Wichita Indian Village

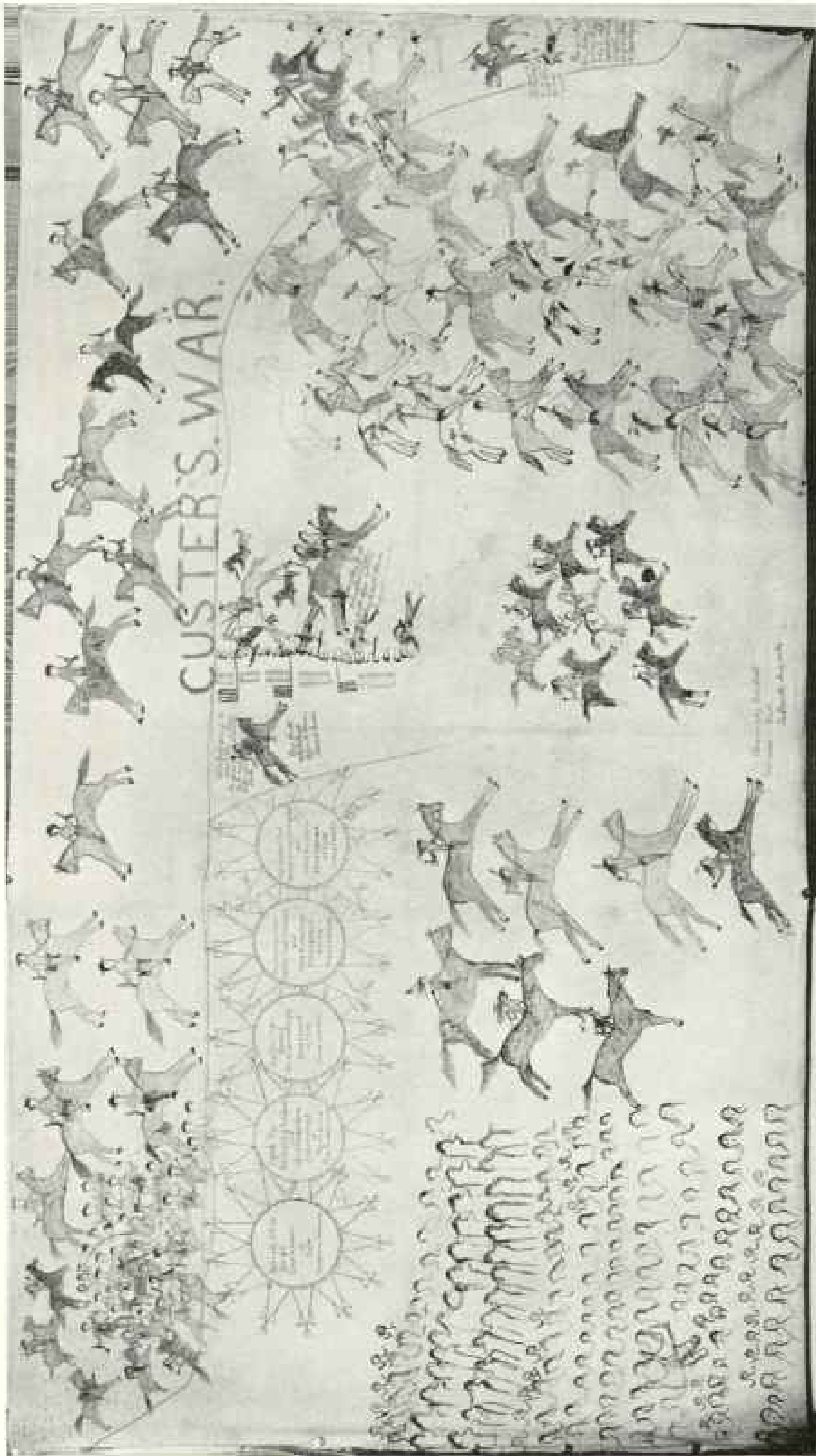
This Anadarko, Oklahoma, settlement was photographed about 1880. Grass lodges of the Wichitas were described by the chroniclers of the Coronado expedition



American Museum of Natural History

Vanished *Stenomylus*, Slender-limbed Camel Which Roamed the Western Plains Millions of Years Ago, Left Its Bones Behind

These specimens come from a stratum of volcanic ash exposed along the Niobrara River in Sioux County, Nebraska, a few miles below the famous Agate Springs Ranch. Here dozens of complete, or nearly complete, skeletons have been found, lying close together. This area may have been a bad ground, where the animals died off one at a time; or a herd of them may have been suddenly overcome by poisonous fumes or an ash fall. These gazellelike creatures were about as tall as sheep, averaging some 27 inches in height at the shoulder (page 73).



14. Oct. 4, B. Weston

On This Canvas, One Bull Records, in Color Pictures, His Exploits During "Custer's War"

The drawing, about 54 by 70 inches, shows the Custer massacre in upper left (Plate IV). The line stretching across the canvas represents the Little Bighorn River. Below it, at left, tepee circles are inscribed with the names of the tribes taking part in the battle. Figures at lower left depict Indian women and children fleeing to a hill. The right half shows Maj. Marcus A. Reno's running fight with the Indians. One Bull (Plate XVI) figures prominently, since such a picture record, common among Plains warriors, usually was autobiographical. Emerging from the Hunkpuna camp, where Sitting Bull had his tent, is the mounted figure of One Bull, advancing toward Reno's battle line. He next appears on a larger horse to the right of the battle line, where he has broken through to rescue a wounded friend, Good Bear. At extreme right center he is seen again, striking a soldier who is firing his revolver into the air. English lettering was done by One Bull's daughter.

It is probable that the more severe climate in the north, together with less favorable agricultural conditions, prevented any considerable occupation of this section in aboriginal times, so that it was left open to the escaping Woodland groups.

Tepees Supplant Earth Lodges

Most characteristic dwelling of the Plains Indians was the earth lodge (page 101). Before Coronado, the central Plains had been dotted with earth-lodge villages of agricultural peoples. Their remains may still be seen from North Dakota through Kansas.

Some of these groups had evidently brought with them from the northeast knowledge of the conical tent. In the northeastern Woodlands this structure was bark-covered, but in the Plains buffalo skins were substituted (p. 76).

The simplicity of the tent's construction, and its knockdown, portable nature made it extremely useful to the earth-lodge peoples when they adopted the custom of following the buffalo for part of the year.

With the introduction of the horse, the Indian could increase the size and portable range of his tent, or tepee. As time went on, a number of the tribes moving westward toward the Rockies abandoned the earth lodge and its accompanying agriculture, became nomadic hunters, and used only the skin tepee as a dwelling.

Typical of such tribes were the Comanche, the Kiowa, the Arapaho, the Cheyenne, and the Crow, most of whom have definite traditions of splitting off from the earth-lodge tribes.

The size, and to a certain extent the form and details of construction of the tepee, varied with the different tribes. Among the Crow and Blackfeet, tepees were in exceptional cases more than 50 feet in diameter.

For the cover of a typical tepee, 10 or 12 buffalo skins were required. These were divested of hair and tanned on both sides, then skillfully tailored to fit tightly over the conical framework of poles. The tent poles were usually from 14 to 16 feet long. The bark was peeled off and the poles rubbed smooth.

To erect the frame, three or four poles, depending on the tribe, were laid on the ground and lashed together about three feet from the small ends. These tied poles were raised and the butts spread apart the required distance and firmly set in the ground.

Ten to 20 more poles, according to the size of the tent, were then arranged with their bases in a circle and the upper ends laid in the forks made by the tied ends of the original poles. They were set in place so they

would lock one another, making a frame firm enough to resist a high wind.

A flap was built in the upper portion of the cover, next to the opening on top, for use as a ventilator. This was attached to a separate pole, the position of which could be changed according to the direction of the wind (p. 100).

Women Literally the Homemakers

Making, erecting, and transporting the tepee was strictly the work of the woman, and the tepee was considered to be her property (Plate VI). Frequently it was decorated by painting.

A simpler, more graceful, or more practical dwelling was never devised by man. A large tepee encampment of the western Plains around the middle of the last century was one of the most picturesque sights offered in the North American Continent.

To build an earth lodge, a well-drained level spot was selected and a circle from 30 to 60 feet in diameter was marked out. The sod within the circle was then removed to a depth of about a foot and the earth thrown around the circle in the form of an embankment.

Small crotched posts about 10 feet high were set 8 or 10 feet apart around the circle, and these were joined by beams laid on top. Split posts were laid against this frame, the lower ends being braced against the inner bottom of the embankment, forming a sloping wall. An opening was left for a doorway, usually facing east.

Halfway between the wall and the center were placed four heavy crotched timber uprights, 10 feet high, with beams laid across the tops in the form of a rectangular frame, to support the roof. The rafters were made of long, slender, tapering poles, stripped of their bark.

The butts were tied to the lower frame with bark strips and also were fastened in the same manner where they crossed the upper frame. The small ends were drawn together at the top, tightly woven together with bark cords, and cut to equal lengths, so as to form a circular opening for ventilation and the egress of smoke.

Across the rafters, willow branches were placed horizontally and lashed closely. Over these was placed a heavy grass thatch sufficient to shed water. On the grass was put a thick layer of sod, the segments overlapping like shingles. The sod then was tamped with earth, to be impervious to rain. From the door was built a tunnel-like entranceway, with movable skin curtains hung at both the inner and outer openings.

The floor was carefully prepared by first leveling and tamping the ground and then flooding it with water; then dry grass was piled on it and set on fire. This operation was repeated several times until the floor was hard enough to be swept easily.

In the center, directly below the smoke hole, a depression was made for the fireplace.

Built-in Couches Were Daytime Seats

Couches were built around the wall. These consisted of crotched uprights with cross-pieces making a rectangular frame, on which buffalo robes were placed. They served as seats by day and beds by night.

Near the entrance of the earth lodge a sort of miniature cellar was built. This was a hole in the ground about 8 feet deep, rounded on the sides and bottom and with an opening just large enough to admit a person. It was lined with poles and grass covered with sod.

In this the winter food supply was placed, consisting mainly of corn and dried meat, carefully packed. Skins and extra clothing were as a rule also kept in the cache, to be out of the way.

The earth lodge was airy, clean, and admirably suited to the severe winters of the northern Plains.

The sod house of the early white settlers of the prairies was merely a modification of the earth lodge.

The grass houses of the Caddo, the Wichita, and the Waco were very similar in construction, although the walls were steeper and they lacked the sod covering, since the milder climate of the southern Plains did not require it (Plate XI and page 76).

In the eastern part of the Plains area, many of the tribes lived in the mat- or bark-covered lodges as used in the eastern Woodlands area, keeping the habits of their ancestors who came from the forests east of the Mississippi. Among these were the Kansas, the Missouri, the Iowa, the Osage, and the Quapaw.

Typical of the sedentary agricultural tribes were the Mandan.

La Vérendrye, a French explorer, visited them in 1738. They then had six villages, all protected by encircling palisades and a deep ditch. The French were much impressed by the strength of these fortifications, which they observed must be impregnable to other Indians. This was evidently the period of greatest strength and prosperity of the tribe.

The Mandan were probably the earliest arrivals of the earth-lodge village-dwelling tribes of the upper Missouri. Later the Hidatsa, or Minatarees, as they are sometimes called, moved into the region from the east

where, although speaking a different tongue, they adopted in general the living customs of the Mandan.

Still later, a group of the Hidatsa separated and, moving farther westward across the Plains, gradually abandoned the earth lodge for the nomadic life of the tepee. Ranging near the headwaters of the Cheyenne and the Yellowstone in the eastern Rocky Mountains, they became the tribe known as the Crows.

From the south, about the same time or somewhat later, another group separated from the Pawnees and, gradually moving northward, likewise became earth-lodge neighbors of the Mandan. These were the Arikara, one of the most warlike of the upper Missouri tribes.

George Catlin described the principal Mandan village as it was in 1833, in this realistic account:

"In ranging the eye over the village from where I am writing, there is presented to the view the strangest mixture and medley of unintelligible trash (independent of the living beings that are in motion), that can possibly be imagined. On the roofs of the lodges, besides the groups of living, are buffaloes' skulls, skin boats, pots and pottery, sleds and sledges—and suspended on poles, erected some 20 feet above the doors of their lodges, are displayed in a pleasant day, the scalps of warriors, preserved as trophies; and thus proudly exposed as evidence of their warlike deeds.

"In other parts are raised on poles the warriors' pure and whitened shields and quivers, with medicine bags attached; and here and there a sacrifice of red cloth, or other costly stuff, offered up to the Great Spirit, over the door of some benignant chief, in humble gratitude for the blessings which he is enjoying.

"Such is a part of the strange medley that is before and around me; and amidst them can be seen in the distance, the green and boundless, treeless, bushless prairie; and on it, and contiguous to the palisade which encloses the village, a hundred scaffolds on which their 'dead live,' as they term it."

Smallpox Ravaged the Mandan Tribe

Fortunately for our knowledge of the Mandan, such observant travelers as Lewis and Clark, Brackenridge and Bradbury, Catlin and Maximilian visited them early in the 19th century, for in the spring of 1837 a smallpox epidemic struck them (Plate XV).

F. V. Hayden (page 101) reported that when the disease had abated the total number of grown men was 23, of women 40, and of children 60 or 70. These were all that were left of the 1,800 souls that composed the na-

Indians of Our Western Plains



© National Geographic Society

Painting by W. Langdon Kilin

Eagle Calf Dons His War Bonnet of Ermine Tails, Owl and Eagle Feathers

The warrior is a Blackfeet of Montana. This is the third in the series of paintings of American Indians from the brush of W. Langdon Kilin, made exclusively for the NATIONAL GEOGRAPHIC MAGAZINE.

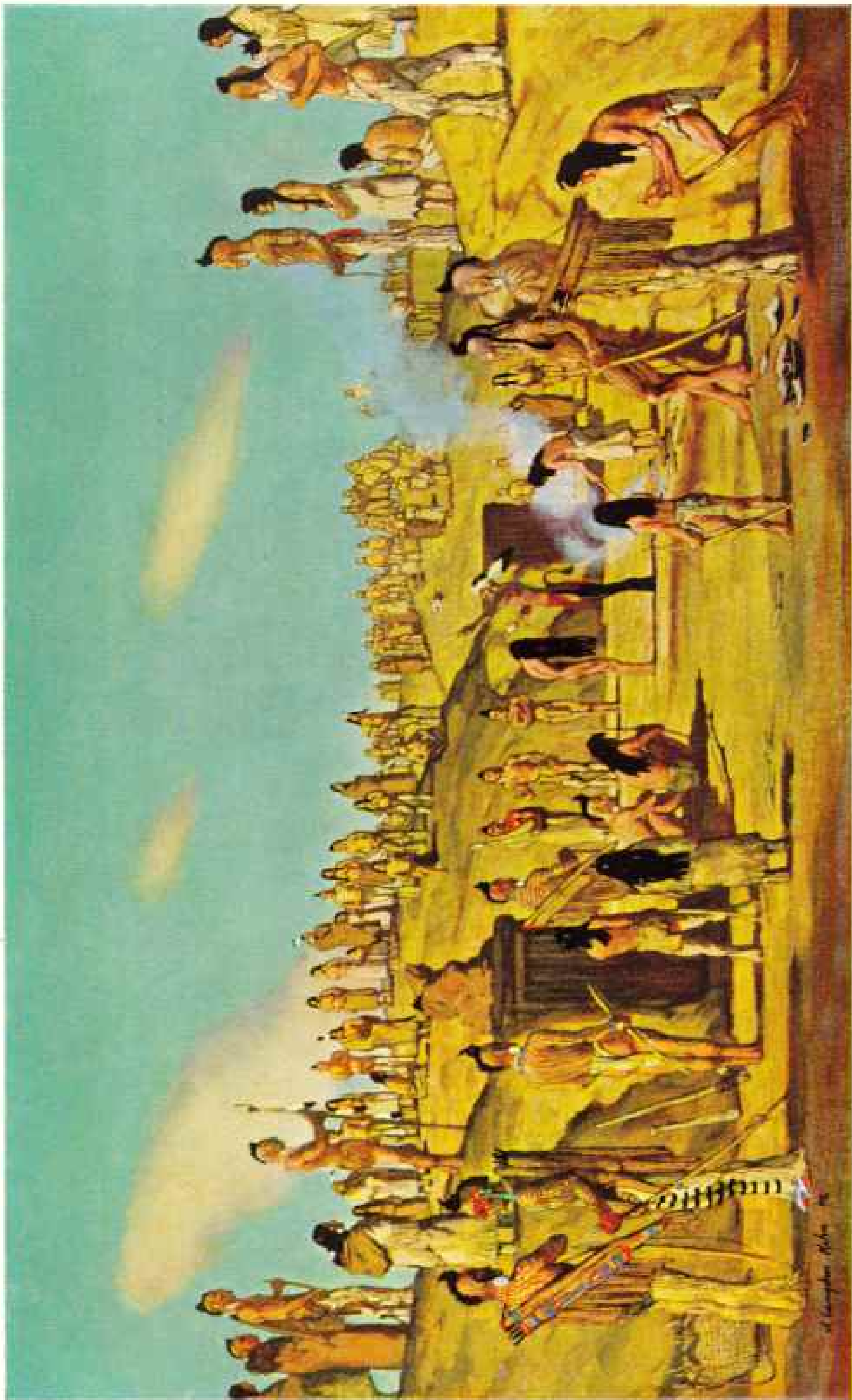


© National Geographic Society

Painted by W. Lamson Chan

Alarmed by Blanket-waving Indian Beaters, Trapped Buffaloes Stampede and Plunge over a Cliff to Their Death

Blackfeet hunters first built a V-shaped barrier of logs, rocks, and brush along the plain near the edge of the cliff. Indians on horseback, with buffalo robes thrown over both riders and mounts, led their quarry into the trap. These decoys escaped as best they could when the onrushing buffaloes swept down on them. The few animals not killed in the fall were seriously crippled and made easy targets for Indians waiting at the base with bows and arrows.



© National Geographic Society

Painting by W. Langdon Kahn

In the Smoke of a Sweet Grass Fire, the Nude Body of a Captive Girl Is Bathed before She Is Sacrificed to the Morning Star

Human sacrifice among North American Indians was rare. This rite, believed to make the earth fertile, was practiced by the Skidi-Pawnees. It is reminiscent of sacrifices held long ago in the valley of Mexico. The girl was tied to a scaffold and shot through the heart with an arrow. At such a ceremony 125 years ago, a young Pawnee warrior dashed to the scaffold, rescued the victim just as she was about to be slain, and carried her away on his horse. So impressed were the elders of the tribe with his heroic action that the Skidi-Pawnees eventually abandoned the barbarous custom.



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Painting by W. Langdon Kirby

Crafty Sioux Mass for Attack as General Custer Marches to His Fate on the Little Bighorn

Here the artist portrays the scene in the Indian camp just before "Custer's Last Stand," on June 25, 1876. Mr. Kihn went over the battlefield, with One Bull (Plate XVI), nephew of Sitting Bull, the Sioux chief who prayed to the gods during the fight. Dashing cavalier Custer had divided his 655 men into three battalions. Two of these, under Reno and Benteen, were several miles away. The Indians, numbering more than 7,500 and led by Gall and Crazy Horse, surrounded and annihilated Custer's small force, shown here approaching the Sioux rendezvous.



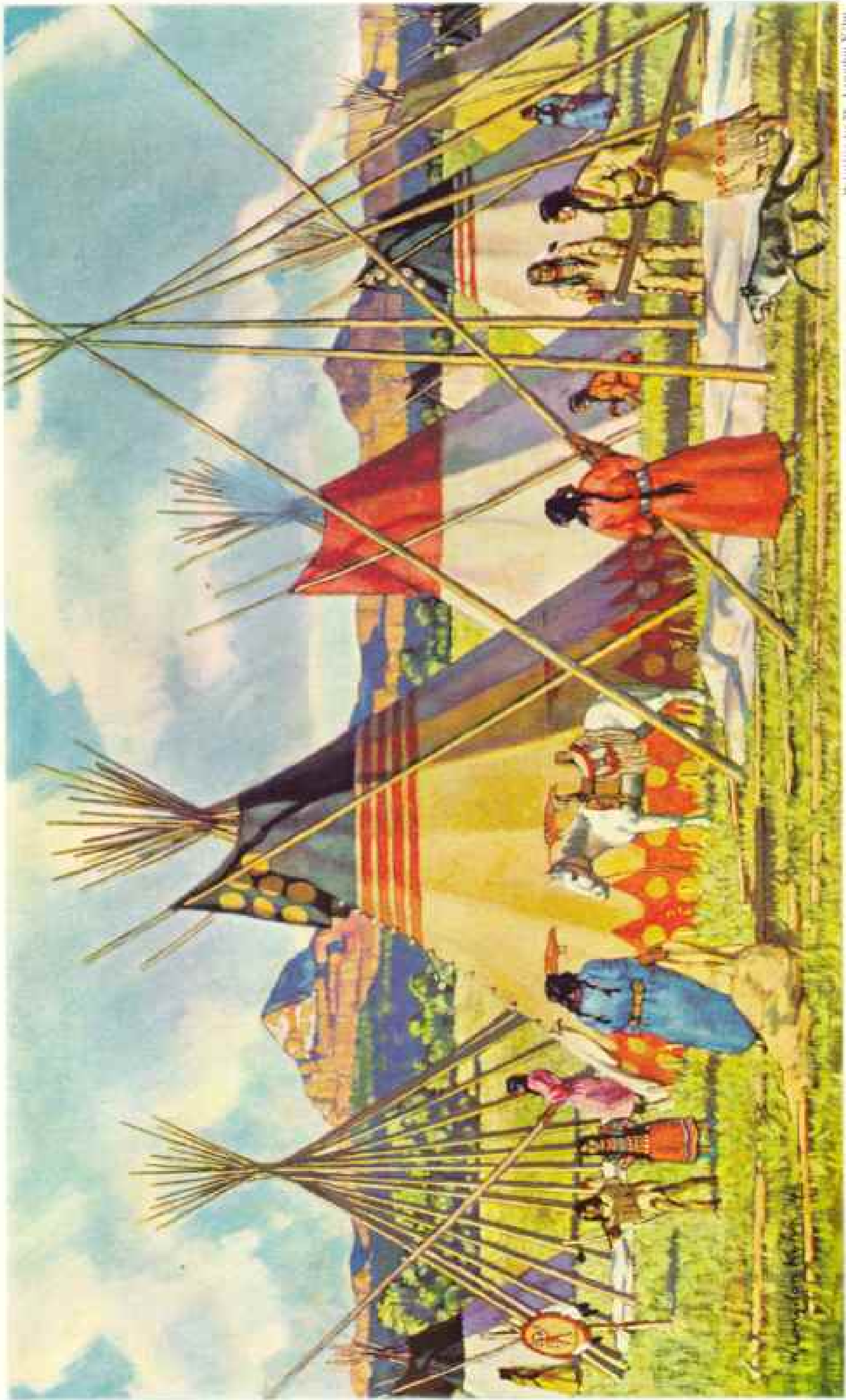
© Langdon Kiffin '40

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Painting by W. Langdon Kiffin

Headed by Seven-foot White Owl, Arapaho Line Up for the Famous Sun Dance of the Plains Indians

A sacred tribal pipe is wrapped in the medicine bundle, mounted on the four-legged support in front of the Sun Dance pole. Until recent years a feature of this ceremony was self-torture. Dancers would skewer their breasts and be dragged around by the sharp sticks until their flesh tore loose. The dance usually resulted from a vow made by a brave to overcome some force of Nature. This canvas depicts ceremony observed by Mr. Kiffin at Arapahoe, Wyoming, in August, 1940.

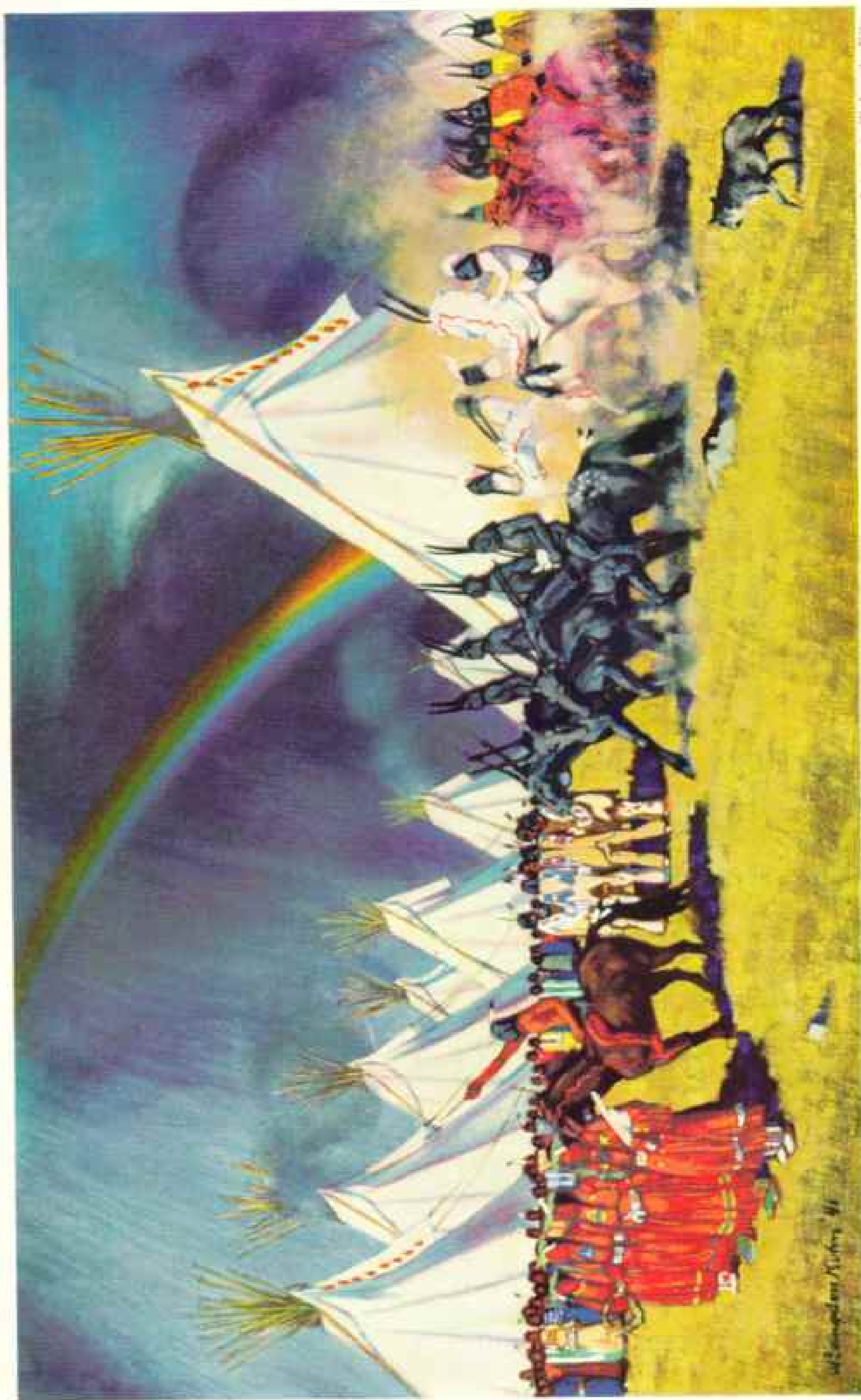


Painting by W. Langdon Kuhn

Blackfeet Women Put Up the Teepees as the Tribe Makes a New Camp

If a brave had trouble with his wife, he couldn't order her out of the teepee. It was her own property. He had to leave. One way of putting up a teepee was to lay three poles on the ground together, and fasten them into a tripod. This was raised in place, and other poles were stacked around the crutch. Then buffalo skins were stretched over the poles and sewed down the front, leaving a flap opening.

© National Geographic Society



Painting by W. Langdon Kirby

Rain and Hail Fall Near by in Answer to the Pleas of Sioux Horse Dancers

The artist and other spectators were drenched, but the downpour missed the performers, who carried out the ceremony in bright sunshine. Four black horses represent the west; white, the north; sorrel, the east; buckskin, the south. Riders are painted the color of the horses. Four girls in the van wear scarlet-dyed buckskin dresses. Their faces are dyed scarlet, single eagle feathers hang from their braided hair, and they wear wreaths of sage around their heads. Between the girls and the horsemen are six grandfathers, who sing songs.



© National Geographic Society

Painting by W. Louchton Kitchin

Masked by a Howling Blizzard, the Horse Thief Stealthily Approaches a Mount Tied Near Its Sleeping Owner's Teepee

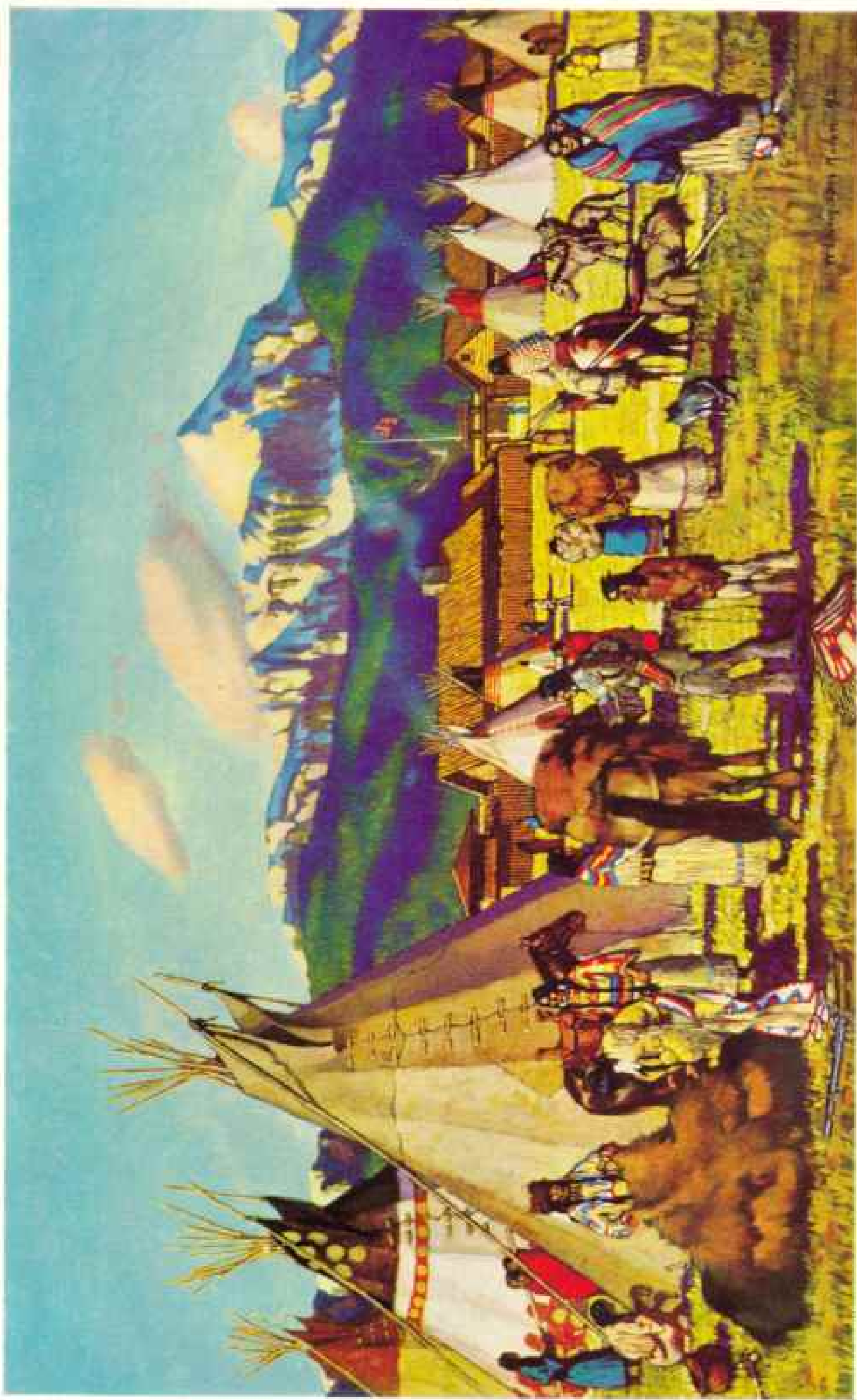
Stealing horses was an honorable occupation among the Plains Indians. A successful thief not only got a horse, but his fellow tribesmen acclaimed him for exposing himself to danger. If he was caught he was killed, just as white men killed horse thieves in the early days of the West. Chief honors came from stealing a mount tied near a teepee, which was much more dangerous than taking one in an open field.



Painting by W. Langdon Koch

"Now You See It, Now You Don't"—Sioux Indians Played the Moccasin Game for High Stakes

Sometimes the bettors, in desperation, gambled their wiven away at this sport, which resembles the old-fashioned pen-and-shell game. Ladderlike frames in this comfortably outfitted tepee are lazy-backs, or buck rests, which took the place of chairs. Beds are ranged around the wall. Containers and war trappings hang from the poles. The center fire kept such a tepid warmth in winter.

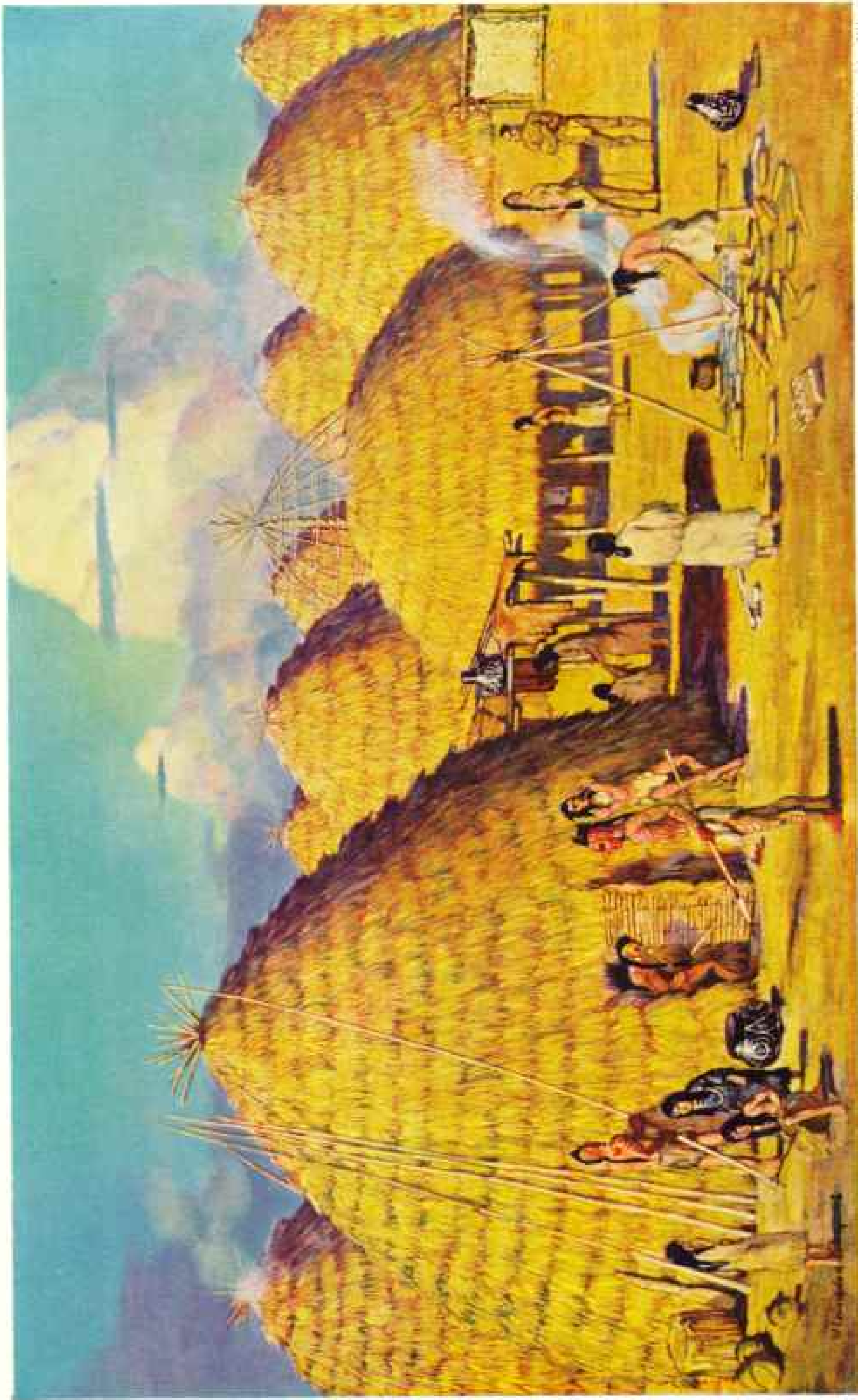


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Painted by W. Langbein, 1910.

Where Indian and White Man Met When the West Was Growing Up—A Government Trading Post

Here Blackfeet tribesmen have brought pelts to trade for dry goods, tobacco, vermilion (for face paint), brass, and diluted alcohol. A trader is emerging from the fort entrance beneath the flag to barter with the Indians. Soldiers stationed in the bastions could sweep the front of the fort with rifle fire. In the old West, tribes on the warpath often attacked such trading centers.

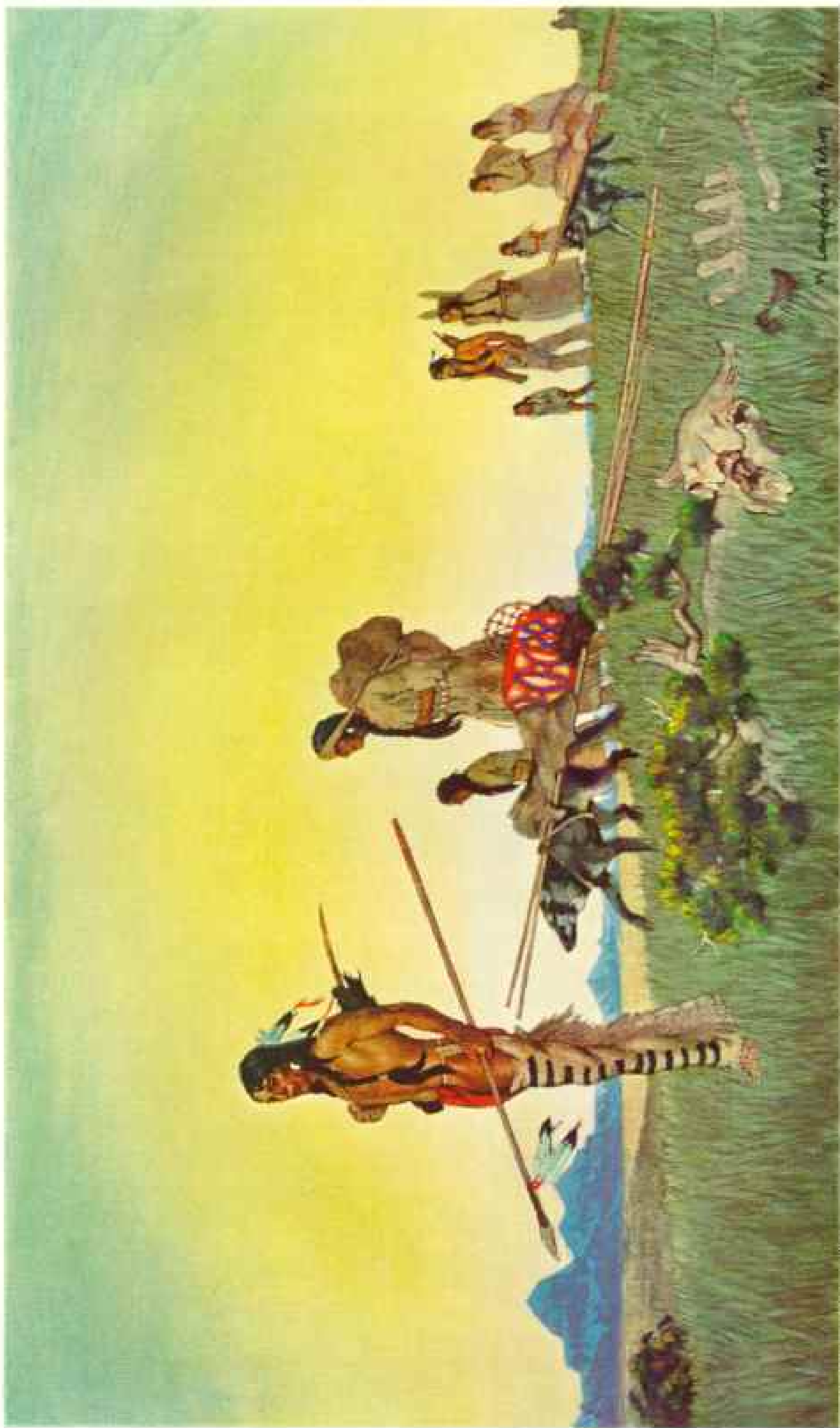


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Grass Huts of the Caddos, Southern Plains Indians, Look Like Dwellings in a Samoan Village

Painting by W. Langdon Kilim

Actually they are similar in construction to Indian earth lodges, which have sod covering added. Designs on the warriors' bodies are tattooed. Caddos and Wichita were fine potters. When Spanish explorers visited these tribes in the 16th century, they observed that the artistic style of the pottery was equal to the finest in Spain.



© National Geographic Society

Painted by W. Langsdorff Kibbi

Before the Spaniards Brought the Horse, Migrating Plains Indians Used Dogs and Travois to Help Carry Packs

A travois was two trailing poles, serving as shafts, with a platform built on to hold the load. Spanish horses, escaping their owners, fled to the Plains and large wild herds were built up. The Indians soon used horses instead of dogs with the travoises. Coronado encountered migrating groups such as these Kiowas when he reached the Plains in 1641. Although the Indians lived in permanent villages much of the year, they moved long distances in search of buffalo.



© National Geographic Society

Women, Wearing Braves' Regalia, Take Leading Roles in the Shoshoni Sculp Dance

Sculps flutter from the poles they carry. In no other tribal ceremony are they the leaders, and at no other time may they wear men's clothing. This dance is believed to bring benefits to the tribe. When it is held, the entire collection of scalps accumulated through the years is brought out, and the Indians dance around the trophies. The large emblem, center, is the insignia of a tribal military society which was carried by a battle hero, or, if he had been slain, by his widow.

Painting by W. Langston Allen

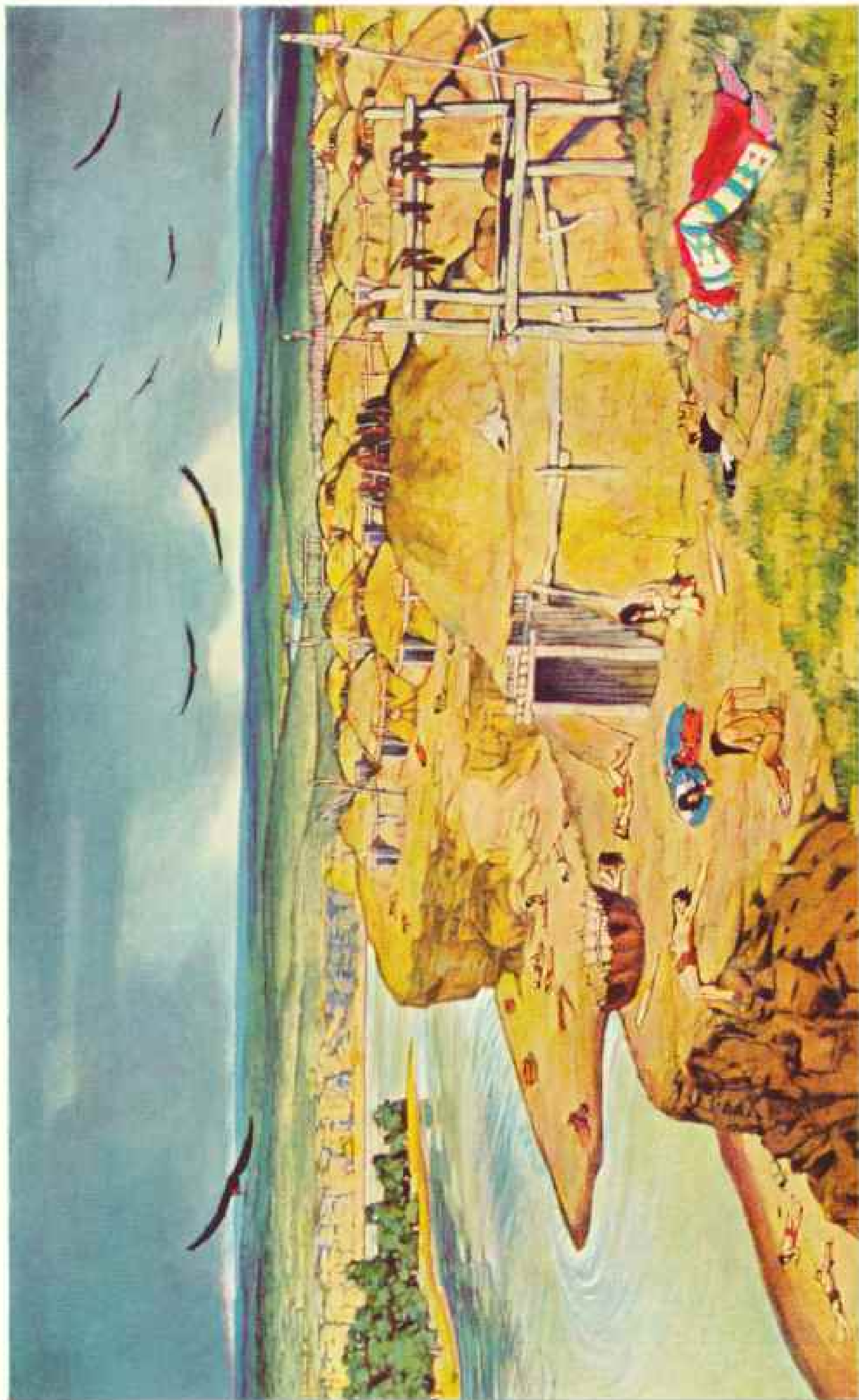


C. Nelson, Geographic Society

Indian Lookouts Spot a Gold Rush Wagon Train in the Sioux and Cheyenne Country

Painting by W. Langford 1887

They will carry the news back to their tribe and an attack will follow. When swarms of immigrants to California crossed the Plains in vast covered-wagon caravans, this intrusion on Indian domains brought many clashes between the two races. From 1843 to 1857 some 350,000 pioneers made the long trek. Nearly everyone in the East had a relative on his way to the Pacific Coast. Thousands of tales about the hostile western tribes filtered back home. That is how the Plains Indians became "The Indians" of North America in the minds of most people, and still remain so.



© National Geographic Society

Smallpox Scourges a Mandan Village in the 1837 Epidemic Which Nearly Exterminated the Tribe

Painting by W. Lammie K. Doh

Some of these upper Missouri River Indians were stricken after boarding a trading boat on which two white men were suffering from the disease. The epidemic spread throughout the tribe. The Indians had no way of combatting smallpox, and whole families succumbed rapidly. In a few months, only 23 men, 40 women, and 65 children had survived. Most of these were disfigured. They were soon absorbed by other tribes and the Mandans ceased to exist as a nation.



© National Geographic Society

Painting by W. Langdon Kihn

One Bull, Nephew and Adopted Son of Sitting Bull, Fought against Custer's Men
The veteran chief, 95 years old, vividly described for Mr. Kihn the Sioux encampment portrayed on Plate IV.

tion before the epidemic. Even those that recovered were disfigured almost beyond recognition.

Pottery was manufactured by the more sedentary, agricultural tribes such as the Caddo, the Pawnee, the Arikara, and the Mandan. Probably this art came into the Gulf States from Mexico and gradually worked its way northward.

Most skillful of the pottery makers were the Caddo. Their decorative ware drew the praise of 16th-century Spanish explorers, who compared it with the best in Spain (Plate XI).

The Pawnee and the earth-lodge tribes of the Missouri made earthenware until the middle of the last century, when metal utensils were introduced.

In 1833, Maximilian said of the Mandan, Arikara, and Hidatsa: "They understand the manufacture of earthen pots and vessels, of various forms and sizes. The clay is of a dark slate color and burns a yellowish red, very similar to what is seen in the burnt tops of the Missouri hills. This clay is mixed with flint or granite, reduced to powder by the action of fire.

"The workwoman forms the hollow inside of the vessel by means of a round stone which she holds in her hand while she works and smooths the outside with a piece of poplar bark. When the pot is made, it is filled and surrounded with dry shavings, and then burnt, when it is ready for use."

Buffalo an Animal of Many Uses

The thick woolly hair of the buffalo was used to stuff leather-covered balls for ball games and to pad saddles; for weaving bags and ornaments; for making rope; for cushioning beds and back rests.

The buffalo's beard was made into ornaments for clothing, bows, and lances. The tail became a decoration for tepees, a whip, or a fly swatter.

The skin went into tepee covers, clothing, bags and other containers, cooking vessels, shields, saddles, and robes.

From the ribs were made skin scrapers, arrow points, gaming dice, quill flatteners, and, when perforated, arrow straighteners. The shoulder blades were utilized for fleshing tools and axes, and by the agricultural tribes for making their principal implement, the hoe. They were even used as an artist's palette for mixing paints. The leg bones became knives, awls, fleshing tools, and hammers.

The skull was utilized as a fetish, and the porous nose bones as "paintbrushes." From the horns were made spoons, bowls, cups, arrowheads, and head ornaments.

Sinew was used for backing bows to increase their resilience, for sewing, and for making bow strings. From the scrotum were made rattles and stirrup covers; from the bladder, water bags. The intestines were used for string and for bow wrapping; the paunch for boiling water.

All the flesh, the organs, and the marrow in the bones were food. The fat served as a base for mixing paint, and as a deodorant for traps. Along with the brain and the liver, fat was used for tanning. Hoofs were turned into rattles, fetishes, and glue; gallstones into yellow paint. Blood and intestinal juices were used for drink. The dried dung, famous "buffalo chips" of the prairie, was an important fuel.

Three Ways of Hunting the Buffalo

The buffalo hunt was of primary importance to the tribe. Success as a hunter was one of the principal means of gaining prestige for the individual.

Buffalo hunting, however, was an organized affair subject to strict leadership and regulation. When scouts found buffalo in the vicinity, they took care not to be discovered by the animals, and reported at once to the village authorities. These men assigned particular roles to all the hunters, who were under military discipline as long as the hunt lasted.

Three methods of organized hunting were practiced. In the "surround" system, the animals were stampeded in a circle and shot by the horsemen, one by one, from the edge of the herd, until as many were killed as required. Skillful approach, clever utilization of the terrain where the herd was found grazing, and daring riding were essential as the hunters closed in.

This method was used in the south almost to the exclusion of all others, but was practiced to some extent in the north as well, particularly in the summertime.

In the northern Plains, the ground was covered a good part of the winter with heavy snow. Under these conditions the method of impounding was used. A strong corral was built with a narrow entrance, from which long fences in the form of wings extended outward in a V-shape. The animals were herded into the wings of the funnel, and men stationed along the sides kept them converging until they entered the enclosure where they could be easily killed.

Blackfeet and Crow practiced a third method of community hunting, based on a similar principle. Long converging wings were directed to the edge of a cliff and the animals driven over where they would be killed by the fall (Plate II).



Blackfeet Meet Maj. Gen. Hugh L. Scott at a Historic Gathering

Chief Owen Heavy Breast, left, and Chief Mountain Chief, wearing General Scott's old uniform, were Blackfeet leaders at the meeting held in July, 1925, on the site of old Fort Union, near Williston, North Dakota, famed in the annals of early explorers and fur traders. Beside General Scott stands a modern-generation Blackfeet woman, who put on tribal regalia only for the occasion.

When the buffalo were scattered, individual stalking was sometimes practiced. The hunter frequently covered himself with an animal skin and approached his quarry against the wind, until within shooting range. Both the lance and bow and arrow were used. The latter was a more effective weapon for a mounted hunter than the single-shot rifle.

Bow and Arrow an Effective Weapon

The short, recurved, sinew-backed bow used principally by the western tribes was admirably suited for short-range work on horseback, and observers have repeatedly reported arrows passing entirely through the body of a buffalo.

In early times the arrows were tipped with flaked stone points which were later replaced by triangular iron points after the coming of the trader. Southern and eastern tribes used mainly plain wooden bows, Osage orange being the favored material. The horn bow,

backed with sinew, was a very powerful type used by a number of tribes. In the West, mountain-sheep horns were used and in the North, elk horns.

Because of its effectiveness, the bow and arrow did not give way completely to the gun until the very end of the 19th century.

To the women fell the task of preparing most of the products of the hunt. The meat of the buffalo was cut into strips and hung on wooden frames where it was dried and smoked so that it could be preserved. Pounded with dried berries and wild cherries and mixed with fat, the dried meat was made into pemmican, a concentrated, nutritious food particularly suitable for carrying on journeys.

The skins of the buffaloes were staked out on the ground where the women scraped and dried them, and later made them soft and pliable by dressing with brains and other ingredients. They could then be worked into robes, dresses, or tepee covers.

The parfleche, a common container that largely took the place of baskets on the Plains, was made of rawhide. Stretching rawhide when wet made it thin. Repeated wettings and shrinkings made it thick, for use in the circular shields of the warriors.

On the Plains, rawhide soles were placed on soft leather moccasins. Indians of the eastern Woodlands made one-piece moccasins of soft leather; southwestern and Mexican Indians wore sandals.

Before the coming of the whites, the usual costume of Indian men was a small skin apron attached to a belt. The white traders brought in the breechcloth, which was worn by passing it between the legs and tucking it under the belt, fore and aft, so that it hung down a little at each end. This, with moccasins, was the normal dress for ordinary occasions.

Long skin leggings, reaching from ankle to thigh and fastened to the belt, might be added. Apparently only extreme northern tribes wore shirts, introduced by Canadian Indians.

In recent years, decorated skin shirts for display on dress-up occasions have been popular among all Plains tribes. Buffalo robes, made of dressed skin with the fur left on and the bare side decorated with painting or quillwork, seem long to have been a feature of the Plains.

Women Wore Elkskin Dresses

While near nudity characterized the men, women were more fully clothed. In most tribes they wore a full-length sleeveless dress of elkskin or buckskin, the upper portion of which extended to drape over the shoulders in the form of a cape (page 98). They also wore leggings which reached to the knee, where they were held by garters.

Clothing was decorated by painting and by simple geometric designs formed of dyed porcupine quills. When the white traders came, colored glass beads gradually replaced the quillwork.

It is usually possible to tell the date of an example of Plains beadwork, as the types of beads brought in by the traders changed from time to time. A favorite and much-valued decoration for women's dresses formerly consisted of the milk teeth of the elk, which were perforated and attached to the dress by sinew or thread.

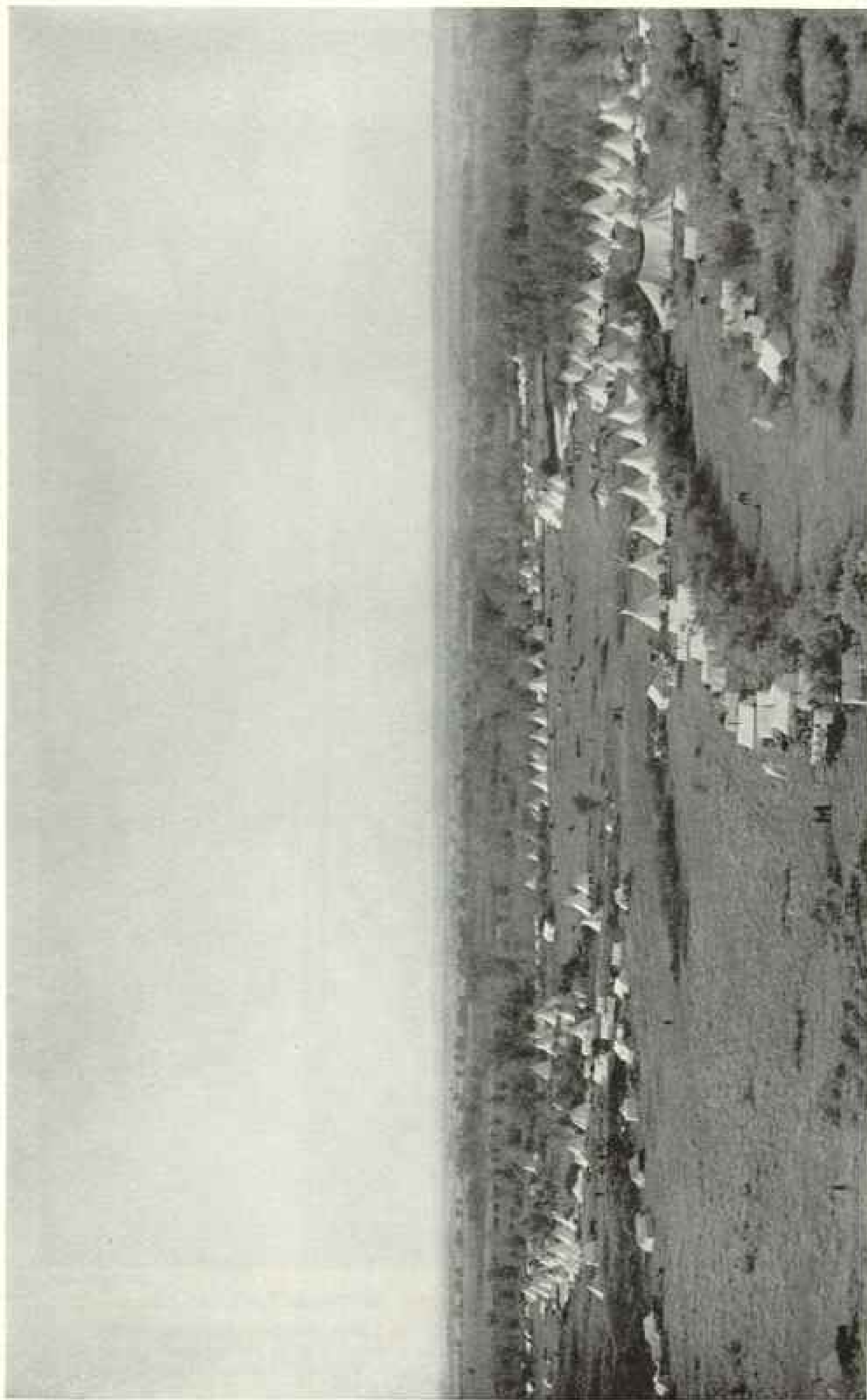
The women of the Osage, Pawnee,



© T. J. Hilman

On the Inside Looking Out

One American Indian practical invention is the baby cradle, held in place by a strap around mother's shoulders. The smiling papoose is comfortable and the squaw has both hands free for other tasks. The back of the cradle is a flat board. Cradle styles varied from tribe to tribe.



Historic Wasmuth-Hooper Expedition

In This Modern Crow Indian Camp, Standard Tents Encroach on Tepees; Paleface Canvas Covers Them All

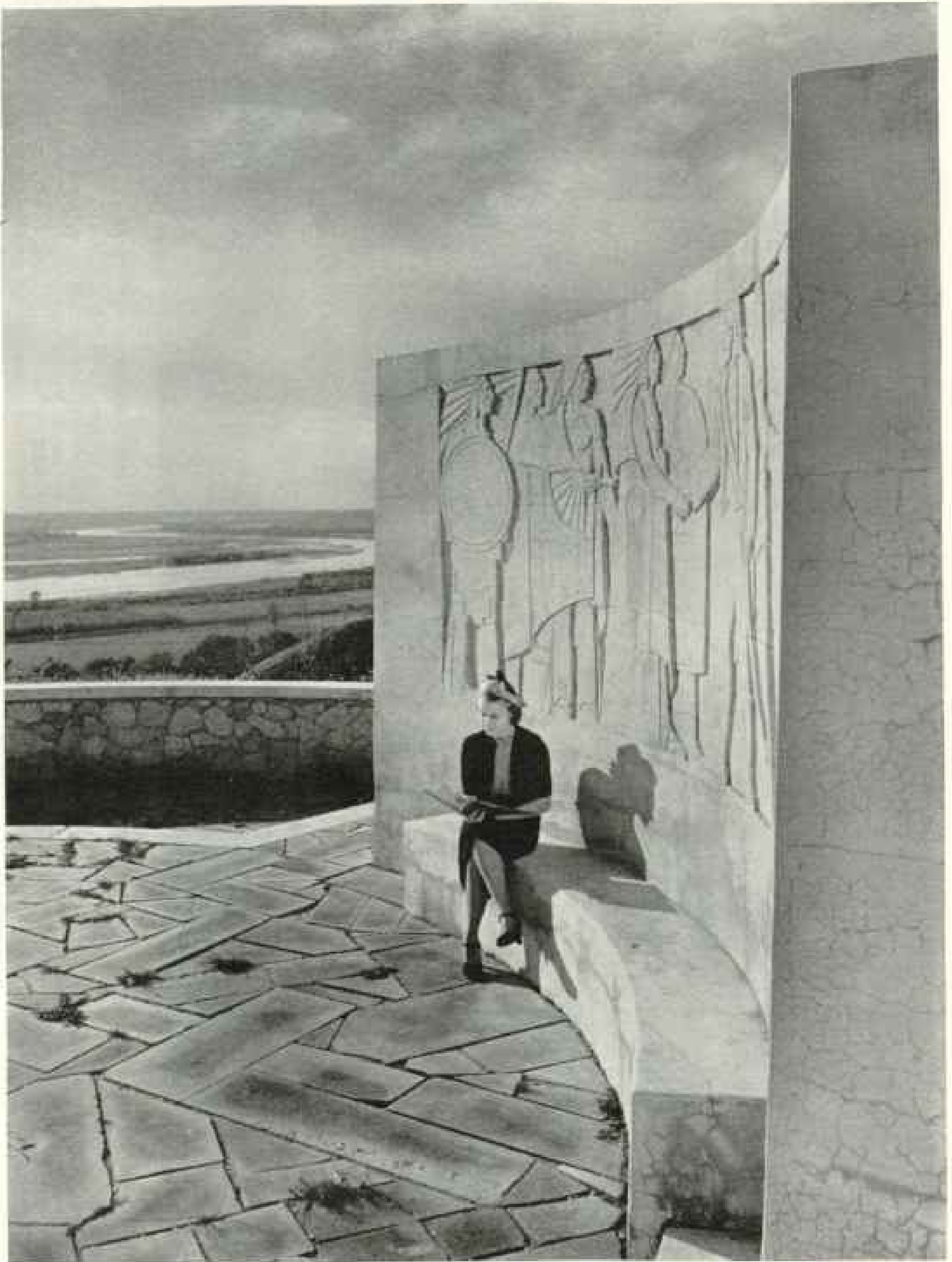
Even the traditional encampment arrangement has been altered by time and progress. In the old days, each band arranged its tepees in a small circle. Covers formerly were of dressed buffalo skin. Tepees of the old Plains Indians were made, cared for, and set up by women. Long, slender poles formed the framework. Wings, or flaps, kept the wind out of the smoke hole at the top (pages 76, 77).



Smithsonian Institution

73 Years Ago William H. Jackson Photographed These Pawnees Outside Their Earth Lodges on a Fork of the Platte River

Dome-shaped, sod-covered homes have tunnel-like entrances. The weather is cold, so the Indians wear blankets, some of buffalo skins and others of trading-post wool. Teepee poles are stacked over the entranceway. Roofs afford vantage points from which to watch anything of interest going on in the village. The picture was made on one of Jackson's famous early camera pilgrimages to the West. From 1870 to 1878 he was the official photographer for the Hayden Surveys, headed by Ferdinand V. Hayden, first United States Geologist. In those days of wet photographic plates and cumbersome equipment, pack mules and rugged trails, Jackson's exploits were outstanding. In 1871 he made his first series of the Yellowstone, a collection which helped induce Congress to make it a national park the following year. This foremost photographer of the Old West died on June 30, 1942, at the age of 99.



J. Darius Roberts

This Memorial Marks a Historic Meeting of Lewis and Clark with Plains Indians

On the explorers' expedition up the Missouri River in 1804 (page 73), they stopped at the present site of Council Bluffs, Iowa. Either here, or across the Missouri (background), in Nebraska, they held council with Oto and Missouri Indians. The memorial, erected in 1935, stands on Scenic Rainbow Drive in Council Bluffs.

and Cheyenne wore a two-piece costume like that of the eastern Indians, consisting of a separate skirt and cape.

No headgear was worn by either men or women, except that in the far-northern limits of the Plains fur caps were sometimes used.

The feather war bonnet with tail seems to have spread in recent times from the Dakota to the other Plains tribes (Plates I and XVI). Very few individuals were entitled to wear them, and then only on certain ceremonial occasions or when on a war party.

During the present century this decoration has so caught the popular fancy that in the mind of the public it has almost become the trademark of the American Indian. It is now worn by professional Indians in distant tribes who 50 years ago had never heard of it.

In traveling, the Plains Indian apparently never made use of the great waterways that traversed his domain. Entirely lacking canoes or boats, he used only the so-called bull-boat for ferrying across the larger streams. This consisted of a circular framework covered with buffalo hide, making an unwieldy craft shaped like a half orange. It was propelled with a wooden paddle.

Coronado Brings the Horse

When Coronado's men first visited the western Plains, they found hunting parties utilizing a large wolflike type of dog as a beast of burden. The dogs were equipped with packs weighing 40 to 50 pounds or were hitched to the travois (Plate XII).

This device consisted of a frame platform mounted on two light poles, the smaller ends of which were attached to a harness around the dog's shoulders, while the butts dragged on the ground behind.

Crude as was this primitive device, it marked the most important step in the beginning of the nomadic life, which later was the most characteristic feature of Western Plains Indian life. Employment of dogs as burden bearers and use of a sledlike device are probably traits that came from the north, where such usage was common.

Not until almost a century after Coronado did the horse appear in any numbers, but when this happened it rapidly brought about profound changes in the ways of Indian life. As a mount, the horse enabled him to hunt the buffalo more effectively and to pursue game at greater distances. As a beast of burden, it facilitated the moving of equipment and personnel. In the languages of almost all Plains tribes, having no word for this new animal, they called him by a term meaning "big dog."

The mounted Indian rode bareback. The women utilized a saddle modified from the type introduced by the Spaniards. The horse was adopted quickly, but nowhere in the world were more expert horsemen developed.

Just as the horse increased the effectiveness of hunting, so did it increase the effectiveness and range of war expeditions. Transcending its original primary purpose of vengeance or protection, warfare developed into a glorified game or pastime for gaining honors and prestige or for pure excitement and adventure.

Like any game, it acquired definite rules and a scoring system. The ultimate object became the exposure of the individual to risk and danger rather than the killing of enemies, which was of secondary importance.

The principal scoring was from the counting of coup. The highest honor to be obtained was to touch an enemy in combat with the hand; next in order was to touch him with bow or a coup stick, usually carried on war expeditions for this purpose.

To spear an enemy with a lance and thus dismount him was also a great honor. Much less of an honor was to shoot him with a bow and arrow or gun. Witnesses to such exploits were of course desirable, but seldom did a man falsify his achievements. On certain occasions it was the right of a warrior to boast publicly of his deeds.

Warriors Kept Records of Feats

Also important were such feats as capturing the gun of an enemy, taking a scalp, or stealing horses from another tribe (Plate VIII).

Records of these exploits were kept by the warrior in picture writing, painted on the walls of the tepee or on the bare side of his buffalo robe. In later years notebooks or ledgers obtained from the whites were often used for this purpose.

A man became an "ace" after he possessed four coups or more, and this was in many tribes a requisite for positions of honor or leadership.

Performance of such exploits entitled the warrior to wear certain combinations of feathers, face painting, or other insignia which told the initiated onlooker at a glance just what honors the wearer held.

Prominence and authority in the tribe depended mainly on the accumulation of such war honors. Prestige was enhanced by a reputation for generosity and by giving help to the needy. The element of self-denial implied in giving away valuable property, such as horses, was admired.

"Family connections" had nothing to do with the standing of an individual in his

group. Leadership or the so-called chieftaincies were not inherited but were the reward of a man's personal achievements.

The Plains Indians' concept of warfare was far different from our own. Not until warfare in defense of his territory was forced upon him by the advance of the white man did he fight for motives consistent with our ideas.

Disregard of Indian war regulations by the white man gave the Indian a handicap under which to fight and increased his contempt for the lack of sportsmanship of the white, who was ignorant of the rules, for the most part, and probably unwilling to follow them in any event.

As the whites pressed westward in ever-increasing numbers, taking up the lands and slaughtering the buffalo, the Plains Indian realized that unless this advance was checked he was doomed as a free person.

Disease and Hunger Defeated the Indian

Treaties failing, he felt that armed resistance was his only hope. Not accustomed to organized warfare, the Indian probably did not realize in full the hopelessness of his task, but his success against insuperable odds was remarkable. In his favor was his familiarity with the region in which the fighting was conducted, his fine physical condition, excellent horsemanship, and, above all, the tradition of warfare and the fact that he was fighting to preserve his deeply loved homeland and his way of life.

Against this were the organization, superior equipment, greater numbers, and resources of the invaders, and in most instances foemen with a persistence and courage equal to his own.

In the end, with all these handicaps, it was disease and the decimation of his food supply rather than bullets and the numbers of his enemies that brought about the inevitable end of his regime.

Political organization as usual among American Indians was rather loose in practice. We speak of tribes, but it is not always easy to say what constitutes a tribe. There are 7 divisions among the Dakota: the Yankton, Teton, Sisseton, Yanktonai, Mdewakanton, Wahpeton, and Wahpekute. These groups were all self-governing and independent. Yet, bound by a common language, they thought of themselves as one people and did not make war on one another. The name Dakota means, in the Sioux language, "Friends."

The Blackfeet have three independent political groups: the Piegan, Blood, and Blackfeet. Like the Dakota units, these consider themselves closely related.

The Hidatsa, an earth-lodge people, speak

the same language as the Crow, a tepee-dwelling group. Yet because their customs differ in many respects, they do not think of themselves as closely affiliated.

Each of these subdivisions is split up into several smaller groups commonly designated as bands, each with its own leader or chief. Membership in bands is as a rule hereditary, and they are in effect family groups. In many cases marriage within the band is forbidden.

In the tepee-dwelling tribes, the organized camp circle was a prominent feature. Each band pitched its tepees in an assigned segment of the circle. In the center was the council tent, where the leaders of the bands would meet as a group to decide common affairs. At regular intervals around the circle were the tepees of the police, appointed by the council to enforce all regulations. They were selected from men's societies or clubs, which were of a military or ceremonial nature.

These men's societies were generally named for animals. In many of the tribes the societies were arranged according to age grades, so that a man automatically "graduated" from one to another as he grew older.

Some tribes in the northern Plains had women's societies organized along similar lines, but lacking the military or police functions. Frequently the practical function of the women's society was the performance of ceremonies to aid in obtaining game.

Names Secret, and Subject to Change

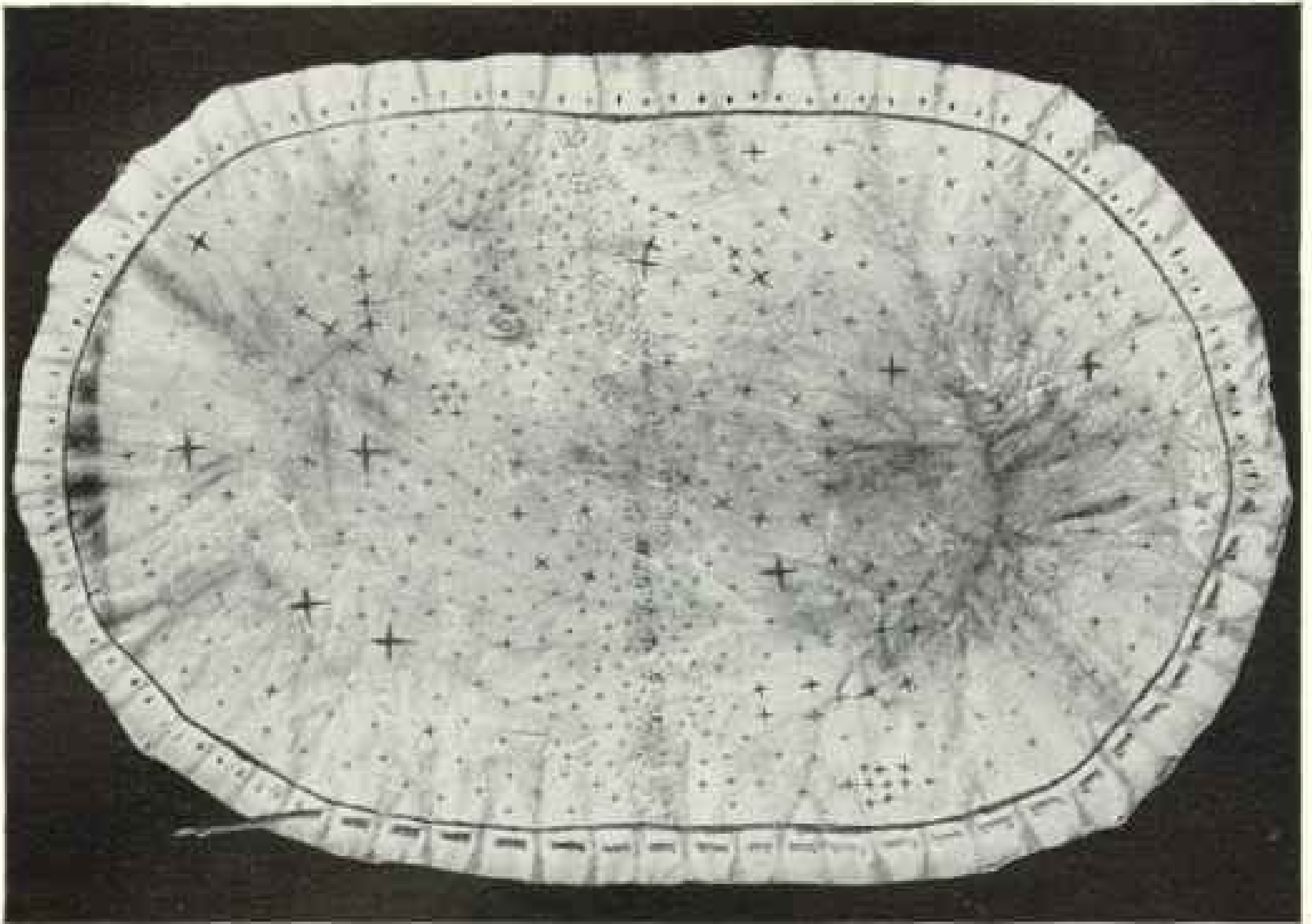
Among the Plains tribes, names were believed to possess magical virtues. When a child was born, the parents usually selected an old person, preferably one with many achievements, to bestow a name. The Indians did not inherit family names as we do. In the case of a boy, his first name was retained until adolescence, when frequently a new name would be bestowed upon him.

When, as an adult, he had an unusual dream or performed some noteworthy deed, his name would again be changed, not once, but sometimes several times. As a rule, girls retained their first names throughout life. Marriage did not alter a woman's name.

Names could be sold, pawned, given away, or discarded at will. The name of a particularly brave or successful man was usually considered a valuable property.

Individuals in most tribes were never addressed by name. To do so would be considered the deepest insult. Often the owner of a desirable name kept it secret.

Frequently Indian names suggested by some exploit or incident sound curious to our



In the Days of Columbus, the Pawnees Made This Famous Star Map

For generations tribal chiefs kept their treasure a guarded secret. Dr. George A. Dorsey, Indian scholar, discovered it after he had been elected a member of the tribe. The map is now in the Chicago Natural History Museum. So accurate is the workmanship that astronomers can calculate its approximate date by the positions of the major planets.

ears. A prominent Kiowa gloried in the name "Stinking Saddle Blanket." To the Indians this implied that he was a man who rode so hard and far on the warpath that he did not have time to change his saddle.

Loose or mistaken translations of Indian names into English often produced curious results. The name of the famous Chippewa chief "Hole in the Day" should have been translated "Rift in the Sky." The well-known Dakota Sioux warrior "Young Man Afraid of His Horses" actually was "Young Man Whose Very Horses Are Feared."

Sitting Bull, the Hunkpapa Sioux leader (Plates IV and XVI), was so called because the hieroglyph of his name appeared to represent a seated buffalo. Actually, in translation, his name meant "The Bull in Possession." This name was common among Plains Indians.

Occasionally whites liked or admired by the Indians have been given names formally in Indian fashion, this action implying acceptance as a group member. In recent years the name-giving practice has degenerated into a profitable racket in many places, donation of

a valuable gift or of money by the white person being a requisite of the ceremony.

Among most groups a real or valued name can be formally transferred by tribal representatives only after it has become "open," as it were, by the death of the individual last holding it. Conferring of such names has real significance to the Indians. For commercial ends, good-sounding names are coined for the purpose and conferred at will.

The Indians are far from devoid of a sense of humor. A Blackfeet, noted among his fellow tribesmen for his stinginess, carried the name "Johnny Belches When He Eats." He reported to the council that since associating with the whites he had been much embarrassed by the fact that they usually laughed at him when they heard it. Therefore, he formally requested the council to bestow a new name on him.

It was necessary for the beneficiary to furnish a feast for the gathering; so Johnny purchased for the purpose, at minimum cost, a very small and undernourished steer. The council met and, after keeping Johnny in sus-



Staff Photographer Richard H. Stewart

Indian Chiefs Induct Stratosphere Flyers into the Sioux Nation

In cowboy hats and chaps, Capt. Albert W. Stevens (now Lt. Col., U. S. A., ret.) and Capt. Orvil A. Anderson (now Brig. Gen., U. S. A., with Eighth Air Force in England) received the warriors at their camp near Rapid City, South Dakota, in November, 1935. Capt. Stevens, left, received the title of Chief Fly Against the Clouds; Capt. Anderson, Chief Swift Eagle. Here, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the officers ascended in their balloon, *Explorer II*, to the world altitude record of 72,395 feet. With them in the gondola (background) they took aloft nearly a ton of scientific instruments, with which extraordinary results were obtained.

pense for a couple of days, finally called him in to announce that they had agreed his cause was just and that they had given him a new name.

"Henceforth you are to be known as 'Johnny Does Not Belch When He Eats.'"

Plains Indians Sought "Wakonda"

The religious concepts of the Plains Indians are similar to those of American Indians in general. The term *wakonda* in the Siouan languages expresses the idea of super-

natural force. Many natural phenomena are viewed as deities. With most Plains tribes the sun is pre-eminent, a conception evidently coming from the south. The sky, the moon, the earth, and the wind are also personified as deities.

Lesser supernatural beings are the ruling spirits of the buffalo and the bear, lightning, thunder, rain, and whirlwind. Associated with these are numberless mythological beings whose exploits are narrated in a lengthy series of myths. The basic religious ideas seem rather vague to the Indians themselves, but the rituals, paraphernalia, and concepts which have to do with the utilization of these powers are specific.

One of the primary ambitions of every man is to acquire part of *wakonda* for himself, by establishing contact with some supernatural being. He seeks the aid of a medicine man, who instructs him and sees that he undergoes a prolonged fast with prayer in some lonely place. Usually the period culminates with some heavy physical exertion, such as climbing to the top of a steep hill, where the man has

a vision and speaks with some animal helper in anthropomorphic form.

These encounters usually entail learning a song from the supernatural being, the naming of some object to be carried as a personal charm, and the acquiring of specific tabus, such as certain foods that must never be eaten.

The vision is usually recounted to the medicine man, who interprets it, and the future life of the individual is conducted accordingly.

The animal who gave the revelation is regarded thenceforth as the protector of the

individual, who generally carries with him the skin or feathers or some other part of such an animal, together with additional objects associated with the vision. These are then made into a bundle which is always carried on any dangerous or important undertaking.

Ceremonies for Sale

If he were so unfortunate as to be unable to have a vision of his own, the man might purchase such a bundle from a medicine man. These so-called medicine bundles constitute a conspicuous aspect of Plains religion.

Some famous bundles became the property of societies or tribes and were made the central feature of elaborate ceremonies. The more important bundles are usually made up of sacred objects obtained from several individual bundles.

Very frequently a tobacco pipe is an essential feature of the bundle and is passed around during the ceremony. These bundles acquire high value but may be sold or transferred. Even sacred songs, prayers, or entire ceremonies may be sold or borrowed.

The most widespread and characteristic ceremony of the Plains is the so-called Sun Dance (Plate V). At one stage of the ceremony, participants gaze with open eyes at the sun while dancing. The central pole of the lodge or bower in which the dance is held symbolizes an enemy and, as part of the ritual, the dancers strike it and count coup (103).

The most spectacular feature of this dance in former times was the practice of self-torture. Several of the male dancers placed wooden skewers through the skin or fleshy part of the breast and back. The dancers were suspended on lines attached to the skewers, where they struggled until the flesh gave way and dropped them to the ground.

A variant of this was to attach heavy buffalo skulls to the lines. These were dragged on the ground by the dancers until the flesh holding the skewers gave way. If, as was considered desirable, the skewers were placed so deeply that they refused to break loose, other dancers would sit on the skulls to give them added weight.

This dance, always held in the summertime, is given by a tribesman out of thankfulness for a supposed divine deliverance from great danger, at which time a vow was made to hold the ceremony.

Another interesting ceremony was the sacrifice to the Morning Star as formerly practiced by the Skidi-Pawnee (Plate III). This ritual involves ideologies which appear Mexican in character, and it is evidently southern in origin.

Like the ancient Mexicans, the Pawnee regarded the heavenly bodies as representing important deities. The two most important sky gods were the Morning and Evening Stars, which represented respectively the male and female principle. As such they were regarded as parents of the first humans.

Kidnaping a Bride for the Morning Star

The sacrificial ceremony was not held at regular intervals but usually resulted when the Morning Star appeared in a dream to some warrior and demanded it, or when the star seemed to be unusually bright, or when a comet appeared in conjunction with it.

As a preliminary, it was necessary to capture a maiden, the more beautiful the better, from some neighboring tribe, to be sacrificed as a bride of the Morning Star. Frequently the captive would be held for several months until the proper season for the ceremony arrived. During this time she was given every comfort and treated with the greatest respect, as befitted the prospective bride of a god.

When the day for beginning the ceremony arrived, the priest came to the lodge of the chief and spread out the contents of the medicine bundle as an altar. Prominent participants were the chief and the man who had captured the girl.

The girl was brought into the lodge, undressed, and her entire body painted red. She and her male captor then were dressed in costumes contained in the bundle.

Residents of all the villages were invited to the ceremony. Preliminary ceremonies lasted three days, during which time everything possible was done to allay the fears of the girl. On the afternoon of the fourth day, a scaffold was erected outside the village, consisting of five symbolically painted horizontal bars lashed between two uprights. The right half of the girl's body was painted red and the left half black, and a fan-shaped eagle-feather head-dress was attached to her hair. She was led to the scaffold, everything possible being done to conceal her fate from her.

The procession was timed so that the arrival at the scaffold corresponded with the rising of the Morning Star. If the girl mounted the scaffold of her own will, it was considered an especially favorable omen.

The girl was lashed to the scaffold, and as soon as the star appeared over the horizon, a small group of warriors sprang from concealment and rushed toward the scaffold as if attacking an enemy.

The man who had made the capture shot an arrow from close range through the heart of the victim, using the bow and sacred arrow



© 1891 by Grant

William F. Cody, "Buffalo Bill" (left), Points Out a Hostile Indian Camp

He is a scout for Maj. Gen. Nelson A. Miles (center). The picture was made on January 16, 1891, during General Miles' campaign which crushed the Ghost Dance uprising of the Sioux tribe that winter. "Buffalo Bill" became a celebrated wild West showman in 1883.

from the medicine bundle. Every male in the tribe then shot an arrow into her body, fathers or male relatives pulling bows for boys too small to do so themselves.

The sacrifice was the climax, but not the end of the ceremony. For the next three days the entire village feasted and danced. The sacrificial victim was supposed to represent the Evening Star and the ceremony was intended as a renewal of life on earth.

A Pawnee Lochinvar

The Pawnee apparently always disliked this ceremony. One of the most romantic episodes in Plains Indian history took place in connection with it. The hero of this affair was a young Pawnee chief named Petalesharo, who was considered the handsomest and most daring man in the tribe.

In 1818 the tribe was assembled to hold the Morning Star sacrifice. The girl had been lashed to the scaffold preparatory to the final act, when Petalesharo stepped forward, dramatically declaring that he intended to rescue the girl or lay down his life in the attempt.

He leaped on the scaffold, cut the girl's bonds and, seizing her, carried her rapidly through the astonished crowd to a point where two horses had been led. Placing her on one and mounting the other, he rode swiftly away

with her until safe from pursuit. He then presented her with the horse she was riding and with food, and told her to return to her own people, some 400 miles distant.

Petalesharo returned to his village. His prominence and previous honors were such that no attempt was made to punish him. It is probable that most of his tribesmen admired the unprecedented feat. Human sacrifice was never again connected with this ceremony by the Skidi-Pawnee.

The colorful paraphernalia of the Plains Indian have lately been copied from coast to coast, until they have almost standardized the former multiplicity of local Indian costumes and decorations.

Artists have looked upon him as the perfect Indian model. From time to time his features adorn some of our coins, paper currency, stamps, and public monuments.

Like the eagle whose feathers he prized, the Plains Indian has become almost a symbol of America. His brave and fearless struggle to retain the lands which he himself had so recently pioneered won the admiration and respect of all who opposed him.

No one by act or thought has more perfectly symbolized the spirit of proud freedom and independence which we cherish as an ideal in our type of democracy.

Behind the Lines in Italy

BY CORPORAL MACON REED, JR. *

ALL SICILY seemed to be covered with mashed-up ripe tomatoes, smaller, more pear-shaped, and less juicy than our own. In every doorway and vacant space in the sun lay planks and stone slabs covered with mash, which was getting considerable attention from the insects. It was tomato paste in the making.

That was my first impression of Italian life. Since then, along with tens of thousands of other behind-the-lines troops, I have seen and mingled with a great deal of Italian life, some in Sicily,† but mostly on the mainland, and I never get very far from those tomatoes. The Italians eat this paste, or *salsa*, at every meal.

Most city families eat a smooth, strained, commercial product put up in streamlined, sanitary fashion; but what we eat with our village friends down the hill is the old-fashioned country stuff, scraped off the planks and slabs, liberally salted, and put up in an open stone crock. It is at least half peels, and a slight fermentation gives it a special tang.

Chicken or Rabbit Stew? Each Costs \$5

When G. I. grub on our own Monastery Hill palls unbearably, we drop over the bank to "Mama's" and order rabbit or chicken. A medium-sized specimen of either costs \$5.

Mama waddles to the salsa crock and ladles liberally from it into the big iron pot. Then she chops in a little onion and garlic, adds water, and heaves the pot onto the tripod in the open fireplace.

Papa by now has finished cutting up the meat, and in it goes. We sit under the smoke-blackened rafters of the ancient stone inn overlooking the sea, and over a glass of wine watch proceedings in the giant pot in the corner. After about an hour we are busy agreeing that French cooking seems overrated, and we are also busy trying to dodge the head, if it was a rabbit.

Italians eat all of a rabbit, with the possible exception of the fur. We are willing to go a long way down the road with them in this, but that head! There is something disconcerting in the one-eyed-profile stare of half of a cooked rabbit head.

Enthusiasm of an Italian friend for beans cooked with salsa led me into a delightful cross-country junket. Beans, at 90 cents a pound in the black market, and otherwise unobtainable, are an impossible luxury among our villagers. My friend, however, heard a

rumor that beans were only 30 cents a pound at a village 40 miles away.

Red Orrell is in charge of a little outfit near this village. I had a 36-hour leave. The circumstances just naturally dovetailed for me into a hitchhiking expedition across sundry hills and a big plain full of armies. I was looking for Red and for beans.

Tall Grapevines and Deep-cut Roads

Leaving aside the military, the most interesting phenomena I observed were the depth of the roads and the height of the grapevines. It seems to me that the vines certainly must be the world's highest. Across the plain stretched row after row of widely spaced, rather tall, and almost limbless trees. Up each trunk ran a cable's girth of grapevine, and often as not, at a height of 50 or 60 feet, the vine would be trained out over space to the next tree, 50 or more feet away.

The object, so the natives said, was to give the grapes the utmost in sunshine for the good of the wine.

The trees, apparently a sort of poplar, were permitted to grow just enough twigs and foliage to keep alive. An incidental result of the high-flying vine scheme was that it permitted the large-scale cultivation of winter wheat on the ground below.

The little dirt lanes and roads across this plain, as well as those on the hills, are almost always cut to a remarkable depth, enough to hide from sight a horse and cart. Why? Just a matter of a few hundred years, possibly three or four thousand, of traffic that has gradually cut the roadbeds down into the soil.

Red's outfit turned out to be practically on the water, surrounded by sand and never-ending, ordinary low-level vineyards.

His off-duty men spent a lot of their spare time hanging around back of the beach, hungrily eyeing a flock of birds offshore. Bill Bittner had pronounced them wild ducks, and there was always the off chance that he might be right and that they might come in close enough for a shot some day.

The boys stayed back of the beach because

* The author, a member of the ground troops, Army Air Forces, has been in the Mediterranean theater of war since the United Nations' invasion of North Africa in November, 1942. Before entering the service, Corporal Reed was a Washington, D. C., news correspondent.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Sicily Again in the Path of War," by Maynard Owen Williams, September, 1943; and "Zigzagging Across Sicily," by Melville Chater, September, 1924.



O. S. Army Signal Corps, Official

"What Do You Do in the Infantry? You March, You March, You March!"

A foot-weary United States soldier strikes the pose of this Italian World War I memorial statue in the Sicilian town of Brolo. He was in the Yank army that trekked eastward from Palermo along Sicily's northern coast to capture Messina in August, 1943.

of certain big black things, half uncovered by the waves, that looked like tortoises nesting in the sand. They were German antitank mines.

Red's camp had adopted three Italians—a 15-year-old who did the K.P. work in exchange for his food, and two six-year-olds who did mascot duty, particularly around mealtime.

The mascots were named Pinoke and Minoosh. Both were very silent children, which is unusual in Italy, and very hungry, which is normal. Of the two, Minoosh was the more interesting, being perfectly square.

Next day we climbed a small mountain to

look over a ruined old monastery. The mountain had one of those gravity-defying springs almost at the top, and we followed the rill all the way up. It was cluttered with delicious water cress, which we munched as we climbed, to the astonishment of Italian field workers. But we were just as astonished that they did not eat it. With the battle for food what it is, you don't see the Italians passing up much that is eatable.

The spring jumped out of the mountain under an elaborate terra-cotta bird cote and beside a small and now-empty pool, both of which were part of the monastery. It was said that in the old days the monks bought their fish alive and kept them in the pool until needed.

The stone ruins were almost ancient enough to support Red's claim that they got there ahead of the mountain. A friend of his, an Italian youth, lived there with his mother and father, and nine brothers and sisters. There were several big stone rooms intact. This boy said he had

escaped impressed labor with the retreating Germans by hiding out 45 days in a forgotten grotto with the wheat crop.

Life Revolves about a Wheat Basket

That wheat, four or five hundred pounds of it in an immense rope-fiber basket, was the solid center of gravity of the family. It sat in the dining room. The little sisters, from one meal to the next, worried it into flour through a decrepit old ten-cent-store coffee grinder. Red's friend could not persuade us to stay for dinner, nor could we persuade him to sell us either a chicken or an egg. And he had no beans. The Germans got them.

So we went back to Red's camp empty-handed, but it was a balmy spring day in the dead of winter, with wild flowers blooming on the mountain where snow had been a week before and would be again a week later.

The mountain was fairly well covered with grass and brush and bramble, but without trees, and, as Nimrod Bittner concluded after poking into every clump of weeds, without quail.

Inquiry at the village established the truth of the beans rumor. I trekked back to my own mountain and monastery with eight pounds of them in a sugar sack: cost, \$2. After a few hours' leisurely association with salsa (page 109) in Mama's iron pot, those beans tasted like another trip pretty soon.

If food looms large in the behind-the-lines, nonmilitary life of American soldiers, you must remember that we get extremely hungry for something different—and the people we sojourn with get extremely hungry.

Virtually my first act on taking up life in the field, in November of '42, was to buy two eggs from an Arab shepherd boy and squat in front of my pup tent in a high wind to cook them in a mess kit. The one unforgettable thing about each of the many places where we have been stationed is the price of eggs.

Those first two eggs cost three cents apiece. Last summer in Tunisia, two eggs cost 20 cents or 10 cigarettes.* The high point in our hot, dreary day was egg frying at dusk over a blowtorch under an olive tree the natives claimed was 1,500 years old. Our chief association with the Tunisian natives was in the purchase of food.



Charles Seawood from *Actus*

By Friendly Signs, She Welcomes an M. P. to Anzio

Signora Marcella Giorgi, 81 years old, was the only woman permitted to remain on the Nettuno-Anzio beachhead during the Yank invasion. She remained to care for her invalid husband, who could not be evacuated from the danger zone along with other civilians. The Signora kissed every arriving soldier who came within her reach.

Our eggs came from Big Arab Joe, so called to distinguish him from other Arabs, since of course all Arabs were named Joe. He lived under a mat of wheat straw just outside our vast olive orchard, and he had a camel named Winston. If we had an officer named Winston at that time—well, that was a remarkable coincidence, wasn't it?

Irrigation by Camel-power

Anyway, Winston the camel walked up and down all day attached to a superbly fashioned

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Eastward from Gibraltar," by Cyrus French Wicker, January, 1943, and "Americans on the Barbary Coast," by Willard Price, July, 1943.



International News

A Sicilian Donkey Takes to the Road Again as Guns Are Stilled in Comiso

The wrecked tank is mute evidence of the futile Italian defense of Sicily. The sign, "Duce," is one of thousands on walls and buildings. Parasols are "must" equipment for Sicilian belles, to keep the hot sun from creasing their smooth skin.



U. S. Army Signal Corps. Official

Center of Attraction in an Italian Village Is an Army Movie Cameraman
Civilians and Italian police crowd around as the sergeant tries to explain the mechanism of the camera.

rubber-sheathed section of G. I. power cable. The cable led over a lopsided, hand-carved wooden wheel into a well and was tied to a camel-hide water bag. On each trip Winston hauled water up into a cistern.

At dusk Big Joe uncorked the cistern, and as far as the water would flow out on the parched ground, so far extended his cultivation of tomatoes and peppers and melons.

Tunisian melons are not nearly so sweet as American ones, and the Sicilian melons were even worse. The latter are so dry that it is no wonder that, hung from the rafters of the combination dining room-living room-kitchen-wine cellar-storeroom, they kept until after Christmas.

In both Sicily and Italy, by the way, they pick tiny tomatoes in September and hang them up in the cold, where they will keep for months, more or less fresh.

Eggs in western Sicily were seven cents, but constituted virtually our sole dietary relief during a hot, dry, late summer. There were, of course, endless grapes, which were allowed to hang on the vine through the ripeness and well into the raisin stage before being harvested for wine. That made the wine very sweet.

When we reached Italy in October and got settled on Monastery Hill, the price of an egg was 35 cents. Since there were no eggs, the price made little practical difference, unless to convince us that the war was really going pretty far.

Our billet was on a hill, flat as a pancake on top, but with extraordinarily abrupt slopes. We found the earth wonderfully soft for digging our foxholes, and my friend Stud wants to carry some along to our next location so



Charles Curtis from *Armed*

G. I. Joe Shares "Mess Kit Luck" with Two Young Admirers

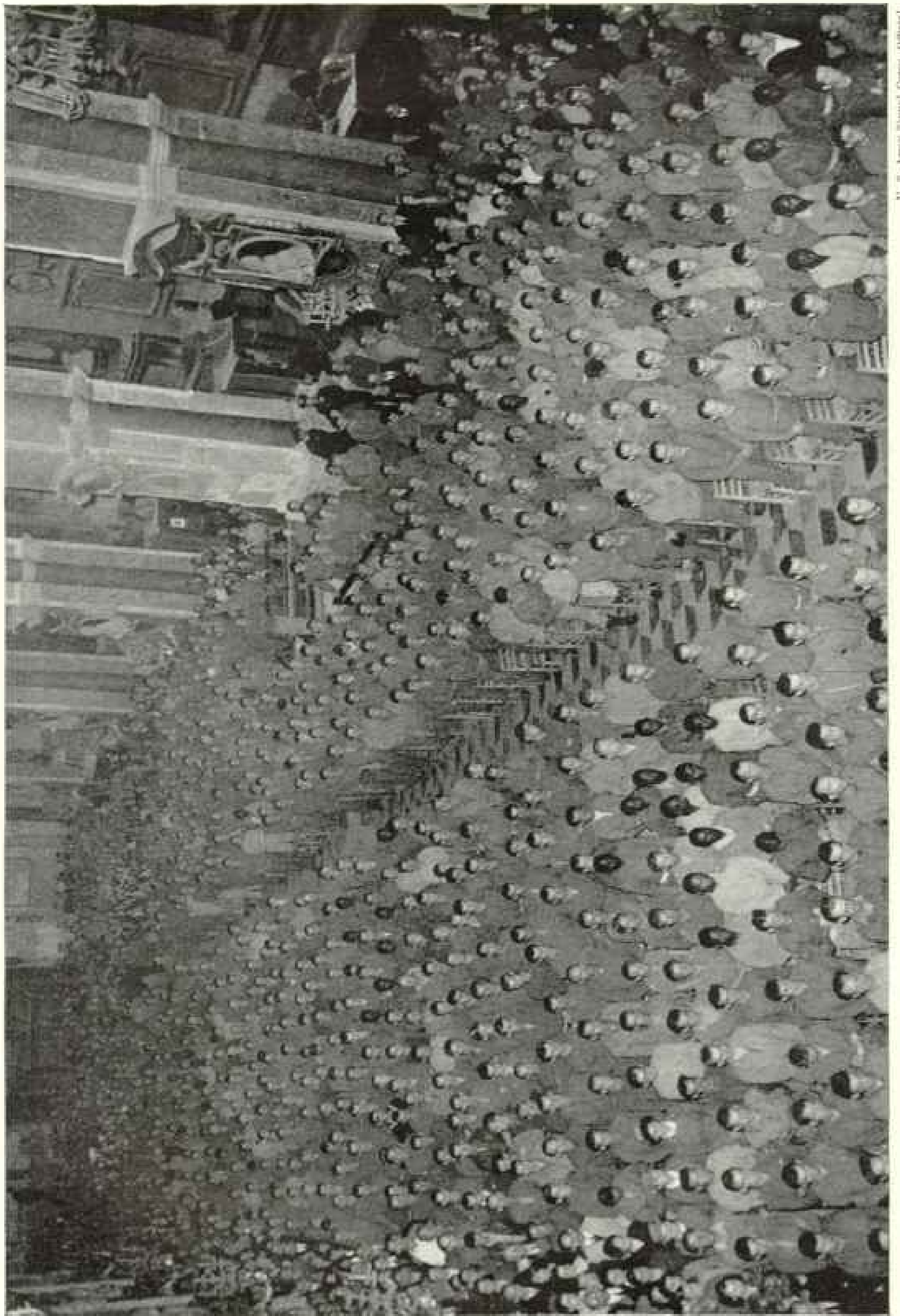
This scene is enacted daily at any U. S. Army camp in Italy. Italian youngsters put a vigorous stamp of approval on Army rations. The author's camp adopted two waifs as mascots. They never failed to appear for mascot duty at mealtimes (page 110).

we can dig our holes there in the same dirt.

The flat, soft top tends to slough away, but is retained by thick walls and a circlet of fine, sturdy evergreens that look like a cross between live oak and holly. Sometimes we have a curious wind that seems to blow *up* the slope, threshing the cliff-side and top branches of these trees violently, yet leaving our little plateau in a dead calm.

Our Italian neighbors accepted our incursion with pleasure and wonder, though they previously had mingled with soldiers from the other side of this war.

Our cook, Bill Stanphill, has a regular bi-weekly wine racket. On bread-baking days he exchanges a handful of salt, a scarce com-



U. S. Army Signal Corps, Official.

American Soldiers, Flanked by Italian Civilians, Attend Religious Services in an Italian Cathedral



Little Alickin from American Red Cross

Some U. S. Infantrymen Arise for Early Mass; Others Slumber on an Attic Storage Floor in the Italian Battle Zone

modity hereabouts, with the Italian baker for a glass of wine, also getting scarce.

The brick-lined bread oven is deep in a basement. The baker first heaves in several armloads of grapevine cuttings and ignites them. When they have burned out completely, he rakes the ashes out, mopping the oven floor with a succession of tufts of alfalfa and wet burlap on the end of a long pole.

Then, deftly, with a 12-foot paddle, he deposits 25 or 30 loaves of dough directly onto the stone floor. Three hours later the retained heat has done them to a turn.

One of our chief delights is to visit the Monastery Hill (not to be confused with the more celebrated Monastery Hill overlooking Cassino), which is within walking range of our camp. The monks, few in number and all elderly and prodigally bearded, lead a pretty shut-in life, and before the war visitors were scarce. You had to be practically an ambassador or at least a visiting king or queen to get in at all.

Jive Music Sounds in a Monastery

As we came to know them, we decided to give them a little radio music; so we rigged up a set and a loud-speaker within earshot of the monastery vineyard for their edification. The monks have no radios within the walls of their monastery and are not supposed to be listening to any, but they reasoned that if the stuff was coming in anyway, and they happened to be within hearing distance, they could not very well not listen.

An extraordinary amount of puttering about with the grapevines seemed necessary in the immediate vicinity of that loud-speaker, particularly when we turned on some Italian programs for them.

Every inch of the grounds around our billet is cultivated. Artichoke plants line the walks. Turnips are sowed between the grapevines almost before the fruit is gathered. The turnips are gone now, and green peas are racing to grow up and get eaten before the vine foliage thickens to shade them.

The whole countryside is just as intensively cultivated, even to the chestnut stumps. Two- and three-year-old sprouts are cut off for firewood, with a couple of sprouts left to keep the stump functioning. Cauliflower and broccoli are favorite between-the-vines crops in many vineyards. The broccoli is leafier, coarser, and tastier than the fancy bunches we get in the States, and fries excellently in bacon grease, if a fellow can coax a couple of spoonfuls out of Stanphill.

From one brow of our mountain, the terrain is a maze of steep-sided ravines which in

America would be abandoned as gullies. Here they are laboriously terraced to the top. First a bank some six feet high, holding back a terrace level perhaps 15 feet wide, with two or three rows of grapes and a carpet of alfalfa or winter wheat; then another 6-foot bank; another carpeted vine strip; and so forth to the top.

Terrace Farming on Ravine Slopes

The grass crops are harvested by hand, and often as not fed armful by armful to rabbits or chickens. "Plowing" on such terrain is accomplished in a manner evoking groans of sympathy from G. I. country boys who know real work when they see it. The plow is a heavy hoe, more than twice the size of the American cornfield implement, and it gouges the earth to a depth of ten inches.

With the same hoe, an Italian field hand can swing dirt up onto a terrace side and tamp it into place, thus keeping his banks mended.

Within the hour of our arrival, one such hoe heaver, soft-spoken Vincenzo Pastore, made inquiry whether we could use his boy Francesco, age 15, as camp pot-walloper. He would cheerfully work for nothing—except the leftover food. The proposition was warmly advocated by the day's K.P., and Frankie was hired forthwith.

He was a skinny, peaked little fellow, but industrious and cheerful. A few weeks of G. I. eating turned him out apple-cheeked and sturdy, and his family eats wonderfully, all on food that otherwise would be wasted. Many, if not most, Army camps have such arrangements.

Frankie is about the most popular man in camp and is well clothed in a collection of castoff G. I. garments. Tips shower down on pay day to the tune of 15 or 20 dollars. When called to attention, Frankie snaps to with great precision, but a three-star general couldn't wipe that smile off his face.

The boy's first windfall came after Stud invested the mess fund in a pair of half-grown turkeys. He tied them to a grapevine and fed them prodigally, but they drooped. Stud figured they needed exercise, and took to herding them personally about the grounds with an old German rifle. The rifle was for use in case they should try to fly off.

But the turkeys were past flying. Stanphill declared they undoubtedly had the roup, or maybe the big craw, and could not survive without a special serum, of which our medics had none. So Frankie fell heir to the sick birds and got an hour off to race them home to the chopping block before they should expire of illness and be uneatable.



Ollie Atkins from American Red Cross

Neapolitan Bootblacks "Shine 'Em Up Fine" for U. S. Officers and Red Cross Girls

Their impromptu stand is along the Via Roma, Naples' main traffic street, which cuts through the city in a straight line from south to north. Numerous avenues and lanes stem out from both sides. The Via Roma was laid out four centuries ago. In background, the arched doorway leads to one of Naples' numerous arcades, lined with small shops.

One of Frankie's regular perquisites is the garbage, although there was considerable litigation about it for a while, the neighbors wanting it mightily for their chickens.

Frankie used to sell it to a pig-owning villager until our sergeant's girl friend, whose papa also kept a pig in the basement, took to pooping. It looked as if Pat did not like her much, she declared, letting the garbage go somewhere else when "*Porco di papà molto fame finish promenade.*" Translated: "Papa's pig is too weak from hunger to walk."

Garbage Concession Changes Hands

Pat finally bought back the garbage concession from Frankie, and now "Papa's pig eating much; can walk." And Pat is still *persona grata*.

At our first stop in Italy, a few miles from here, I met a family of four elderly ladies. One kept house, two did needlework, and one

went to business as a typist. That is, she had until our bombers finished her place of business a couple of weeks before. As the family's sole wage earner, she brought in 590 lire a month. Rent on a very nice three-room apartment is 190 lire, and potatoes cost about three lire a pound. It is a little close, but the family gets by.

The Allied Army comes in and fixes the lira at 100 to the dollar. It is a very convenient figure: one lira equals one cent.

My corporal's pay is 7,900 lire, about a year's pay for the typist lady. Rich was no word for me—for a few days. I casually paid \$20, two thousand lire, for a hand-knit bedspread, and they thought I was a fool for offering such a price.

But I am not alone. Italy is crawling with thousands of G. I.'s, all of whom are throwing around—according to Italian standards and the official exchange rates—unheard-of



U. S. Army Signal Corps, Official

An Italian Turkey Learns about the American Christmas Dinner

This U. S. Army Quartermaster Salvage Battalion mess sergeant and his helper arrange preliminaries for the annual feast. Turkeys in Italy forage for themselves until they are confined for fattening a few weeks before they are to be killed. Efforts of the author and his camp mates to put weight on two stubborn birds ended in failure (page 116).

amounts of money. Prices leap violently. Today I couldn't touch that bedspread for \$75. It cost the old ladies 15 lire to treat me to a rather nice bottle of wine to celebrate the bedspread deal. Today a much poorer bottle costs 80 cents in our village.

Potatoes, which the black market offers most days and the legitimate market rarely, if ever, cost 20 cents a pound. It is to be hoped that the women are selling a lot of bedspreads at the new price.

Fresh meat, under the pressure of G. I. buying, runs quickly to \$1.25 a pound; fish is no cheaper. The same is true of everything, from cameos to haircuts.

There is at the time of writing a universal distribution of bread, a shade under half a pound per person per day, at nominal cost. There is some question whether this amount, plus what fresh vegetables are within reach of the ordinary citizen, is enough to maintain

life. My Italian friends say not, and explain that they are compelled to buy bread at 75 cents a pound in the black market.

It is hard to tell just how acute their food difficulties are, for the tale of woe is sure to grow with the telling. I have scouted around a good bit and have never seen anybody dying of hunger; on the other hand, I never found anyone without a pretty keen appetite.

This continual hunger, probably more exasperating than serious in most cases, is the key factor in Italo-G.I. relations.

G. I. Joe Takes Up Stove Fanning

In the individual case, you can imagine G. I. Joe's impulses upon making friends with an Italian family, as thousands have done. Joe is a generous fellow and his friends are hungry. And this does not apply just to pretty girls, either. The result is a substantial



U. S. Army Medical Corps, Official

U. S. Medical Corps Men Give First Aid to a Pretty Civilian Casualty

Her home village, near Benevento, became part of the battleground in the American Fifth Army drive to cross the Volturno River. Many villagers fled to surrounding hills during the bombardment, later returning to find their homes reduced to heaps of debris.

stream of all kinds of supplies trickling out of kitchens, supply trucks, and dumps.

By the same token, G. I. Joe's friendship is welcomed in many families with a warmth which is not altogether disinterested.

Even so, I believe the people here are pretty genuinely fond of us. They say that we are much less high-hat and standoffish than were the Germans. G. I. Joe is certainly gregarious and friendly, and the first thing the family knows he is out in the kitchen making himself at home fanning the stove while Mama works up the macaroni.

Macaroni (*maccheroni*), by the way, is plural in Italian, and if you like the macaroni you should say the macaroni *are* good, not *is* good.

But to explain stove fanning: The Italian kitchen stove, a type prevalent in North Africa also, is a charcoal burner which is middle-named economy. It is a block of masonry set in the corner, maybe four feet high by

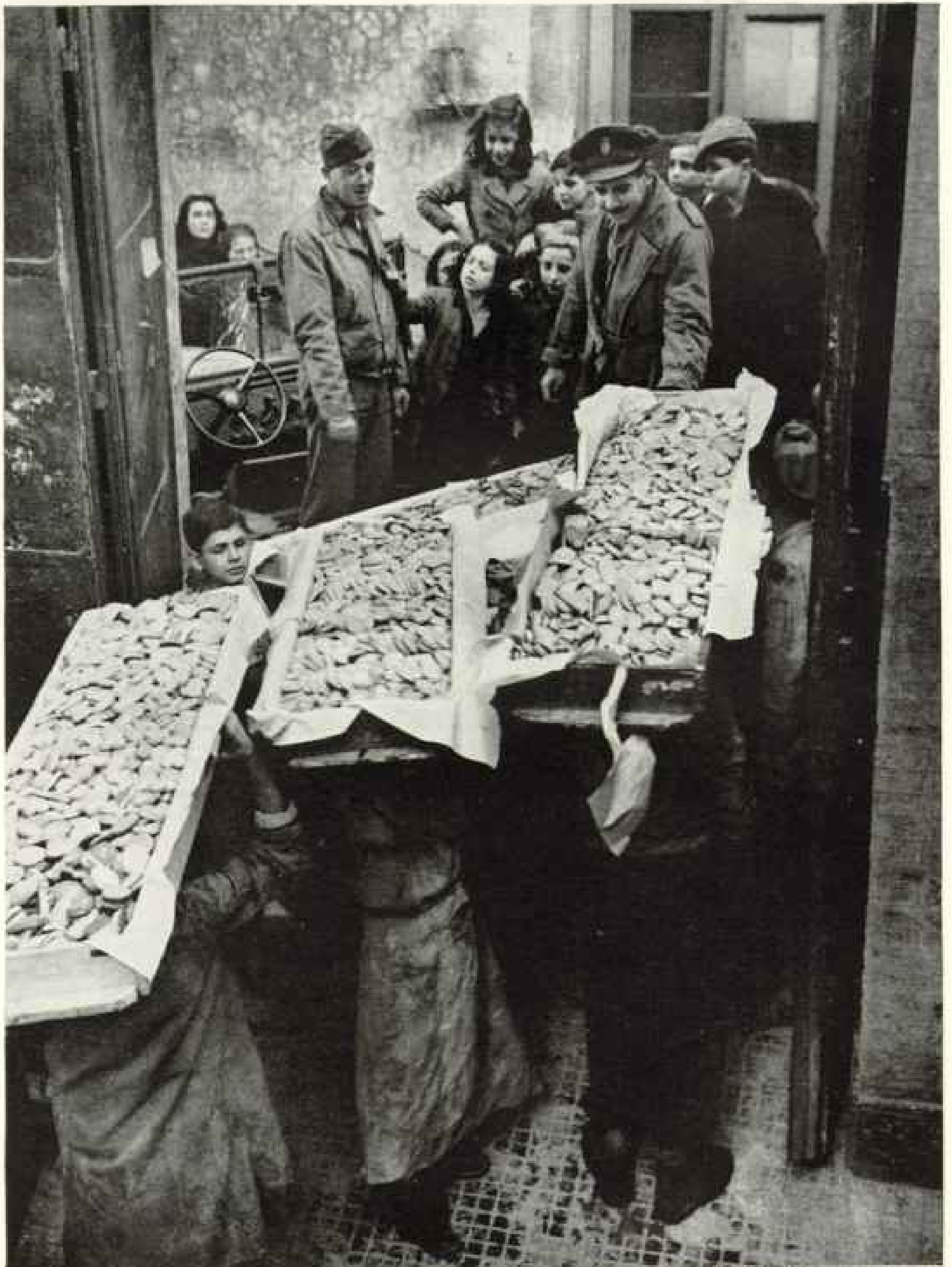
three long by two wide. It is topped and faced in pretty light tile.

Each "burner" is a 6-inch-square hole in the top of this affair. A handbreadth down the hole is a grate. A scrap of paper, a splinter of kindling, a pinch of charcoal, half a match, and the coffee is boiled—if you brought the coffee. A double pinch of charcoal, and there are fried potatoes.

Half a match? Why, matches are scarce. Mama splits down the middle each of those paper-stemmed safety matches you gave her and makes two.

The ashes sift through the grate into a compartment opening on the face of the stove. That is where Joe stands with the regulation kitchen fan, whipping a blast of air into the ash compartment and up through the burning charcoal. Vigor of fanning regulates the heat.

Standard practice in our village is to make charcoal in the open fire. Sometimes Mama shovels a mass of glowing coals directly into



Ellie Atkins from American Red Cross

Cookies for the Troops Run a Gantlet of Urchins from Bakery Door to Truck

The American Red Cross man must get the trayloads from this Italian bakery up to American fighting men, but the boys and girls know there is always a chance that a few cookies might slip off during loading operations. With the pastry will go gallons of ice cream to supplement Army rations.



U. S. Army Medical Corps, Official

G. I. Joes Add Pin-up Girls to an Italian Home's Decorative Scheme

Two members of a U. S. Army photographic unit are welcome temporary boarders for the wife of a small-town mayor. The cup she holds is Army mess kit equipment; her supply of cocoa and milk in the storage alcove came from the United States. The house, like most dwellings in southern Italy, is of stone, with interior plaster finish.

the stove burner; sometimes she puts them in a stone crock with a tight lid, in the corner of the fireplace. There the coals go out for lack of air and provide charcoal as needed.

Fuel is an acute problem, frequently for G. I.'s and always for the local population. Coal shipped in from somewhere and the huge cases in which war supplies are packed furnish the Army most of its combustible material, but sometimes the boys have to go out and chop down a tree.

The villagers, who haven't the right to cut down the landowners' trees, love to follow a G. I. wood party: there's a wealth of chips and twigs and stumpage. And if an extra tree or two should come down, how will the landowner prove the Americans didn't fell it?

The home folks are advised to beware the return of any G. I. who has learned about beef-steak cooked over charcoal. (Ah, and what

if it *was* horse? What a fellow didn't know won't hurt him, will it?)

Gene Glenn and I compared drawings the other night of our postwar kitchens. Charcoal stoves were prominently featured in both.

Southern Italy offers many tourist attractions, though the Americans don't get around to them with the zeal of the British. Given a two-day leave and a flair for hitchhiking, even those of us who wintered far behind the fighting front were within reach of such points as Naples, Vesuvius, Pompeii, Capri, Bari, and Sorrento.

South Africans Knew Their Lions

I went to Pompeii with an English officer and two officers from South Africa. Wandering among the historic ruins, we came to an amphitheater where holiday crowds once watched lions kill human victims. The Afri-kanders were skeptical. They objected that



Offie Atkins from American Red Cross

This Trio of Porkers Escaped Nazi Foragers

An American Red Cross man watches them again roaming the streets of an Italian town. Villagers hid them well during German occupation. In the Naples campaign, shells screamed over these old stone houses nestling against a steep mountainside.

the wall separating the arena from the seats was too low.

"Lions like those we have at home would have hopped up into the audience in no time," one of them complained.

The Italian guide vanished. A few seconds later he came back with some iron nets which he exhibited with pride. It seems the ancients always put the nets up before they let the lions into the arena. The Afrikanders were satisfied.

My one leave in Naples convinced me that, though battered, it is as beautiful as advertised. The great industry is selling low-grade cameos to G. I.'s at ten prices. Every Italian who ever wielded a fine chisel on a conch

shell, and many who had not, got busy. G. I.'s like to stand and watch the craftsmen scrape at the calcified outer shell and leave in neat relief against the horny inner shell a Signal Corps, Engineers, or other Army insignia.

The smooth execution of an old G. I. overseas trick—getting lost in somebody's yard—brought me an acquaintance with a fine villa. People over here are just as curious to meet G. I.'s as the other way around, and any reasonable dodge to scrape an acquaintance is all right.

Well, this villa was the property of a paint and varnish manufacturer, now retired by action of American bombs on his late factory. He was about 65, but vigorously learning English out of a dog-eared grammar published in 1872, so that the conversation kept reverting to Aesop's fables.

The grounds featured big, black-green trees of a sort strange to me, and tall, topknotted pines. The latter are limbless to a great height, then break into

a mop of foliage like a country boy's hair cut under a sugar bowl. Reproductions of celebrated statuary, in plaster and terra cotta, populated the premises, along with a family of black birds nearly as big as quail.

There were a date tree for the tropical touch (although Naples is too far north for the fruit to ripen), grottoes for summer, and a tiny chapel for family worship.

It was a shock to walk over to the precipitous edge of this seemingly isolated sylvan sanctuary and stare full into the face of a week's family wash on the roof of the apartment house next door. The villa was practically in the middle of town.

Inside, the only room I saw was like an

overcrowded museum: dark, and with a plethora of paintings, antique chairs, miniature statuary, and bric-a-brac and vases everywhere. It made a suitably aristocratic setting for the host's gracious elderly signora, who sat at the gleaming black piano and played for a G. I. a long way from home, even though her Bach and Beethoven were somewhat over his head.

Up to the Brim of Vesuvius

The padlocked gate of the villa opened for me into a smelly street full of urchins demanding candy and cigarettes, old women bargaining savagely with street vendors for pieces of boiled pigskin to eat, for single carrots, for splinters of wooden army crates for firewood.

Was that street Italy, or was Italy that chamber full of art and music? Or beans bubbling gently in a black iron pot over a peasant's fire, with Tony bubbling folk songs in the background?

Then I went to see Vesuvius, something entirely different.

The volcano had been pretty quiet for a year, but it put on a mild show the first time I was there. It is a crater-within-a-crater affair, shaped like a Mexican hat. The small, ever-active inner crater is in a little cone that sits up like the crown of the sombrero within the large crater, which is comparable to the wide, turned-up brim.

As I stood on the brim, which is several hundred yards around, the interior looked to me like a gigantic bowl in which some playful Titan whipped up a batch of taffy and then forgot it, leaving great twists and coils to solidify in fantastic shapes. This formation was in reality a crust on a lake of molten lava.



Best Detail from Artist

Signal Corps Wires Turn a Statue into a Telephone Pole

The classic marble figure stands on a balustrade on the grounds of the Queen's Palace, a few miles from the Volturno River (page 124). Use of its outstretched arms saved time in stringing communication lines just before the American Fifth Army forged across the river last October.

I could clamber safely about on the surface, though there were many fissures and cracks through which the molten mass appeared a few inches below. In one such fissure a G. I. thrust a canteen of cold coffee, bringing it out a couple of minutes later piping hot. All the soldiers around him took a pull at the canteen, so they could tell their grandchildren they once drank volcano-made coffee.

One soldier brought a little yellow dog up to the crater, and the animal had a fine time until he investigated an area of new glossy-black lava. He suddenly discovered an uncomfortable warmth about his feet and became the busiest little pup in all Italy. He came off unharmed, at great velocity.



WERT BRONKHORST/FRANK ARZNER

With Neapolitan Statuary for a Backdrop, Americans Hook a Few Small Ones

Bait is a bit of Army C ration; tackle is improvised. The trout pool is on the grounds of the Queen's Palace, near the Volturno River. The night after this picture was made, October 12, 1943, these fishermen were at the front when the Americans began to force a crossing of the Volturno in a heavy engagement.

The Italian guides, after crossing the crust to the base of the inner cone, figured that right there discretion became the better part of valor. But a lot of the G. I.'s had to scramble up the almost vertical sides of this little cinder heap—its top is about 100 feet above the crust level—and peer into the very gates of hell. It turned out to be just like peering into the spout of a steaming teakettle. We could see lots and lots of white steam.

It is from the nozzle of this inner cone that Vesuvius is a perpetual pillar of cloud by day and fire by night.

From the base of the inner cone poured a hissing stream of lava, tinted with the light pink of cherries just about to ripen. The stream was easily the girth of a 50-gallon gasoline barrel, and it flowed right along, adding up, I judged, to several thousand barrels a day.

The flow cut through the crust and dropped into the molten depths below, to well up

several hundred feet away at the edge of the lake and spill over the sombrero's rim onto the mountainside.

Italians with iron bars stood beside the stream, gouging out blobs of lava smaller than your fist, into each of which was planted a small coin. The result, when cool, made a souvenir of which myriads were bought by G. I.'s who never got any closer to Vesuvius than Naples or Pompeii. But they make nice curiosities.

My second trip to Vesuvius, several months later, was more eventful.*

* The author's second trip to Vesuvius took place late in March, 1944, after the volcano had begun its most violent eruption in 72 years. Allied military trucks evacuated families from three villages on the slopes at the height of the disturbance.

There has been another major eruption of Mount Vesuvius in the twentieth century, on April 7-8, 1906. It was described by Dr. Thomas Augustus Jaggar in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1906.



U. S. Coast Guard, Official

Invading Yanks Make Friends in Paestum, Scene of Greek Ruins

The Coast Guardsman (left) and three soldiers are part of the force which landed at this coastal village after establishment of the United Nations' beachhead at Salerno, 22 miles to the north, in September, 1943. Many U. S. soldiers have visited the town since to see its three ruined temples, built here by Greeks from Sybaris about 600 B. C. The Greek name of Paestum was Poseidonia, or City of Neptune.

I learned in the *Stars and Stripes* that the volcano was acting up; so I worked a two-day leave to see for myself. Various maneuvers landed me at a little town at the base of the mountain. There I boarded a train which wound around the lower shoulders for a spell and finally went into a five-wheel drive (there is a cogged center track in the line) to bend up a steep ridge.

We passed rich patches of vineyard and orchard and vegetable gardens. Manurial salts in the volcanic ashes have made the sides of the mountain extraordinarily fertile. I noted with hungry eye that English peas were in bloom.

Smoke Screen Marks Lava Course

On the train we got our first close view of the lava stream, the course of which was marked out from afar by a smoke screen. The stream looked like a dirty-gray strip of rubble

left by a departed mountain freshet. It smoked on the edges where vegetation was burned. In the center, motion was faintly discernible; chunks of stuff seemed to be tumbling along, bit by bit, slowly. Here at the lower tip of the lava tongue there was little suggestion of a flowing stream.

The extreme viscosity of the lava—it requires quite a forcible blow to drive a crowbar into the hottest of it—makes the stream flow more like a glacier than like water. It tends to thrust objects out of its way, as well as to flow over and around them. The stream seemed to have thrown up on each side a ridge of rubble precisely like the lateral moraines of the Rhône Glacier.

The train stopped on a high shoulder and let us off because it could not go all the way up; lava had cut the track somewhere above. We dropped down into the ravine near where the lava was flowing. The lateral ridge, as



Steaming Lava from Erupting Vesuvius Toasts Bread for Venturesome M. P.'s



(U. S. Army Signal Corps, Official)

Yanks Replace Tourists as Subjects for This Souvenir Photographer



U. S. Navy, Official

Vesuvius Stages Its Most Violent Eruption in 72 Years

This striking photograph was made by a U. S. Navy cameraman who flew over the angry volcano near Naples. The author visited Vesuvius at the height of the eruption. He ventured a short distance into the vast outer crater, but beat a hasty retreat when a piece of blood-red lava suddenly hurtled through the air and dropped about 100 feet from him (page 128).

I suspected, was stationary. This ridge was 10 to 20 feet high and consisted entirely of newly erupted matter, 24 to 48 hours old. Too hot to climb, it was for all the world like a bed of coals after a wood fire.

The lava did not cool in long, sleek lines, curls, and liquid whorls. Lava I had seen before always dried as if it had been caught in the act of flowing like molasses. This lava just did not do that. It was ashes and clinkers, the latter tending to form spherically.

Coming upon this strip of stuff in the ravine without knowing what it was, one would think it was ashes, dumped in a long, thin pile.

From afar we could hear distant detonations, as of artillery practice fire, and see a lot of black specks fly out of the cone and rain back into the crater.

It seemed miles to the top, I had a cold, and I was hungry, but I got some almost inedible grub and persuaded a sergeant from Mississippi to go with me. We had not taken two

steps when a little English vehicle pulled up, at our wave, and gave us a lift. A quiet, graying lieutenant and his driver were aboard.

We pig-tracked back and forth for several miles up to a point where the real climb begins. There a finger of that dirty-looking clinker, about three or four feet high and thirty feet wide, had pushed across the road. It was still hot, but could be walked across.

The whole top half of this mountain is made of loose ash and cinders. The climber, going straight up the face, takes one step up and comes back down two.

The Mississippi sergeant, younger and more agile than the British lieutenant and I, forged way ahead. I was leading the lieutenant by several feet as we made our way up the lava splash. This was old lava, of the type with which I was familiar: all one mass, but heaped and twisted in a thousand black, evil, fantastic coils and shapes. The sun was obscured by smoke and cloud. I crawled over



(The chairs from American Red Cross)

Through Bombed and Shelled Benevento Drive Two American Red Cross Field Men

The town, on a hill between the Sabato and Calore Rivers, was a strong defense post for Nazi troops who tried to halt the United Nations' advance north of Naples. It fell on October 4, 1943. From the wreckage the Italian woman at right has salvaged two chairs.

the last writhing coil to find myself alone.

There was the crater, flaming and fuming. The whip-crack explosions beat directly upon my ears. Masses of matter, thrown high into the air from each detonation, at close distance appeared the dull red of old blood.

The big particles which flew up were not sharp-edged forms like scattered rock but globular masses of flying liquids. They tumbled back upon the outer slopes of the cone to create flaming-red splotches and gashes where they struck.

That inner cone, which especially venturesome G. I.'s climbed the first time I was there, was solid living fire except for its thin black exterior coat of ash, which was flicked away by the falling missiles.

The lieutenant joined me and we ventured a little way into the vast outer crater, which is about two miles around. There was a huge detonation, followed shortly by a hissing whistle and a horrible glugging thud about 100 feet in front of us. A piece of blood-red lava bigger than my typewriter grounded there.

The lieutenant sauntered away. Never mind what I did!

From a somewhat greater distance, we watched the lava pouring out of the big outer

crater. Here it was behaving like a liquid, in continuous, rapid flow, a great sinuous body of it, smooth, swift, and even.

The stream was more than 20 feet wide. Goodness knows how deep! The line of flow was straight down the steep face, sharp left and for miles along a vast ravine, then out onto the lower shoulders of the mountain.

During the day, the entire line of flow was gray or black. At night it was transformed into a red glow, visible for miles, a long, smooth stroke branching off about midway down. As the stream reached the very lowest gentle slope of the mountain, it branched like a river of many mouths.

Going down, the top half of the mountain was so loose and crumbly that I stood and trundled my feet in a pedaling motion, and zip, zip, zip, I dropped 1,500 feet (my guess).

Seeing Vesuvius in eruption was more than I expected when I joined the Army. It was a thrilling experience.

There is a lot of Italy and, despite a few contretemps here and there, I believe that the many thousands of us who have lived the long winter here will bring some of it home with us, and will retain at least a little soft spot for Italy in our hearts.

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To carry out the purposes for which it was founded fifty-six years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, the Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, the Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, the Society and the Smithsonian Institution, January 16, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 791 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1933, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

The National Geographic Society-U. S. Navy Expedition camped on desert Canton Island in mid-Pacific and successfully photographed and observed the solar eclipse of 1937. The Society has taken part in many projects to increase knowledge of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted \$25,000, and in addition \$75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1936.

PRESIDENT TAFT GAVE THE STARTING SIGNAL

IT is June 1, 1909. For weeks the papers have carried the exciting news. Now, before New York's City Hall five "horseless carriages"—an Acme, a Shawmut, an Itala and two Model-T Fords—stand hub to hub.

Anxiously mechanics make final adjustments. Then, from the White House, President Taft flashes the starting signal. And America's first transcontinental auto race is under way.

West of St. Louis, seven-day rains had turned the roads into quagmires. Across the prairies and in Colorado average speeds were cut to ten miles an hour.

At Cheyenne, Wyoming, the big Itala quit the race. The others

plowed on. Near the summit of the Cascades they fought their way against towering snow drifts.

Days later, Ford Car Number 2—the winner—entered the gates of Seattle's Alaska-Yukon-Pacific Exposition. It had crossed the continent in 22 days and 55 minutes, with New York air still in the two front tires!

As he awarded the trophy cup, Col. M. Robert Guggenheim said: "Mr. Ford's theory that a light-weight car, highly powered . . . can go places where heavier cars cannot go, and can beat heavier cars costing five and six times as much, on the steep hill or on bad roads, has been proved. I believe Mr. Ford has the solution of the problem of

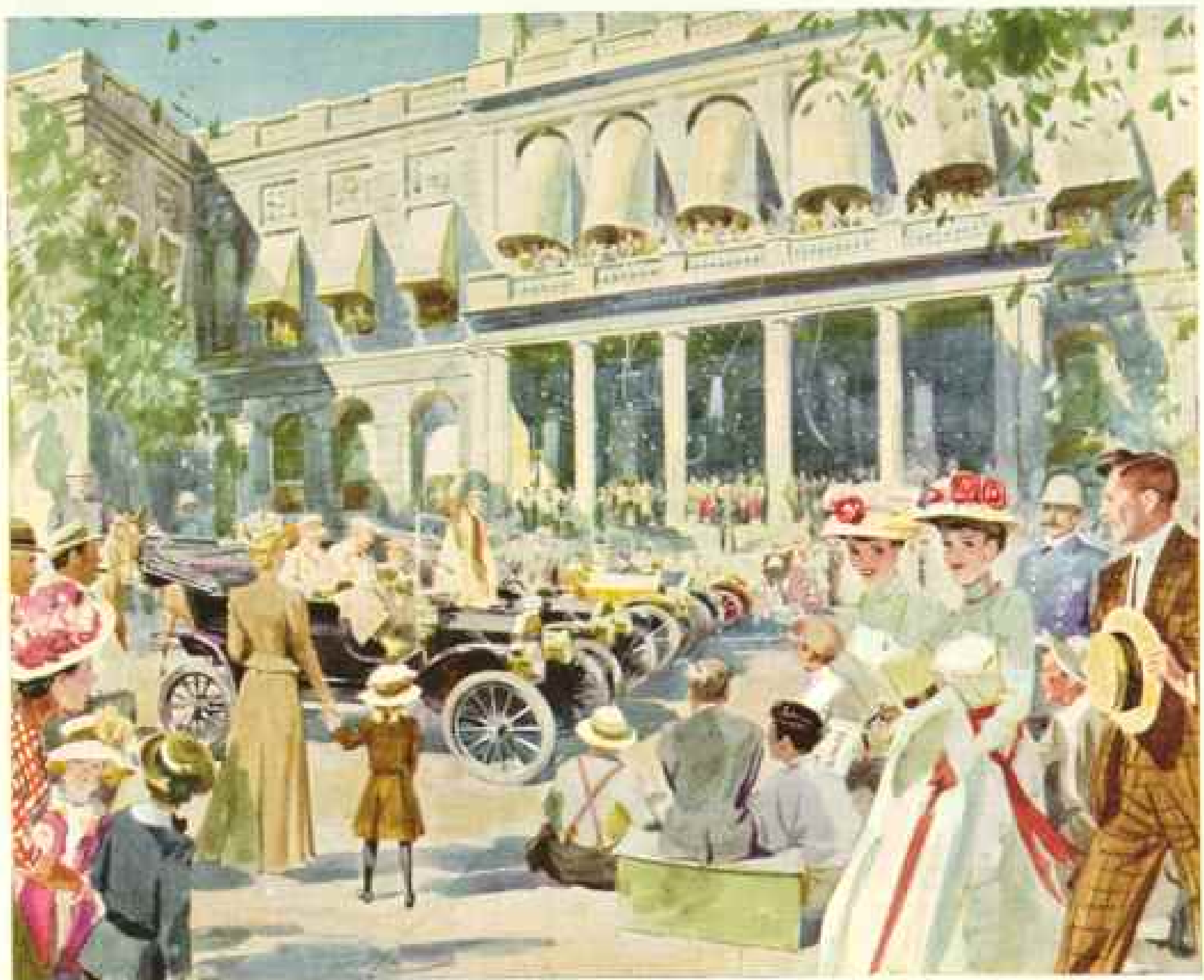
the popular automobile."

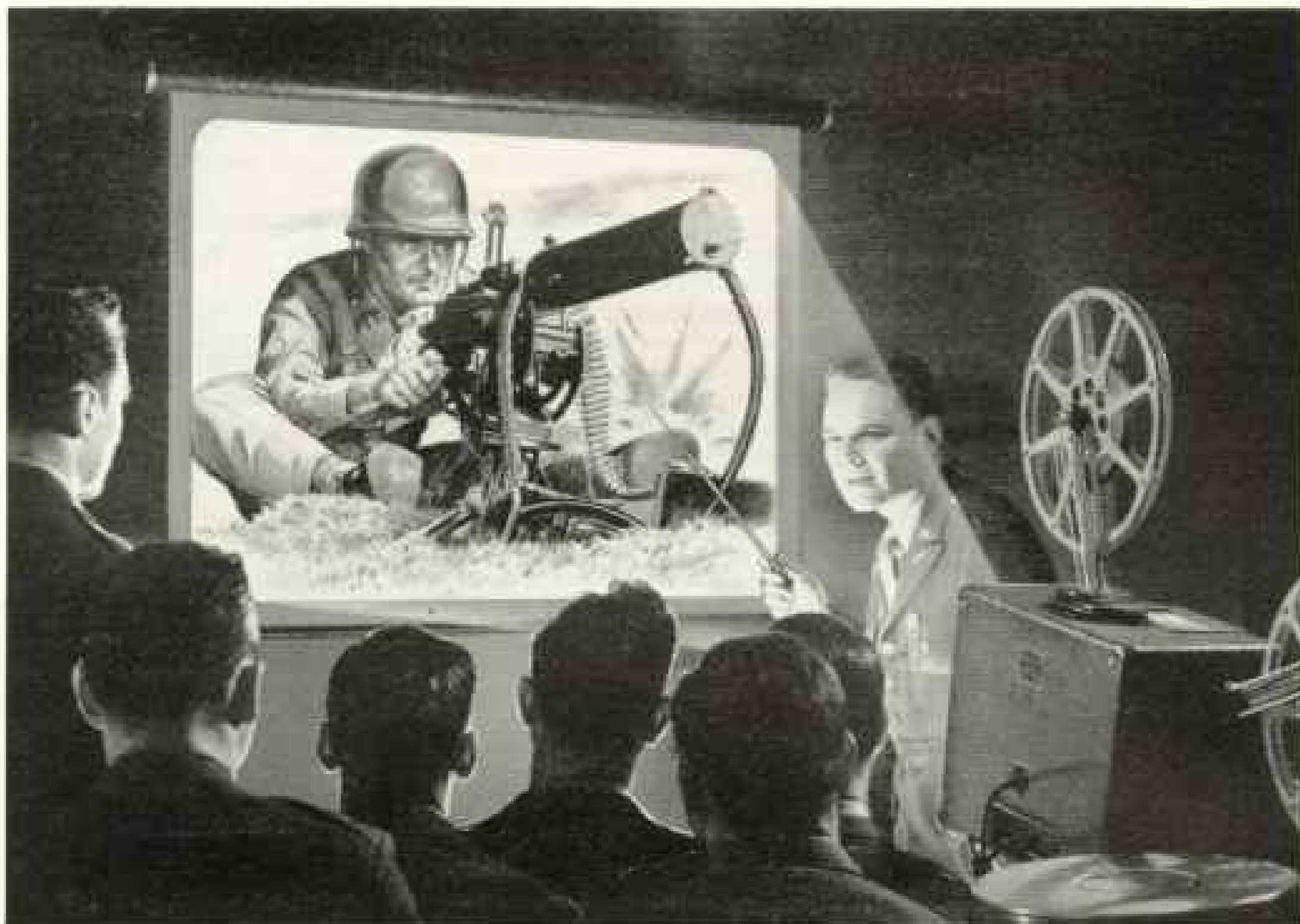
The proof of that statement no longer rests in a single car, which won a race, but in the 30 million cars and trucks Ford has built since then. And today millions of them are providing reliable, economical transportation for wartime America.

Meanwhile the inventive genius and the precision skills associated with the name Ford continue to serve the nation in the mass production of giant aircraft and other means to victory.

In the days of peace ahead, Ford's resourcefulness in developing new ideas and methods will again produce soundly-engineered motor cars, priced within reach of the largest number of people.

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That same surety of results will, after

Victory, add to your enjoyment of your own home movies.

For out of our war research in OPTI-ONICS* have come truly exciting promises for tomorrow's B&H Cameras and Projectors . . . cameras that provide new conveniences . . . projectors that enhance every scene . . . sound reproduction that will be an "illusion of presence."

So wait patiently . . . or otherwise . . . for even finer personal motion pictures. They'll be worth it. Bell & Howell Company, Chicago; New York; Hollywood; Washington, D. C.; London, Est. 1907.



*Trade-marks registered.

*Opti-onics is OPTics...electrONics...mechaniCS. It is research and engineering by Bell & Howell in these three related sciences to accomplish many things never before obtainable. Today, Opti-onics is a WEAPON. Tomorrow, it will be a SERVANT...to work, protect, educate, and entertain.



Buy MORE War Bonds

Bell & Howell



Hildegarde, star of "Beat the Band," Wednesday evening over NBC, and inimitable artist of the Persian Room, the Plaza, New York.

YOU'LL HEAR HILDEGARDE IN "NATURAL COLOR"—ON A G-E FM RADIO!

There's a new kind of radio waiting for you that does what no radio has ever done before!

Major Edwin H. Armstrong invented it. General Electric built the first set for the public. Today Frequency Modulation radio (FM) is as different from ordinary radio as color movies are from black and white!

Radio up to now has been a reasonable reproduction of the singer's voice, or an orchestra, or a dance band. But because

of technical limitations, *only a third* of the tonal range could be heard! That's why reception is often so flat and colorless.

General Electric FM radio captures *all* the tonal range—high notes, low notes, in-between notes. Tones and overtones are heard in *natural color*. Static disappears!

When it is again possible to manufacture home radio sets G.E. will offer radios and radio-phonographs with FM,

table-models, and a new kind of portable with built-in storage battery and charger. General Electric, Schenectady, N. Y.

- Tune in General Electric's "The World Today" and hear the news from the men who see it happen, every evening except Sunday at 6:45 E.W.T. over CBS network. On Sunday evening listen to the G-E "All Girl Orchestra" at 10 E.W.T. over NBC. Every week 192,000 General Electric employees purchase more than a million dollars' worth of War Bonds.

RADIO • TELEVISION • ELECTRONICS

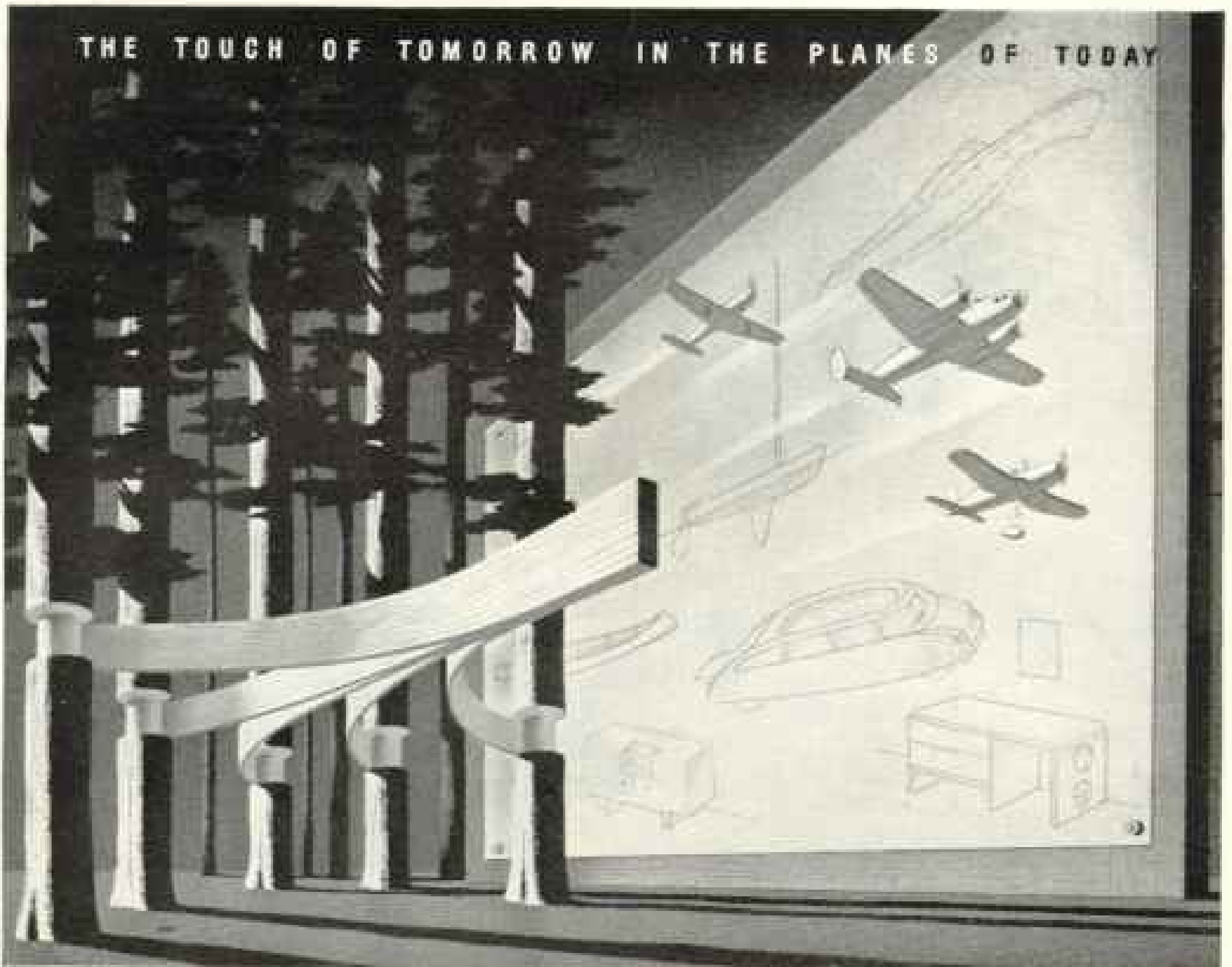
GENERAL ELECTRIC

Every General Electric radio is an electronic instrument

The heart of every General Electric radio is the electronic tube. This tube is similar to electronic tubes used in G-E television equipment, and in G-E electronic apparatus that speeds war output in thousands of industrial plants across the continent.



THE TOUCH OF TOMORROW IN THE PLANES OF TODAY



Look Up, Builders of Tomorrow!

In steadily increasing numbers, United Nations aircraft are utilizing a new structural material. It is known as DURAMOLD. And it is being used in a great diversity of applications, all the way from dropable gasoline tanks that add hundreds of miles to a plane's normal range, right on up to the entire structure of the plane itself.

The current acceptance of DURAMOLD has been gained only after thousands of man-hours spent in research for suitable materials, in engineering that pioneered an uncharted course of new techniques, and in testing of finished products that subjected them to punishment far in excess of actual usage.

By the DURAMOLD process Fairchild engineers permanently mold layer-on-layer of wood, fabric, paper or even glass cloth, with special adhesives applied under heat and pressure, into single and multi-curved surfaces of uniformly high quality.

DURAMOLD takes to the skies today as another example of Fairchild's "touch of tomorrow". The builders of many of tomorrow's civilian products, far removed from the field of aviation, may look to DURAMOLD as a new basic material which has already proved itself in the toughest test of all—the stress and strain of war.

Write for free illustrated booklet

BUY U. S. WAR BONDS AND STAMPS

 **FAIRCHILD**

ENGINE AND AIRPLANE CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK

Katger Aircraft Engine Division, Farmingdale, L. I. • Fairchild Aircraft Division, Hagerstown, Md. • Burlington, N. C. • Duramold Division, New York, N. Y.
Subsidiary: Alfin Corporation, New York, N. Y. • Affiliates: Sinton Corporation, New York, N. Y.



...you just know the quality is there

GENERAL'S EXTRA PRICE always has brought car owners SO MUCH MORE

In paying *more money*—for 30 years—for General's famous *Top-Quality*, car owners have been certain that they have bought the best.

They have realized that General's longer mileage, extra safety and superb performance were worth many times the extra cost.

Thus, it is no surprise to millions of General users that the great new General Tire is as far ahead of ordinary tires as Generals always have been.

That is why today, more than ever, sound judgment tells you to get General's *Top-Quality*.

Everyone knows, of course, that you must conserve your present tires. For expert help . . . for dependable repairing and General Tire-Kraft System recapping . . . see your General Tire Dealer.

BUY MORE
WAR BONDS



— goes a long way to make friends

**He said:
"WE THANK
ALL YOU FOLKS
FOR DOING A
SWELL JOB"**

The Army doesn't endorse any product. Neither may any of its personnel.

But here at Buick we get letters from people who've learned that Buick powers the Liberator.

And there's one that holds a special place with us because of what shines through its direct and homely phrasing. It reads, in essence:

"This bomber I was in had Buick's bomber engines. Well, we got shot up bad... Our engines were shot up bad too... They held out just long enough to get us back to our base.

"We 8 of that bomber thank all you folks for doing a good job on them engines. We can't lose with folks like you all that are making them engines."

No heroics. No colorful writing about bursting flak, riddled wings, vicious enemy attack.

Just faith. Good, solid American trust in every word!

What honest American can fail to put his best into any task, big or little, with faith like that riding on what he does?

Buick powers the Liberator. And as long as we do, we'll do the best job we've ever done on anything.

war goods
WHEN BETTER AUTOMOBILES ARE BUILT BUICK WILL BUILD THEM



The Army-Navy "E" proudly flies over Buick plants.



**BUICK
POWERS THE
LIBERATOR***

YOU LEND A HAND WHEN YOU LEND YOUR DOLLARS * INVEST IN MORE WAR BONDS

BUICK DIVISION OF GENERAL MOTORS

Every Sunday Afternoon

GENERAL MOTORS SYMPHONY OF THE AIR—NBC Network

**As of May 15, 1944, Buick has built more than 45,000 Pratt & Whitney aircraft engines.*



Copyright 1944, The Pullman Company

"I never did this in daylight before!"



Back home, he came in the house with his shoes in his hand only when he'd stayed out late—to keep from disturbing Mother and Dad.

But this is an *Egyptian* home. And he remembers that the War Department's Pocket Guide to Egypt says:

"Take off your shoes before entering a room—leave your socks on."

That's something he's never done before—in daylight. But it's the custom of the country.

There's a custom of our country, too, that's something many boys had never done at night before they entered service. It's the American custom of *traveling in comfort*—which troops in training do at the rate of almost a million a month.

So going Pullman is new to lots of them. And it will be new to you when the war is over.

Then, there'll be new kinds of Pullman cars. One kind will be *all rooms*.

Riding in a *duplex-roomette* car, you'll have every convenience that you'd have at home—with light and heat and air conditioning all individually controlled.

Sleeping there, as you speed safely and dependably toward your destination, you'll get a grand night's rest in a wonderfully comfortable bed. And you'll waken to your own dressing quarters—your *private* washing and toilet facilities.

That's one of the new type cars that are coming.

And Pullman plans that duplex-roomette space will cost little—if any—more than lower berths cost now.

Another new type car—the *coach-sleeper*—will offer Pullman comfort and convenience for *less* than the present rate for a berth in either standard or tourist sleeping cars.

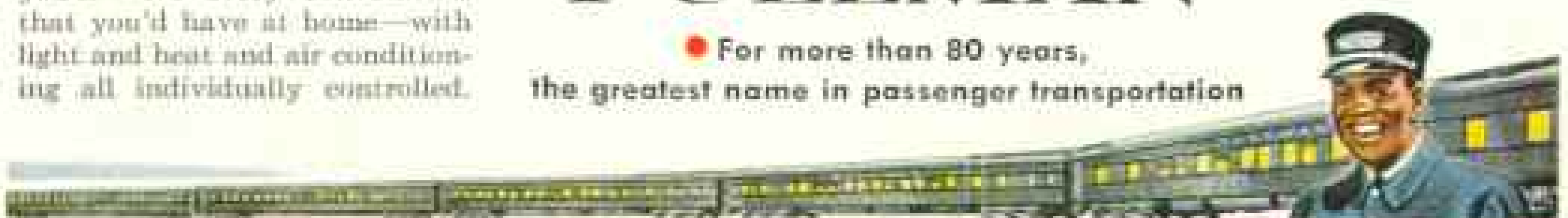
So, when you can travel for pleasure again, Pullman will see to it that you travel in even *greater* comfort than you ever have before.

* * *

NOW'S THE TIME TO BUY ANOTHER WAR BOND!

PULLMAN

● For more than 80 years,
the greatest name in passenger transportation





*Today he smiled
for the first time . . .*

His wound had healed . . .

But when he lit a cigarette, his hand shook . . . and any sudden noise would make him start and tremble . . . and then he'd break out in a cold sweat.

For the sounds of war beat through his head . . . and he couldn't forget.

Then they tried music . . . soft music all day long . . . and the melodies reached into his tortured mind, soothing, peaceful, familiar.

Today he smiled for the first time . . .

Yes, there's a power in music . . . a power to heal, a power to relax, a power to give men fresh courage and hope.

Right now our only job—and our great obligation to our fighting men—is to produce the radios and communications equipment for war.

But when Victory is finally won we will again bring you all the radio pleasure of FM—all the richness of music and natural reproduction of your favorite program through a Stromberg-Carlson.



OUR "E" FLAG means many things to the men and women of Stromberg-Carlson. It means . . . keep turning out the equipment for our fighting men. It means . . . keep buying War Bonds till it hurts. It means . . . give blood to the Red Cross. It means . . . keep praying and working for Victory to bring our boys home!

IN RADIOS, TELEVISION, TELEPHONES, SOUND
EQUIPMENT...THERE'S NOTHING FINER THAN A

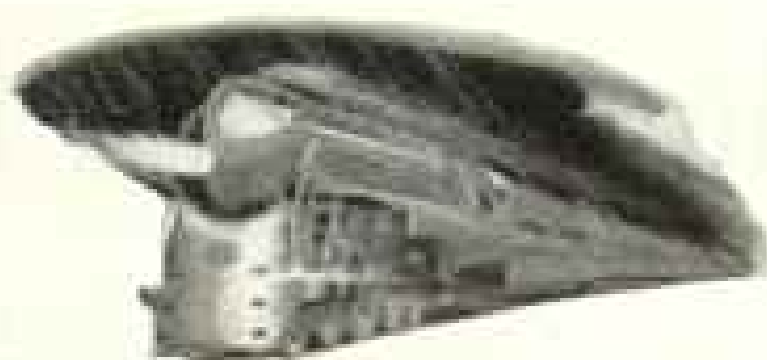
STROMBERG-CARLSON

A HALF-CENTURY OF FINE CRAFTSMANSHIP

IN CANADA, STROMBERG-CARLSON, LTD.

© 1944, STROMBERG-CARLSON COMPANY, ROCHESTER, N.Y.

Neither snow, nor rain, nor heat, nor gloom of night
 stops these couriers from the swift completion of
 their appointed rounds."
 Herodotus



Traveling on a POSTAGE STAMP

How 3 billion pieces of
 wartime mail a year
 speed over the
 Water Level Route

No 20th Century Limited passenger
 ever sets foot here. This car is
 reserved for wartime travelers of a
 different kind... tiny V-mail... busi-
 ness letters... registered envelopes
 packed with war contracts and blue-
 prints... all part of the three billion
 pieces of mail that speed each year
 over New York Central.

Hour after hour, as the Century
 bores through the night, expert postal
 clerks sort this "preferential mail."
 Tomorrow, on arrival, it will be ready
 for immediate forwarding or delivery.

Winter or summer, through any
 weather, "post offices on wheels"

provide lowest cost transportation
 for 96% of the nation's vast mail
 tonnage. A vital war service of Ameri-
 can railroads today. A service that
 will be still more efficient aboard the
 finer, faster trains of tomorrow.

LAST BAG ABOARD! Just before the
 Century pulls out, several bags of last-
 minute mail are collected from the mail
 room in the station. Many business
 firms regularly send messengers to the
 station with important mail for
 overnight delivery between New
 York and Chicago, as well
 as intermediate points.

MILE-A-MINUTE SORTING

Pouches with mail from all parts of the United
 States and many foreign countries are
 dumped on this table for sorting. Here,
 highly trained clerks work through
 the night as their car speeds east
 or west over New York
 Central's Water Level Route.



WASH ROOM
 AND LOCKERS

PIGION HOLES

OVERHEAD
 PAPER BOXES

CHECKING
 MAIL BAGS

CINDER
 SHIELD

DOOR TO BAGGAGE AND
 EXPRESS COMPARTMENT

TRAVELING MAIL BOX
 This letter chute permits pas-
 sengers to put letters directly
 aboard the post-office car at
 stops along the way.

MAGNIFYING V-MAIL
 Clerks often read photographically-
 reduced V-mail addresses under a lens.
 These tiny envelopes get speed prefer-
 ence, and regularly ride the Century.
 Soldier mail moves in vast volume, but
 even more would be welcomed by ser-
 vice men and women far from home.

"PICKER-UPPER"
 On most through trains, this Catcher Arm is
 swung out to snatch mail bags from mail
 cranes at way stations... providing fast mail
 service for even small towns.

BUY MORE WAR BONDS

New York Central
 ONE OF AMERICA'S RAILROADS — ALL UNITED FOR VICTORY



Plying the sea lanes to CUBA...

good friend and ally



Peacetime years see \$107,000,000 of tropical products reach our shores from Cuba—much of it in AGWI SHIPS!

Thousands knew Cuba as a tourist paradise—but until war came not many realized the importance of *trade* with Cuba. Then the shortage of shipping, cutting normal imports, was felt in every sugar bowl in the land! . . . for we usually bring in over three and three quarter billion pounds of sugar a year from Cuba.

Ordinarily, too, we buy many vegetables and tropical fruits from Cuba in winter. Pineapples, cigars, tobacco, and other products move north all year. In exchange we ship down millions of dollars' worth of foods, textiles, machinery, cars, and other manufactured articles.

To serve this peacetime trade, great steamship organizations have grown up.

Not only fleets of ships, modern piers, and refrigerated warehouses, but trained shore staffs—men who handle smoothly all the intricate operations involved in exporting and importing.

★ ★ ★

For more than 100 years—interrupted only by war—ships of the Cuba Mail have sailed between our Atlantic ports and Cuba. Today these ships are scattered over the oceans on war service, but when peace dawns, they'll be back, helping again in the great exchange of goods with the friendly island republic.

CUBA MAIL LINE



Foot of Wall Street, New York 5, N. Y.



ATLANTIC GULF AND WEST INDIES STEAMSHIP LINES

**AGWI
LINES**

CUBA MAIL LINE + PORTO RICO LINE

CLYDE-MALLOY LINE + SOUTHERN S. S. CO.

Serving Cuba, Mexico, Puerto Rico, Dominican Republic, Texas, Florida, and the South.

**HELP CRUSH FORTRESS EUROPE
BUY MORE WAR BONDS**

The LaFayette — 1837. One of the earliest B & O locomotives to haul the trains of the Presidents of the United States.

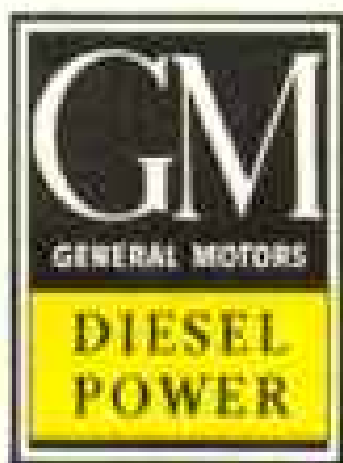
PREFACE OF A NEW ERA



GM Diesels have the exacting job of hauling B & O's highest-class freight, including trains of perishables and other foodstuffs for the armed forces as well as for civilian markets.

KEEP
AMERICA
STRONG
BUY
WAR BONDS

DAY in and day out, General Motors Diesel Locomotives are proving their ability to haul huge loads far, fast, with little attention and at low cost. In any vision of the future of transportation, these tireless giants must loom large. Already they have won a place of rare importance by their unprecedented performance in the work of the railroads at war.



LOCOMOTIVES ELECTRO-MOTIVE DIVISION, La Grange, Ill.

ENGINES . . 150 to 2000 H.P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

ENGINES 15 to 250 H.P. DETROIT DIESEL ENGINE DIVISION, Detroit, Mich.

Clash go the cymbals, showering sparks of brilliance

through fine music . . . and listening

with a Scott, you hear the

last shimmering over-

tone . . . unbelievably



One of the most accomplished musicians in the orchestra, poised for his cue, gives his brass cymbals that vibrant kiss that flashes like a shooting star. That instant, fleeting touch was written by the composer for a radiance in some passage . . . but to the radio engineer it means capturing an elusive sound that reaches 15,000 cycles, far beyond the range of ordinary instruments. A Scott, so exact as to be uncanny, brings you the cymbals and all other voices in the orchestra in a "living performance."

Today Scott Radios are sailing all the oceans of the globe. Men whose lives and ships depend upon the Scott bless its range, its reach, its magnificent ease with difficult assignments. Lonely watchful sailors on distant seas listen to the Scott-you-cannot-have-for-a-while, and are grateful for their favorite programs, the news, and the sense of being in touch with home it gives them. And always it is *silent to our enemies*—the first safe radio for men-at-sea, engineered with no telltale leak-back to submarine detection devices.

Our technicians will, very happily, turn their fingers and their skill back to the arts of peace. Meanwhile, you can hasten the day by buying Bonds, Bonds and more Bonds. The whole world of music awaits you.



SCOTT
FINE RADIO
RECEIVERS

E. H. SCOTT RADIO
LABORATORIES, INC.
4448 RAVENWOOD AVE., CHICAGO

E. H. SCOTT RADIO LABORATORIES, INC.
Dept. LM4—4448 Ravenwood Ave.,
Chicago 40, Ill.

Please send me a complimentary copy of
your radio booklet, "Achievement Through
The Years."

Name

Address

City State



E.H. SCOTT



**Why America
is still**

THE LAND OF PLENTY

RECENTLY a high government official stated... "There isn't one chance in a million of America going hungry."

Why? Because the two things on which this nation relies for food—farmers to grow it, railroads to move it—are coming through, war or no war.

Sure, a lot of fine husky farm lads have gone to fighting fronts—but their Dads are out there harvesting one of the largest crops ever to come to market.

Yes, the railroads are shouldering the greatest war load in history—but they're also mobilizing the cars to move those crops... *and at low pre-war freight rates!*

Pennsylvania Railroad

Serving the Nation

- ★ 45,921 in the Armed Forces
- ★ 174 have given their lives for their country

BUY WAR BONDS & STAMPS

Why Pay More than \$40 for a Quality Hearing Aid?



The New Zenith Radionic Hearing Aid Proves Better Hearing Need Cost No More!

SUCCESS speaks for itself! America's hard of hearing—eager to enjoy a fuller life, to take a more active part in working for victory—are buying the Zenith at a rate undreamed of before in the hearing aid industry! Here, indeed, is conclusive evidence that no one need pay more than \$40 for a quality hearing aid!

How can Zenith bring its finest quality thus within reach of all? One reason, of course, is Zenith world leadership in the exclusive manufacture of radionic products. Another is this: The Zenith is built not to a price, but to an improved, modern principle of hearing aid design: INSTANT PERSONAL ADJUSTMENT. You, yourself, "focus" this instrument for your particular hearing needs—for different voices and surroundings—as conveniently as you focus a pair of binoculars!

That's why the Zenith requires no elaborate testing and frequent adjustments... no special offices, no home calls. *Zenith Quality Is in the Instrument Itself!*

No longer is there any reason to delay hearing a demonstration. You owe it to yourself—to your country—to all who have your interest at heart. Your local Zenith-franchised optical establishment invites you. No one will urge you to buy, or call at your home. For free descriptive booklet, write Zenith Radio Corporation, Dept. NG-4, P. O. Box 6940A, Chicago 1, Illinois.

\$40

COMPLETE, READY TO WEAR

Available at Zenith-Franchised Optical Establishments Throughout America

Only Zenith Gives You These Great Advantages



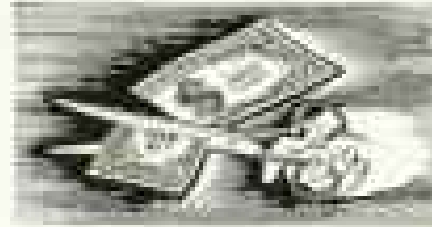
1 New "Self-Focus" Hearing Control

The flick of your finger brings hearing into range for your particular needs—for different voices and surroundings—as conveniently as you focus binoculars! Outmodes old-way "fixed-adjustment" principle.



2 New Low-Operating-Cost Battery Circuit

An exclusive circuit—specially developed by Zenith engineers to insure outstanding performance throughout the life of the batteries. Brings average operating cost to only 3/10 of one cent per hour.



3 Zenith's Finest Quality—About 1/4 the Price

You get the fine premium that modern knowledge and engineering made possible, at about 1/4 the price of other quality vacuum tube instruments! One model. One quality—Zenith's best! One price—\$40.



4 Zenith Guarantee, 5-Year Service Policy

Guaranteed by Zenith... world's leading manufacturer of radionic products exclusively, for a full year. You also get unique Zenith 5-year Service Policy with coverage enjoyed exclusively by Zenith wearers.

ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS

*Accepted by American Medical Association
Council on Physical Therapy*

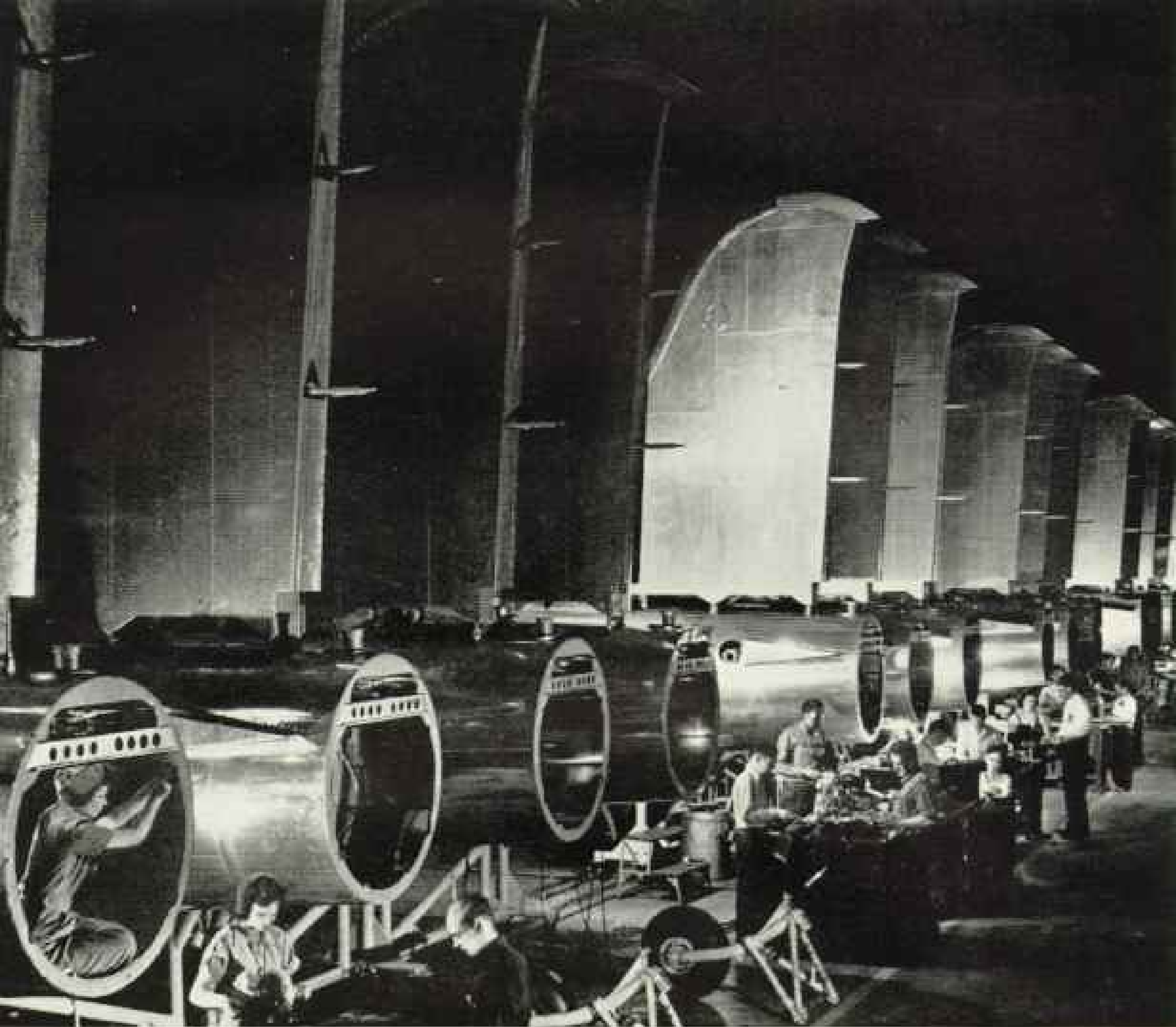
There are cases in which deficient hearing is caused by a progressive disease and any hearing aid may do harm by giving a false sense of security. Therefore, we recommend that you consult your ologist or ear doctor to make sure that your hearing deficiency is the type that can be benefited by the use of a hearing aid.

MAKERS OF
ZENITH
RADIO

RADIONIC PRODUCTS EXCLUSIVELY—
WORLD'S LEADING MANUFACTURER

All Production Now for War or Rehabilitation

COPYRIGHT 1944,
ZENITH RADIO CORP.



Buy more than before . . . in the 5th War Loan

Cutting the cost of victory

How much will victory cost? No one dares hazard a guess, but of this you can be sure—every day, every hour, every minute by which this war can be shortened will aid in reducing its cost by millions of dollars and thousands of lives.

Boeing is helping reduce the cost of war by producing more Flying Fortresses than was ever thought possible—bombers that are blasting the enemy, sapping his will to fight. Boeing's total production of Flying Fortresses in 1943 was almost twice as great as in 1942.

Furthermore, on each of the four contracts since Pearl Harbor, the

price quotation to the government has been substantially lowered. Yet the Boeing Flying Fortress is now a better airplane than ever—constantly improved to meet changing combat needs.

How has it been done? By the Boeing system of utilizing every man, every machine, every bit of space to the highest capacity; by introducing production shortcuts, advancements in tool design, and new manufacturing methods. For the year 1943, Boeing production ranked highest of all aircraft builders in pounds of completed airplanes per square foot of floor

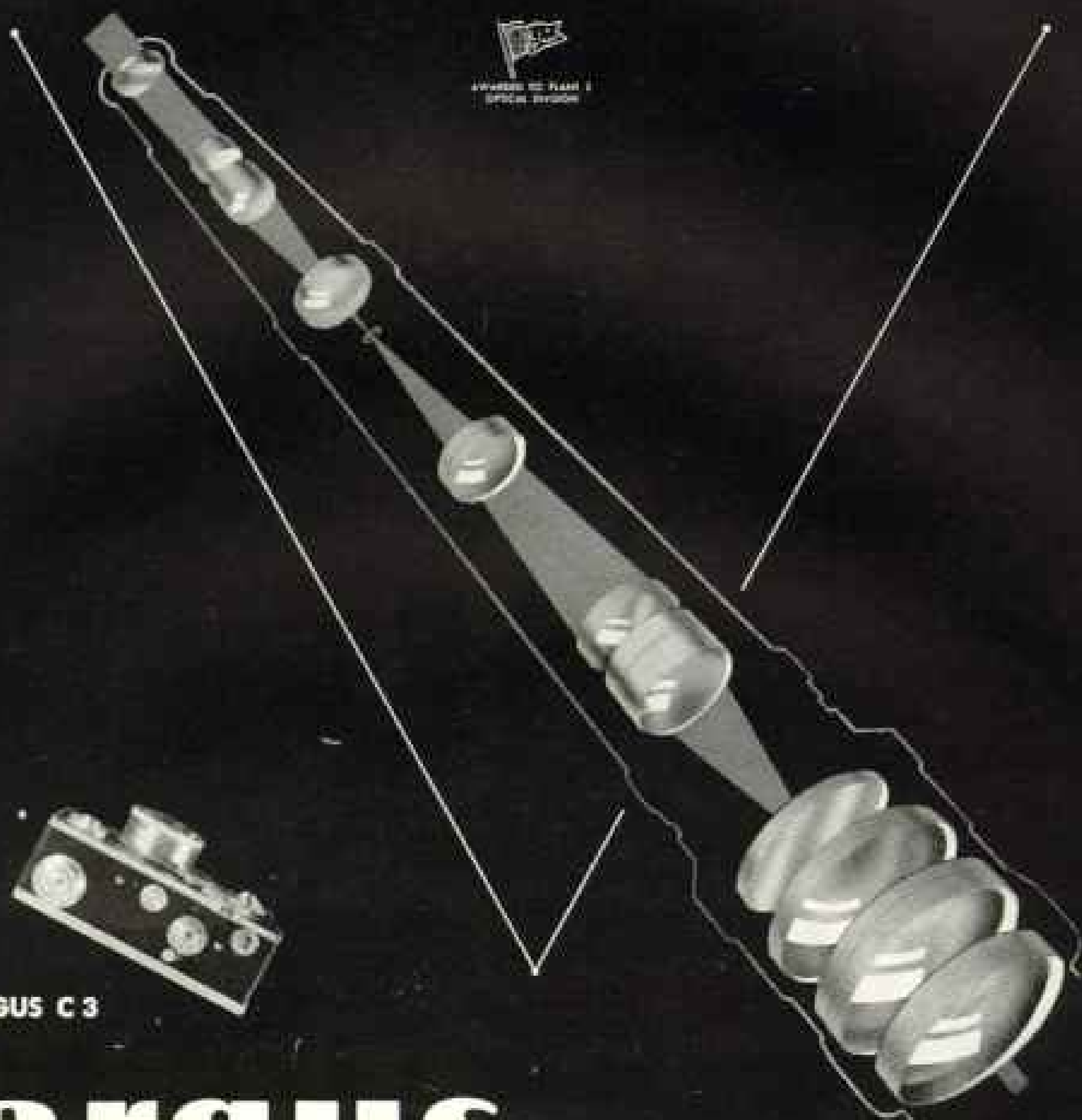
area, and pounds of airplane per man-hour.

Boeing's complete engineering and production information has also been made available to the Douglas and Lockheed companies so that even more Boeing Flying Fortresses can be produced by these additional facilities.

When Victory is won, peacetime products will again have the benefit of Boeing skills in research, design, engineering and manufacturing. You can be certain of this . . . if it's "Built by Boeing" it's bound to be good.

Jewels of Today

ARGUS EYES FOR VICTORY



ARGUS C 3

argus

Cameras and Optical Equipment



ANN ARBOR

MICHIGAN

Tomorrow's Cameras - from Today's Gunsights
The experience gained in the production of America's most famous camera enabled Argus to produce Precision Optical Instruments for the Armed Forces. • Tomorrow the underlying research, technical knowledge, rapid growth and expansion of manufacturing facilities will make possible a new camera by Argus for everyone.



Chris-Craft

Place this low-priced Chris-Craft Runabout model at the very top of your list of things to buy after Victory . . . better still, put your *boat dollars* into *bond dollars* and mark them "for my postwar Chris-Craft." It'll keep your spirits high and also help speed victory. We're 100% on war work now!



Algonac, Mich.



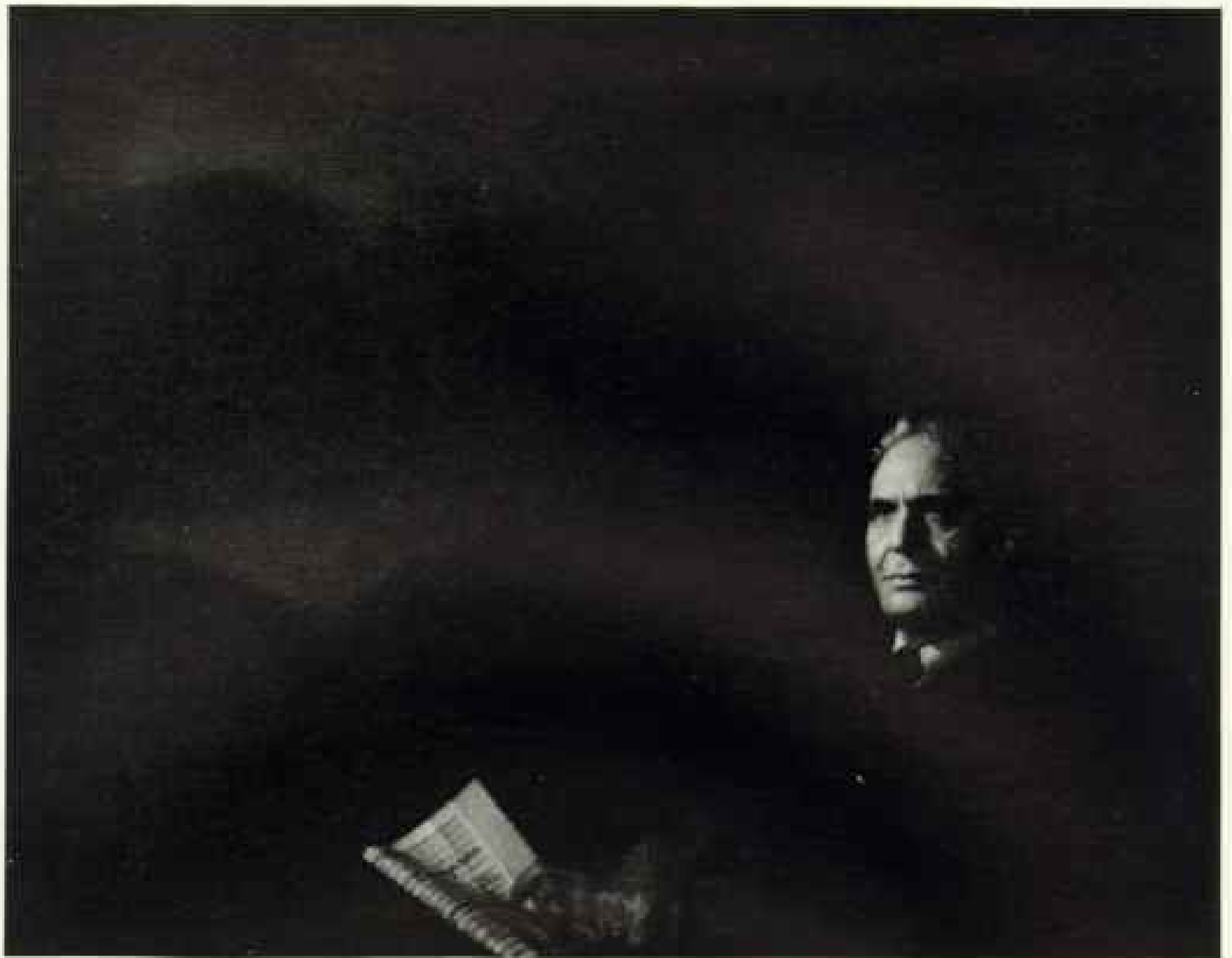
Cadillac, Mich.



Holland, Mich.

**Buy U. S. War Bonds Today—
Tomorrow Command your own**

CHRIS-CRAFT



As he listens... **Bruno Walter Dreams of an "American Salzburg"**

This was recorded music as Salzburg's own Mozart might have dreamt it, centuries ago. Music that soared to ethereal heights, then crashed to abysmal depths, rising once again to touch all the infinity of human emotion. It was the music of a symphony that Bruno Walter had directed in Salzburg long ago, but now its notes were as sharply etched and crystal-clear as though each instrument had fallen anew under the spell of his baton.

"Never have I heard such faithful reproduction," said the famed conductor. "It is superb, incomparable!"

Bruno Walter was listening to the only Meissner electronic radio-phonograph in existence — the final laboratory model perfected just before the war. From Mt. Carmel, Illinois — widely known as "The Little City of Great Music" — will come your own luxurious postwar counterpart of the priceless model which Bruno Walter found so enthralling. Then you, too, will know the faithfulness of Meissner reproduction... and you'll join with Bruno Walter in welcoming the many important Meissner advantages described at the right.

AUTOMATIC RECORD CHANGER — plays both sides of a record in sequence, *one side only*, or *repeats* a record just played... avoids record breakage. Provides 2 hours or more of music without your touching a record.

FREQUENCY MODULATION — plus advanced electronic features for fidelity and tonal range greatly surpassing such qualities in home radio-phonographs now in use.

SUPER SHORTWAVE... DISTINGUISHED CABINETS... NEW IDEAS in a host of other advancements already being engineered into Meissner electronic equipment for our armed forces around the world.

For tomorrow -
A NEW WORLD OF MUSIC AT YOUR FINGER TIP



MEISSNER
 MANUFACTURING COMPANY - MT. CARMEL, ILL.
 ADVANCED ELECTRONIC RESEARCH AND MANUFACTURE





*Exquisite examples of the use of
FORSTNER 14 Karat Gold Snake Chain
by several of America's foremost
Jewelers and Goldsmiths*

Forstner
CHAIN CORPORATION

Department 5, Irvington 11, New Jersey

Upon request we will gladly furnish the names of the jewelers whose creations are here illustrated as typical



BUY MORE
WAR BONDS

The "pup" that meets all trains

HIS home is in a little town—and the railroad station is a long trot away. But rain or shine, snow or sleet, this wistful dog is down there on the platform twice a day—waiting for a pal he's always sure the next train will bring back.

Again war has made the railroad station the focal point of life in America's cities, towns, and villages.

Brave good-byes are said there—excited greetings shouted. And over the glistening rails, by day—into the signal-lit, shadowy vastness of the far beyond by night—click the freights, the troop trains, the crowded limiteds, the fast mails of a nation speeding up its date with Victory.

Such are the trains that serve the towns and cities on The Milwaukee Road's 11,000-mile system. Between the Great Lakes and the Pacific north coast, in big city terminals and unpretentious depots, the story of America at war unfolds, in all its drama, day after day.

The Milwaukee Road is ever mindful of its duty to the men and women in the armed services. Their needs must and will be met.

At the same time, The Milwaukee Road is making every endeavor to maintain adequate and dependable service for all the people in all its territory—and this goes for the "Way Station", where the pup meets all trains, as well as for "Big Town".



THE
**MILWAUKEE
ROAD**

SERVING THE SERVICES AND YOU



BUY WAR BONDS AND STAMPS

Asleep in the deep with a jeep!

Some jeeps fly and some jeeps float—but this one was a deep-sea diver.

The crew of a U. S. submarine took it from a pier at Pearl Harbor. They stowed tires and engine inside the sub, lashed the rest to the deck, and rambled all over—and under—the Pacific. But with so little time ashore to enjoy the jeep, they finally swapped it to a destroyer for three gallons of ice cream!

Such a price for a prized possession shows how much service men like ice cream. Like the Marine who wrote from his jungle foxhole that he wanted ice cream three times a day every day after the war.

Fighting men may eat ice cream just because it's good. But the nutrition experts regularly include it in service menus because it's also a valuable food, rich in vitamins and calcium.

Today, of course, the ice cream supply is limited by the world-wide need for milk, cream, butter and cheese. But if you'll be content with your fair share, you can still enjoy it.

For our part, we'll continue and enlarge the program of research that has constantly improved the quality of ice cream—and has developed so many other useful products from milk—nature's most nearly perfect food.

Dedicated to the wider use and better understanding of dairy products as human food . . . as a base for the development of new products and materials . . . as a source of health and enduring progress on the farms and in the towns and cities of America,



**NATIONAL DAIRY
PRODUCTS CORPORATION**
AND AFFILIATED COMPANIES

*"Why talk to me about Old Age?
I'm only 40!"*

Even if you are only 40—or 35—here are some things you should know about growing old...

Since 1900, the average life span of Americans has increased about 17 years—a wonderful record.

One result of this trend is that more people now live to a ripe old age than ever before. About nine million Americans are now 65 or older.

However, the goal of medical science is not only to add years to your life, but also *life to your years*. Old age without good health can be a heavy burden . . . with health it can be useful and contented.

Doctors are doing wonders to help elderly people who suffer from the chronic illnesses of later life—such as diseases of the heart . . . diabetes . . . cancer . . . Bright's disease . . . arthritis.

But doctors know that the best way to be healthy at 50, 60, 70 and beyond is to take care of your health at much younger ages. The reason? . . .

Diseases common to later life seldom appear suddenly. They creep up gradually, quietly gathering force for a number of years before they strike or become disabling.

The moral: Now is the time to start taking care of your health—before you grow old. Visit your doctor regularly for medical checkups. Give him the opportunity to discover conditions which might lead to later disability . . . to uncover diseases in their early stages when they may be arrested or cured. Let him advise you about correcting faulty habits or living conditions which may be shortening your life.



As you get on in years, the following suggestions will help you keep healthy and happy . . .

Keep your mind open to new ideas. A hobby is a wonderful tonic for mind and body—"always have something to do tomorrow." Remember that, with age, less food may be required, but it should be carefully chosen. Regular, undisturbed sleep is essential. Drink plenty of water to help carry off wastes. Get sunshine, fresh air the year round. Moderate exercise helps keep muscles firm, the circulation active.

At any age, good health is a priceless asset. Guard it in every way.

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He shoots them down with water flak.

He waits just beneath the surface of the water until a tempting insect settles on some overhanging twig or perhaps flies overhead. Then, pushing his mouth upward, he shoots his liquid charge straight at his quarry. Battered and wet, the insect falls into the water and is quickly swallowed.

Now, strangely enough, there is a certain parallel between the problem of the archer fish in supplying himself with food, and that of a thoughtful man providing for himself and his family.

Each must use a special and ingenious method to obtain something which would not otherwise be within his reach.

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But because a man with a family must think of the future, he wants more. For, as things are today, it is almost impossible for the average man to make a sufficient income to protect his family for the present and for the future, too, when he might no longer be able to earn for them.

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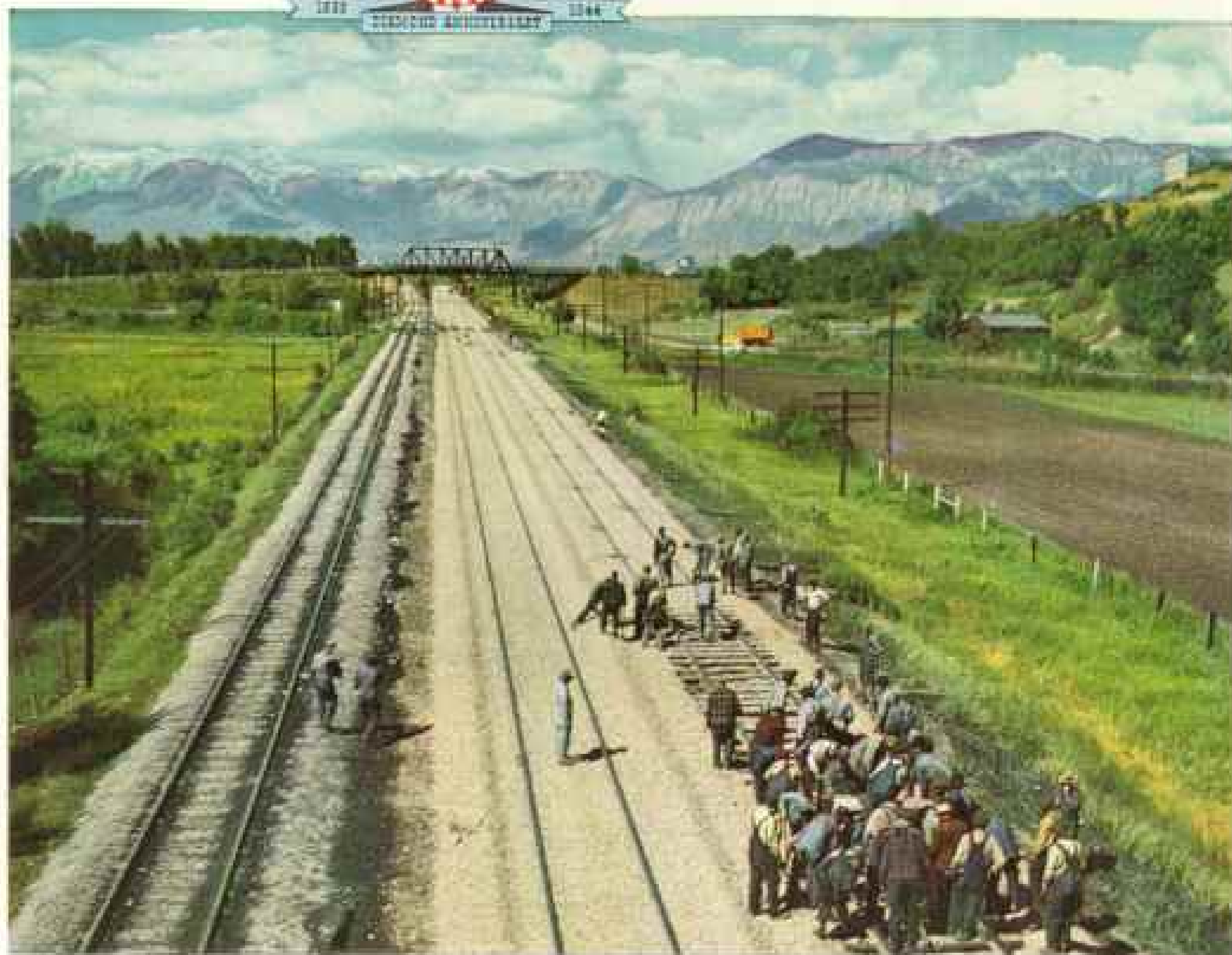
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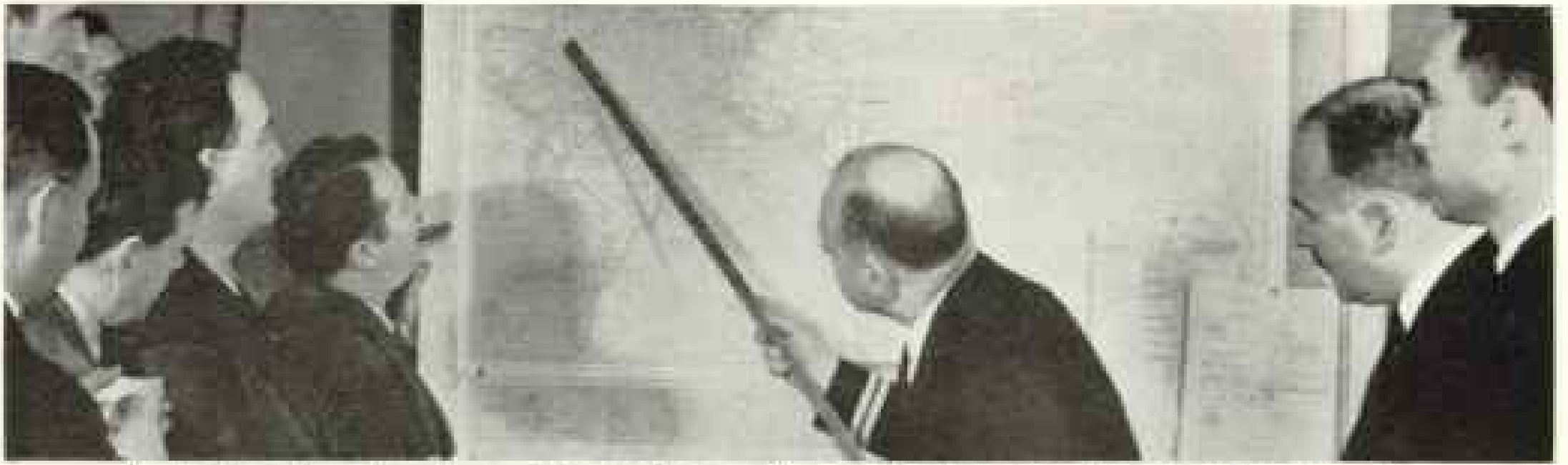
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