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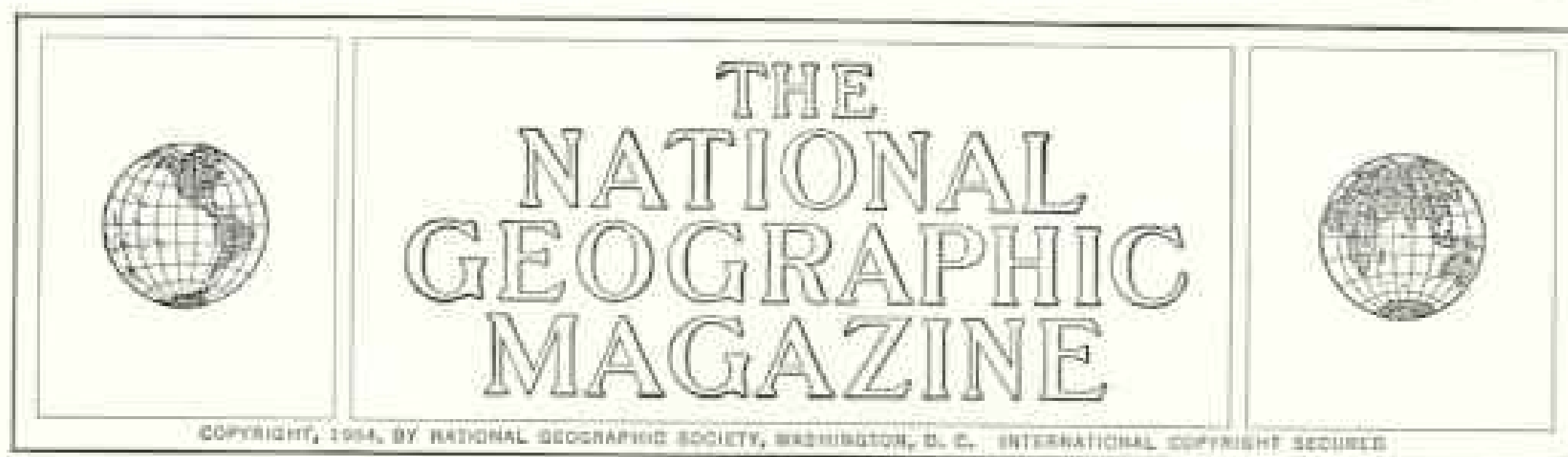
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Stop-and-Go Sail Around South Norway

Steep-walled Fjords, Historic Seaports, and Friendly People Greet
a Connecticut Yankee Cruising Along Viking Coasts

BY REAR ADM. EDMOND J. MORAN, USNR

With Photographs by Randi Kjekstad Bull and Andrew H. Brown

AS a Yankee mariner bound to the profession by birth and by association (three generations of Morans have followed the sea), I had met in my New York office scores of Norwegian skippers and shipowners.

Some of the salty flavor of Norway had rubbed off on me from contact with these sea-wise visitors. But it was not until Mrs. Moran and I took part in a 2-boat sailing cruise around the southern coast of Norway that I was able to return the call of these nautical ambassadors of good will from the land of Sverdrup, Amundsen, and Nansen.

Our open-sesame to Norway's blue water, brisk air, and mighty hills was, essentially, a case of job fatigue.

During World War II, when I put on Navy uniform to help with the Allied landings in France, extended leave was unthinkable. Then, after the war, more vacationless years slipped by in getting my business, the Moran Towing & Transportation Company of New York, back into peacetime operation.

Yes, we were overdue for a holiday.

Yachts Take a Boat Trip

By happy coincidence, as Mrs. Moran and I were grappling with the problem of where to go, my friend Percy Chubb 2d, a New York insurance executive, called me. He was planning a cruise around southern Norway from Bergen on the west coast to Oslo on the east. Could we make it a 2-boat venture?

We could indeed. Our problem was solved.

So it came about that *Deep Water*, my 36-foot cutter, rode to Norway pickaback on a freighter. *Laughing Gull*, Percy Chubb's 44-foot yawl, arrived with her owner aboard the liner *Stavangerfjord* (page 170).

Wet Bergen Stages a Dry Spell

Our voyage was to begin—and end—close to the 60th parallel of north latitude. Although Bergen lies 1,333 miles nearer the North Pole than my Connecticut home, it is almost "deep South" to Norwegians; their country extends another 750 miles toward the top of the world!* (See map, "Northern Europe," a supplement to this issue.)

Bergen, drenched with about 80 inches of rain a year compared with 40 for New York City, relented to favor us with bone-dry days. So between supply visits to *Deep Water* at her mooring, we roamed Norway's second city and second port, grown proud and prosperous since King Olav Kyrre founded it A.D. 1070.

For an over-all view we rode the cable car to the top of Fløyfjellet (Weathervane Hill). That dizzy ascent led to a tremendous outlook over the roofs of Bergen, 1,000 feet below (page 159).†

* See "Around the World in Eighty Days," by Newman Bunstead, NATIONAL GEOGRAPHIC MAGAZINE, December, 1951.

† See "White War in Norway," by Thomas R. Henry, NATIONAL GEOGRAPHIC MAGAZINE, November, 1945.



Stubby Norwegian Fishing Boats Nudge Each Other in Bergen Harbor

Norway lives by the sea: her slender land is essentially a mountain-backed coastline; most of her cities are ports; her people by the thousands follow the sea as fishermen and merchant sailors.



Wind Whips the Flags of City and Nation Above a Rain-swept Market

Waterfront vendors sell fish, vegetables, and flowers. Steep-gabled buildings (far left) are replicas of Hanseatic warehouses that stored the cargoes of medieval times (page 136).

The heart of the city occupies the only level land for miles around; landlocked harbors, busy with shipping, nearly moat it. The tide of growth has washed suburbs far up the slopes of the seven surrounding mountains.

Back down in the city streets, we stood at housewives' elbows as they selected live sea food from tanks in the Fish Market. Close by stand warehouses built in the style of Hanseatic times—narrow, steep-gabled structures (pages 154 and 160).

Fronting what was called the German Quay until after World War II, these buildings remind Norwegians of a German occupation—but not Hitler's. The Hansa "invasion" was a commercial conquest antedating the Nazis by 600 years. In the 14th century merchants of the Hanseatic League moved in and took over the trade of Bergen and western Norway.

Secure in their monopoly, the German bosses grew fat at the expense of the Norwegians. If Spain wanted to buy codfish, the Netherlands timber, or England pine tar from Norway, they could deal only through the Hansa merchants, who skimmed off the profits by using one set of scale weights for selling and another for buying.

Like Hitler and his generals, our Bergen friends told us, the Hansa merchants eventually fell prey to corruption. Mutual distrust was cynically acknowledged by triple locks on cashboxes, the keys held separately by three traders.

Bergen later became a fountainhead of Norwegian culture. Here was Edvard Grieg's home (his near-by residence, Trollhaugen, is a tourist goal) and also the birthplace of Ole Bull, world-famed violinist.

Ole Bull founded a national theater in Bergen where works of Grieg, Henrik Ibsen, and the noted dramatist, novelist, and poet Bjørnstjerne Bjørnson were presented. Grieg it was, of course, who put to music the adventures of Ibsen's egotistic rascal, *Peer Gynt*.

Boats Spread "Wings" in Take-off

Bergensers we met gave us unstinting aid at every turn. But of them all, none did so much to make our visit happy and help launch our voyage as Birger Gjestland, a prominent shipping man, and his delightful family.

Our departure day arrived. Bergen basked in bright sunshine of a June morning. Above the quay wheeling gulls chorused raucously.

"*God tur!*" (good trip) called out friends gathered at the harborside to see us off.

"*På gjensyn*" (au revoir), I replied, prompted by my Norwegian-speaking shipmates on *Deep Water*. Our companion boat, *Laughing Gull*, moved off fast to starboard; someone aboard her waved us on.

Deep Water's sails flapped a moment, then filled. As we picked up speed, water gurgled under the stern and waves slapped on the hull. Fine old Bergen, with the sea bred in her bones, grew small down our wake.

Aboard *Deep Water* we were a crew of five—my wife Alice and myself; my office associate, John Bull, and his wife Randi, both fluent in Norwegian; and William Pyle, professional sailor. Percy Chubb's hands in *Laughing Gull* were his wife and three of their children.

Telephones That Dial "Backward"

Long association with *Deep Water* had made us familiar with the location and purpose of every sheet and halyard, each cleat and locker (page 173). Under way, the pleasant business of sailing her was a well-known routine. Yet the homelike little vessel was to introduce us to an unfamiliar and captivating new world.

Ashore in Norway, unsuspected novelties awaited us. We would sleep under feather quilts sacked in sheeting, spin telephone dials with numbers running "backward," and travel Norwegian miles each equal to more than six U. S. miles. We would have the problem, leaving hotel rooms, of what to do with door-key tags (wooden balls, blocks of rubber, or slabs of metal) that weighed as much as a quarter of a pound—far too bulky to abscond with unintentionally.

We were to find Norway an up-and-down Kingdom with only four golf courses but with a ski jump close to almost every town, and a land where the local bookstore is as indispensable as the butcher's or the baker's shop. It turned out to be the country where *seil*, *dekk*, *anker*, *fish*, *kupong*, *salong*, and *se ut av vinduet* meant, as we hoped they would, "sail," "deck," "anchor," "fish," "coupon," "salon," and "look out the window."

Soon we were scudding southward from Bergen. Pines and oaks clothe these rocky shores. Cottages—white, yellow, and red—cling to coves and headlands.

"Every young man in Norway wants three things in life," a friend told us: "a pretty wife, a sailboat or motorboat, and a cottage in the fjords." It was reassuring to see how many of them had got their wish.



Laughing Gull Shows the Stars and Stripes in Cloud-draped Hardanger Fjord

Rear Admiral Edmond Moran and Percy Chubb led shipped their auxiliary sailing yachts from New York to Bergen, launching a 600-mile cruise around Norway's south tip. Five persons lived and slept comfortably aboard the Chubb's *Laughing Gull*, a 44-foot yawl. The Morans' 36-foot cutter, *Deep Water*, also accommodated five.

Our charts showed the west coast of Norway to be a maze of capes, rocks, islands, and narrow passages; we were relieved to find lights, buoys, and channel markers everywhere.

The superb Norwegian charts locate hazards and navigation aids. They also show the prodigious depth of these coastal waters. In Bjørne Fjord we sailed over one spot marked 364 fathoms—2,184 feet of water within one mile of land.

Folge Glacier a Souvenir of Ice Age

A squall flung us, like a rocket from a launcher, out of narrow Loksund into the wide expanse of Hardanger Fjord. Perhaps the capricious sprites of mountain, cavern, and waterfall—trolls, *huldras*, elves, and nixes—contrived that dramatic unveiling of what probably ranks as the world's favorite fjord.

Splendor clothes the scene (pages 157 and 172). Eastward, across glittering water, gaunt mountains hold aloft the alabaster Folge Glacier (Folge Fonni). This chilly dome is a souvenir of Pleistocene ice sheets that once buried the whole country and gouged out the fjords.

Vegetation from shore to mountain summits displays climates ranging from temperate to arctic. On the lowest slopes we saw gardens and luxuriant groves of birch, poplar, and ash. Orchards and fields of grain climb a little higher. Then follow pine forests, summer pasture, and bare cliffs. A rock-ribbed mantle of ice and snow completes the picture.

Ranks of fruit trees—cherry, plum, pear, and apple—came into view as we turned north in this 70-mile-long arm of the sea. Hardanger, we knew, boasts Norway's richest orchard district; its most productive groves grow farther inland, along the tributary Sør Fjord.

Sunday finds many people clad in Hardanger's native costume, the women with starched white bonnets, white blouses and aprons, and red embroidered bodices; the men in black pantaloons, with red waistcoats and silver buttons. This bright costume still is traditional for weddings, holidays, and celebrations. Gold and silver triankets encrust the bride's version.

"Ah, you should see Hardanger in May!" friends told us with sighs of blissful recollection.

Few scenes, I am sure, can be more dazzling. The snow reaches fingers far down the mountainsides; every waterfall roars in spate, and thousands of blossoming fruit trees lift perfumed powder puffs along the green shores.



Deep in Sør Fjord, where the runoff from upland snow fields provides abundant water power, electrochemical, zinc, and aluminum works cling to the shores. Shipping of products is economical. Fjordland's waterfalls, providing cheap power for near-by factories, tumble into water navigable by large ocean-going vessels.

After a brisk run through Hardanger Fjord we stopped for the night at Bakke on the west shore (page 172). Next morning Jan Dysvik, sheriff and local administrator, came aboard *Deep Water*.

He began a little speech with John Bull acting as interpreter. "Yours are the first American yachts ever to come to Bakke," he told us. "Your visit honors our town."

The sheriff's formality soon melted. He told us he had a sister living in America on



Sea Water All But Makes an Island of Bergen, Norway's Second City

The Norwegian colors grace 5,800 seagoing ships—merchantmen, sealers, whalers, fishing vessels, coastwise freighters. Eighty-five percent of the merchant ships, chartered to foreign interests, never touch at Norwegian ports. Bergen itself has a million and a quarter tons of shipping. Here the camera looks down from Fløyfjellet (Weathervane Hill), one of seven mountains that cradle the port (page 133).

a street called Park Avenue. Was that a good district? He produced two silver spoons, presenting one to Percy Chubb and one to me in token of Norwegian esteem for the United States. We were deeply touched.

Weighing anchor, we sailed across the fjord and skirted the eastern shore, seaward bound again. Mountains lifted a 4,000-foot wall above us. Against blue sky the Folge Glacier seemed light as cake frosting.

We swept within view of the baronial estate of Rosendal, now an experimental farm. The main building, erected in the 1660's, is among Norway's handsomest.

Threading islands in the mouth of Hardanger Fjord, we pressed on through mist and rain to Tveit. As we lay at anchor, a farmer rowed under our stern. Seeing fresh-caught fish in the bottom of his boat, we called out to ask if we might buy some.

From America? That's Different!

"The fish are not for sale," he answered. "I have been out catching supper for my family." His tone was polite but firm. Then his curiosity got the better of him. "Where are you from?" he asked.

When we answered, "America," the man



← "That's Just Two Kilos!"
Says a Bergen Fishmonger
as Cod and Brass Weight Balance

Herring, pollack, mackerel, and other fish lie on display a stone's throw from the quay where the boats unload (page 154). Tasseled red caps label the youthful customers as seniors in gymnasium, Norwegian equivalent of high school. Graduates wear them for the last time the day they enter one of Norway's two universities, at Bergen and Oslo, then discard them for more elaborate black college caps.

↓ Mandal's Town Planners Lived
Before the Automobile Age

Southernmost town in Norway, Mandal typifies the tranquil old seacoast villages of Sørlandet, the South Country. Here Store Elvegata (Big River Street), Mandal's main stem, traverses Bondeheimsplassen, the Square of the Farmers' Home. Only 12 feet wide at one point, the winding street gives better passage to bicycles than to the town's few automobiles. *Konditori* sign marks a confectioner's shop.





↑ **This Ulvik Hotel Serves Scenery with Breakfast**

On a fateful day in 1940, a Nazi warship steamed 70 miles through Hardanger Fjord to the blue water outside this window. Her guns leveled Ulvik in reprisal for opposing the German invasion.

Rebuilt, the town today attracts thousands of Norwegian and foreign vacationists. A ferry again crosses the fjord to take automobiles from one network of scenic highways to another. Here a waitress wearing native costume of the near-by Voss district attends guests of the new Brakanes Hotel.

↓ Hardanger costume enhances the charm of these playmates.

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Tiny Figures (Upper Right) Stand on the Pulpit, 1,800 Feet Above Lyse Fjord

Ice Age glaciers carved the hundreds of fjords, or narrow inlets, that deeply indent Norway's entire coast. These arms of the sea, a serious hindrance to land transportation, turn Norwegians into a boat-loving people.



High Road Meets Low Road in Tvedestrand; Slashed P Says "No Parking"

Since the 16th century this southeast-coast port has shipped timber and the products of the old Nes ironworks from its harbor. The builder of the corner house tailored it to the lot but skimped on windows.

swung about and towed alongside. He tossed his biggest fish on *Deep Water's* deck and touched his cap. He refused cash payment but accepted chocolate bars.

To seaward of our next day's course lay the island of Bømlo, with a proud war record. Much of the Allies' surreptitious small-boat traffic between German-occupied Norway and the Shetland Islands and England operated from its western inlets with surprising regularity. Many young Norwegians escaped by this route to join Allied fighting units.

Contacts between this part of Norway and the Shetlands have been close throughout history. Hjelte Fjord, near Bergen, gets its name from Hjaltland (Shetland), which was Norwegian territory until 1468. That year Shetland was mortgaged for the dowry that the Norwegian-Danish King Christian I pledged for his

daughter, who married James III of Scotland. Christian never paid the dowry, and Shetland was annexed to Scotland in 1472.

Flikk Flakk for a Boatman's Breakfast

Life aboard *Deep Water* quickly shook down to a smooth routine. The Bulls occupied the after cabin, while Alice and I bunked amidships. Seaman Pyle slept up forward.

Our able professional was up each morning at 5:30 to swab and polish while the dew still lay heavy on brass and woodwork. He rubbed all mahogany and cushions with chamols and polished stanchions, winches, cleats, ship's bell, and motor levers (page 173).

I was usually up next, and John soon after, for he was breakfast cook. In fair weather breakfast was served aft in the cockpit: fruit juice, Flikk Flakk (like Wheaties) or Topp



© National Geographic Society

Photographs by Harold Kjetland Bull

↑ **Five Little Girls Explore a Rockbound Harbor**

Children swim and handle boats at an early age in south Norway, where an arm of the Gulf Stream warms coastal waters. Aboard *Deep Water*, the Morans watched these sprites row out into Kjerringvik anchorage, peel off clothes, and dive gleefully overside.

↓ **Young Vikings Come Aboard for a Gam on Deck**

Here anchored at Evjesund in Oslo Fjord, *Deep Water* carries the name of the author's home town, Darien, Connecticut. Yacht club burgees also adorn the life ring. Shiny binnacle, whose cover the Admiral holds, houses the compass.



Korn (corn flakes), goat cheese (brown as peanut butter), eggs, toast, and coffee.

After breakfast John tuned our small receiver to the day's weather forecast, always remarkably reliable. Every evening we were aboard, Alice made up for the habitual picnic lunch with a full-course dinner.

On many days, warm woollens from the skin out were welcome. Yet on other occasions, especially along the southeast coast, we wore shorts and T shirts.

Every day scores of vessels came into view—fishing boats, freighters, and passenger ships. Near Bømlo three Russian trawlers passed us. South from Bømlo we hugged the open coast to Haugesund. Here farmhouses cling to earth hollows on bare islands. Green sod, often bright with flowers, roofs many buildings.

We went ashore at Haugesund armed with a letter to Dr. Wilhelm Bøe, district health officer. After welcoming us enthusiastically, he and his boy, Ole, walked us along the water front.

Brightly painted warehouses border both shores of the harbor, where small boats chugged up and down (page 166). Other craft lay against the quays, loading or unloading cargo. Gulls perched watchfully on ridge-poles or screamed as they circled floating refuse. Small boys and girls seemed hypnotized by fish swimming in a vendor's tank.

Harold Wins a Haircut

"Haugesund, they say, is built on herring bones," Dr. Bøe told us. "Our population often increases by half with the invasion of fishermen during the spring run." With pride he added, "Whether you prefer the lean herring of spring or the fat one of summer, you'll never find a better herring than ours."

Haugesund also is home port for fleets of freighters and tankers; the city is Norway's fourth in shipping tonnage.

On the edge of Haugesund we visited the granite obelisk that marks the reputed burial mound of Harald Hårfagre (Harold Fairhair), Norway's first king.

"This column was dedicated in 1872," Dr. Bøe told us, "a thousand years after the Battle of Hafsrfjord, southwest of Stavanger. That was where Harold whipped rival Viking chiefs to unite Norway's clans into a single kingdom.

"Legend says that Harold swore not to have his locks shorn until he had united Norway. After Hafsrfjord the fighting chief had his

long-deferred haircut. The people dubbed him 'Fairhair.'"

At Haugesund we replenished water and gasoline supplies. We also entered a dairy and blithely asked for four liters of milk. A liter is a little more than a quart.

"Your cans or bottles, please?" The polite salesgirl extended an expectant hand.

"Sorry," we replied. "What cans do you mean?"

"We sell milk only in bulk," was the surprising answer.

This is the practice in some of Norway's towns; no can, no milk. We had to beg bottles from the Bøes.

Norwegian Courtesy Charms Visitors

Early in our travels I noticed that whenever we were offered help or attention, from waitresses, maids, bellhops, salesgirls, or taxi drivers, the services always were accompanied by what first sounded like a whisper or a muffled sneeze. The sibilant password was the phrase, "*Vær så god*" (be so good), a universal expression of courtesy, roughly equivalent to "Please" or "At your service."

Courtesy is deeply inbred in Norway's people. They delight in saying "Thanks." Every day you hear "*Takk, takk*," "*Tusen takk*" (a thousand thanks), "*Mange takk*" (many thanks), and "*Takk skal De ha*" (thanks shall you have).

The Bøes invited Alice and me and the Bulls to dinner. Dr. Bøe, his wife, and their three children occupy a roomy white clapboard house facing the open sea.

Fourteen-year-old Ole Bøe spoke excellent English. In Norway, several years of English study are a requirement for every school child.

"Big winter winds," young Ole told me, "fling sand against our windows like hail. Spray sometimes cakes the front of the house with salt."

By contrast, the Bøes' big parlor window overlooks a quiet back garden snug with shrubbery and gay with flowers.

Both dining room and parlor hold tall glazed stoves. Such stoves, often with tiled fronts, supplement or replace central heating. On the west coast the mild climate, even in midwinter, makes stoves alone quite adequate. Electric heating is being installed in new homes, with fireplaces or stoves to throw out added warmth on the coldest days.

Dr. Bøe's, we agreed, epitomizes the many Norwegian homes we visited, a few richer,



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"Haugesund, They Say, Is Built on Herring Bones," Said the Author's Host in This Thriving Port

Haugesund's population of 20,000 increases by half each spring as fishermen arrive for the herring run. Smaller smacks, like the one under way in the riverlike harbor, fish with drift nets. Others use purse nets. A tiny passenger ferry crosses the harbor between mooring buoys. Gulls on rooftops watch for food. Annual rainfall up to 80 inches rains no eyebrows in Norway. Haugesund families, leaving the Church of Our Saviour, defy the rain with bright umbrellas.



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ST. SERAFIM'S BEECHCROFTING

many poorer. But to each we all had the same reaction: they look lived in and enjoyed. In every one much of Norway—landscape paintings, native brassware, hand-decorated chests or trays, embroidery, silverware, carvings—is proudly present. Norwegian home decoration is as informal as the good-humored occupants, who rarely take themselves or any of their material possessions too seriously. Except, perhaps . . .

Yes—their boats! Most Norwegians live on the seacoast or close to it. Boats, inevitably, are legion. For thousands of families they are a necessity, taking the place of automobiles. To build or buy a boat calls for sacrifices, and, once in possession, the average owner spares no pains to keep his craft shipshape, whether it be a 15-foot motor dinghy or a 100-foot ocean-going trawler.

As we cleared Haugesund, a piping breeze swept *Deep Water* through the narrow Karmsund, between the mainland and the remarkable island of Karmøy. Low-lying and almost treeless, Karmøy supports 20,000 fishermen, farmers, and miners of the local pyrites deposits—a surprising total for a single island in a thinly populated land.

Archeological finds prove the importance of the island back to Viking times. It occupied a strategic position between north and south Norway. Sea traffic, invariably following the inside passage through Karmsund, could be closely watched from Karmøy.

Crew Takes to a Taxi

Out in the mouth of Bokna Fjord, exposed to open ocean, cresting waves tossed our boats like chips. Then we swooped into the sheltered anchorage at Tananger, on the Stavanger peninsula. *Deep Water's* deck, suddenly level after hours of being heeled over, gave us the feeling of walking on legs of unequal length.

From Tananger in a *drosje* (taxi), we drove to Stavanger. Shady streets led us into the hubbub of Norway's fourth largest city (after Oslo, Bergen, and Trondheim), with 50,000 people. Accessible now by road, rail, ship, and air, Stavanger is a rising star in southwest Norway (pages 170 and 171).

Roaming narrow cobbled streets, we came to squares that have changed little in hundreds of years. But modern buildings, hotels, and new harborside shipping offices showed us that Stavanger is not content to drowse among its memories.

We found that shipping and fish canning

(mostly *brisling* and *sild* sardines and kippered herring) still earn most Stavanger *kroner*. (The Norwegian krone is worth approximately 14 cents, U. S.) The absence of large centralized fish plants struck us. Instead, numbers of rather small firms here produce half of Norway's canned-fish exports.

Even world-famed Chr. Bjelland & Co. "farms out" its packing among smaller units. Bjelland, a poor boy who sold brooms for a living, founded Stavanger's million-dollar canning industry. Many canning plants devote slack periods between fishing seasons to packing vegetables, meat, fruit, and preserves.

As we walked through one canning plant, the tangy flavors of oak smoke, cooked fish, and olive oil made our mouths water (page 185). Our friend and guide, Torolf Smedvig, snatched a filled can just before it received its top and handed it to me. With oily fingers Alice and I took turns popping into our mouths tasty *brisling* fresh from the North Sea.

Seafarers Are Norway's First Citizens

Johan David Behrens, managing director of Stavanger's great Rosenberg shipbuilding firm, took us aboard a 17,000-ton tanker standing half-completed on the ways. We ambled over bare steel decks, dodged welders and swinging crane hooks, and outshouted the clatter of riveting.

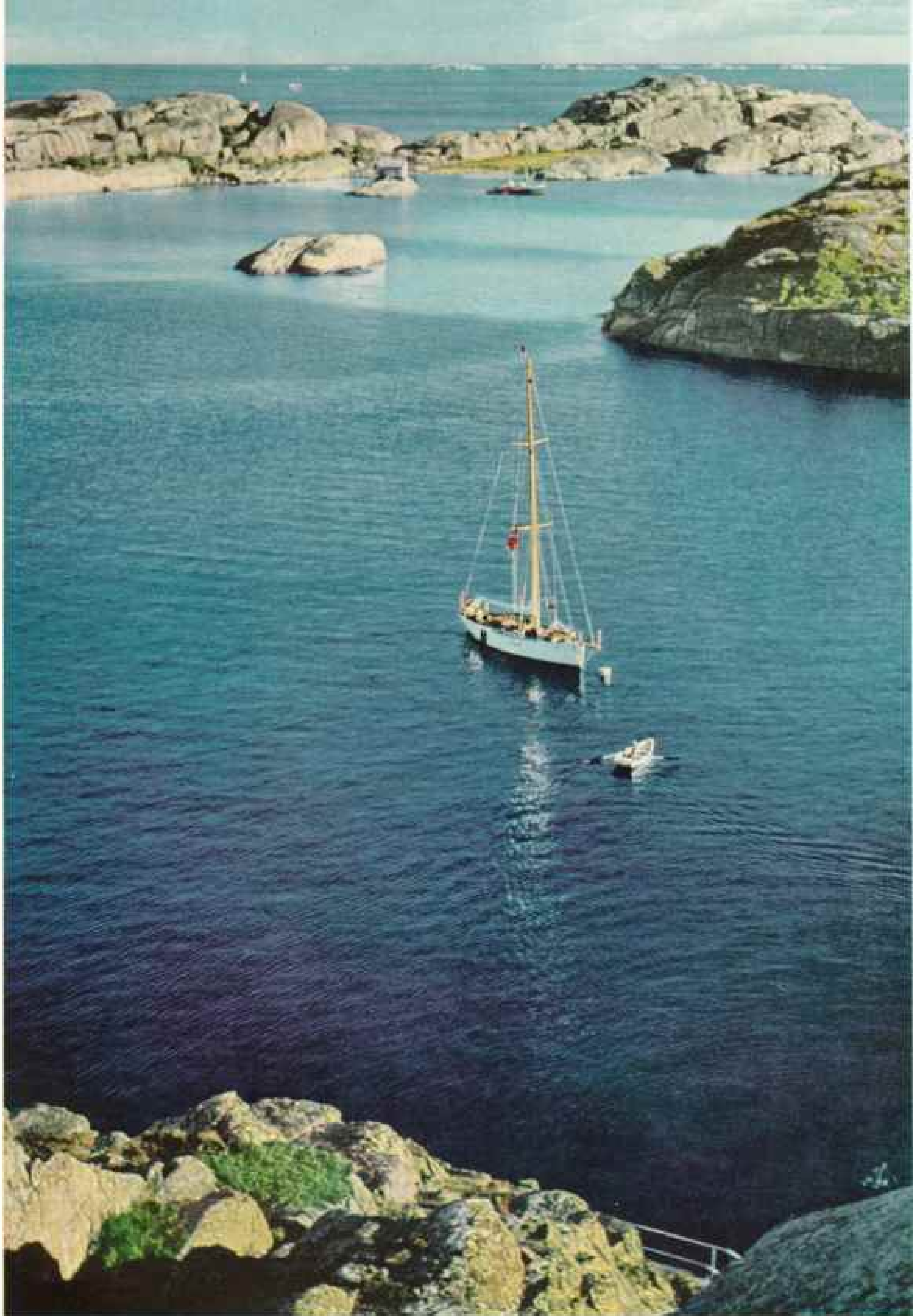
I knew, from many business contacts, that shipowners are a highly respected class in Norway. For one thing, the employment they provide still has the glamour of far places and strange sights. Shipowners, generally prosperous, often are outstanding community benefactors; they are large contributors to such worthwhile projects as hospitals, museums, clinics, and sports activities.

Later I did a little research on Norway's shipping and came up with some amazing facts.

When Norway was swept into the last world conflict, she had 5,000,000 tons of shipping, with about 1,000 of her merchant craft in foreign waters. In World War II this seafaring Kingdom, so dependent on her sea-borne carriers, lost about half her merchant fleet.

But today, thanks to the investment and energy of her people and substantial Marshall Plan and Mutual Security aid from the United States, Norway has built up her merchant fleet to a new high point of 6,450,000 gross tons (more than half of it in tankers) and to a

(Continued on page 177)



Deep Water Rests in Kjerringvik Anchorage, Snug Behind Sheltering Rocks
Honoring her host country, the author's cutter wears Norway's colors in her starboard rigging.



Blue Fingers of the Sea Bring Ocean Shipping Deep into Stavanger's Heart

Norway's fourth city, a major port, shelters *Stavangerfjord*. The Norwegian-America Line vessel honors the city's name; there is no such fjord. † Alexander L. Kielland, 19th-century Norwegian author, wrote of Stavanger's shipping and shipowners. Now his statue stands in the chief market place; the King, Haakon VII, uses the near-by Kielland family estate during royal visits to the city.





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↑ **Hardanger Fjord's Snow-capped Peaks Smile Down on a Yankee Yacht**

Grandeur and accessibility make Hardanger Norway's best-known fjord. Important industries at Odda, Eltrheim, Tyssedal, and Alvik depend for hydroelectric power on water tumbling from the surrounding heights. The Folge Glacier rims the far horizon.

Laughing Gull rides at anchor off Bakke, whose aberrif gave the yachtsmen silver spoons to commemorate their visit. Fishermen store gear in the frame buildings near the water.

→ Towing their dinghies, *Laughing Gull* and *Deep Water* beat slowly out of Hambo, yachting center on the east shore of Oslo Fjord.



Deep Water Wings South from Bergen Past Norway's Cerulean Coast

Here the cutter's crew relaxes in the cockpit while the yacht moves downwind. The author takes moving pictures. William Pyle stands a tick at the wheel. Mrs. Mornin (left) and Mrs. Bull enjoy the northern sunshine.

Complex ship's gear holds no mysteries for *Deep Water's* people. Notched gallews at the stern holds the main boom when the mainmast is furling (page 164). A backstay (with block, at the Admiral's right) helps support the mast.

Rope balyards for raising sails—mainmast, forestaymast, jib topsail, gennoa jib, and spinnaker—fasten the mast. Bell-shaped fitting between them, adjustable for height, holds the spinnaker boom when that spar is in use. Winches on mast and deck lighten the labor of setting up balyards and sheet ropes (lying on deck) used for trimming sails. A mahogany skylight lights the after cabin on which perches the boat's electric horn.

© Hutchinson by Russell K. Johnson/Flatt





↑ A Fast Sloop Arrows
Across Bokna Fjord
near Stavanger

Yachtsmen find a summer paradise in the wide seaward reaches of Norway's fjords and its sparkling open waters between coastal skerries. Inner fjords, surrounded by mountains, breed errant gusts and dead air, both handicaps to a wind ship.

The slim red yacht is a 20-foot Dragon, designed in Norway and built by its owner. American and Canadian yachtsmen have imported many of her sisters produced in commercial yards.

→ Norse Shop Spawns
Two More Dragons

Norwegians have built good boats since Viking times. This yard at Arendal, owned by the family of Ivar Bentzen (white cap) for more than 150 years, turns out a Dragon for a Puget Sound sailor. Carpenter at left drills for the fastenings that will hold the planking to the frames. His companion drives the screws, made of a salt water-resistant alloy.

© Kodachromes by Andrew H. Deery,
National Geographic Staff





Setesdal Holiday Dress Includes Trouserlike Skirts for the Women

Northward from coastal Kristiansand runs the Setesdal, a region isolated by geography from the rest of Norway. Its people farm and tend goats in high pastures ringed by mountains where all the snow rarely melts. Old dialect, customs, and costumes still survive in the valley.

Here Andrew H. Brown of the NATIONAL GEOGRAPHIC staff and a Valle innkeeper model Setesdal's famous festival costume. Bright embroidery and silver ornaments stand out against heavy black wool. Stiffening keeps the skirt flared and divided to resemble trousers.

↓ A Sunny Smile Greets the Law's Guardian

Norway boasts one of the lowest crime rates in the world. Its respected police carry no guns, enforce traffic laws rigidly. Like most Norwegians, nattily uniformed Inspector Harald Foss of the Kristiansand city force refused to cooperate with the Nazis in World War II. He spent months in a concentration camp. Here he chats in the city flower mart.

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Kodachrome by Arneid Nergaard (left) and Andrew H. Brown, National Geographic Staff

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firm hold on third place—after the United States and the British Commonwealth—in tonnage of vessels in foreign trade. (Most Norwegian ships, of course, are built in foreign yards.) On a tonnage-per-capita basis Norway leads the world. And of Norway's total population of 3,500,000, some 50,000 are merchant seamen.

Stavanger's First Bishop Was English

From the varied tongues we overheard in streets and hotel lobbies it was easy to tell that Stavanger is a favorite tourist gateway to Norway. Passenger liners linking Bergen and Newcastle, England, call here regularly.

Ties with England are of long, long standing: Stavanger's centuries-old Cathedral was begun by an Englishman, the town's first bishop.

We spent one night at Sola Strand Hotel, nestled in seaside dunes close to Stavanger's important Sola airport. A "gay fellow" in Norway is known as a *glad laks* (literally "happy salmon"). Sola Strand has dedicated a snack bar and beer parlor to this carefree type, calling the room "Den Glade Laks." A monster 60-pound salmon hanging on the wall is a reminder to anglers, gay and otherwise, of the rewards awaiting them in Norway's rushing streams.

On the Sola beach, the evening of the Fourth of July, we fired aloft a dozen distress rockets bought in a ship chandlery. They were the only fireworks we could find with which to do honor to the day.

Sola lies at the northern end of the flat Jæren district, a geographic anomaly in Norway. We drove through it returning to *Deep Water* at Tananger and next day, southward bound, skirted its coast.

Jæren, an extensive coastal plain, provides a shelf of fertility between sea and mountains. Its stone walls, tidy farms, and green fields reminded us of parts of southern England.*

From the sea Jæren appeared a sandy wreck-strewn waste, held together with heather and dune grass, wide open to the southwest gales. Yet inland its farms and pastures produce grain, hay, fruit, and vegetables. The district enjoys almost 300 frost-free days each year.

Jæren eggs are sold all over southern Norway, and its sheep provide a fourth of the country's wool. Much of the bacon from Jæren's annual "crop" of more than 20,000 hogs goes to Oslo and Bergen markets.

The Viking chieftain, Erling Skjalgson, made his home in Jæren; he is credited with being Norway's first progressive employer, allowing his serfs to work their way out of bondage and become free men.

A fair wind hustled us through the rock-bound passage leading to Egersund. Rounding a bend, we were nonplused to find the way blocked by a caisson put down in the construction of a bridge between the mainland and Eigerøy.

I was at the helm, taking the boat through the tortuous channel. "What shall we do?" I called out to navigator John Bull.

"Can't get through," John shouted. "Come about! We'll have to hold up."

It was a bad spot for maneuvering a fast-moving yacht with a 7-foot reach of keel. But we managed to head into the wind while workmen on the bridge obligingly pulled aside the obstacle to let us through.

Egersund's harbor lay in the shadow of old warehouses. The neat town, known for its mackerel fishery and pottery output, is fast outgrowing its sea-level living space; new frame homes splash the hillsides.

Ashore for a Can Opener

Our ships' womenfolk went ashore to replenish the larder with bread, cake, and sea trout. I headed for a grocer's shop to buy some canned pears and bottled orange juice. I needed also an extra can opener (one of our two having been dropped overboard) and asked the English-speaking grocer how to phrase my request at a hardware store.

"It's called a *hermetikkåpner*," he said. "But wait. I'll get one for you."

Before I could protest, the man scurried out of his shop. In three minutes he was back with an opener no bigger than a penknife. In Norway you become spoiled by this kind of spontaneous courtesy.

The day we moved on to Jøssing Fjord was rainy and almost windless, so we motored along, hugging the cliffs and wallowing in the lap of an old sea.

Jøssing Fjord's beetling precipices, under a dark, wet sky, loomed oppressively. At the head of the short fjord we all did a double take at the sight of two housewives hanging out the family wash in a pouring rain. Then we saw that the sheer cliff behind overhung enough to shelter completely homes, yards,

* See "Country Life in Norway," by Axel H. Oxholm, NATIONAL GEOGRAPHIC MAGAZINE, April, 1939.



Burdened Bikes Bring Campers to Sjøksanden's Pine-scented Tent Grove

This resort, near Mandal, offers one of Norway's best beaches; its park provides cheap tent space with electricity and running water. Three hundred tents may mushroom beneath the trees on a summer week end.

and clotheslines. We tied up where freighters load titanium ore brought from the mine on a mountain-hopping cableway.

Jøssing Fjord was the scene of the *Altmark* incident, in February, 1940. The British destroyer *Cassack*, threading the fjord entrance in darkness, forced aground the German raider *Altmark* and rescued 300 captive British and Indian seamen. From that event came the word *jøssing*, designating a loyal Norwegian, in contrast to a quisling, or collaborator.*

In shipshape Kirkehavn (Church Harbor) on Hidra Island, our next port of call, a cheery customs officer, Jacob Sivertsen, brought a brother, Peter, to call on us.

"He lives in your home State," Jacob explained. "He is president of the Globe Slicing Machine Company at Stamford, Connecticut."

Richer by a 6-pound salmon and a basketful of lettuce from the Sivertsen garden, we

set sail to turn Norway's southwest corner, the rocky finger of Lindesnes. Its light—the Naze—is a sailors' landmark. We by-passed Farsund, whose natives claim it to be port of registry for more vessels, in relation to its population (1,600), than any other in the world.

Norway Loves Its Southland

Now our boats were plying the waters of Sørlandet, the South Country. It borders the sea along the whole south coast from Stavanger on the west to Kragerø on the east.

The Norwegians' sentimental attachment to their southland compares with the Americans' for Dixie. The appeals are similar. A gentler climate than regions farther north. Patrician dwellings, not white-columned and box-hedged, to be sure, but noble in propor-

* See "Norway, an Active Ally," by Wilhelm Morgenstierne, NATIONAL GEOGRAPHIC MAGAZINE, March, 1943.

tion and tasteful in detail. And a sense of relaxation and easygoing joy of living in good summer weather. But instead of the scent of magnolia and orange blossoms, we sniffed delightful aromas of tar, pines, and seaweed. White towns and fishing villages deck the shoreline.

Weather softens in Sørlandet, and so does the scenery, quieting down eastward to grassy river mouths, gently rolling farm and forest land, and sandy bays. Countless rocky islands, called skerries, fringe the coast (page 169). Throughout the summer sailboats and motorboats skim and chug *innenskjærs*, "inside the skerries."

But in contrast to the milder conditions expected, we ran into gales and driving rain. Landmarks vanished in the turmoil of sea, scud, and storm.

Groping landward for the night, we were engulfed in fog. Compass and charts were little help. All of us were a bit on edge, when Alice raised a hand for silence.

Above the splash of sea and whistle of wind we heard a moan. Ominous sound, but welcome now! It was the fog warning on Ryvingen Light, offshore from Mandal, Norway's southernmost town (page 181).^{*} We changed course slightly to pick up the light, and presently the red shaft with its single broad white band took shape through the gloom.

Laughing Gull Loses the Way

Once inside the islands, we relaxed. *Deep Water* made for Ny Hellesund, but *Laughing Gull*, in worsening weather, failed to line up three buoys that showed the way. Percy Chubb sought an alternate anchorage.

The *Norway Pilot* called the handy cove of Rosnesvåg accessible "only with local knowledge." As Percy hesitated, his young son, Joe, innocently asked, "But, daddy, how can you get local knowledge without going in?" Percy laughed, accepted the challenge, and took the *Gull* in without trouble.

Members of the yacht club gave us anchorage next evening at Kristiansand and made us welcome to Norway's sixth-largest city. A major stop for foreign and coastwise steamers, Kristiansand surprised us with its wide, straight streets and regular block pattern, like many Midwest cities in America. Hills crowd close, but the main part of town lies, checkerboard fashion, on a flat sand plain.

Kristiansand, we learned from one of our

sailor hosts, is the only South Country city built by royal decree. King Christian IV of Denmark and Norway had a passion for creating cities; he founded it in 1641, supposedly laying out the plan himself. To populate his settlement, Christian resorted to forced immigration from towns and villages as far distant as Stavanger. He even shifted the bishopric from Stavanger.

Kristiansand is important industrially, with a great nickel refinery, foundries, canneries, shipyards, wood and paper products plants, and flour and textile mills.

Setesdal Preserves Old Customs

We visited one of Norway's fish-net plants, Kristiansand Fiskegarnsfabrik. Steel fingers of long weaving machines build the mesh by tying hundreds of knots simultaneously in cotton or linen twine. After dunking the nets in a preservative, workers hang them out to dry.

Kristiansand is gateway to the Setesdal, the majestic valley of the Otra River, reaching 125 miles north into the mountain heart of Norway. We explored it by car to a point beyond Valle.

The Setesdal, for centuries virtually inaccessible, preserves old customs almost undefiled. Even today the only access to its upper reaches from the south, except by foot, follows a road blasted and tunneled out of a sheer cliff along Byglands Fjord. Its very name, according to one theory, derives from *sætersdal*, "valley of the saeters," those lonely summer pastures high in the mountains.

In Setesdal we saw farm women wearing native costume in the fields. The work dress is woven of heavy white wool, edged with black and embroidered with touches of red. Not so common are men laboring in white shirts and black trousers—somewhat formal-looking for haying and pig feeding!

The Setesdal dress costume, which is worn to church, parties, and weddings, is of black wool trimmed with red, white, and green (page 176).

Along the road above Byglands Fjord we stopped at several silversmiths' shops to watch the craftsmen (the old ones stern and aloof, the young men affable) painstakingly filigree, appliqué, and burnish silver brooches, necklaces, bracelets, and pins.

^{*} See "Native's Return to Norway," by Arvid Nygaard, NATIONAL GEOGRAPHIC MAGAZINE, November, 1953.



A Keeper's Skilled Hand Focuses Ryvingen Light

Most Norwegian lighthouses now use electricity instead of gas-lit Dalen burners like this. Powerful prisms in the huge rotating Fresnel lens concentrate light from the mantle (upper center) and beam it seaward. As highly polished bull's-eyes revolve, they identify the light with four quick flashes followed by a 20-second pause (opposite page).

Above Valle, at Rygnestad, antiquarians' efforts have made a museum of ancient heavy-timbered buildings of the Aasmund Farm. "Bad Aasmund," a rugged individualist who made enemies as easily as most of us catch cold, was as self-sufficient as he was arrogant. His buildings were, in effect, blockhouses; from small windows he let fly with bow and arrow at such unwanted visitors as sheriffs and tax collectors.

"Bad Aasmund" Finally Turned Good

Yet in later life, abandoning the role of bad man, Aasmund settled down and became a sheriff and tax collector himself!

We marveled at the old *stabbur* (storehouse on stilts, also his dwelling), dating from the

16th century; one end of the main farm building is even older. Pitch in the timbers protected them from rot and insects; their surface, weathered to the color of antique leather, seemed rock-hard to the pressure of our thumbnails.

"This wood is so old it's petrified," suggested Alice.

Back to the sea at Kristiansand we headed our little ships east and then gradually swung north, making toward Oslo Fjord. We passed Lillesand, where sunlight bounced from white mansions, the houses of wealthy sea captains of clipper days.

Then Grimstad lay to port. Here Norway's revered dramatist, Henrik Ibsen, composed his earliest lyrics to relieve unhappy days rolling pills as a druggist's apprentice.

In a plant at Eydehamn, our next anchorage, coke is combined with native quartz to make Carborundum silicon carbide abrasive.

Eirik Hammer, manager of the plant, took us through the vast, smoky room where electric furnaces are switched on in sequence to ensure a continuous production of the synthetic mineral. One furnace had recently been broken open to cool.

Mr. Hammer picked out big iridescent silicon carbide crystals from one end and small ones from the other, to show how the size of crystals varies in different parts of the furnace. There are commercial uses for all sizes of crystals. Most, of course, go into a wide variety of abrasives. One-third of western Europe's Carborundum output originates in the Eydehamn plant; it is a subsidiary of the Carborundum Company of Niagara Falls, New York.

During the last war Norwegian patriots, parachuted from British aircraft, blew up the electric transformers, thereby wiping out production for two years, until new transformers were forthcoming from Sweden. Mr. Hammer, who persuaded the German occupation officers to let him negotiate with a Swedish electrical equipment firm, came back to report that delivery would "unfortunately" be slow. The first unit was available for installation just a few months after German troops had been driven from Norway.

Mr. and Mrs. Hammer invited us to dinner at their home, a museum-in-miniature of Norwegian culture (page 189).

In a corner fireplace, open on two sides, we broiled steaks over the coals. The humor and understanding of our multilingual hosts made the evening delightful.

Myriads of "Candles" Flare from This Iron Beacon

Norway's southernmost light winks seaward from tiny Ryvingen Island, where live three lightkeepers' families and a few pets. Ryvingen's fog warning relieved anxious moments for *Deep Water's* crew on one occasion (page 179).

The man on the gallery near the top of the 74-foot red-and-white tower wipes wind-blown dirt off the outer glass each night before the light is lit; lenses inside get even more scrupulous attention.

Andrew H. Brown,
National Geographic Staff





Symbol of Modern Norway, Oslo's New Twin-towered Town Hall Guards the Harbor

A relief of St. Hallvard (below the clock), patron saint of the capital city, looks down on a motorboat from a visiting British cruiser. King Haakon VII landed in 1905 on this water front to take the throne of newly independent Norway. Again in 1945, after Germany's defeat, he ceremoniously stepped ashore at this spot.

The southwest wind, dead astern, urged us along to Risør. A brassy sun hung above our wake. Sails bellied and rigging hummed before the *solgangsbris* (literally, "sun-going breeze"), a dependable summer wind that blows throughout the day from the direction where the sun stands.

Risør, its narrow harbor thick with boats, is another place built to order for the setting of a sea saga. Old white mansions with black tile roofs front on the quay. Narrow streets wind among fishermen's cottages, where fat cats leap from garden fences.

After so much fair wind and weather a sudden squall next day caught us off guard as we were making for Stavørn. Struggling to douse the mainsail, we lay beeled to the lashing gale. We had to work fast in rain and stinging hail, seeing the froth of shoals to port.

Minutes later it was all over, and a hot sun beat on the flat sea. The calm made us drop sail and use the engine. Later in the day we pushed on to near-by Kjerringvik and dropped anchor.

Of the many pleasant places along this beguiling shore, Kjerringvik, for setting, was



voted first choice by *Deep Water's* crew (pages 164 and 169). A great bare rock rises more than 100 feet in the middle of the harbor. At the landward end of the sandspit linking rock and shore an arc of white houses foots a wooded hill. Surf lathers the fringes of sea-worn islets. Cottages lie in clefts among humps of rock.

Soon after clearing this summer resort on July 19, we caught sight of the monolith of Ferder Fyr (Ferder Light), marking the western portal to Oslo Fjord. Two hours later we entered the last leg of our cruise.

Deep Water and *Laughing Gull* tacked through Oslo Fjord on a leisurely schedule. First we stood across to Hankø on the eastern shore, world-famed yachting center and

annually the scene of an international sailing regatta. Here the Honorable C. Ulrick Bay, who recently completed long service as Ambassador to Norway from the United States, skippered his 12-meter class yacht, *Norsaga*. He also cruised into most of the harbors of Sørlandet.

Our newest envoy to Norway, His Excellency L. Corrin Strong, shares his predecessor's love for the sea. Ambassador Strong's yawl *Pavana* crossed the Atlantic with his son Peter in command; since then the graceful 47-foot yacht has become a familiar entry in Norwegian sailing events.

Erik Anker, commodore of the Royal Norwegian Yacht Club, gave us a warm welcome to rockbound Hankø and showed us the summer home of Norway's popular Crown Prince Olav.

Our next leg took us back to the west shore of the fjord. We anchored at the island of Husøy, lying outside Tønsberg, Norway's oldest town. This venerable settlement, we discovered, celebrated its millennium in 1871. As early as the 14th century it boasted 10 churches and a castle.

The town today is a center for the Norwegian whaling industry. John Bull reminded us that a Tønsberger invented the explosive harpoon that revolutionized whaling.

But it was a native of Sandefjord, to the south, who designed the first floating whale factory. In these strange craft, some as large as 25,000 tons, the local skippers make whaling big business with months-long cruises to the Antarctic to catch the world's largest mammal. We saw floating factories and flotillas of smaller whale catchers lying moored in the harbor, being repaired and refitted for their next 25,000-mile round-trip cruise. Sandefjord is the world's chief whaling port; whale-oil plants line its harbor shores.

Our guide in this region that whaling boomed was Tom Wilhelmsen, grandson of the founder of Norway's largest shipping firm, Wilh. Wilhelmsen, many of whose ships bear "Tønsberg" on their sterns as home port.

Viking Queen Sails to Next World

On a map Wilhelmsen pointed out to us near-by Oseberg, which gave up the marvelously preserved vessel we saw later in the Viking Ship House at Bygdøy, near Oslo. In it a young Viking queen and her servant were dispatched to the next world fully equipped for traveling. The ancient craft when excavated contained beds, pillows, quilts, and blankets.

Tapestries adorned the burial chamber. Chests contained lamps, scissors, and other daily necessities. Enough remained of a pair of wild apples picked about A. D. 900 to establish the fact that they were ripe when stowed aboard the vessel.

From Husøy we loafed across Oslo Fjord once more. This long arm of the sea is distinctive on several counts. Because of the influx of fresh water from many rivers, its salinity, particularly at the upper end, is far less than the open sea's.

Temperature, we learned, is another of Oslo Fjord's peculiarities. In winter the thermometer sometimes tumbles lower than it does in seacoast places 750 miles to the north, far beyond the Arctic Circle. Ice on rare occasions closes the port of Oslo.

The shores of Oslo Fjord loomed steep and wooded around us. We knew, however, that behind its walls lay fertile fields. Though the region surrounding the fjord totals less than a twenty-fifth of Norway's area, it includes almost a quarter of the nation's farmland.

The proportion of land under cultivation around Oslo Fjord is 30 percent, compared with only 3 percent for the whole of mountainous Norway.

As Oslo Fjord narrowed, signs of civilization increased. The naval base of Horten slid past to port. To starboard, at Moss, paper mills and sawmills sent aloft their smoke plumes. Once through the Drøbak strait, dodging ships became a problem.

Randi Bull, who lived for years in Norway, pointed out landings for the "papa boats," so-called because they pick up and deliver fathers commuting to city jobs from cottages along the fjord.

Oslo, 26 Times Bigger Overnight

At Nersnes we made our last overnight anchorage. Next day, July 24, Oslo appeared on the northern horizon. As we made in for our mooring, two contrasting landmarks stood out: gray old Akershus Castle, with its candle-snuffer spires, and the square dark-brick mass of the new Town Hall.*

Deep Water and *Laughing Gull* dipped colors to King Haakon VII's white yacht, *Norge*, anchored among scores of lesser craft.

Oslo is a good place to leave a ship and come ashore (pages 182, 188, and 192). Although Norway's leading port, the city smacked more to us of land than sea. It lies

among wooded hills on the lakelike fjord, with the aroma of pine, not seaweed, in its air.

Henning Astrup, official of a shipping firm, helped us understand his city as only a native of Oslo could.

"On New Year's Day of 1948," he told us, "Oslo bulged out to 26 times its former size when it officially swallowed 175 square miles. What other big city is almost half forest?"

Oslo folk take full advantage of their outdoor play space. On clear winter Sundays nearly a fourth of the city's people desert streets and offices for near-by ski slopes and woodland trails. At Easter half the populace clears out of town, to return as tanned as if they had basked on tropic sands.

Subway Runs Above Ground

"We're the smallest city in the world served by a subway," claimed Astrup. "Our underground, starting at the National Theater, comes above ground, however, far short of its terminus, 1,500 feet up on the hill of Frognerstegen."

In downtown Oslo we joined the promenade along Karl Johans Gate (Karl Johan Street). Far into the summer night laughter and the click of heels animate this boulevard of the north. Every May 17, thousands of school children march along it to the Royal Palace in a Constitution Day salute to their royal family.†

Further to test our land legs, we headed for Holmenkollen, climbing the path to the elevator in the hill's famous ski-jump tower. Here the country's finest skiers perform, and here in January, 1952, a Norwegian, Arnfinn Bergmann, won highest jumping honors in the winter Olympics.

At the observation windows overlooking the steep run-in of the jump, we were 1,300 feet above the streets of Oslo. Far below, the city seemed to drowse in the summer calm.

The Oslo Fjord looked more like a broad lake than an ocean arm. But we remembered well enough that it had brought us here from white fishing towns, dark fjords, and salt-stung skerties.

"Let's get down from here," said Alice, "before we decide to sail *Deep Water* back again to Bergen."

* See "Midshipmen's Cruise," by Midshipmen William J. Aston and Alexander G. B. Grosvenor, USN, NATIONAL GEOGRAPHIC MAGAZINE, JUNE, 1948.

† See "Norway Cracks Her Mountain Shell," by Sydney Clark, NATIONAL GEOGRAPHIC MAGAZINE, AUGUST, 1948.



An Oslo Craftsman Covers Gleaming Silver with Gay Enamel

Handicrafts flourish in Norway. Little *hjemlig* (home industry) shops everywhere sell patterned woolens, costumed dolls, painted chests, and carved woodenware. Many regions offer specialties: the Setesdal, for example, produces exquisite silver jewelry, painstakingly filigreed and appliquéd.

Norwegian artisans see no incongruity in hiding precious silver beneath glossy colors. Here in the factory of David-Andersen, famous silversmiths, a table holds baked-enamel coffee spoons, owl-shaped salt and pepper shakers, ash trays, and a fat coffee pot. The workman lays color on a hand mirror. Later it will go to an oven for baking to harden the enamel.

© National Geographic Society

These Tiny Fish Carry Stavanger's Name to Far Places

Gourmets everywhere acclaim Norway's *brisling* and *sild* sardines, both rich in vitamins, minerals, and iodine. Pictured here are *brisling*; *sild* run larger. Norwegian packers have canned as many as 1,450,000 cases a year.

Stavanger's numerous small canning plants account for half the country's canned fish exports. Between fishing seasons some factories pack vegetables, meat, and fruit. Others turn out kippered herring.

Stavanger's specialists clean and steam-cook the fish and smoke them over oak fires. Then women swiftly pack the cans by hand, as here in a Central Canning Company plant. A machine squirts in olive oil and another seals the tins.

Illustrations by Andrew H. Brown,
National Geographic Staff





↑ Saturday in Arendal: Boat-loving Norwegians make ready for a week end. Sacked blankets and camping gear line the quay. ↓ Lumberjacks raft mining timbers for storage in the Nid River at Arendal. Man at left marks logs according to size and grade.



Shoppers Jostle in the Heart of Norway's Capital

Oslo bears the name of a medieval village that stood here until fire wiped it out in 1624. King Christian IV rebuilt the town and named it Christiania. Not until three centuries later was the old name restored.

In 1948, crowded Oslo swallowed the adjacent district of Akter, 175 square miles of forest and suburbs. It thus multiplied its size 26 times, although its present population is only 440,000.

Norway's chief port and commercial center, Oslo helps set the nation's cultural standards with its orchestras, museums, art galleries, the University of Oslo, and the National Theater.

Capital thermometers rarely fall below zero, even though the city shares latitude with Seward, Alaska, and the southern tip of Greenland and is some 1,500 miles farther north than New York City. Within minutes via subway and trolley, Oslo's people reach ski slopes in winter or leafy hiking trails in summer.

This car track on Grensen, a downtown street, leads to the Oslo Cathedral, formerly called Vår Frøbers Kirke (Church of Our Saviour).

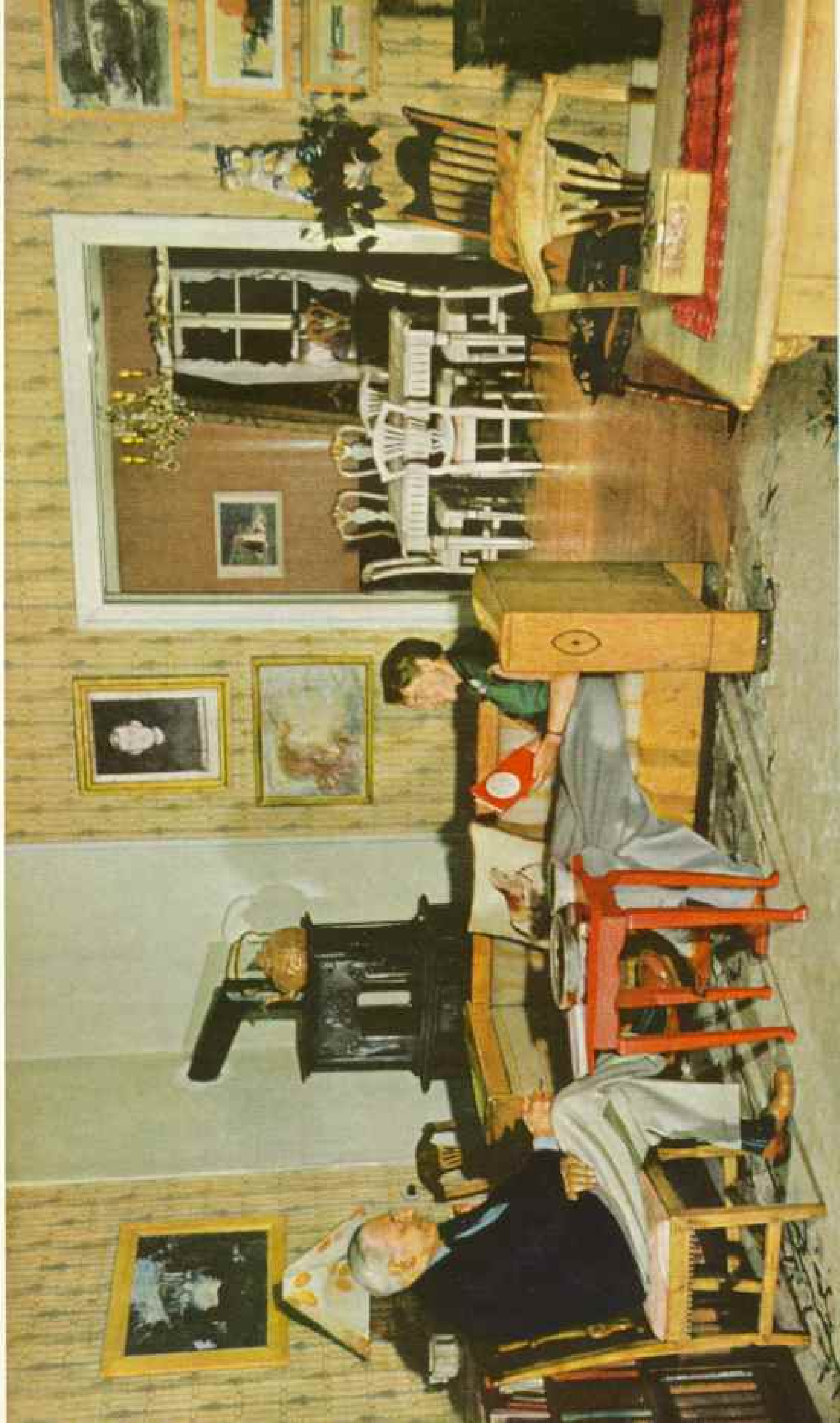
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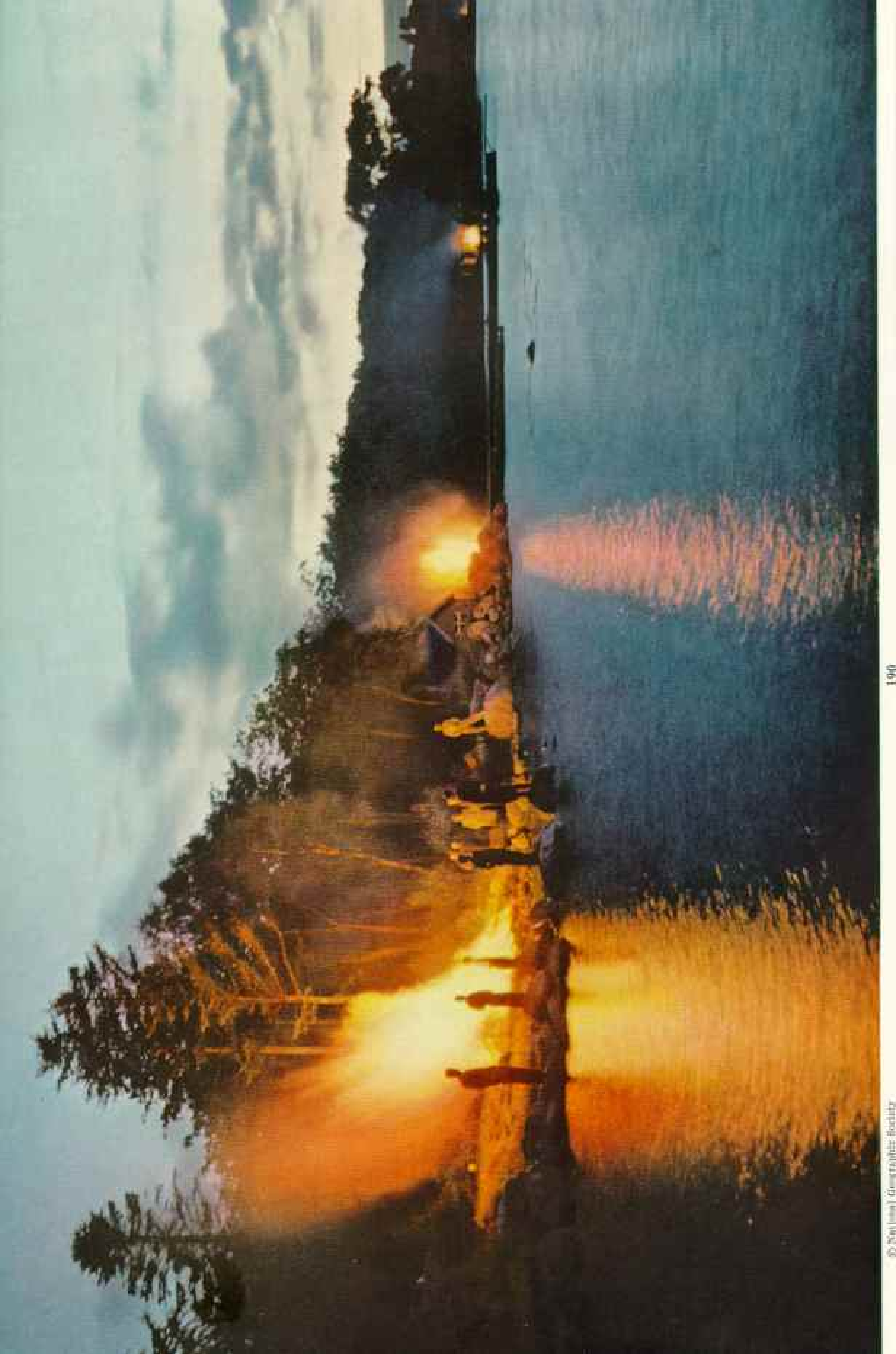


An Ornate Corner Stove Helps Warm the Eirik Hammers of Eydehamn. Older Norwegian Homes Lack Central Heating
Mr. Hammer, close friend of the author, manages the Arendal Smelteverk, which turns out a third of all the silicon carbide produced in Free Europe.

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© Ketchum for Audubon H. Inman, National Geographic Staff





↑ Norwegians Welcome Summer's Warmth with Huge Bonfires

As the sun sinks late on June 23, fires flare in parks and yards, on skierries and mountaintops. Norwegians call the holiday *Sanktjans-aften*, St. John's Eve, or Midsummer Eve. From this spot on Stavanger peninsula the photographer counted 27 blazes.

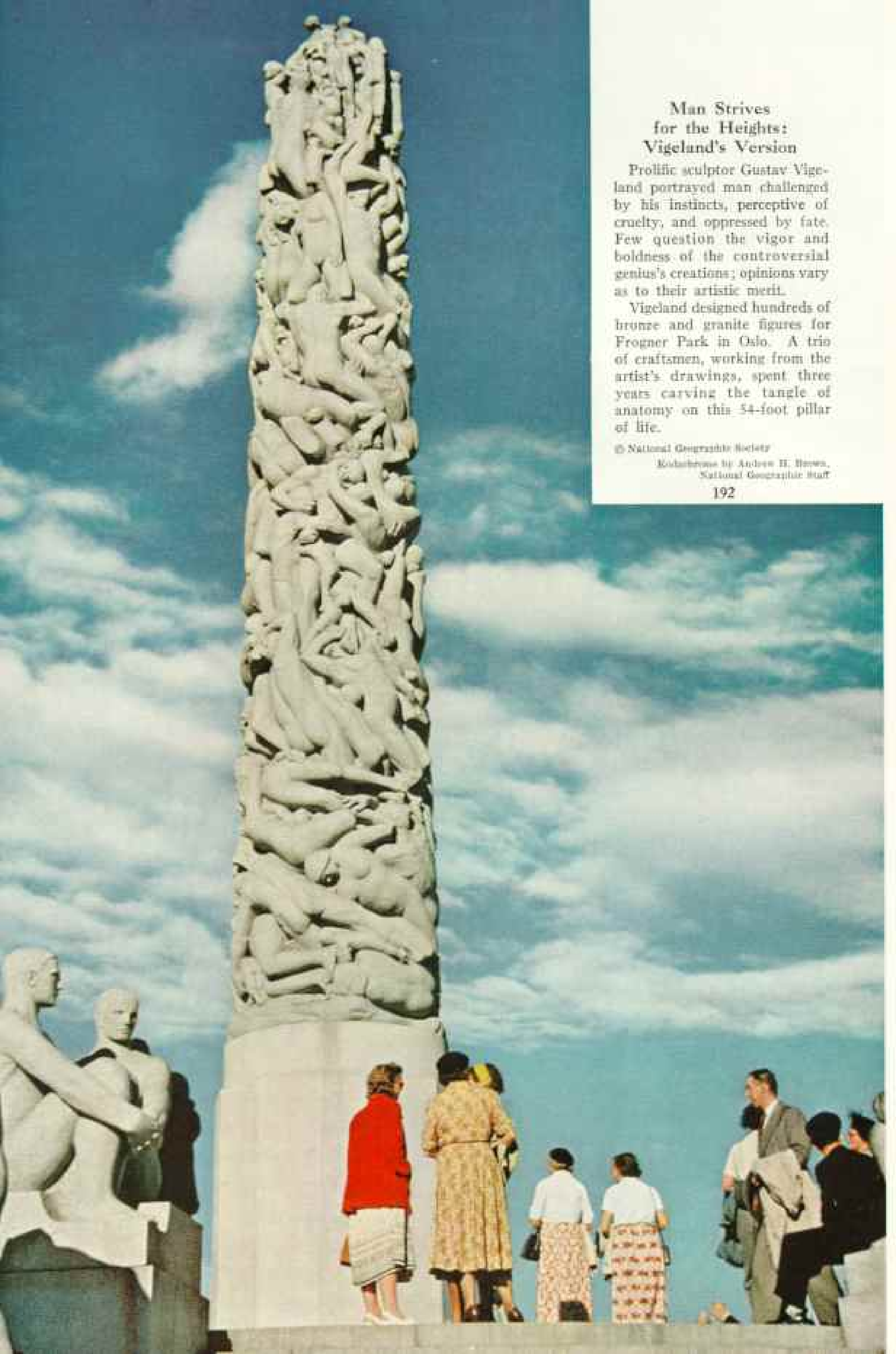
Fram Lives On, → Safe Behind Glass

Carrying the Fridtjof Nansen expedition, the 123-foot *Fram* in 1893-96 drifted 3,000 miles across the Arctic Ocean, purposely locked in the ice. In 1910-11 she took Roald Amundsen to the Antarctic's Bay of Whales, whence he went on to discover the South Pole. Framed in Italian oak grown to the shape of ships' timbers, *Fram* (Norward) has wooden sides 28 to 32 inches thick and an ironshod oak stem more than four feet through.

Now the gallant vessel, still sound, rests in a tent-shaped building on Oslo's Bygdøy peninsula.

© Reproductions by Andrew H. Brown, National Geographic Staff





Man Strives for the Heights: Vigeland's Version

Prolific sculptor Gustav Vigeland portrayed man challenged by his instincts, perceptive of cruelty, and oppressed by fate. Few question the vigor and boldness of the controversial genius's creations; opinions vary as to their artistic merit.

Vigeland designed hundreds of bronze and granite figures for Frogner Park in Oslo. A trio of craftsmen, working from the artist's drawings, spent three years carving the tangle of anatomy on this 54-foot pillar of life.

© National Geographic Society

Exhibition by Andrew H. Brown,
National Geographic Staff

New National Geographic Map Portrays Northern Europe, Split by Cold War

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NORTHERN Europe, long a key corner of the world, today stands divided by frontiers of the Cold War, from Finland's eastern boundary down into Germany.

On the east stand an expanded Russia, puppet Poland, and Red-dominated eastern Germany. On the west, Free Europe rebuilds its industrial strength and bolsters its defenses.

Though this region lies farther north than the northernmost boundary of the United States, it is able to support 100 million people in latitudes comparable to Labrador, Hudson Bay, and ice-capped Greenland, thanks to the benign influence of the Gulf Stream.

Completes Picture of Modern Europe

In the new 10-color map mailed to member-families with this issue of their Magazine, the National Geographic Society presents this area as the last in a series of three European maps. Supplementing one another, The Society's maps of Western Europe (December, 1950), Central Europe (September, 1951), and now Northern Europe show all the Continent and the British Isles on the generous scale of 39.46 miles to the inch, a scale which on a single map would require a sheet approximately five by five feet.*

Each is the product of months of work by National Geographic cartographers. To meet the needs of The Society's world-wide membership, 2,186,000 copies of Northern Europe have rolled from big lithographic presses.

The new map, with 9,155 place names, depicts an area roughly one-third the size of the United States. It ranges from Germany, Poland, and a corner of the Ukraine to remote Lapland and North Cape (Nord Kapp), Europe's "farthest north," 325 miles above the Arctic Circle. Insets show northern Scotland, the Shetlands, and the Faeroes. Another inset places this map in relationship to the two earlier maps in the series.

From these lands around the Baltic Sea venturesome Vikings penetrated as far as Africa, and, some students believe, North America 500 years before Columbus. Other migrants, the Jutes, Saxons, and Angles, sailed to Britain and blended in the Anglo-Saxon race.

Place names recall history, from Hamlet to Hitler. In Helsingør (Elsinore), on the Danish island of Sjælland, stands the 16th-century castle of Shakespeare's tragic Prince Hamlet.

Waterways—lakes, rivers, streams, and canals—lace the land mass of northern Europe like stitching on a quilt. Retreating glaciers of the Ice Age gouged a maze of long, narrow lakes stretching into the side of Finland; today they serve the country as a vast inland transportation system. Altogether, Finland, smaller than California, has some 60,000 lakes.

Sweden has closer to 100,000. In the southern sector the Göta Canal has joined lakes to form a navigable waterway completely across the country, from Mem on the Baltic to Göteborg and the North Sea. Norway's saw-toothed coast is indented by fjords that reach as much as 70 miles inland or more.

Russia's Belomorsko-Baltiski Kanal Imeni Stalina (Stalin Canal), on the eastern side of the map, reaches from the White Sea (Beloe More) to Lake Onega (Onezhskoe Ozero). It is the northern leg of the great inland waterway system through which the Reds may be able to move submarines as well as cargo from the Arctic south to the Black Sea.

The Baltic Sea and the Gulf of Bothnia split the map from south to north. Both play important parts in the economy, and sometimes the politics, of northern Europe.

Baltic Separates Swedes and Soviets

Baltic herring is a mainstay of the Swedish fishing industry. The sea also provides a barrier between the traditionally neutral Swedes and the front of Soviet power. Swedish fishing boats, venturing too close to the Russian coast, have been seized by the Soviets.

Eastern and southern Baltic shores bristle with Soviet military installations. The Russian Navy maintains a huge base in the Porkkala district, a territory near Helsinki leased from the Finns. Other air or navy bases have been established at Khiuma and Sarema Islands off Estonia, at Kaliningrad (Königsberg), Rügen, and elsewhere.

Water in the shallow Gulf of Bothnia, cut off from sea tides and fed by innumerable rivers and streams, is only slightly salty.

* Members may obtain additional copies of the map of Northern Europe (and of all standard maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices in the United States and elsewhere, 50¢ each on paper; \$1 on fabric; Index, 25¢. All remittances payable in U. S. funds. Postpaid.



Across Frozen Öre Sound, Danes of All Ages Hike to Distant Sweden

Last winter was one of the coldest for northern Europe in half a century. When the 7-mile channel between Denmark and Sweden froze solid, Sjælland islanders walked over the ice to the Swedish island of Ven.

Bothnian coasts are studded with sawmills from which, when ice permits, ships carry lumber and pulp from Sweden and Finland.

Far north near Tromsø, Norway, modern history has produced a new kind of iron "mine." Here the Nazi battleship *Tirpitz*, wrecked by British bombs November 12, 1944, has already yielded more than 25,000 tons of scrap metal.

To the south, British, American, and Soviet flags label zones of occupation in Germany. A green boundary line starting near Lübeck marks the division between East and West. Inside the Soviet zone, partitioned Berlin is a focus of international tension.

Boundaries have also changed in the eastern part of the map. Lithuania, Estonia, and Latvia became Soviet "republics" in 1940, though their absorption by Russia has not been recognized by the United States. Finland has ceded about one-eighth of its territory to Russia. Poland has lost about 45 percent of its land the same way, but gained

38,986 square miles of former German territory rich in industry.

Mapping these Baltic lands that have fallen into the embrace of the Russian Bear requires cartographic research akin to detective work. The problem stems from the Communists' fondness for wholesale name changes in their new empire.

The eastern part of the map is full of Russian and Polish names featuring combinations of consonants baffling to English typesetters and tongues. German Bromberg, for instance, is now Polish Bydgoszcz, but the old name is retained in parentheses.

In the far north, migrations of reindeer-herding Lapps across the Norwegian-Finnish frontier have sometimes caused international friction. This year Norway and Finland agreed to build a barbed-wire reindeer fence along most of their common border. When it is completed in 1957, the frontier-scorning Lapps, like other Europeans, will find their movements restricted.

Largest Land-dwelling Carnivores Gather in a Secluded Valley
to Feast on a Favorite Delicacy: Live Alaska Salmon

BY CECIL E. RHODE

With Illustrations from Photographs by the Author

THE big amphibian had been flying us along the coast of the Alaska Peninsula for several hours. Suddenly I spotted the object of our search and quickly counted under my breath: "Eighteen!"

Dick Chace, my partner, gave me that "I see 'em, too" look. We both turned to the pilot, and he, knowing fellow, headed at once for a landing some three miles distant. Had we circled the area again, we would have frightened some of the 18 away. For Alaska Peninsula brown bears, in crowds or singly, are rarely tolerant of human beings.*

Brownies Fish in Secret Stream

The purpose of our trip was to make 16-mm. motion pictures of the bears for the U. S. Fish and Wildlife Service and to shoot movies and stills for myself. Holger S. Larsen, chief enforcement agent of the Anchorage station of the Service, had told me—on the condition that I wouldn't broadcast it—where I could expect to find a concentration of bears.

He quite rightly wanted to keep the location from becoming common knowledge among hunters. For though the Territory reaps an average of \$2,000 on every brownie felled by a trophy hunter—in license and guide fees, transportation, and lodging expenses—the bear alive is worth infinitely more to the photographer and Nature enthusiast.

I can say that the area is near the base of the Alaska Peninsula. And I can tell you that the bears were fishing on a river that, like so many of Alaska's salmon-spawning streams, has rapids and pools which at low water hold many salmon captive for the hungry fishermen (page 198).

Having unloaded our gear, we told our pilot we hoped to see him again in two weeks and waved him off. Then quietly we made our way through grass and alders to a vantage point about 200 yards below the falls. As we sat and watched, a feeling of awe came over us. It was as if this fishing had been going on unchanged for centuries. Sixteen browns fished peacefully in the small area before us.

How did we know they were brown bears? It is often difficult to distinguish them from grizzlies. Staff members of nationally known museums, in fact, have told me that they have been unable positively to classify certain specimens.

Some authorities break the Alaskan brown and grizzly bear populations into nine groups, which they split further into 30 species and subspecies. On Kodiak and some adjacent islands the browns are called Kodiaks. On the Kenai Peninsula, where I live, we have the Kenai giant bears; and so on over the Territory. But the Alaska Game Commission says the coastal bruins are generally brownies and that interior specimens are more apt to be grizzlies.†

Given the locale, we could actually pinpoint the identification of these animals as Alaska Peninsula giant brown bears (*Ursus gyas*). This species ranges the entire length of the Alaska Peninsula from Cook Inlet to False Pass.

The Kodiak brown bear has often been called the largest. This is understandable, since Kodiak Island has produced many of the record animals. But bears just as large have come from the Alaska Peninsula.

Registered Guide Required by Law

For 20 years I have hunted, photographed, and studied brown bears, but my attitude toward them remains the same. I respect them, and I never forget that they are entirely unpredictable. They can move their huge bulk like a flash of light. They also can take a lot of lead without stopping, unless shot in a vital spot.

During recent years several people have been badly mauled by brown bears, and in the last 20 years a few have been killed.

* See "Larger North American Mammals," by Edward W. Nelson, NATIONAL GEOGRAPHIC MAGAZINE, November, 1916.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Lords of the Rockies," by Wendell and Lucie Chapman, July, 1939; and "Wildlife of Mount McKinley National Park," by Adolph Murie, August, 1953.

Every nonresident hunter is required by law to employ a registered Alaska guide while in the field either hunting or taking pictures. Our guides pride themselves on never having lost a hunter. But guideless hunters haven't been so fortunate. And it isn't always a cheechako (a person new to the Territory) who falls in the path of the brownie.

My own closest rub came when I was alone on a 6-week back-packing trip in quest of moose pictures. I was carrying only a .38 Special hand gun, because I was not in what is considered good brown bear country. Nevertheless, the unpredictable happened. A female brown with two cubs roared and came rushing through the dense spruce toward me.

She halted suddenly about 10 feet from the barrel of my leveled pistol. Would she continue or would she return to the cubs? In a very minute part of a second I had a vital decision to make. Under the circumstances, I fired several shots. They turned her.

Vividly remembering such experiences, I kept up my guard as I photographed the salmon-fishing bears. Armed with a high-powered rifle, a custom-built .45-70 with hand loads, I was extremely cautious.

In time, the animals became accustomed to seeing and scenting us. They continued their regular feeding habits, using the opposite side of the river for retreat. Though the total number decreased a little, we did count at one time as many as 32 browns.

Curious Bruins Come Calling

One of them, with a salmon in his mouth, came to visit us one day. Or so it appeared. He came within eight feet of my camera tripod before he discovered his mistake. Then he simply did an about-face and lumbered back down the trail, the fish still firm in his mouth.

We had to exercise more and more caution as time went on. One evening on the trail, less than a mile from camp, we stopped to rest and watch a brown feeding in the grassy flats below. I suddenly turned at hearing a noise behind us and saw two big browns stop not more than 60 feet back on the trail. Surprised at being discovered, they took off into the alders. Probably the animals were simply curious. Nevertheless, this kind of bear curiosity sharpens your attention.

In areas where man has encroached on their domain, bears restrict their fishing to early morning or late evening. But here on the river they felt safe enough to fish any time of day.

Like men who fish commercially for salmon, the bears had pre-empted their own fishing sites. Occasionally they fought about them. They would box, push, and feint with their paws and bite and tear with their teeth. But most of the business arrangements seemed to have been worked out before we came.

The choicest sites naturally were held by the biggest or most aggressive bears. Each controlled very little territory, perhaps a piece of water 12 feet or so in diameter. There were, of course, a lot of fish here—so many, in fact, that I'm not sure all the long and patient waiting we witnessed was necessary. Sometimes a bear waited 15 minutes or longer before making a catch, or even trying to.

Fishing Techniques Vary Widely

Five or six salmon ordinarily made a big enough catch for the typical bear. He then knocked off for the day, and the next in the hierarchy took over his spot. Sometimes the departed bear came back for another feed.

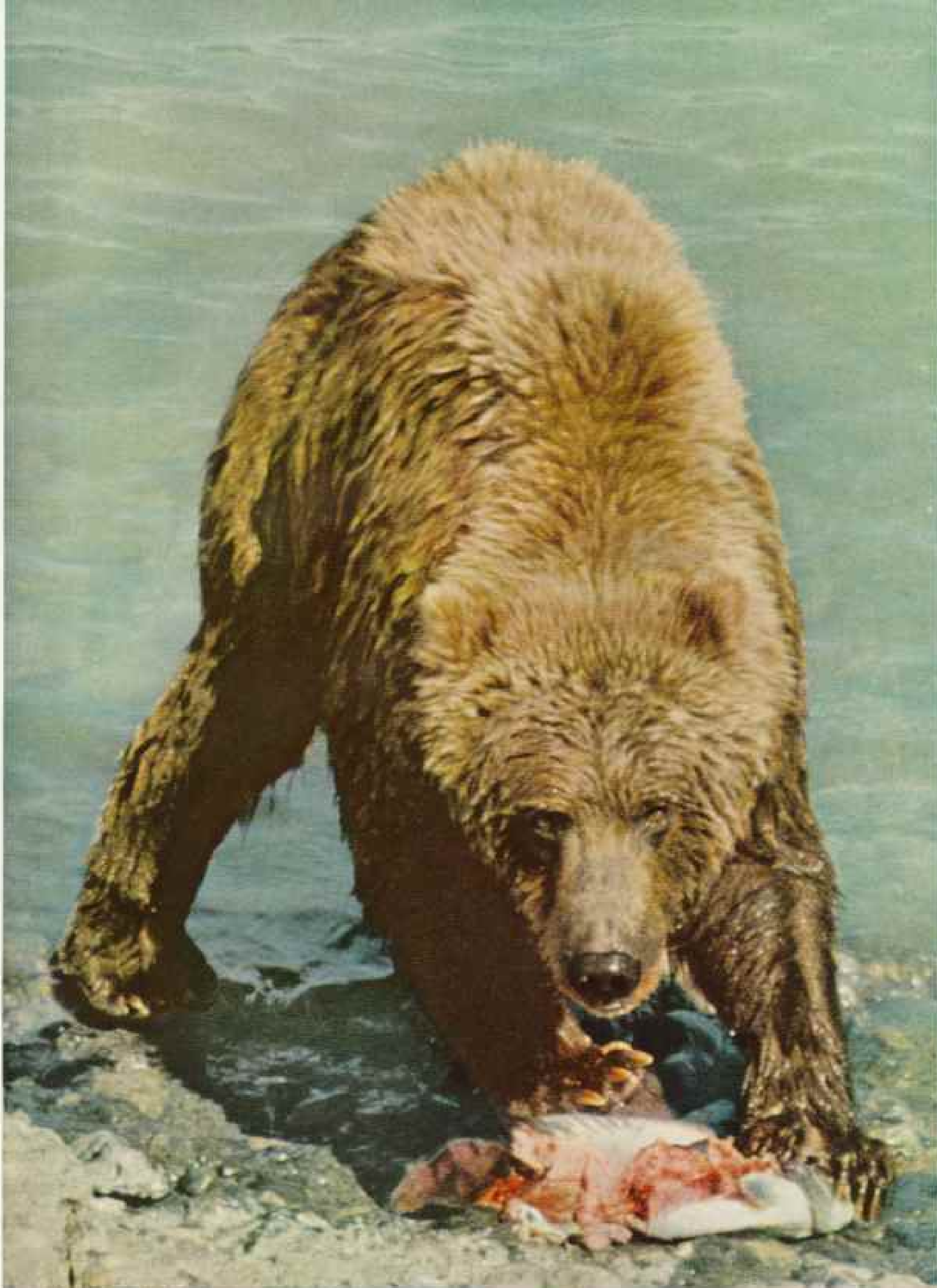
Some bears took only two or three fish, eating them on the spot in rapid succession. Others fished for two or three hours. Meandering from one site to another, they would stop to lie in the grass on the opposite bank, or just loaf in the water, apparently held in fascination by the sudden abundance of good food. While fishing, they did not indulge in much scratching, usually a favorite pastime of bears.

Most of the animals took their fish ashore to eat, either along the stream or in the cover of high grass or alders. But I have seen them sit and eat in the water, holding the fish between their paws. A bear ordinarily consumes everything except head and gill plates.

Like humans, these bears had their own individual theories about the best way to catch fish. Some sat on the dry bedrock close to swirling waters and waited. When a salmon darted in close, out shot a paw and pinned it down for sharp teeth to seize.

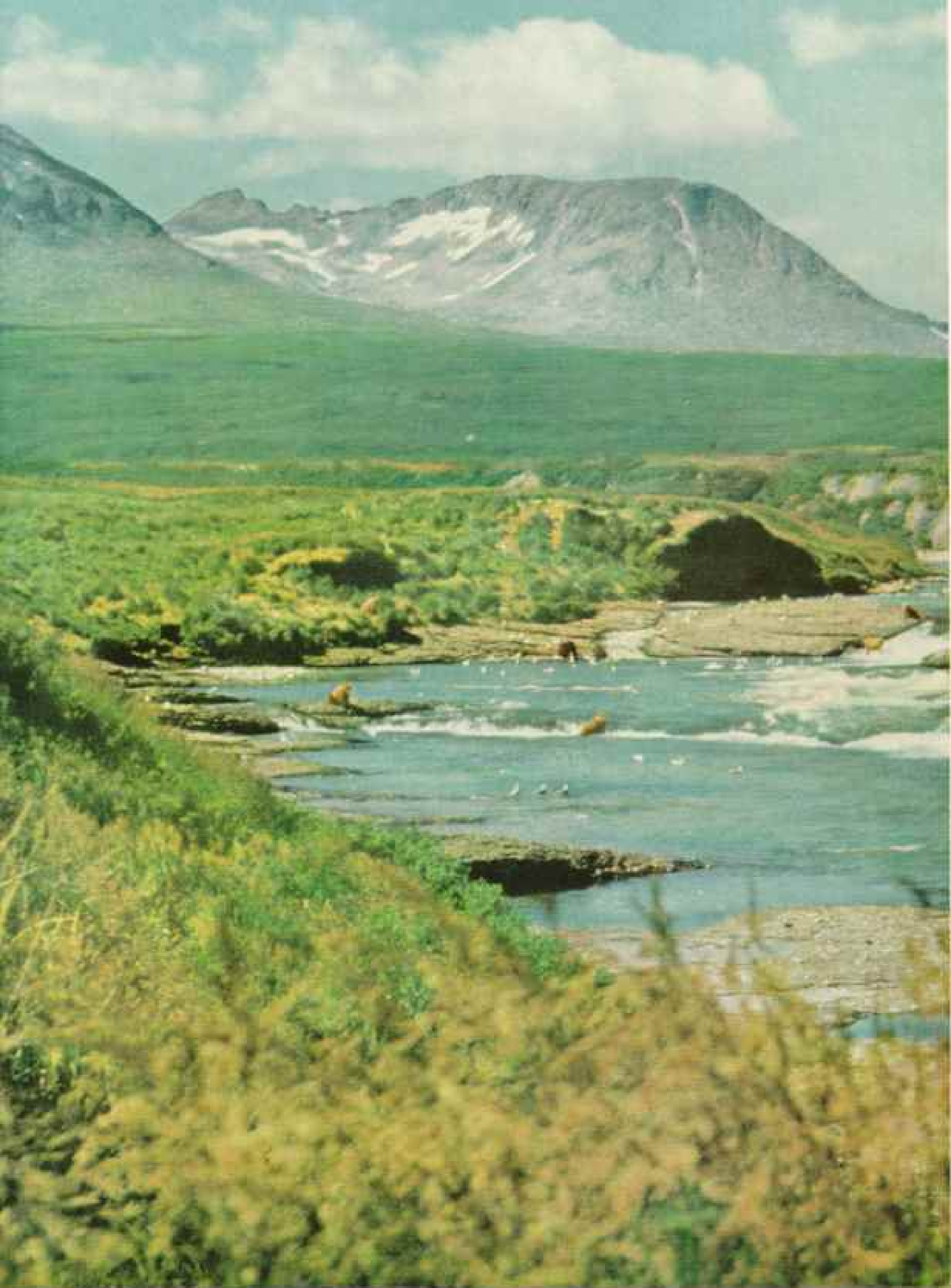
Others stood in the stream closer to their quarry. One old male would walk slowly into the river, turn, and sit down with his back to the current, letting it boil up over his shoulders. There is no doubt in my mind that salmon took him for a natural obstruction in the white water and found refuge, fleeing as it was, in the eddy formed by his huge body. An almost effortless nod of his big head produced a meal.

(Continued on page 205)



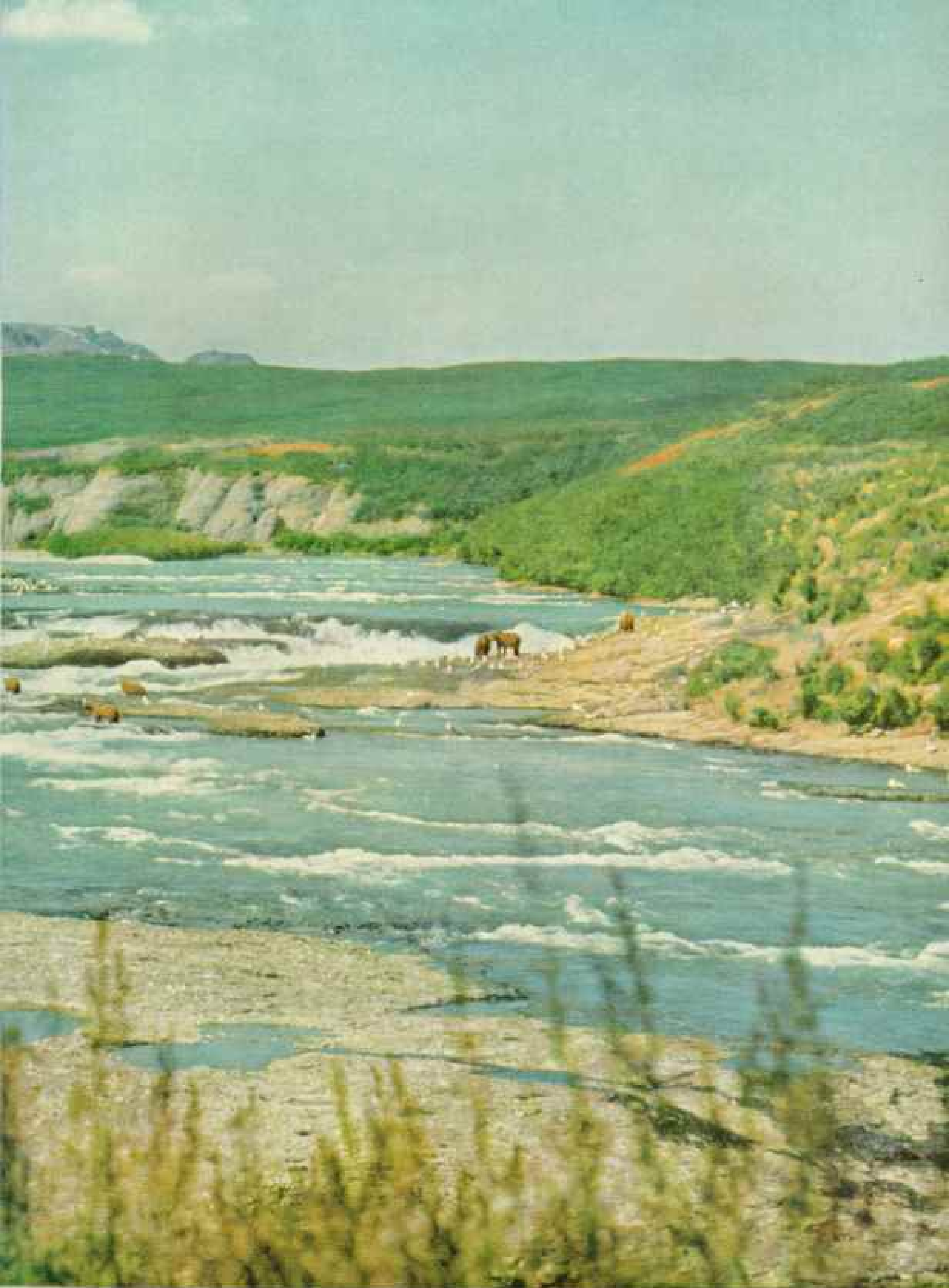
An Alaskan Brown Bear Warns Intruders Not to Interrupt His Lunch

Land's largest flesh eater inhabits Alaska Peninsula's inlets and islands. He may weigh three-fourths of a ton and tower nine feet on hind legs. The crafty titan rarely attacks humans, but hunters hold him in highest respect.



Swift Water and Spawning Salmon Spell Paradise for a Dozen Hungry Bruins

In early spring the giant bears desert their mountain dens for brushy valleys where silver salmon run upstream. The author does not identify this river, lest hunters invade one of the animal's few remaining sanctuaries.



Safe from Guns, Wading Bears Snap Up Fish Slowed by Midstream Rapids

Alaskan brown bears were not definitely known until 1896. Ordinarily they scatter along a stream, but here they congregate near the Valley of Ten Thousand Smokes, fattening up for a long winter's sleep.



© National Geographic Society

↑ "Who Goes There?"

Like most of his kind, the Alaskan brown bear suffers from poor vision, but his keen nose and ears alert him to danger.

"We had to be always on watch against their stumbling upon us downwind," said the author. "My neck muscles actually became sore from the constant turning on lookout."



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↓ A Young Bear Gorges on Fresh Fish, His Favorite Food

On a visit to the rapids, the shaggy fisherman may gulp down six or eight salmon averaging better than four pounds apiece. He leaves only the head and gill covers for the gulls. His huge size, color, massive skull, and short, thick front claws help to distinguish the brown bear from his close kin, the grizzly. A brownie in shaggy fall coat will appear a third larger than he does here in summer dress.

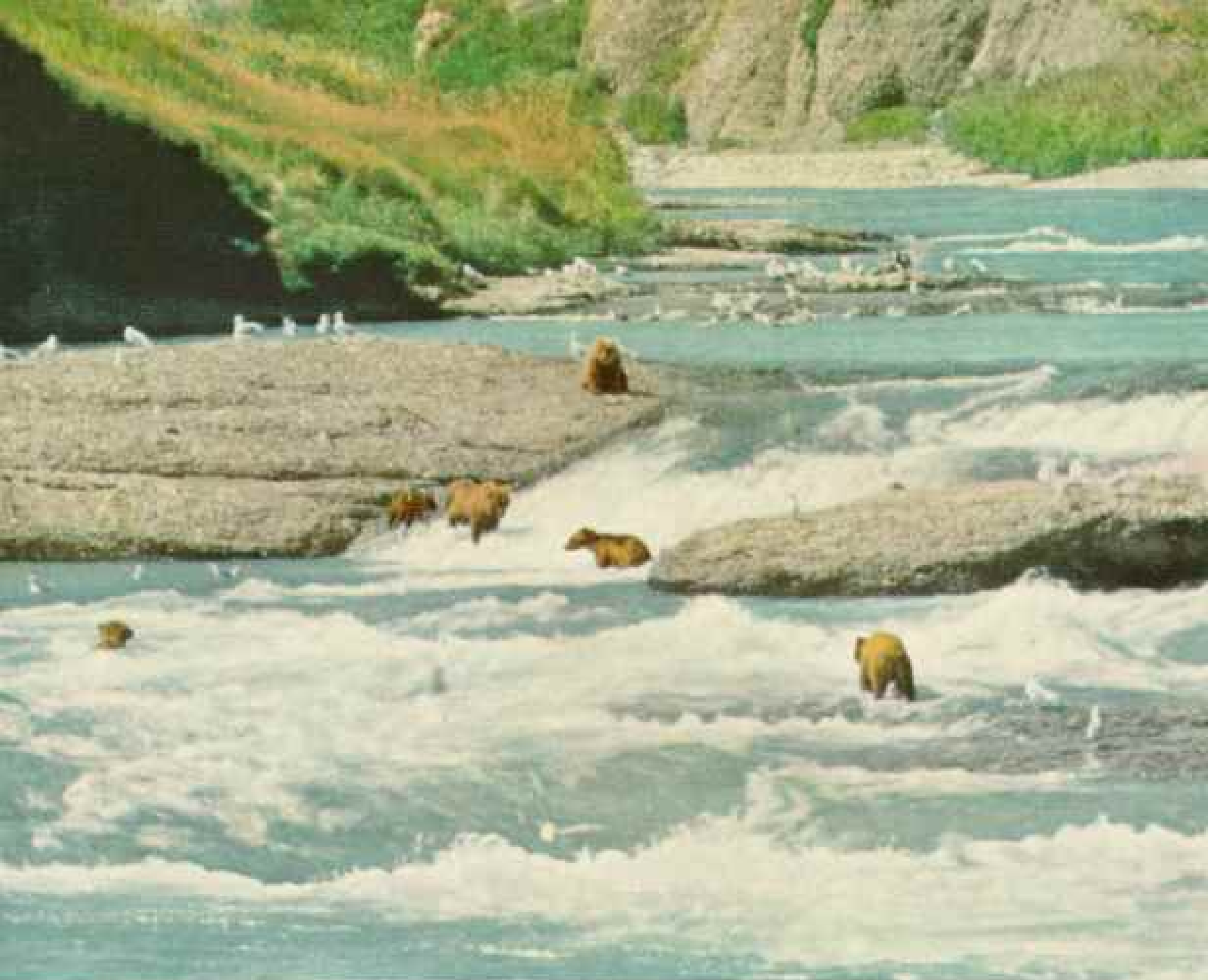




† Wise Photographer Uses a Telephoto Lens for Bruin Portraits

Dick Chace, the author's camping companion, aims a 14-inch lens at feeding bears. Rushing water drowned shutter noise. Wary at first, the animals virtually ignored the photographer a few days later. Chace stands knee-deep in pink fireweed (*Epilobium angustifolium*). Wide flats to his right, now passable, are periodically covered by high tides. Volcanic hills rise above the almost treeless plains.





© National Geographic Society

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↑ **Prize Fishing Sites Go to the Strong. Fearless Gulls Await Leftovers**

Big, aggressive males pre-empt the superior stations; females with cubs take next best. Each animal regularly returns to his favorite spot. Swimmer at left dives for fun, not fish.





Twins Frolic While → Mamma “Markets”

These 6- or 7-month-old cubs were born the previous winter while the female hibernated. This summer they learn to catch mice, marmots, and ground squirrels; next summer mother will teach them angling. They are permitted to frisk and play with each other, but not with strange cubs.

← Brown bears may pounce on swimming salmon with paws, but they always plunge heads into the water to seize prey in their strong teeth. This fellow eats his fish where he catches it; others take their dinner ashore. Brownies may feed on berries and fruit, but they prefer a fish diet.





← **Salmon-sated Trio
Pads Brushward
for a Nap**

Alaska's brown bears vary from dull golden yellow to dusky brown, sometimes almost black. Brown-colored bears in our mainland national parks are grizzlies or a color phase of the black bear.

Chances are this mother would swiftly and violently attack anything threatening her cubs. Here she leads her family along a labyrinth of well-worn paths radiating from the falls.

↘ **Rotating Diners Play
"Musical Chairs"**

After making his catch, the bear farthest up the bank relinquished the site to the mother and her 18-month-old cub at center. She then helped her youngster land a salmon. Brownie in water has just completed his turn and splashes away past envious gulls.

© National Geographic Society

Kodachromes by Cecil E. Rhoads

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There were two fancy divers in the crowd. These fellows ran from the shore or shallows in a burst of speed, took a long, gliding plunge, and submerged. Though they often came up with fish, their purpose seemed more to be fun than food.

There was, I'm sorry to report, another kind of fisherman. Having tried various methods and failed in all, he would sneak around and make off with his neighbor's catch.

One fishing practice common to all was silence. They made hardly any noise, only an occasional growl to assert a property right.

Junior Gets a Fishing Lesson

Why were some of the bears poorer fishermen than others? Possibly, I thought, because they had had no teacher: born in January or February, the cubs are too young to fish the first year, and the second summer, at 17 or 18 months, they often have to learn by themselves. A good many females with yearlings fall to the hunter's rifle during the spring hunt, and that leaves Junior without a coach.

On one of our last visits to the falls I particularly noticed a mother and her yearling cub. When I first saw them, the mother fished alone, carrying salmon up the steep bank to Junior. He clumsily took over and generally ended up by dropping the lively prize back into the stream.

Soon, however, he was accompanying the female to the fast water, wading out a little way to make false passes with a front paw exactly as his mother did. And in a few more days he was ducking his head in an attempt to seize a salmon.

I think I saw that cub bring his first fish ashore. With his teeth sunk squarely in its back, he made his way slowly up the steep rocks. The fish flapped so vigorously it shook his whole body. But he brought it triumphantly to land.

Males do not help feed the young. In fact, it is doubtful that they even recognize their own offspring.

Family life among the bears we photographed boils down to a close relationship between mother and cubs. The mother's protective instinct is very strong, and she will fight tooth and nail—and what weapons they are!—for her offspring.

The only approach to community life I observed was the rather cautious interest the cubs of one mother had for those of another. They wanted to play with the other kids! The

play generally started with one cub pushing or nipping another. But it never got very far. One of the mothers invariably herded her offspring away. Brothers and sisters, however, often played together.

The length of the fishing season on any particular stream depends on how many of the five species of salmon run up it. Pacific salmon start their runs in the spring and continue through the fall.

Certain species run up only certain streams. A particular stream may have a run of kings, one of the first to start, and then no more salmon for the rest of the year. Another may have kings, followed by other species.

Presumably, as the salmon dwindle, the bears travel to other streams for later runs or follow the fish if they work farther upstream. After the spawning period the bears sometimes roam the shoreline looking for fish carcasses, for Pacific salmon die shortly after they spawn. Since salmon are only intermittently available, bears depend on a variety of other foods, such as vegetation, berries, and marmots.

By the time we arrived, the dog salmon run was at its peak. Now, two weeks later, it was about over, and the bears were gradually leaving the stream.

During our last night on the beach we crawled out of wet sleeping bags at 2 in the morning. While my companion held the center pole of the tent to keep it from collapsing, I bailed out the rain that had blown through the top onto the waterproof floor.

Farewell to Bear Country

All next day the wind blew unabated, driving white spray 60 feet or more into the air off the cliffs. When ocean swells rolled up nearly to our tent, we moved upriver. There, in a dry natural cave protected by an overhang, we waited for better weather.

After two unsuccessful attempts to get through, our plane came in under an overcast. It was a week overdue.

As we took off, I looked back once more. Most of the bears already were working the thick alder slopes for food. Few, if any, would be left on the falls by the opening of hunting season.

Knowing how hard it is for brown bears to hold their own against civilization, I hoped their retreat to the hills, and ultimately into hibernation, would help to preserve this spot for all who would study and enjoy these magnificent animals.



Longs Peak, Climbers' Goal, Lifts a Sheer Face 1,700 Feet Above Chasm Lake

With Colorado Mountain Club members (foreground), the author climbed to the 14,255-foot summit (page 248). Only experts with ropes tackle the forbidding east face; an easier route provides a rock-anchored cable.

Lured by the Grandeur of Distant Peaks, Four Adventurous Girls
Try Their Luck at Week-end Mountaineering

BY KATHLEEN REVIS

With Illustrations from Photographs by the Author

DECISIVE moments in one's life don't always occur in dramatic settings. Mine came in a clinical laboratory.

I was working as a medical technologist in the University Hospital at Charlottesville, Virginia. It was May, and students at Thomas Jefferson's grand old University of Virginia would soon be leaving for home. Spring fever floated through the windows on air already warm and humid.

Through the windows drifted, too, the sounds of men working on the rising walls of a new hospital building. Along with the clatter of bricks and trowels came snatches of a workman's whistled tune—"Don't Fence Me In." Suddenly my mind conjured up a vision of frosted peaks under limitless blue skies. I saw the Rocky Mountains as I had seen them as a girl of 15 touring the West with my family.

The vision faded, but an idea grew. Why not come to know those proud peaks as close and intimate friends?

Denver, Door to a Mountain World

Making arrangements took months, but in the end I boarded a train bound for Denver and a position in a hospital there. My work would be much the same; beyond the laboratory windows, however, new mountains and a wide western world would beckon.

On the second day of my train ride, as dawn slowly lit the vast, empty stage of the Great Plains, I saw the Rockies again for the first time since my teens. Faintly, then more definitely, the misty profile of the Front Range appeared ahead. A fellow passenger pointed out one soaring summit. "That's Longs Peak," he said.

I made a private vow: "Some day I'm going to stand on the top of that one."

In Denver I soon found congenial spirits who shared my desire to get up into the mountains: Joanne Mahkorn, a laboratory technician from Milwaukee; Fern Johnson, a secretary from South Dakota; and June Markley, an office worker from Kansas.

One evening, as we pored over a map of Colorado, June made a suggestion.

"Why don't we plan circuit routes that we can cover by car on different week ends?" she asked. "If we take sleeping bags and camp out overnight, we'll save enough to pay for the equipment, and we'll be able to stop whenever and wherever we please. I've never camped out before, but I know I'd enjoy it twice as much as putting up in a cabin or a motel."

None of us, it turned out, had ever slept under the stars, but we decided we'd like to.

First Goal: Pikes Peak

We assembled a jumble of equipment: sleeping bags, air mattresses, cooking utensils, an ax, and a spade. Forest Service maps provided a key to 273 campsites scattered through 12 national forests which cover almost 22 percent of Colorado's area (map, page 208).

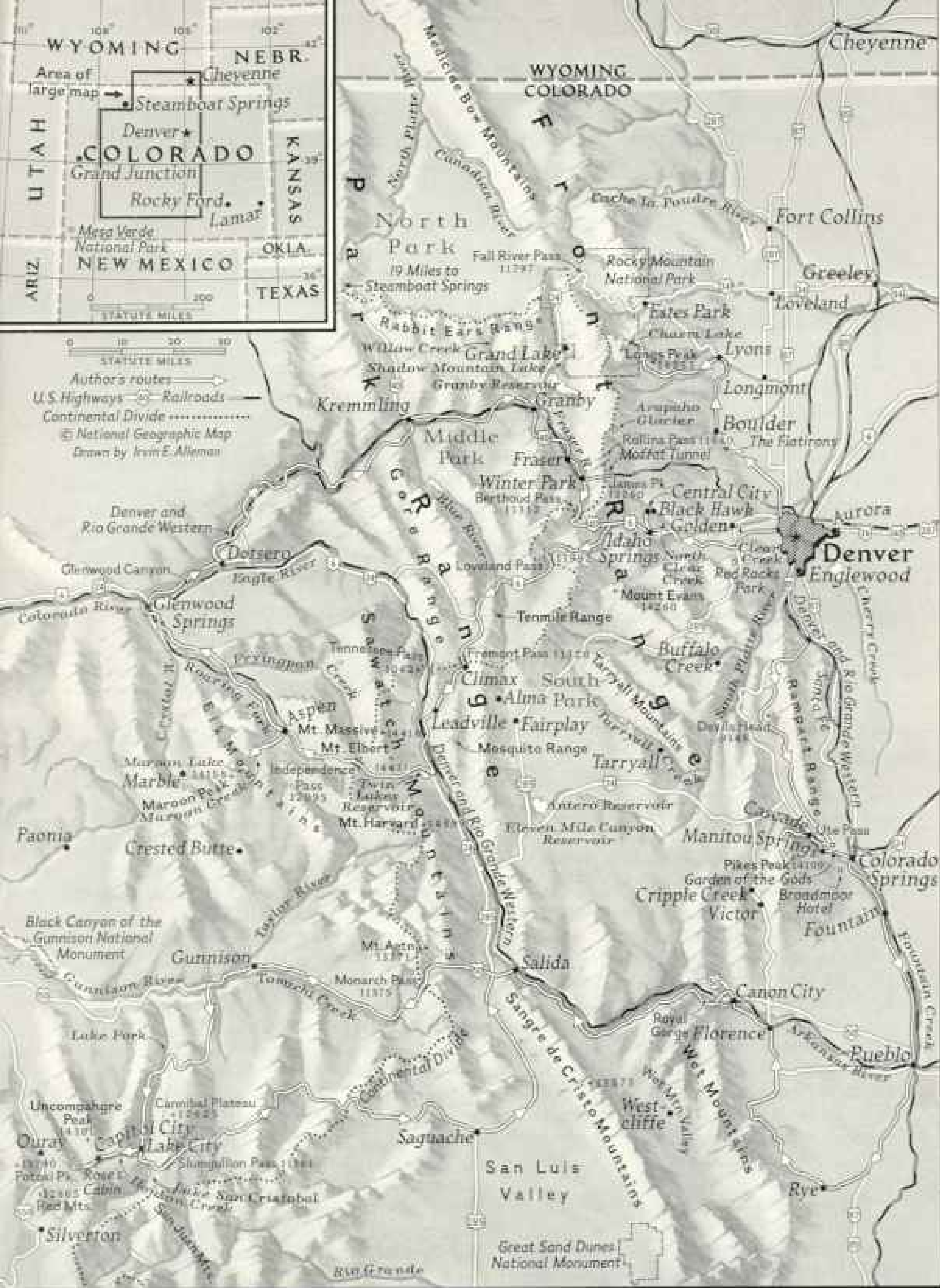
With so many targets to choose from, we settled happily on the most obvious: Pikes Peak (page 228). It isn't the State's highest mountain by any means. But gold seekers who trudged toward it across the Plains 95 years ago, using its summit as a beacon, made it the most famous.*

From Denver our road to Pikes Peak wound south along the crest of the Rampart Range into Colorado Springs, where the new Air Academy of the United States Air Force is to be located. The bald rock of Devils Head rises above huge boulders scattered among the trees.

Near the end of the drive we looked down on a highway winding through Ute Pass, 2,000 feet below. Here ran an Indian trail which gave passage to hordes of miners tramping westward in the 1860's to the gold strikes of South Park.† This mountain-rimmed expanse of grassland, 9,500 feet above sea level, stretches 30 miles in length and breadth. To

* See "Colorado, A Barrier That Became a Goal," by McFall Kerbey, NATIONAL GEOGRAPHIC MAGAZINE, July, 1932.

† See "Colorado's Friendly Topland," by Robert M. Ormes, NATIONAL GEOGRAPHIC MAGAZINE, August, 1951.



High Lakes, Cloud-wrapped Peaks, and Mountain Trails Lure Vacationers to Colorado

With automobile and camping gear the author's party roamed this Rocky Mountain State's scenic areas. Lines broken by arrowheads mark their routes, from Longs Peak in the north to Slungullion Pass in the south.



The Nation's No. 1 Angler Tries His Luck in a Colorado Trout Stream

Fly rod in hand and 10-gallon hat on head, vacationing President Eisenhower cautiously wades the South Platte River near Buffalo Creek. Secret Service men stand guard in the background.

the Utes it was a favorite hunting ground; early trappers, or mountain men, saw thousands of buffalo roaming its meadowlands.

Mining camps mushroomed in 1859 as gold was washed from South Park streams. Most of the placer mines soon petered out, however, and were deserted. Only traces remain of the Denver, South Park & Pacific Railroad, which at the height of the rush supplied the rich districts of Fairplay, Alma, and, west of the Mosquito Range, Leadville and the Arkansas Valley. Freight rates once ran as high as \$29 a ton; passengers rode for 10 cents a mile.

From the Rampart Range Road we de-

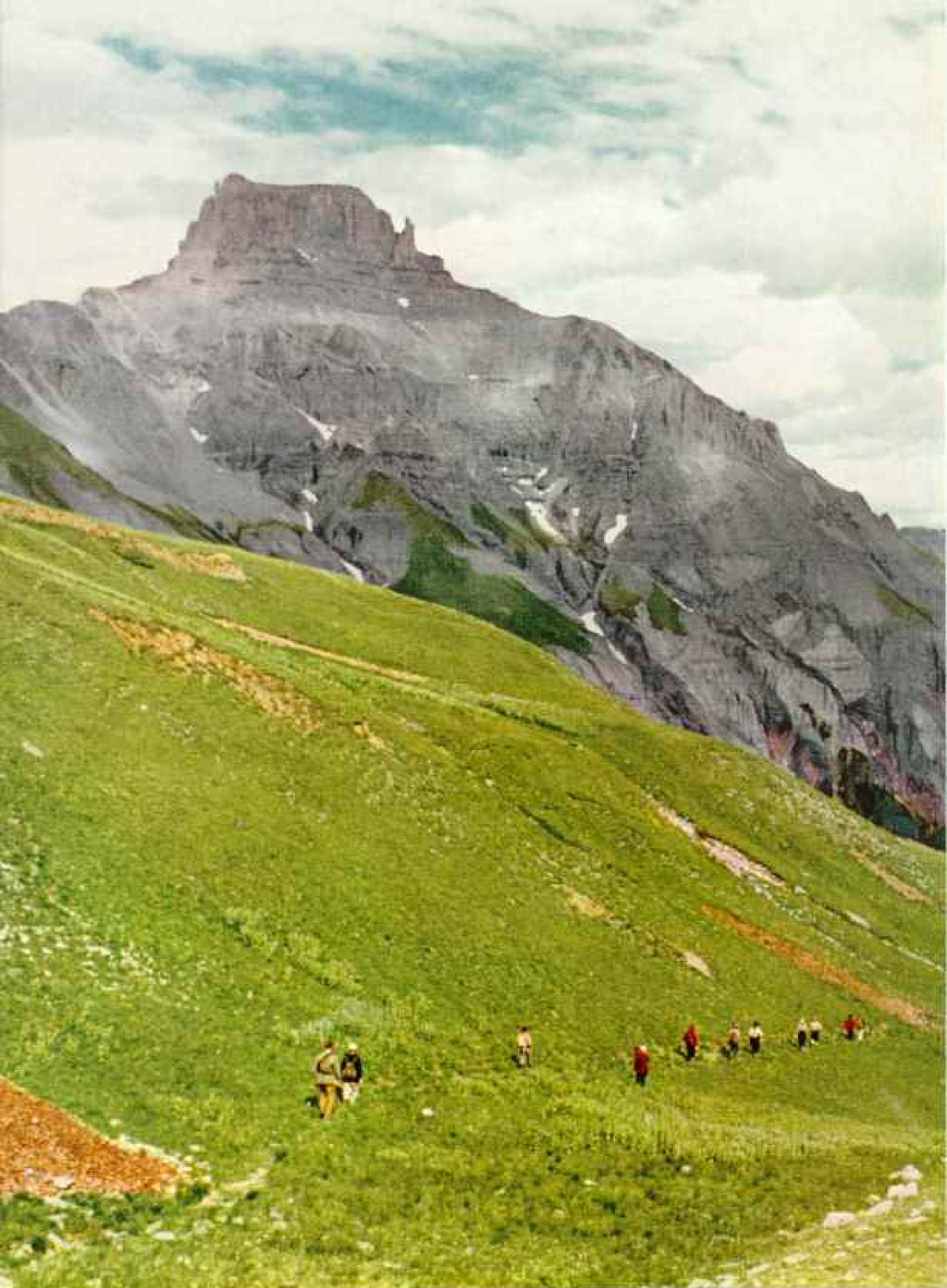
scended to the Garden of the Gods and drove to massive Gate Rocks (page 220).

Joanne gulped: "Look at the human flies!" Sure enough, on the sheer walls above us roped men swayed like window washers. Members of a climbing class held by the Colorado Mountain Club, they were mastering the art of scaling cliffs on ropes secured to pitons driven into the rock.

Outside the garden we stopped at a fountain to rinse a vacuum bottle. One shake and pop!—out flew the cork.

A passer-by chuckled: "You're strangers here, aren't you? That's mineral water!"

There are some fifteen springs here. Indians



Craggy Potosi Peak Towers Above an Antlike File of Alpinists

The 13,790-foot mountain lies in an area rich in mining history. Members of the Colorado Mountain Club, on their annual two-week outing, head for base camp after an ascent of near-by Mount Sneffels.



Southwest Colorado: "Thar's Gold in Them Thar Hills"

Beyond Potosi's ridge lies Camp Bird Mine, source of the fabulous fortune made by Thomas F. Walsh. Here the San Juans, near Ouray, offer climbs that challenge experts. Fourteen peaks exceed 14,000 feet.

believed they were formed by the breath of the Great Spirit and considered the ground sacred—whence the name Manitou Springs. Many are tapped for health baths, and a local plant bottles the water for shipment.

The Indians had some ideas, too, about the origin of Pikes Peak. Long ago, one legend tells, the land of Colorado was given to them by the Great Spirit as an earthly paradise. But, tiring of it, they gathered sacks of soil and rock and started out to build a better land in the Happy Hunting Ground. Angered, the Manitou barred the entrance to heaven and sent vast rains, flooding the land. The Indians flung down their burdens, forming a great peak that rose above the waters.

Racers Compete in Pikes Peak Climb

The "Grand Peak" was first publicized in Lt. Zebulon Pike's journal of 1806-7. In the years that have followed, thousands have climbed to its summit by car, cog railway, and on foot.

The view from the top is a rich reward for the effort. Massachusetts-born Katherine Lee Bates, looking out across the limitless land below, composed lines her countrymen now apply to all America. As we in our turn gazed from the same ridge, the stirring words of "America, the Beautiful" came easily and naturally to us:

O beautiful for spacious skies,
For amber waves of grain,
For purple mountain majesties
Above the fruited plain.

My most startling view of the Peak came later, when I stood in a chilling mist and watched race cars zoom around a 146° curve in the Pikes Peak Auto Hill Climb. The hazardous twelve-and-a-half-mile course to the top, run each Labor Day, has been covered in a little more than 15 minutes.

Riding down the Pikes Peak highway to Cascade is a milder experience, but exciting in its own way. The builder of this scenic route, the late Spencer Penrose, also was responsible for the striking Broadmoor Hotel at Colorado Springs. Around it are clustered some of the finest homes in a city noted for its beauty. In the adjoining Broadmoor Ice Palace, figure skaters of international fame dart and leap in endless practice sessions, characters from a wintry world set down in the midst of a modern city.

Another 45 miles along Fountain Creek brought us to Pueblo, "Steel City of the

West." We were interested less in Pueblo's steel, however, than in its hills.

Ahead of us rain clouds hung low over wooded slopes; we had come to the Wet Mountains. As we pitched our first camp in a deserted hollow on these ridges, blue skies belied the name given the mountains by their Spanish discoverers.

Joanne proved handy with the ax; wood was abundant, and steaks were soon frying over coals banked in the lee of a boulder.

We swept the ground clear with improvised brooms of spruce; then weary bodies relaxed in cushioned bags. A chorus of coyote howls rose and fell in the distance. We burrowed deeper and took comfort in the protective glow of the fire. Darting flames cast into bold relief the silver trunks of aspens and accented the blackness of spruce. Then, as the moon tipped the treetops, only the hoot of an owl broke the stillness.

Zebulon Pike's Unhappy Birthday

In 1868 Canon City, Colorado, had the choice of a State penitentiary or a State university. It chose the prison, because, says a guidebook, "it was an established institution and likely to be better attended."

In Canon City next morning, we paused to read a granite marker in State Park, opposite the penitentiary's gray walls; it commemorates Pike's blockhouse.

The story behind the marker is in Zebulon Pike's Journal for January 5, 1807:

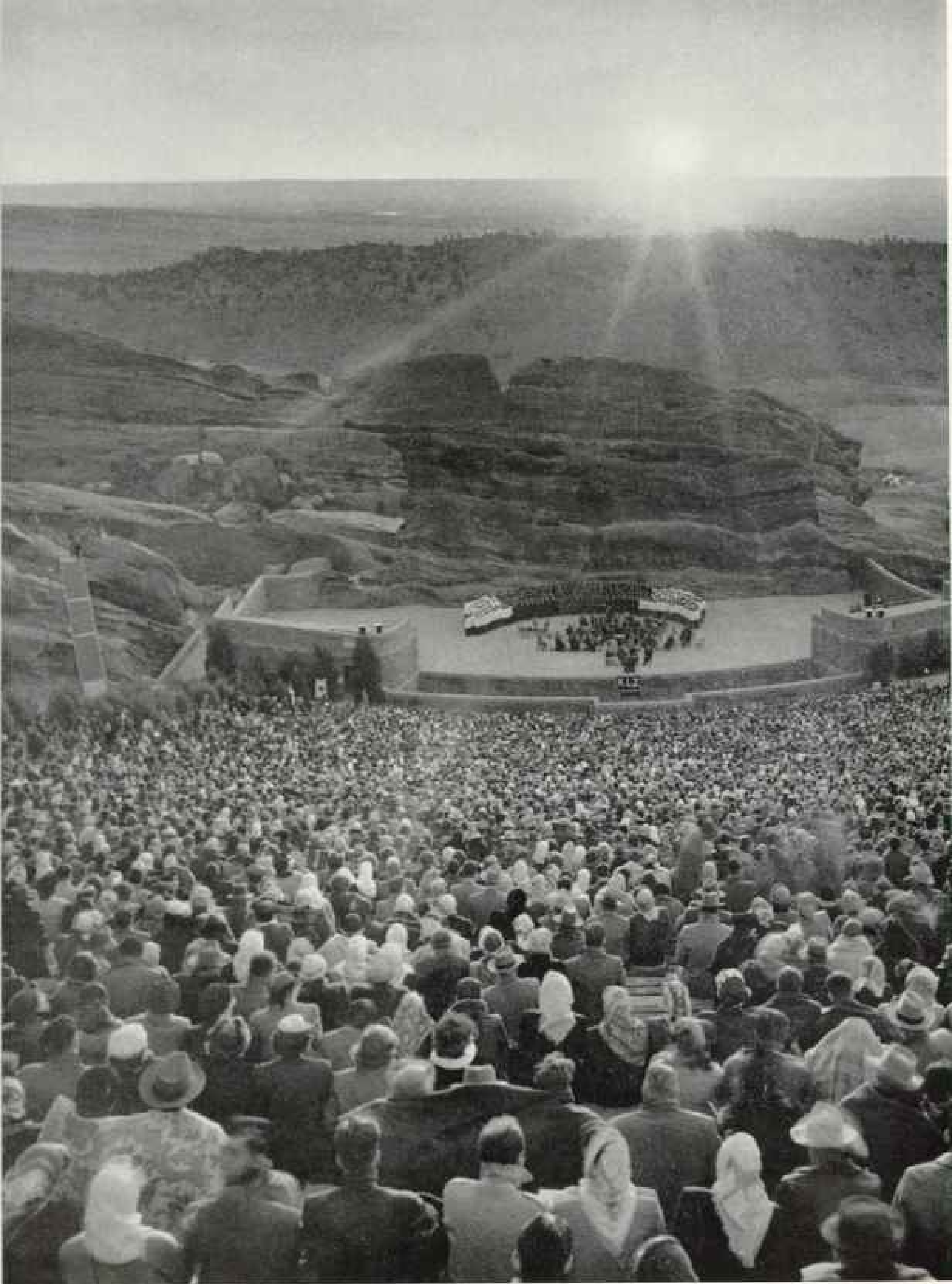
"This was my birthday," it tells us, "and most fervently did I hope never to pass another so miserably."

The 28-year-old lieutenant had reason to be discouraged. He and his men were exploring portions of the Louisiana Purchase, "to ascertain the direction, extent, and navigation of the Arkansas and Red Rivers." Following the Arkansas across the plains to the site of Canon City, they had struck north over the ridges into South Park, turned south-

Clock Says 3:45; Smiles Say "School's Out!" →

These book-laden girls stroll homeward from Denver's East High School. Educators in the city's nationally famous system stress individual guidance, directing youngsters into courses that will prove most rewarding. As a result, only 9 to 12 percent of students entering Denver's 3-year high schools fail to finish. National average of "drop-outs" in those grades is about 30 percent.





Blanketed Against Morning Chill, 14,000 Attend Easter Sunrise Services . . .

Months before this annual event, Denverites begin clamoring for tickets. On Easter Sunday many arrive two hours before dawn to get good seats. Natural rock serves as sounding board for a 400-voice choir.



... In Red Rocks Park, Near Denver

Denver Symphony Orchestra and touring artists give summer concerts in the amphitheater.

west, and on December 18 came upon "what we supposed to be the Red River, which here was about twenty-five yards wide; ran with great rapidity, and was full of rocks."

After exploring the headwaters, the party descended along the stream. On Christmas Day they camped near the present Salida, "Eight hundred miles from the frontiers of our country, in the most inclement season of the year; not one person properly clothed for the winter, many without blankets, having . . . cut them up for socks and other articles."

For 10 days the men struggled through a forbidding canyon. Pike's party emerged on the prairie on January 5, only to find they had been following the Arkansas through the Royal Gorge and were back at their Canon City campsite. What a birthday surprise!

Here the party rested and built the block-house whose marker I was examining.

West of Canon City we stopped at the Royal Gorge, into which Pike's expedition struggled a century and a half ago. From the bridge spanning it I watched a dwarfed train puff along tracks 1,000 feet below.

To reach the bottom of the gorge, we boarded an inclined railway that slants down through a break in the canyon walls. A door clanged shut and we were off down the 45° tracks (page 235).

Five minutes later we were walking along a roadbed beside the Arkansas River (page 234). These tracks, I discovered, were the cause of a bitter contest in 1878 between two pioneer railroads—the Atchison, Topeka & Santa Fe, and Gen. William J. Palmer's Denver and Rio Grande. The narrow canyon could accommodate only one roadbed. When rival construction workers arrived at the canyon's entrance, a battle royal began. Crews laid rails during the day and at night sabotaged those of their rival, rolling boulders down the canyon, dynamiting the roadbed, and dumping tools in the river. Not until two years later was the dispute legally settled, in favor of General Palmer's railroad.

Frank Gimlet Speaks His Mind

"Women ought to stay home; they've got no business traipsing over these mountains."

So said a bearded miner seated by an open fire on top of Monarch Pass (page 227). He had watched as I scrambled up a rocky bank for a photographic vantage point and shouted to Joanne and Fern to get out on the edge of a cliff. When I wasn't satisfied and urged them out still farther, the miner concluded we just shouldn't be allowed at large.

A Bus from Britain, on Good-will Tour, Visits the Statehouse

Patterned after the Nation's Capitol, the seat of Colorado government dominates Denver from atop Capitol Hill.

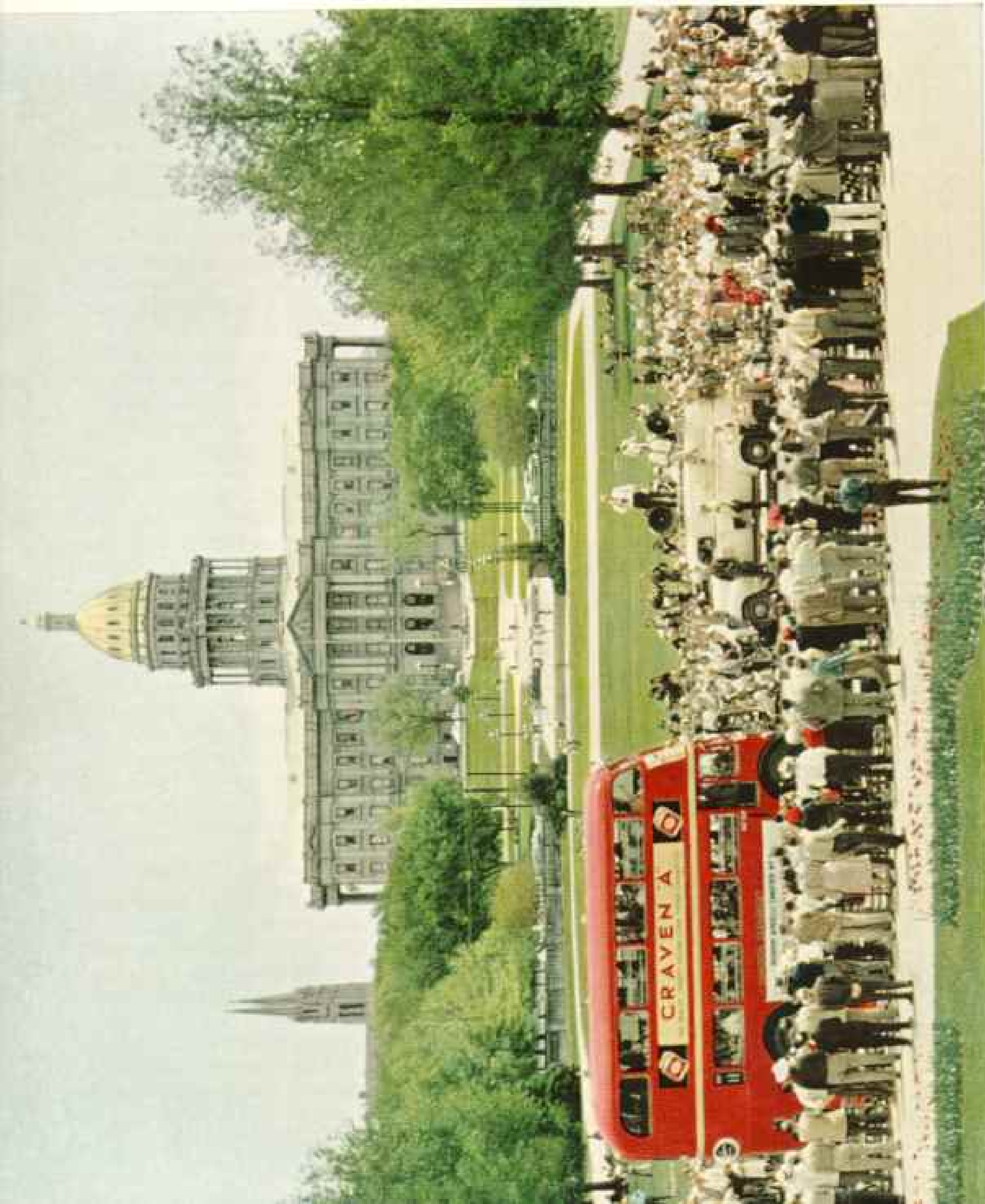
The statehouse dome gleams in a new coat of gold leaf donated by Colorado miners. A granite step on the western portico bears the inscription: "One Mile Above Sea Level." From this vantage point may be seen the matchless Rocky Mountains vista that makes Denver so popular (opposite page). Foothills lie virtually in the city's back yard; beyond rises the 150-mile Front Range, from Pikes Peak on the south to the Wyoming border on the north.

↓ Armistice Day: Flags Fly in the Civic Center

Thirty-five leading Denver architects pooled talents to design the crescent-shaped City and County Building, which faces the capitol. Besides offices, it houses the Denver Art Museum.

Highest automobile road in the United States winds to the 14,260-foot summit of Mount Evans (extreme left), where scientists study cosmic rays in a University of Denver laboratory.

© National Geographic Society







Prospector Frank Gimlet simmered down, however.

"Mountains are like women," he observed. "You've got to spend a lot of time with them—then you find you're just getting acquainted. But first you've got to get to them."

Ghost Town Once Challenged Denver

Beyond Gunnison we headed south over rolling hills to the canyon of the Lake Fork of the Gunnison River. Surrounded by towering mountains and shaded by branching cottonwoods, Lake City has an aura of sleepy isolation that even mass infiltration by vacationing Texans has failed to dispel. We were meeting friends here, and inquired for them.

"They're fishing," neighbors told us. "You might try Henson Creek."

As we neared what seems an unbroken rock wall skirting the town, we could see a narrow canyon. Driving through it high above the stream, we passed clustered mine buildings and a gray bog of silt, waste from the proc-

essing of lead ore. Farther on, our route swooped close to the stream, squeezing between willows that line the edges. Then the terrain opened abruptly; before us a two-story brick house rose in an emerald valley.

We went in, and illusion vanished. Beyond the sagging door, lathing lay exposed by the ceaseless gnawing of rats. Floors tilted alarmingly. A dislodged pebble rattled between boards and splashed into an unseen pool. Through glassless windows we eyed still meadows. This was Capitol City, named by optimistic residents who in 1877 predicted it would replace Denver as the State capital.

Voices broke the eerie silence as our friends appeared, bearing several large trout.

After we had swapped greetings, Enid and Johnny Griffith told us about the region. Enid had spent her childhood in Lake City.

"This is the Lee Mansion," she said. "George Lee owned a smelter and sawmill here. He claimed he had the finest home in the San Juan Mountains. At any rate, he



installed one of the first telephones, and his wife held what must have been the first telephone concert in these parts. People in Lake City, Ouray, and Silverton sang in chorus, while somebody else in Silverton accompanied with a violin."

Five miles from Lee's Mansion stands Rose's Cabin, another ghost house that speaks mutely of the past. As our car ground over rock slides and past crumbling ore chutes, Enid explained that Corydon Rose was a pioneer who built one of the first public buildings in the district. It served as hotel, post office, and store.

That night a spruce grove provided an ideal campsite, but our coming routed its original occupants—a grouse hen trailing seven tan chicks. So inconspicuous were they that I almost stepped on one.

"I can see why they're called fool hens," remarked Joanne. "They don't seem to know what danger is."

Majestic peaks blazing in the first sun, the quiet of a mountain valley broken by the tinkle of a distant sheep bell—who can forget the spell of the high country?*

The aroma of coffee mingling with wood smoke drew me from my sleeping bag; it also attracted a visitor. Rattling down the road, a jeep squeaked to a stop. Its driver explained

* See "High Country of Colorado," by Alfred M. Bailey, NATIONAL GEOGRAPHIC MAGAZINE, July, 1946.

↑ Dude Ranchers Savor Outdoor Life in the High Country

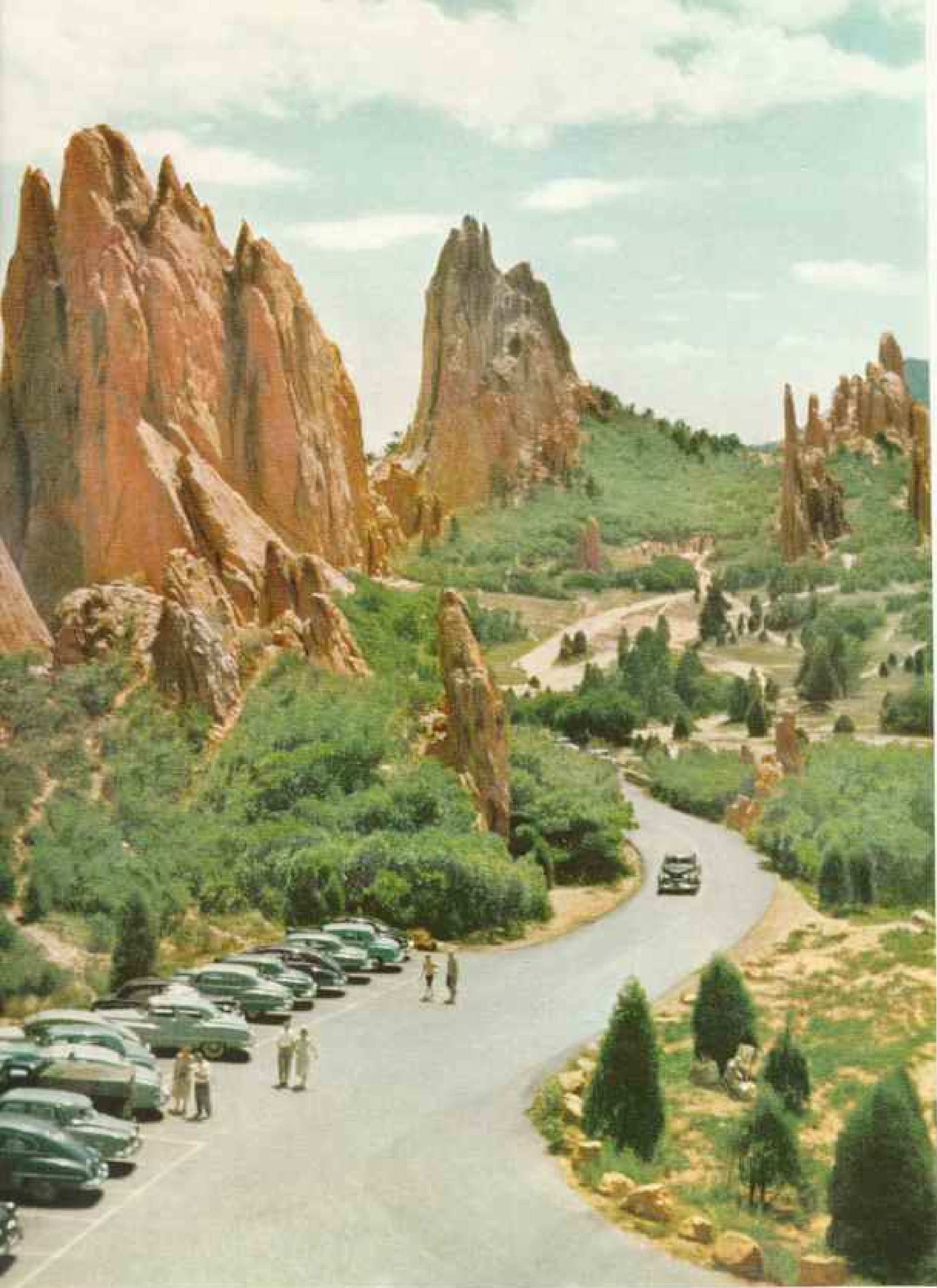
Astride horses, these vacationists work up appetites for a western-style feast soon to be served from the accompanying chuck wagon. Here they explore hills surrounding Granby, Colorado. Their base is Shadow Mountain Ranch, near Rocky Mountain National Park, one of many such retreats within easy reach of Denver.

Those Shiny Flecks → Are Gold!

Visitors from the East watch as a dude-ranch hand demonstrates the prospector's method of panning precious metal from the gravel of Willow Creek, near Granby.

United Air Lines





Fanciful Spires of Red Sandstone Stretch for the Sky in the Garden of the Gods

On Gate Rocks, near Colorado Springs, climbers practice for sterner tests. Writers have exhausted vocabularies trying to describe the garden; their comments range from "wonderland!" to "pale pink joke."

his trip: "We run tours over the old stage route from Lake City to Ouray. I'm on my way to pick up passengers."

"Is the road accessible by car?" I asked.

He shook his head. "I'm surprised you got this far. You'd better get a jeep if you plan to drive in the mountains much. They'll take you anywhere that tracks go."

Sheep Range Above Timber

Curious as to the sheep bells we had heard, we hiked up a narrow ravine where snow bridges spanned the stream. In a high basin above us thousands of sheep ranged beyond timberline. Pastured in these alpine meadows during the summer months, they are driven down in the fall and the lambs shipped to market. Denver, I learned, is the United States' largest receiving market for sheep.

Threatening clouds ended our exploration. Later, as we took leave of our friends in Lake City, Enid advised us to go by way of Slungullion Pass. "Miners," she said, "used to stop there to prepare slungullion—you know, meat-and-vegetable stew. The pass gets its name from the stew, and I guess the stew took its name from a mining term; slungullion is the word for the muddy deposit found in sluices. Anyway, watch out for the road. It's clay, and slippery in a rain."

By the time we reached the road leading to Cannibal Plateau on our way to Slungullion Pass, the sun had come out. But the plateau's history was enough to give us chills just the same.

In the winter of 1873 a party of six prospectors, led by Alfred Packer, vanished in the mountains near by. Packer later reappeared alone, claiming he had been deserted by the rest of the party. Suspicion, roused by his robust condition and possession of a large sum of money, was crystallized when the bodies of his companions were found in the spring with strips of flesh missing.

Packer then claimed that one of the men had gone insane and killed his companions; Packer had shot him in self-defense. Nobody believed his yarn, and he was convicted of murder by a Lake City court.

Beyond, we mounted a steep grade. On the right lay beautiful Lake San Cristobal, for which Lake City is named. On all sides loomed mountain giants, dominated by Uncompahgre Peak.

At the top of Slungullion picnic tables invited a stop for lunch. Rocky Mountain jays

scolded from the pines. When I held a piece of bread in my hand, one bird boldly alighted on the table and bore the morsel away.

"Better not leave the car keys on the table," warned Joanne, whose hobby is bird watching. "These are 'camp robbers.' They're likely to snatch up any loose articles."

From Slungullion we wound downward past streams tiered with beaver dams. Here aspens provide building material and food—green twigs and bark. As the beavers exhaust the groves near one pond, they move upstream to new supplies. Result: another beaver dam.

Dams like these perform a valuable service in flood and erosion control. Mountain storms and spring thaws send torrents of water down Colorado streams. The dams check the force of the runoff and hold the water, letting it seep through gradually. Soil torn loose by the flood is deposited in the ponds, eventually filling them. Many fertile beaver meadows are thus formed to enrich mountain glens.

In secluded valleys we saw farmers stacking fragrant new-mown hay. Lower down, sagebrush appeared. We emerged in the flat San Luis Valley that stretches 30 miles to the Sangre de Cristo Mountains. Like Pike, we had described an arc and were again in familiar territory.

Prairie Wagon with Sails

Denver, our home base, owes its start in 1858 to reports of "color"—traces of gold—found in the sands of Cherry Creek where it joins the South Platte. Men promptly converged on the area with anything that would move: covered wagons, strings of pack animals, wheelbarrows, and handcarts. Some came on foot, with supplies on their backs. One enterprising inventor even rigged sails on his wagon to catch the prairie wind.

Unfortunately, the reports had been exaggerated. Disillusioned thousands turned back. When new and more substantial discoveries of gold were made in the mountains, however, an even greater wave flooded into Denver.

The crude town served as a way station and supply center. But Denver's permanence was doubtful—until silver became king. Passage of the Sherman Silver Purchase Act in 1890 ensured a steady, profitable demand for all the precious metal Colorado's silver lodes could produce.

Bonanza miners brought their wealth to the city, lavished it on elaborate homes and hotels, and founded business enterprises and banks.





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Illustration by Kathleen Berle

High-country Hiking Sharpens Appetites and Makes Sleep Welcome

- ↑ At a campsite near Steamboat Springs, Joanne Mahkorn broils sliced ham in a skillet made of aluminum foil and a forked stick. Packing a roll of foil eliminates the need for heavy, bulky utensils.
- ← The author's companions pause for a bit of Nature study. In the Elk Mountains, near Aspen, they examine needles and cones of Engelmann spruce. Near timberline, spring's first tinge of green shows on slender aspens.
- ↓ Daybreak in Mesa Verde National Park: Campers catch a last few winks before climbing out of their sleeping bags. Groundcloths and ponchos keep dampness out; air mattresses ward off sharp stones.



The city quickly outstripped earlier rivals; today it is the metropolitan hub of one-fifth of the United States (pages 216 and 217). Its population has swelled by a third since World War II—many people drawn, like me, by the lure of Colorado's high country.

From Denver, on another trip, we set out to explore canyon towns linked with the city's growth. As the rising sun spotlighted the peaks above us, we climbed westward in easy grades through the foothills. At Clear Creek pock-marked canyon walls and yellowish mounds of mine tailings recall the feverish digging that followed George Jackson's discovery of gold in January, 1859. "Jackson Diggings" became the town of Idaho Springs.

An even more frenzied rush took place on North Clear Creek, where in May of 1859 John Gregory discovered "the richest square mile on earth." A month later Horace Greeley visited Central City, which sprang up near by.

"The entire population," he noted, "which cannot number less than four thousand... sleep in tents, or under booths of pine boughs, cooking and eating in the open air. I doubt that there is yet a table or chair in these diggings, eating being done around a cloth spread on the ground..." Half the inhabitants had been there but a week, he added, with 500 more arriving daily.

We came to Central City during another boom. The annual Play Festival was featuring Helen Hayes in "Mrs. McThing," and visitors thronged the streets (page 239). From the site of Gregory's strike we climbed a steep grade to buildings sandwiched in the gulch.

President Walked on Path of Silver

At the Teller House (page 238) a guide in the black frock coat of an old-time gambler briefed us:

"When President Grant visited Central City in 1873, he walked into the Teller House over a path made of silver bricks. He wouldn't believe they were real; the townspeople had a tough time convincing him.

"He was lucky to come that year. The next winter the town almost burned up. Most of the frame buildings were lost. The old Teller House here was brick; it might have gone, too, if they hadn't stuffed wet blankets in the windows.

"Afterward, when they built the Opera House, they made it of stone. And what players they had here—Lotta Crabtree, Edwin Booth, Modjeska! We started the Play

Festival in 1932. The University of Denver runs it, you know. You can see everything during the festival from opera to comedy."

On Quartz Hill we peered into the Glory Hole—200 feet deep and 700 feet across. Tunnels honeycombing the rich area, where gold veins converged, caused it to cave in. Miners hauled out the ore and left this big hole.

Beyond Idaho Springs we approached 11,992-foot Loveland Pass, second highest in the State (page 243). Above us loomed the slopes of the Seven Sisters, an avalanche-worn area where hundreds of tons of snow are annually dumped on the road.

Avalanches Started by Howitzer Fire

I hadn't realized that men can control avalanches, any more than they can control an earthquake. But sometimes they can. I got the story from Dick Branson, who then headed the State Department of Highways' avalanche-control division.

"Colorado has 17 mountain passes to keep open through the winter," Dick told me. "It's no fun being caught in an avalanche, and what that snow does to traffic and communications is obvious.

"Avalanches occur, you know, when wind builds up masses of snow on steep slopes. Then a sudden thaw, a high wind, or a new fall, and down it roars.

"By keeping a close watch on known danger areas, we can predict the occurrence of slides within about eight hours. We do it by analyzing the snow itself—its depth, density, and crystal size—in relation to weather.

"Our aim is to predict the slides and then induce them artificially. By blocking off traffic and having snowplows waiting, we can clear the road in 30 to 45 minutes.

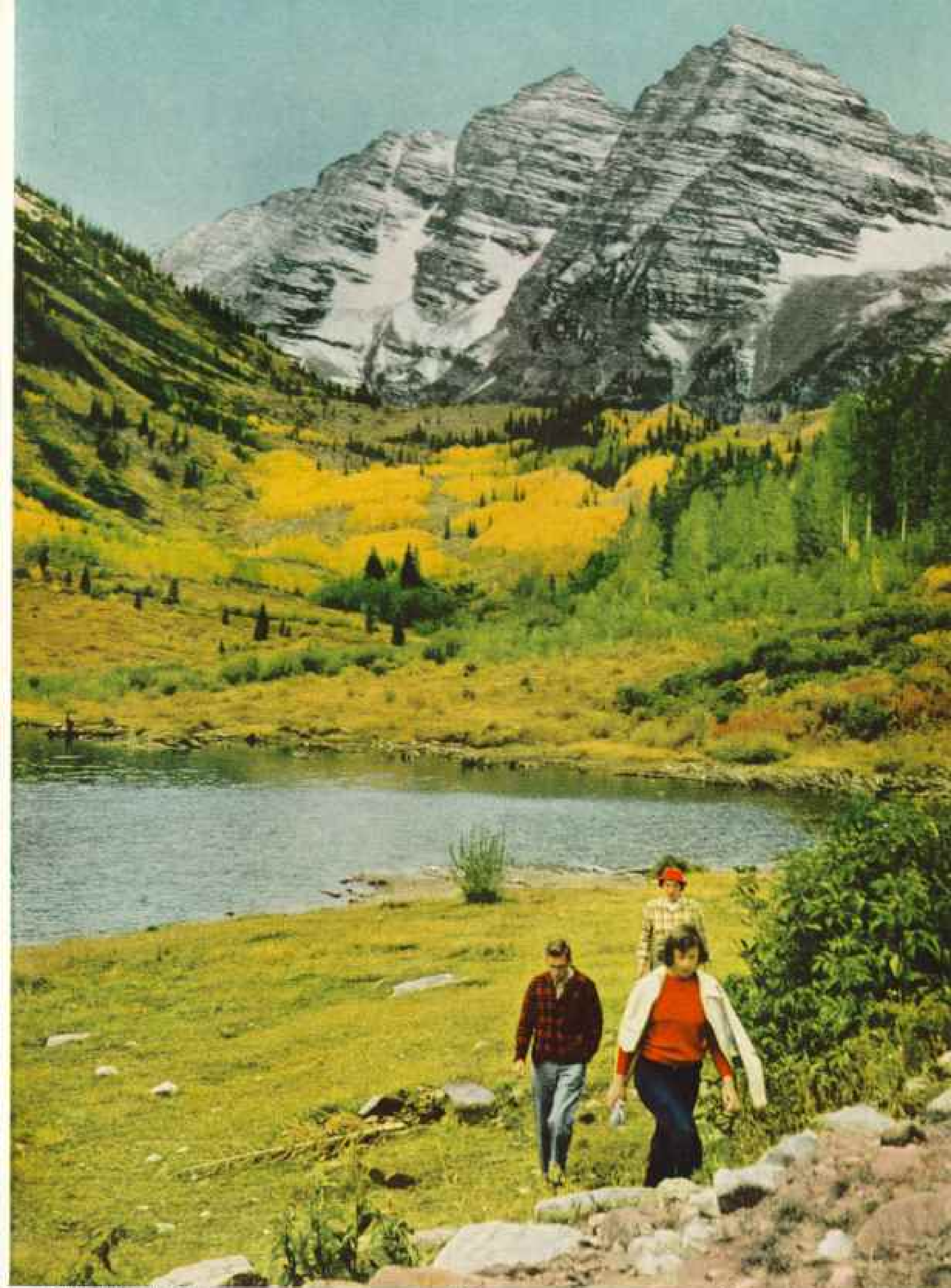
"Until recently one of our men would ski around the area and set off a dynamite charge near the top to start the slide. Now we have two 75-mm. guns to lob shells into the bank from the road" (page 248).

"Isn't dynamiting snowbanks a dangerous way to make a living?" I asked.

Dick Branson introduced his "avalanche technicians," Doug Nelson and Joe Maroney. They looked at one another.

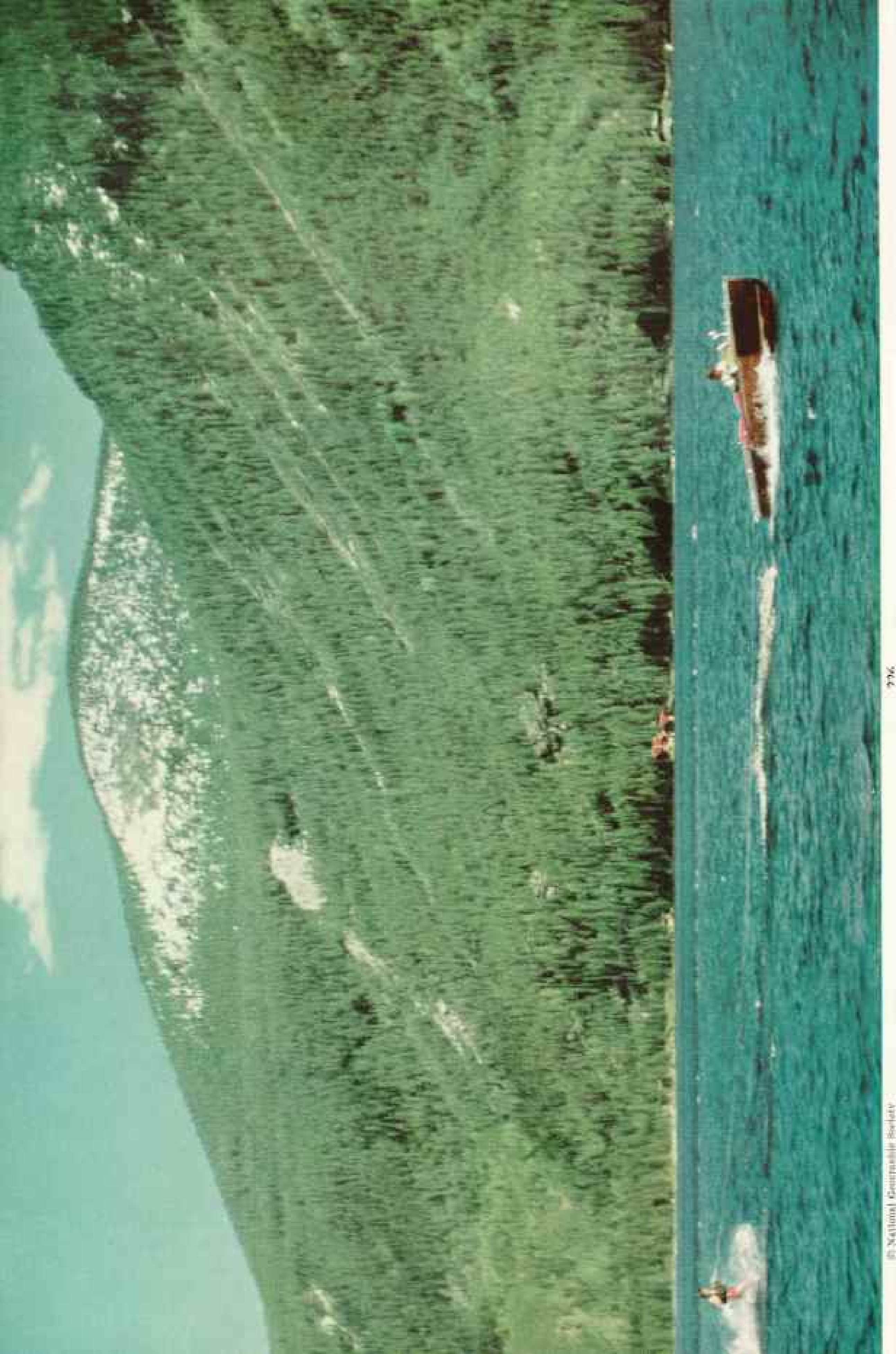
"Well," said Doug, "I got caught in a slide near Climax in the spring of '52 that nearly had me. Joe and I were roped together; he was waiting at the side, and I was skiing under the cornice to set the charge, when the snow

(Continued on page 233)



Snowy Peaks, Golden Aspens, and Blue Water Make Maroon Lake a Choice Retreat

A 10-mile drive from Aspen takes campers within hiking distance of 14,176-foot Maroon Peak, named for its ruddy hue in certain lights. Here in White River National Forest a porcupine invaded the author's bivouac.



↑ Early Summer Skiers, Finding Snow Scarce, Often Try Their Skill Behind Speedboats on This Mountain-rimmed Colorado Lake

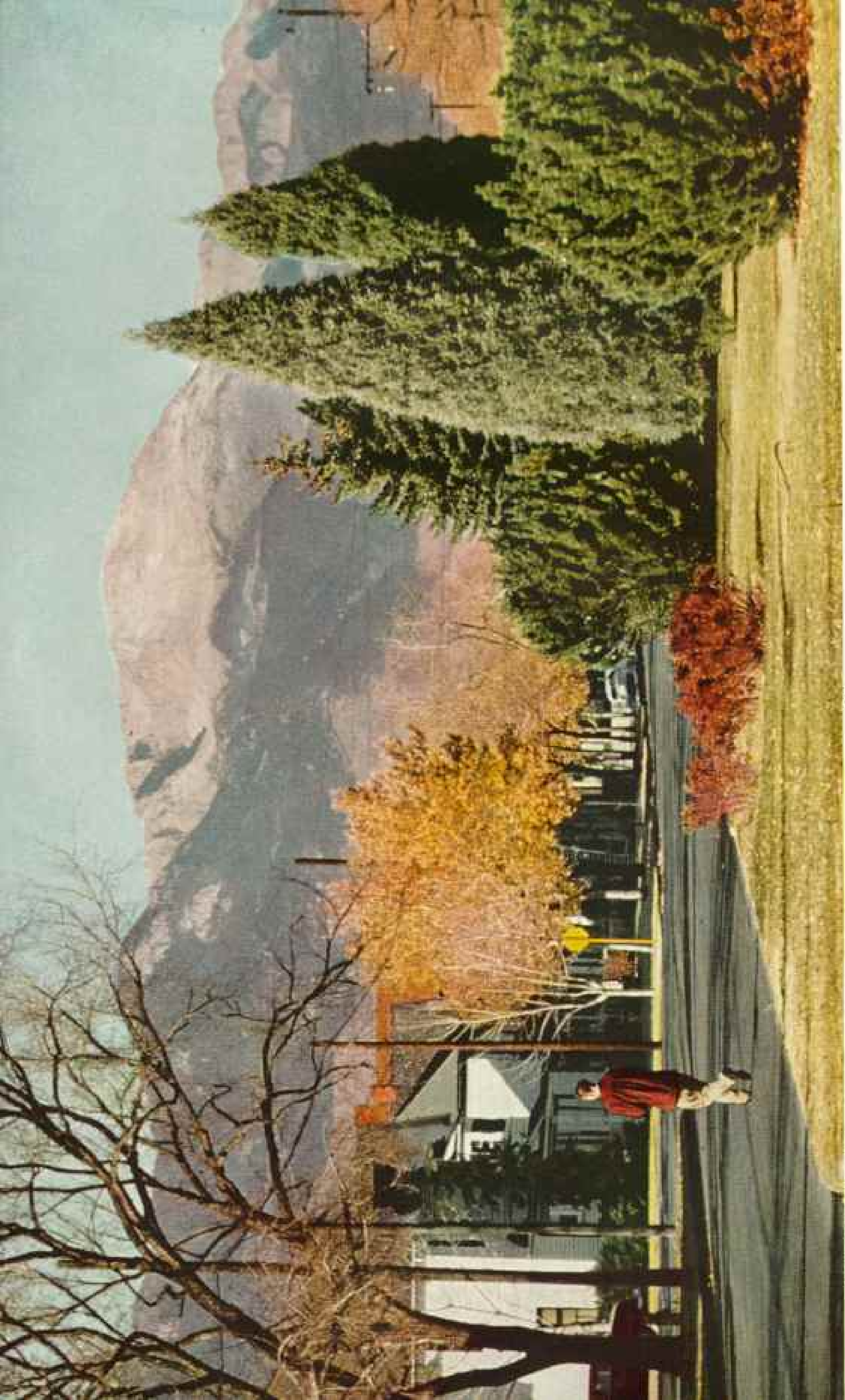
Yachtsmen of Grand Lake, at the western entrance to Rocky Mountain National Park, boast theirs is the country's highest anchorage—8,369 feet. Here a skier whizzes along in a flurry of spray, heedless of an icy dunking to come. Summer homes dot the shore.

✚ Left: Atop 11,575-foot Monarch Pass, Joanne Mahkorn shares a foot-warming fire with bearded Frank Gimlet and listens to his yarns of mining days in Leadville and Cripple Creek. Until his recent death, Gimlet roamed the Colorado high country with a burro. Mount Aetna rises in the background. Right: Joanne and Fern Johnson (left) greet the new day beside an Elk Mountains stream fed by melting snow.

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© Kullbackman by Kathleen Beria





Pikes Peak Soars Skyward Beyond Colorado Springs. A View from Its Summit Inspired the Anthem *America, the Beautiful*

Archers Loft Shafts Toward University of Colorado Library at Boulder. Flatiron Mountains (Left) Give Climbers a Workout

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Colorado's Highest Range, the Sawatch, Borders Twin Lakes Reservoir. This Water Will Irrigate Arkansas Valley Farms

Maroon Creek, Hurrying Toward the Colorado River, Dances Between Autumn-tinted Willows and Aspens

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© Kodakchrome for Eastman House





↑ **All Colorado Comes to Pueblo
for the State Fair**

Late August brings gayety and glitter to Colorado's second city, called "Pittsburgh of the West" for its steel mills. Here in a street parade launching the annual fair, a wagon bears the Sons of the Pioneers, a cowboy singing group.

↓ **Square-dancing Teen-agers
Swing Their Partners**

State Fair includes demonstrations of folk arts as well as a rodeo, horse races, livestock and poultry judging, and exhibitions of farm and industrial products. These youngsters from Lamar wear dresses and shirts of matching calico.



let loose prematurely. Chunks as big as a desk flew past as I was swept down. I guess I was carried 300 feet."

"Doug just disappeared," Joe added. "All I could do was keep paying out rope and hope he could 'swim' out of it. Finally I saw one ski-tip emerge above the snow. By the time I reached him, he had dug his way out—it took about ten minutes, but it seemed years."

Like a giant roller coaster, our route swooped down into the Blue River Valley from Loveland Pass, around jagged Tenmile Range, and up again over Fremont Pass. Fern, consulting our guidebook, identified a huge gash in a hillside as the mine of the Climax Molybdenum Company.

Early Miners Scorned Molybdenum

This ugly hill contains two thirds of the world's known supply of molybdenum. Not that anybody cared, at first. Miners thought the blue-gray ore was lead. In 1900 the Colorado School of Mines identified it, but many years passed before it came into its own as a toughener of steel for high-speed cutting tools.* In 1953 Climax produced 65 percent of the United States' output.

Twelve miles beyond the Climax mine lies Leadville. Famous in mining annals, the town in the 1880's teemed with 40,000 inhabitants. On its wooden sidewalks bearded miners jostled smelter workers; lumbering strings of ore wagons splashed over its muddy streets. First boomed in the 1860's as a gold camp, the town reached its heyday when the heavy black sand that clogged miners' sluice boxes was found to contain lead-carbonate ores rich in silver.

Paralleling Leadville's phenomenal growth and abrupt decline was the fabulous career of Horace Tabor. After turning from unsuccessful prospecting to storekeeping, Tabor grubstaked two German shoemakers who headed for the hills in 1878 with shovels and a jug of whiskey. Digging haphazardly, they stumbled onto the Little Pittsburg lode at the one spot where it lay near the surface. Tabor's share made him fabulous sums; he finally sold his interest in the mine for \$1,000,000. Then, buying a mine that was "salted" with ore to make it look rich, he turned the tables on his would-be deceivers by striking the Chrysolite vein. It made \$3,000,000 before Tabor sold out. Another of his mines, the Matchless, repaid his investment with more millions.

Giddy with wealth and glory, Tabor di-

vorced his faithful wife, Augusta, and married "Baby Doe," a colorful western beauty. Money poured in—and the couple poured it out again just as fast.

Before leaving Denver we had toured Tabor's suite in the Windsor Hotel, once a social center of the boisterous young capital. The rooms boast massive carved walnut furniture. From the balcony outside we visualized Tabor and Baby Doe pitching silver dollars to crowds below. A typical Tabor story—perhaps legend, perhaps truth—is the donation of 3,000 silver dollars to be embedded in the Windsor's bar-room floor.

This Colorado Croesus built Denver's plush Tabor Grand Opera House, furnishing it with paneling of cherry wood from Japan, carpets made to order, and imported marble and tapestries. Here played such greats as Sarah Bernhardt. Before its opening in 1881 Tabor noticed a portrait of Shakespeare and ordered it replaced with his own. "What has Shakespeare ever done for Colorado?" he asked.

Tabor spread his easily won earnings in too many directions, and when the demand for silver declined with the repeal in 1893 of the Sherman Silver Purchase Act, he had nothing left of his fortune. His last words to Baby Doe were: "Hang on to the Matchless."

Hang on she did, living in poverty in a shack on the claim until her frozen body was found in 1935.

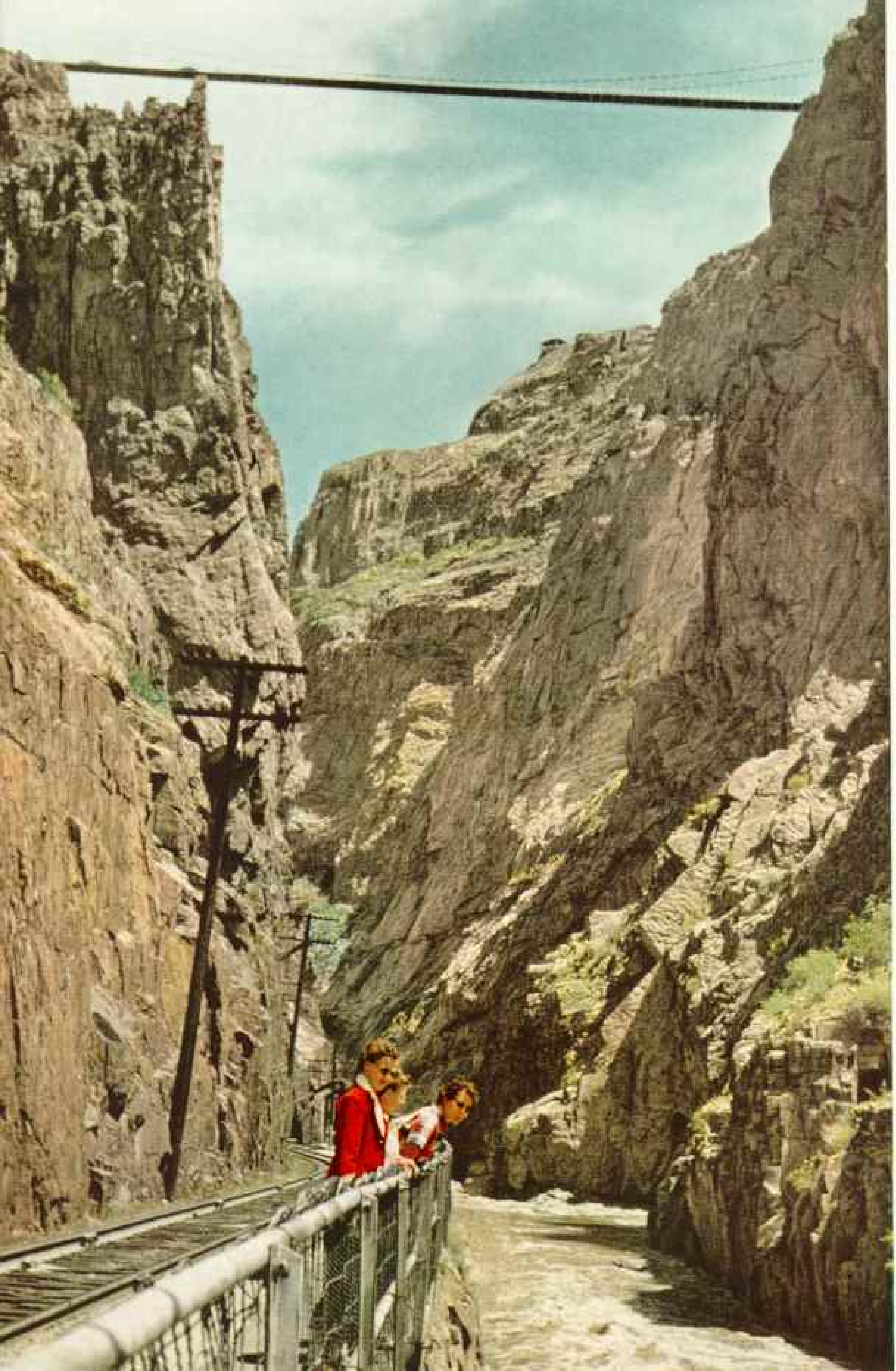
"I remember seeing her on the streets of Denver," a resident told me. "She used to try to interest people in the mine. A little old woman in a shapeless dress and high-button boots, she was a forlorn figure. They tell me she pinned newspapers under her clothes to keep warm."

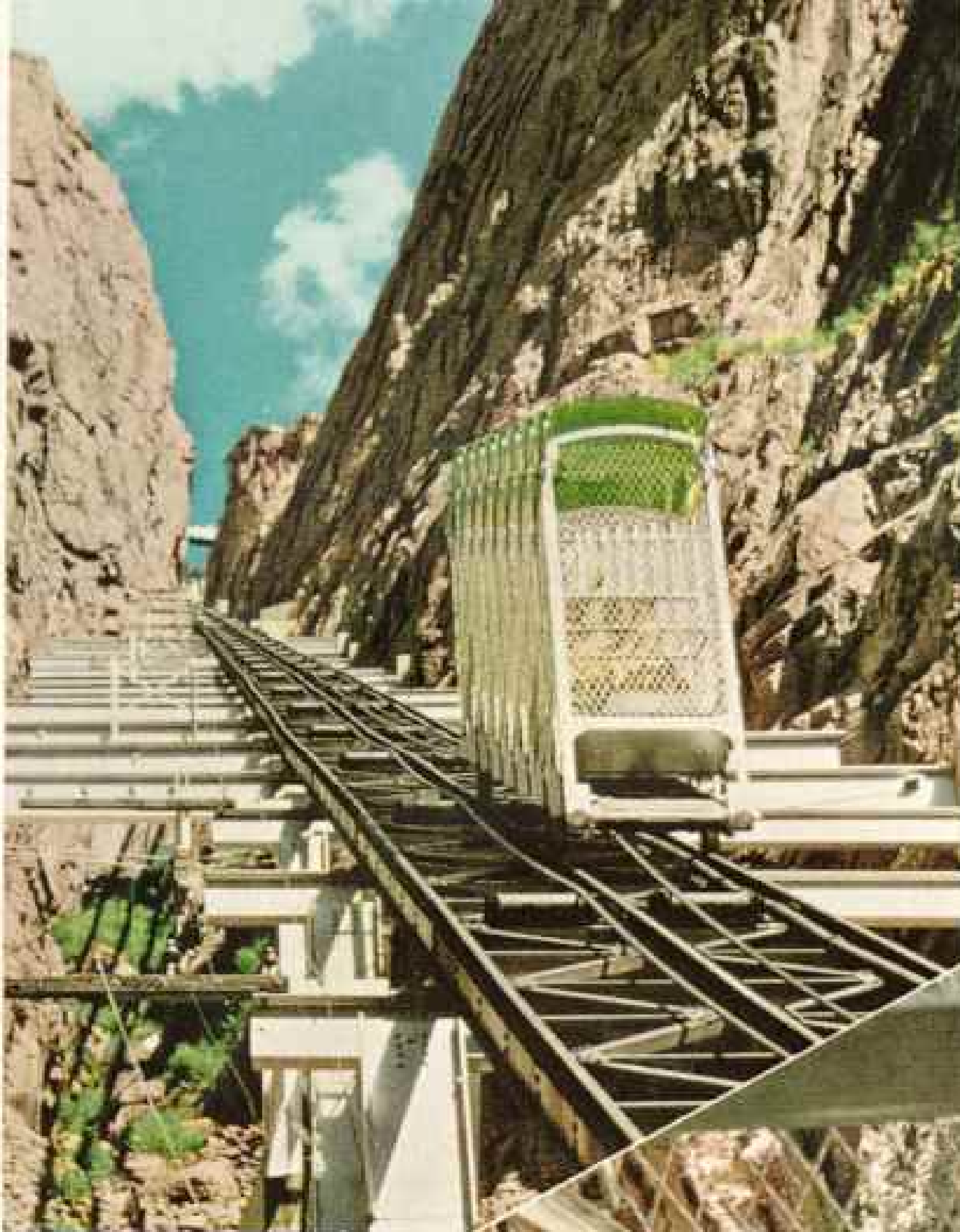
Sheep Plays Hide-and-peek

West of Leadville rise the Sawatch Mountains (page 230), with the three highest peaks in Colorado. Mount Elbert rises 14,431 feet, Mount Massive, 14,418 feet, and Mount Harvard, 14,399 feet. The route over the range ascends 12,095 feet to Independence Pass—the highest, most spectacular in the State.

We stopped by a grassy bank. After a picnic lunch the others stretched out for a brief siesta; I decided to stroll down an inviting trail. A spattering of pebbles caught my attention. On a ledge above stood a moun-

* See "Metal Sinews of Strength," by Frederick G. Vosburgh, NATIONAL GEOGRAPHIC MAGAZINE, April, 1942.





Cage-like Cable Cars Lower Visitors into Colorado's Royal Gorge

Passengers on the 45° inclined railway get an intimate glimpse of a miracle wrought by erosion. These formations demonstrate to geologists that the 8-mile gorge was cut by the Arkansas River, chewing steadily through rock at the incredibly slow rate of about one foot every 1,000 to 2,000 years.

First European to see the Arkansas, one of the Nation's longest rivers, was Coronado, in 1541. Zebulon Pike and his party explored the Royal Gorge in 1806-7 (page 212).

Redactiones by Kathleen Berta

← World's Highest Suspension Bridge Spans the Sheer-walled Arkansas River

Soaring across Royal Gorge 1,053 feet above the riverbed, the bridge gives the illusion of resting its northern end on a rock pinnacle. Automobiles on the roadway appear toy size.

Behind the girls and around the curve, a 271-foot hanging bridge carries mainline tracks of the Denver and Rio Grande Western Railroad. A recently built stone wall helps support it.

Tracks at the bottom of the gorge were completed in 1879 after a bitter struggle between the Denver and Rio Grande and the Santa Fe, each seeking exclusive use of the narrow right of way. Crews laid steel during the day and at night sabotaged the work of their rivals (page 215).



tain sheep, head cocked. When I stepped back to see better, it retreated; as I moved forward it leaned out, more curious than apprehensive. Then, tiring of the game, the animal leaped to a higher ledge and disappeared.

Mine was beginner's luck, for the sure-footed bighorn lives on high peaks and is seldom seen except when driven down for food by heavy snows.* Less than a week later, however, I got a close-up view of eight of the majestic animals—at Denver's Museum of Natural History. Dr. Alfred M. Bailey, director of the museum and a contributor to the NATIONAL GEOGRAPHIC MAGAZINE, was my guide.

"The 50-foot panoramic background shows the Tarryall Mountains, northwest of Colorado Springs, where the specimens were obtained," Dr. Bailey told me. "Years ago, poachers and disease threatened to kill the animals off. One winter, in fact, fewer than a dozen survived. With protection, however, the herd has gradually increased. We estimate it now at about 775 sheep."

Aspen Boasted King-size Nugget

A 20-mile descent from Independence Pass brought us to Aspen. In mining days the town was known far and wide for the tremendous nugget of silver found there. The 2,760-pound giant was found in the Smuggler Mine; it assayed 93 percent fine silver.

Beside a forest road sunlight filtering through leaves fell on motionless forms.

"Look, there's a deer! And another!"

Ears alert, the pair watched our approach; then panic seized them, and, with a flick of white tails, they bounded through the brush. They were larger than our Virginia deer. I could see why, with their big ears, they are called mule deer.

Beyond a stream snowslides had carved wide gashes on timbered slopes. Now we neared a swath 100 feet wide and extending far up the hill. Trees torn from the earth lay scattered at its edge; the bulk of the debris lay part way up the opposite slope, where the force of the avalanche had carried it. We counted 20 such devastated areas within seven miles.

Maroon Peak, mirrored in a lake, marked our goal for the day (page 225). We started a fire immediately, for the temperature had

dropped with the setting sun. Morning found it still colder—a cup of water dipped from a stream acquired a coating of ice, and wet metal froze to fingers. But the sky was clear, with the promise of warmth.

Fern awoke from an uneasy sleep. "I felt something walk over my feet last night and kicked it," she said. "Look!"

Embedded in her sleeping bag were several porcupine quills. Then we appreciated June's foresight in advising us to keep our equipment in the car overnight. Porcupines are fond of salt; they'll chew ax handles, boots—almost any article permeated with salt.

Army of Anglers Invades State

Fishermen were casting over the lake's surface as we set off.

"Any luck?" we called.

"Two rainbows," one of them answered.

President Eisenhower, first fisherman of the land, has boosted Colorado's fishing fame (page 209); three hundred and fifty thousand other angling enthusiasts try their luck in the State's waters each summer. In 1955 they averaged 4½ trout apiece for every day fished. To make this score possible, brown, brook, and lake trout have been added to Colorado's rainbows and native cutthroat.

We passed irrigated fields and sagebrush flats. Cattle and sheep grazed peacefully in adjacent pastures, a sight seldom seen in feuding days, when ranchers and sheepmen fought for the use of dwindling public range. Close-packed flocks of sheep overgrazed the land, cropping grass to its roots; cattlemen retaliated by beating herders and killing and scattering their flocks.

Streams sparkling in the sun merged to flow to the Colorado River (page 231). We explored red-walled Fryingpan Creek, named, tradition says, by prospectors who worked the stream for gold with their frying pans. The Crystal River, banked with slabs of marble, winds past abandoned quarries which yielded stone for the Lincoln Memorial and for the 50-ton Tomb of the Unknown Soldier at Arlington National Cemetery.

"Race you to the end," shouted Joanne, as we joined swimmers in a pool fed from hot and cold springs.

Fern, scornful of exertion which had us puffing in the thin mountain air of Glenwood Springs, soaked blissfully. "This is the way to go camping," she announced. "Last night,

(Continued on page 242)

* See "Lords of the Rockies," by Wendell and Lucie Chapman, NATIONAL GEOGRAPHIC MAGAZINE, July, 1939.

Bronze Brave and Horse → Capture the Spirit of Wild West Days

A young Coloradan suns himself at the base of a famous statue. *On the War Trail* occupies a place of honor in Denver's Civic Center (page 217) as a symbol of life in this Rocky Mountain State before the white man came.

The statue, showing Indian and mount in muscular detail, was sculptured by A. Phimister Proctor, noted for his animal studies.

↓ "Rocky Mountain Canary" Entrances Youngsters in Denver's Zoo

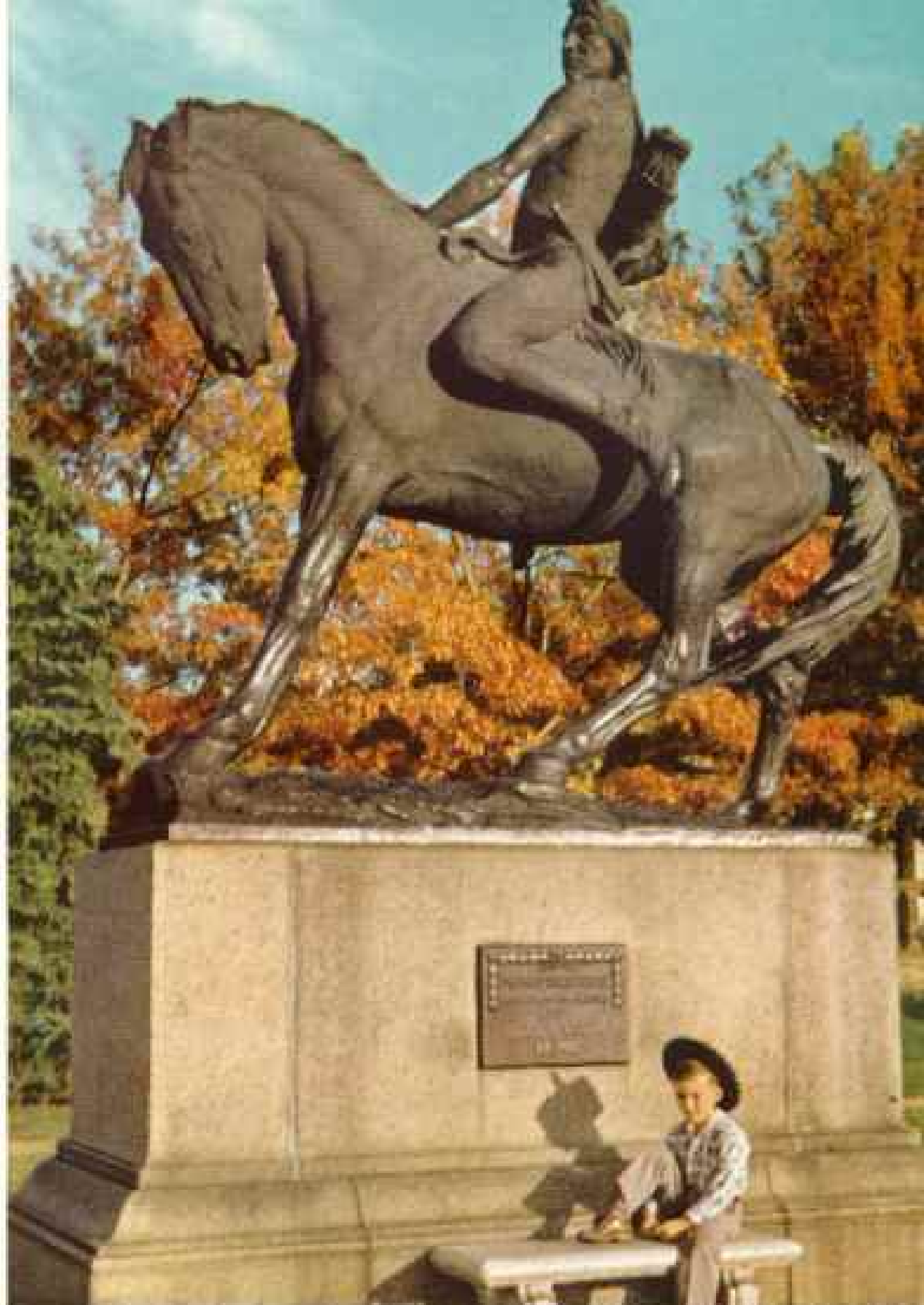
This donkey, Lulu Belle, lives a life of ease in a special children's corner of the Zoological Gardens in City Park. Here are featured farm and ranch animals in buildings scaled to children's size. Young visitors may pet and feed the inmates.

In all Colorado no animal enjoys higher esteem than the shaggy burro, noted for his unlimited stamina, discordant bray, and occasional orneriness. In the old days he helped lonely prospectors over difficult trails, bore their burdens, led them to water holes, and asked little in return.

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George D. Winkler

Colorado's Mining Towns Have Many a Tale to Tell

Black Hawk, when this photograph was made in 1864, rang with the sounds of hammers, saws, mine machinery, and dance-hall roistering. Those were boom days, for near here John H. Gregory discovered Colorado's first gold lode in 1859. Today only 400 people live here.

← The Face on the Barroom Floor

Teller House, still sheltering travelers in Central City, carefully preserves this conception of "lovely Madeleine," heroine of Hugh d'Arcy's ballad of unrequited love. A table protects the picture, painted in 1936.

Charlie Winder





Central City's Play → Festival Offers Broadway Stars

In summer the mountain-girt Colorado town casts off its ghostly appearance and looks much as it did almost a century ago, when it was the center of "the richest square mile on earth."

To satisfy the demands of gold-rich miners who wanted only the best, the stone Opera House was built after the fire of 1874 had destroyed the town's flimsy wooden playhouses. Early performers included Lotta Crabtree, Edwin Booth, and Helena Modjeska (page 224).

Since the first festival in 1922, the Opera House has drawn audiences and critics from all parts of the country: Here playgoers head for their seats to see Helen Hayes in "Mrs. McThing."







Kings and Queens of Skiing Rule Steamboat Springs' Winter Carnival

More than a mile high, Steamboat Springs offers year-round recreation, but specializes in catering to experts and novices on the hickory runners. Skiing is taught in public schools of this northern Colorado town.

February's annual carnival includes jumping and downhill contests on near-by slopes, followed by parades and after-dark processions of torch-bearing skiers.

Above: Baton twirlers slide along Main Street ahead of the ski-mounted high-school band. Spectators shiver in 9-below-zero weather. At extreme right (and in the sleigh, opposite page) is Marlene Fortik, chosen as 1952 carnival queen because of her beauty, scholastic standing, and skiing ability.

◀ A skier, hanging on with one hand behind a snorting horse, leaps into the air to hurdle an obstacle in a ski-joring race.

after the porcupine, I wondered if it was worth it."

Beyond Glenwood Canyon we came to Dotsero, final link in the railway connecting Denver and the Pacific coast.

Until 1934 Denver, in spite of its size, had no direct rail route to the West. But it had visions. As early as 1902 banker David Moffat undertook construction of a line from Denver west through the mountains to Salt Lake City. A tunnel under the Continental Divide was his ultimate aim. But pending its building, the line ran "over the hill"—crossed the Divide—at Rollins Pass, through 31 small tunnels.

Winter Snows Stopped Trains in Tracks

But winter operation of the line was a nightmare. For weeks and months nothing could move over the snow-blocked rails.

The line fell into financial difficulties, and Moffat did not live to see his vision of the tunnel route realized. Finally, in 1922, the State created a tunnel commission which raised a bond issue to pay for the 6.2-mile Moffat Tunnel, which bores through James Peak to Winter Park. It was completed in 1927. There are actually two tunnels; the test bore of the Moffat transports water to Denver from the Fraser River.

But 38 trackless miles still remained between Denver and the nearest westbound rail line. In 1934 the Dotsero Cutoff linked the Middle Park track and Dotsero. Denver at last had a direct connection with the Pacific coast.

On a Dotsero railroad siding we saw pulpwood destined for Wisconsin paper mills. I thought of the long war Colorado has waged against a determined invader of her forests.

Four billion board feet, an estimated one-fourth of the spruce timber in the State, were destroyed by the Engelmann spruce beetle in the last decade. I learned the story of the epidemic and its control from Dr. Noel Wygant, of the Forest Service's insect research division at Fort Collins, Colorado.

The outbreak started in June, 1939, when winds as high as sixty miles an hour swept the forests of the western slope. Spruce beetles swarmed to fallen trees and laid eggs in the bark. Protected by blanketing snow from their natural enemies—woodpeckers and freezing weather—abnormal numbers survived.

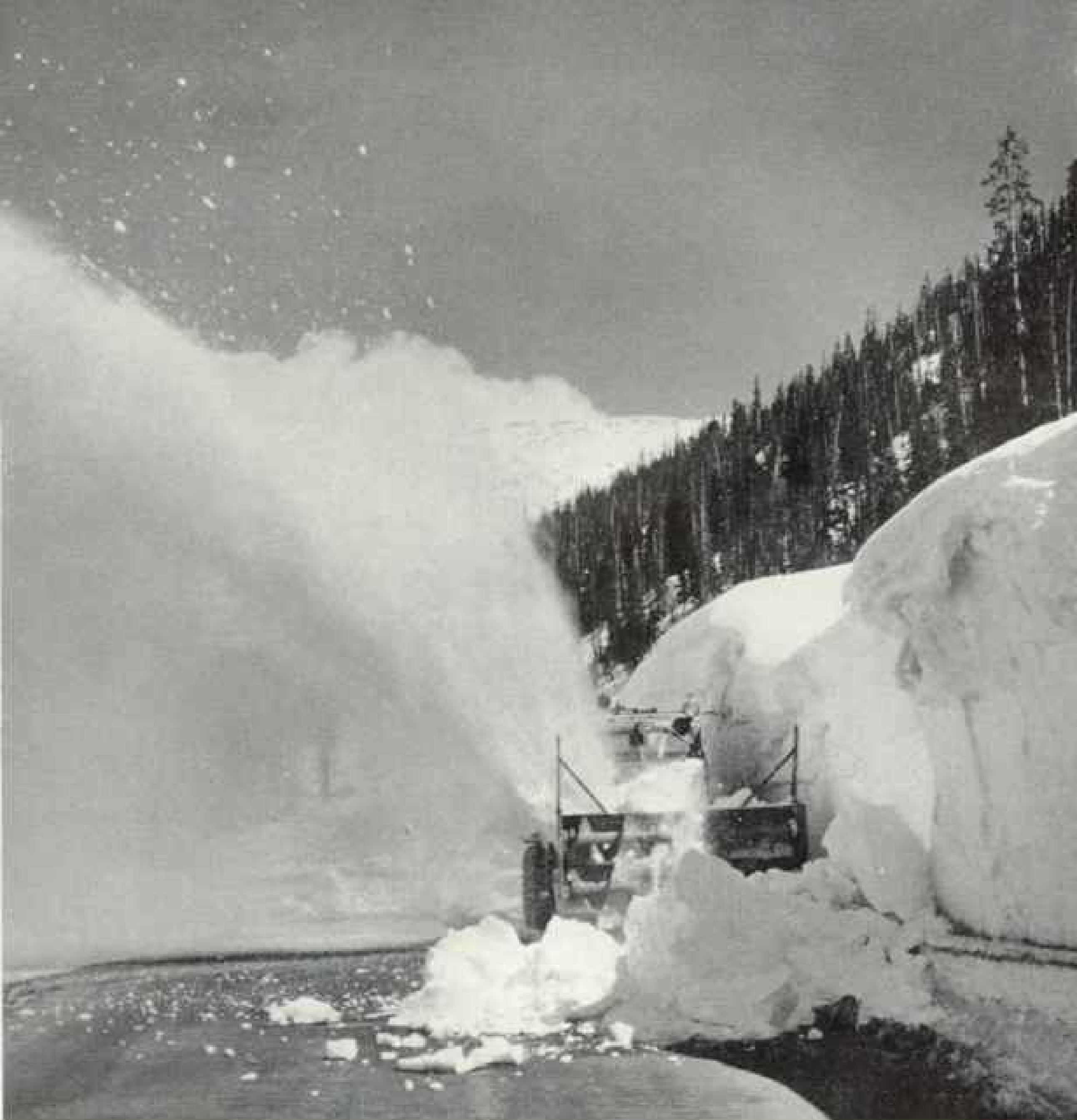
World War II prevented any immediate control measures. Until 1949 the outbreak remained beyond control. That year, winds drove the beetles across the open Colorado River Valley.



Promptly, the Bureau of Entomology and Plant Quarantine and the Forest Service launched a control program to save newly threatened areas. Infected trees were sprayed individually to kill the broods. Green trees were felled to attract migrating insects. These "trap" trees were then destroyed.

During the winter of 1951-52 Nature lent a hand. Temperatures hovered near 50° below zero. This "deep freeze," combined with chemical treatment and aided by hungry woodpeckers, brought the spruce-beetle epidemic under control in 1952. The trees beyond its ravages were saved.

Following the route of the railroad through



↑ **Loveland Pass
Snowplow Casts
a Mighty Plume**

Snows seldom block Colorado's important mountain roads for long; swift-moving highway crews, armed with the latest equipment, efficiently dispose of the massive drifts. Here a rotary plow chews into an overhanging snowbank on U. S. Route 6 west of Denver.

→ The snow-clogged plow, its powerful augers stilled, submits to a cleaning by old-fashioned shovels.

Colorado State Highway Department





Gaily Feathered Tewa Braves Stomp and Prance to a Drum's Beat

These Indians, whose forefathers wore simple loincloths, have created colorful costumes for ceremonials and festivals. Some ideas, such as beaded vests and trousers, were borrowed from Great Lakes tribes. Other touches reflect the Tewas' own ideas of what the well-dressed red man should wear.

Modern innovations include elaborate head-dress and apronlike skirts. Bells worn at calf and ankle replace shell rattles.

Home of the Tewas is on the upper Rio Grande in New Mexico. Each summer they journey north to entertain tourists. Here they perform at Hidden Inn in the Garden of the Gods, near Colorado Springs.

← Small and Shy, He Bears a Big Name: Thunder Ball

Like his elaborately costumed elders (above), the four-year-old grandson of the Tewa tribe's Chief Little Deer comes to Colorado each year. Thousands of sight-seers, drawn to Manitou Springs by the Pikes Peak railway, have seen Thunder Ball and his brother, Mountain Flower, perform in tribal dances.

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Kodachromes by Kathleen Bevis



the canyon of the Colorado, we took a high, narrow road past an elbowlike curve. It reminded Joanne of a story that, somehow, failed to amuse us at the time.

"An out-of-state driver," she said, "once met an old car on this road, right about here. The out-of-stater was supposed to yield the right of way, but he was too frightened to back to the nearest turnout. Finally, he asked the other driver how much his car was worth. 'A hundred dollars,' the fellow said. 'Here you are,' said the out-of-stater, forking over \$100. Then he bumped the car into the canyon and proceeded on his way."

Colorado Claims a No Man's Land

We met no such drivers, fortunately, and descended safely into Middle Park just as sunset tinged the clouds drifting above a wild landscape. Local residents long called Middle Park, hemmed in by peaks of the Rockies, a no man's land. The United States, they insisted, never formally bought it. Their reasoning: the Louisiana Purchase boundary lay to the north, east, and south; Spanish-ceded territory extended only to the Park Range on the west.

So in 1936 they arranged a colorful ceremony. Gov. Edwin C. Johnson raised the United States flag over the park and claimed its 1,000 square miles as part of Colorado.

Farther along, markers told us we were approaching Winter Park, "Denver's Own Ski Haven." Shaved strips on forested slopes formed the ski runs—but how rocky and uneven the courses looked without their blanket of snow!

During winter months, when snows barred camping to any but the hardiest, we had joined "slat-happy" Denverites on these same ski runs. Fifty swift miles from the city, the ski train entered Moffat Tunnel and emerged into a wonderland of blue-shadowed snow and dark evergreens. Here we watched the experts schuss down the steep grades or zigzag dizzily between the markers of a slalom course, with powdery snow plumes tossing in their wake.

Now the last vestige of daylight faded as we started the long climb over Berthoud Pass. I was glad to relinquish the wheel to June and relax as she competently guided the car over the twisting road to the warmth and comfort of home.

"When are you going mountain climbing?" a friend asked me one day.

At first nothing seemed worth that much exertion. But then I saw a notice in a Colorado Mountain Club bulletin:

"Camp will be made at Longs Peak Campground [9,300 feet]. Climb via Cable Route . . . hike to Chasm Lake . . . Some rock scrambling, but nothing difficult . . . Elevation gained, 4,955 feet. Walking distance 17 miles."

I remembered the vow I had made, to stand one day on top of Longs Peak.

That's how it came about that at 6:30 one August morning I found myself adjusting an unfamiliar pack and mentally reviewing its contents: raincoat and hat, lunch, canteen, flashlight (which I hoped I wouldn't need), and gloves to protect my hands.

Two thousand feet above camp we approached timberline. Here the trees are dwarfed and distorted by their grim struggle for survival. Century-old trunks were no higher than our waists. Some sprawled like vines, borne down by countless snowdrifts; others, bent by never-ceasing winds, had streamers of branches sweeping leeward.

The trail climbed to the rim of a glacial moraine. We caught our first full view of Longs Peak.

"Surely we're not going up that cliff!" I exclaimed.

"That's for rope climbers only," answered the leader, Denverite Noah Springs. "The cable route is just to the north of it."

City Water from a Glacier

"See that U-shaped valley over on the peak's eastern side?" he asked. "A glacier carved those cliffs."

"When rock peeled from the mountain, it fell onto the ice stream and was carried down to form this long ridge you're standing on. As the glacier receded, it built up the moraines that now dam the small lakes down there in the gorge. Remnants of that glacier are still here, between Chasm Lake and the precipice."

"Some glaciers in the vicinity are still active," he went on. "Boulder gets its water supply from Arapaho Glacier, which it owns."

We had been following a well-worn path; then above Chasm Lake the rock scrambling began (page 206). As we clambered over boulders, my lungs seemed at the bursting point. It became a grim game of "one more step." Finally someone moaned "Let's rest." We were little more than halfway!

We labored on, and I gained confidence. The grades were steeper, but I had my



Juicy Wares Go "for Free" at Arkansas Valley's Annual Fair

Most eagerly awaited event of the September festival at Rocky Ford is Watermelon Day, when choice specimens from valley farms are presented to all comers.

Watermelon Day originated in 1878, when a grower shared a bountiful crop with his neighbors. In that year a wagonload of melons was presented to about 25 people.

Since then the event has grown steadily in size and popularity. In 1953 some 8,000 watermelons were given to 42,000 people.

Best known for cantaloupes, the Arkansas Valley also grows honeydews, winter watermelons, tomatoes, and dozens of other products which are shipped in carload lots to all parts of the United States.

Farmers in many countries raise cantaloupes from Rocky Ford seed.

A Rocky Ford refinery converts Arkansas Valley beets into sugar. The beet tops are used as finishing-off feed for beef cattle.

Left: This happy fairgoer staggers under a succulent burden.

Right: The girls accept more modest gifts.

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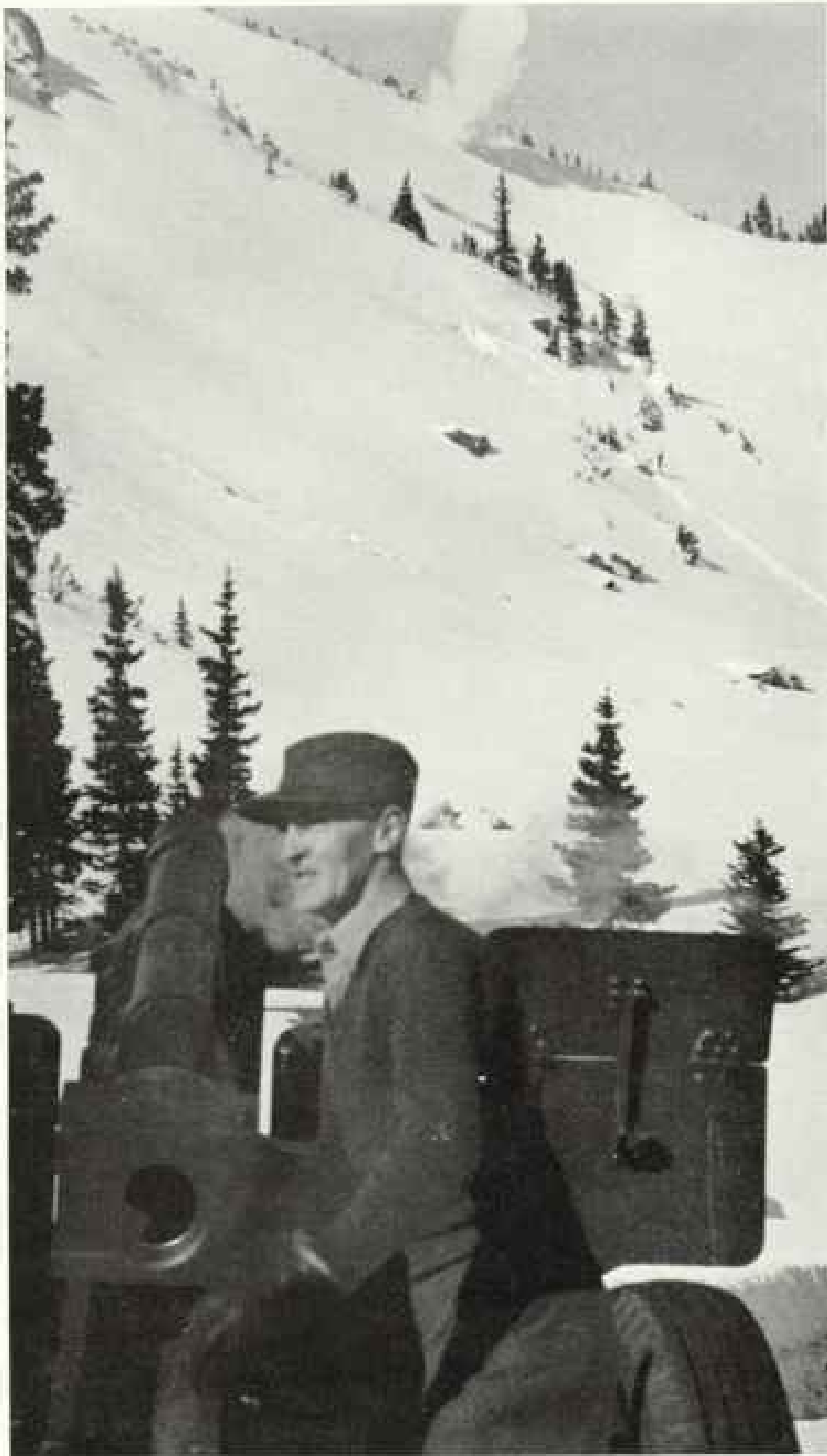
What Happens Now? Captors Say "Come Along!" but Roped Calves Register a Stubborn "Try and Make Us!"

Catch-it-and-keep-it contests are part of the rodeo held at Rocky Ford's fair. Boys who capture calves are encouraged to bring them back for possible awards in the following year's cattle judging.

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© Koshuromes by Kathleen Berria





Colorado Battles Snow with Gunfire

When snow slides threaten the high passes, highway engineers block traffic and set off avalanches (page 214). Here a 75-mm. shell explodes on the slopes above Berthoud Pass, triggering loose the beautiful but treacherous drifts.

second wind, and I knew I could make it.

Once at the top of the ridge, we looked down on Boulder Field, a mass of broken granite extending back for more than a mile. We skirted this and worked our way over to the cable route. Here steel cables are anchored in the cliff above a 1,000-foot drop. We started,

one at a time. Not daring to look around, I hauled myself up hand over hand. Then one final pitch and I was on top. After 6½ hours of climbing, I had kept my promise to stand on Longs Peak.

How does the world look from the top of a 14,255-foot mountain? We were standing on an almost level stretch of 10 to 15 acres of tumbled boulders, its edges dropping sharply into glacial cirques and valleys. Two miles to the west, peaks bristled along the Continental Divide; northward we could trace the Medicine Bow Mountains into Wyoming. Pikes Peak stood sharp and clear on the horizon. I was amazed to learn that it is 103 miles away.

Before the summer was over I joined the Colorado Mountain Club again, this time for an outing in the San Juans high above Ouray, "where the miles stand on end" (page 210). We explored ruined mines and basked in the waters of Ouray's warm springs. Jeeps took us over the awesome Million Dollar Highway; climbing the walls surrounding Ouray, it clings to the sides of a precipitous canyon on its way to the iron-stained Red Mountains.

On my last evening in Colorado's high country, as the moon rose over stark peaks and probed dark canyons, I gazed from the aloof heights to cheerful, firelit faces. The mountains could chill, but to me they had brought also the inspiration of soaring beauty and the warm glow of friendship.

Big in Heart and Hospitality Are the Little People of Lapland—
and a Taxi Will Take You to an Arm of the Arctic Ocean

BY JEAN AND FRANC SHOR

National Geographic Magazine Staff

With Illustrations from Photographs by the Authors

TWO hundred miles north of the Arctic Circle, the wind howled across the desolate fells of Finnish Lapland. It was 10 p.m., but the midnight sun burned bright above the horizon as we bent low to enter a reindeer-skin tent.

A Lapp fisherman sat cross-legged behind a blazing fire in the center of the smoke-filled tepee, studying a pile of metallic objects laid out on a reindeer skin. He was a very little man, with a dark, pointed face, wearing a gaily colored cloth tunic, breeches of worn leather, and tiny fur-covered shoes with curling pointed toes.

Jean and I looked about us with satisfaction. This was what had brought us north—a strange and primitive people living in the ways of their ancestors and stoutly resisting the inroads of civilization.*

The tent and its surroundings and the costume of our host exceeded our highest hopes. Here was something really remote. But what about that pile of metal? We knew that ancient Lapp superstition had endowed certain metals with supernatural properties. Could this busy little man be a shaman, preparing a charm? Looking up, he spoke to our Finnish companion.

"He says it's no good," our friend translated. "He's had to repair it four times this month. It's the carburetor for his new out-board motor."

Machine Age Invades Reindeer Land

Lapland is like that. Here herds of reindeer roam watersheds that feed modern hydroelectric projects, and gleaming amphibian planes disturb wilderness lakes accustomed only to Lapp canoes.

The region called Lapland sprawls across the boundaries of four countries—Norway, Sweden, Finland, and Russia—as shown on the 10-color map, "Northern Europe," which supplements this issue.†

There are about 34,000 Lapps in the world today. Almost two-thirds live in Norway,

nearly a fourth in Sweden. A scattered few are still in Russia. But the most interesting, because they have had less contact with modern ways, are the 2,500 who inhabit Finnish Lapland.

They live much as their fathers lived, close to nature. Most are reindeer herdsman and fishermen. And, as Jean and I found in a summer spent in their tents and cabins and in their long, narrow river boats, they are a warmhearted, friendly people.

"Contrary to a popular illusion," says a report of the Finnish State Commission on Lapp Affairs, "the Lapps are not a disappearing remnant of a dying race. . . . There are more Lapps now than ever before, and their number will probably increase."

Lapland Warmed by Gulf Stream

Shaped like a giant mitten with the Arctic Circle for a drawstring, Finnish Lapland covers 38,300 square miles, almost a third of all Finland (page 251). With a population of only 170,000, it is the fastest growing area of the country. It is rolling and rocky, its thin soil covered with reindeer moss and scanty forests of pine and birch.

Two-thirds of its area lies within the Arctic Circle. But an offshoot of the Gulf Stream System, known as the Norwegian Current, brings a warmth that makes Lapland one of the few places in the Arctic where rye, barley, and potatoes grow.

Jean and I came by plane to Rovaniemi, "capital" of Lapland, a city of 15,000. With us on the 430-mile flight north from Helsinki rode Prof. Dr. Paul Soisalo, head of Finland's largest hospital, whose passion for fishing has taken him to Lapland so many times that he has become an expert on the territory. With a generosity we were to find characteristic of

* See "The Nomads of Arctic Lapland," by Clyde Fisher, NATIONAL GEOGRAPHIC MAGAZINE, November, 1939.

† For articles on the Arctic regions, see the 2-volume NATIONAL GEOGRAPHIC MAGAZINE Cumulative Index, 1899-1953.



↑ South Lapland Abounds in Timber and Water Power

Far to the north, cutting across Norway, Sweden, Finland, and into Russia, lies the country of the Lapps, an isolated people of disputed descent. To study these remarkable nomads, the authors traveled through Arctic Finland, where most Lapps cling to ancestral ways.

On Lake Kemi (left) the Shors visited the lumbering town of Kemi-järvi. Electricity produced here on the Kemi River (foreground) powers factories and pulp mills to the south.

The Teno Is Placid Here, but → Dangerous Rapids Lie Ahead

The Shors traveled from Rovaniemi (opposite) to the Teno over one of the world's northernmost highways. Here the party loads a high-prowed canoe, specially built for swift Lapp rivers. Final goal: Tana (page 278), tiny Norwegian port on an arm of the Arctic Ocean.





**"Shaped Like a Mitten,
with the Arctic Circle
for a Drawstring"**

Thus did Jean Shor describe Finnish Lapland as she studied this map of the area, which identifies the Arctic Circle in Finnish, Swedish, English, and French. Here at Rovaniemi, Lapland's principal city, the authors began the auto-and-boat journey that took them all the way north to the Barents Sea.



the Finns, he offered to spend his vacation accompanying us down the Teno River (Teno Joki) to the Arctic Ocean.

"I know most of the Lapp families on the river," he told us. "You'll be welcome in every home. The Lapp code is simple: No traveler is ever refused shelter, a seat by the fire, and a share of the family's food. But you might want to ask questions; so I'd better go along to interpret for you."

A New City Risen from Ashes

Rovaniemi lies just south of the Arctic Circle, but its airport is nearly a mile north of that shadow track of the midnight sun. So we crossed it first by air, a short time later by car, and in a matter of minutes were being shown to attractive rooms in a spanking new hotel on the banks of the Kemi Joki.

"You'll get accustomed to new buildings up here," a Lapland official told us over a dinner of reindeer tongue and salmon. "There aren't a dozen buildings in all Lapland more than 10 years old. The Germans destroyed nearly every bridge and building in the country during their retreat in 1944."

"Will we find places to stay on our way north?" I asked.

"Better than before the war," our host replied. "We've built 16,000 buildings, more than the Germans destroyed. Take Rovaniemi. They burned it to the ground—and as a result we've built a whole new city, properly planned, and with most of the architecture in harmony."

Lapland's Governor Uno Hannula, our host at breakfast, told us of government plans for the territory.

"This is Finland's last frontier," he said. "Long, dark winters make southern Lapland unsuitable for agriculture and industry, but it has timber and water power. Now that the Russians have taken Petsamo and Karelia, we are making it the power station of Finland." *

Bathhouses Built Before Homes

The governor's home, like the rest of Rovaniemi, was burned by the retreating Germans. We asked if his new house of peeled logs had been the first to be rebuilt.

"Certainly not," he smiled. "I'm a Finn! We built the *sauna* first, and lived in that while we erected our home."

The Finn's sauna, or bath, is an integral part of his life. In this little log hut stones are heated over a birch fire, then drenched

with water to produce steam. Whole families bathe together, seated on bare wooden boards in temperatures above 200° F. Then they whip their bodies with green birch twigs and, racing naked to the nearest lake, plunge into icy waters. In winter they roll in snow.

"The custom proved very helpful just after the war," Governor Hannula told us, jokingly. "A United Nations relief official was here in the winter of 1945 and saw a Finnish family emerging from their sauna. He wired his headquarters to rush warm clothing. 'These people are walking around naked in the dead of an Arctic winter,' he reported."

Heading north, we left in a car lent by Erkki Aalto, president of the power company whose giant generating plants are converting energy from Lapland's rivers into electric current. Gravel roads were well tended, and we had driven 100 miles north before we lunched on smoked reindeer flesh. The meat was chewy and tasted like raw lean bacon. It is, Professor Soisalo told us, the staple of the Lapp diet.

Norway and Russia Both in Sight

North again we drove and, turning off the road, climbed a rounded hill to an elevation from which we could see into Norway to the west; east of us stretched the forests of Russia.

"Better not take any pictures here," said Jean. "The Russians might think we are American spies!"

Shortly after we returned to the highway our car stopped. It had been running perfectly. While the driver worked on the engine, Dr. Soisalo told us of a local belief.

"This is the center of a very strong magnetic field," he said. "It affects the ignition. I've been stopped in this very spot a number of times."

The explanation seemed improbable, but we saw two other cars with the same trouble, and on our return our engine died at the identical spot. It took the driver five minutes to start it.

We slept in Ivalo in a clean, well-run inn. Dinner, no surprise by now, was smoked reindeer served with a hot, unsweetened custard.

"This is like mutton in the Middle East," said Jean. "There I wanted to say 'Ba-a-a' at every meal. Here I'm at a disadvantage."

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Scenes of Postwar Finland," by La Verne Bradley, August, 1947, and "Farthest-North Republic," by Alma Luise Olson, October, 1938.



Snug in a Cradle Swathed in Reindeer Skin, a Lapp Child Smiles at the World



A Birch Bowl Catches the Slim Yield from This Reindeer Cow

Antlers, if unbound, make milking a risky business: an annoyed toss of the cow's head could give the milkmaid a painful wound. Reindeer milk, fatty and strong, is stored in skin flasks to produce a tough cheese.

I don't know what sound a reindeer makes."

A short drive next morning brought us to Lake Inari, Lapland's largest. Fifty miles long and dotted with more than 3,000 little islands, it is, according to a Lapp song, "as deep as it is long."

We had heard of a Lapp settlement a few miles off the main road and stopped at a general store to ask directions. The proprietor obliged and then, having learned that we were Americans, pointed to shelves laden with packaged American breakfast foods. We said we didn't need any and drove off, the professor translating the storekeeper's reaction:

"Funny," he said. "I heard Americans ate that stuff all the time."

The new road to Menesjärvi is only a bumpy track. It had seemed very near to civilization, but suddenly we were in a primeval wilderness.

Jean and I asked the driver to wait for an hour while we walked ahead. It was like wandering through the world when it was new: Virgin forests of pine and birch, dotted with a few spruce, stretched as far as we could see. The springy sphagnum peat was covered with reindeer moss and berry bushes.

Tiny lakes were scattered through the for-

est, where trout and grayling rose. There was utter stillness and peace. Occasional reindeer, their horns still in the velvet, fed beside the track. They looked at us unafraid.

Back in the car we covered the remaining 20 miles to Menesjärvi. A lake about four miles long curved around a small island on which men were cutting hay. Log cabins stood on each side of the lake.

Lapps Dress Like Jesters

A figure walked toward us. Our first thought was that he must be dressed for a masquerade. On his head was a *neljäntuulenlakki*, the "hat of the four winds." Its four billowing points, shaped like oversized ice-cream cones, dangled haphazardly over his ears. It needed only bells to grace a jester.

The embroidered collar of his tunic was stiffened with birchbark. His belt was worn low in front, causing his tunic to blouse out like that of a very fat man. Beneath it protruded slender legs clad in soft leggings made of skin taken from the legs of a reindeer. And his feet were shod with *mutukas*, soled with the thick skin from the reindeer's head.

He was the smallest normal man either of us had ever seen. Mountain Lapps average only an inch over five feet in height, but this apparition was at least four inches shorter. Yet his wiry little body was perfectly made, and he came toward us with the springy step of a woodsman.

Professor Soisalo greeted him warmly, then introduced us.

"You're very lucky," the professor said. "This is Kaapin Jouni. He's known as the 'king of the Lapps.' He's certainly the richest—owns thousands of reindeer. He says he is here on business" (page 275).



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A Little Old Lady Stretches to Light Franc Shor's Pipe

Lapp men average about five feet; this Nilpa grandmother measures six inches shorter. Despite their stature, Lapps are wiry, agile, and strong.

We asked if our new acquaintance could spend the day with us, to teach us the customs of his people. The smiling little man shrugged his shoulders as he replied.

"He says, 'Why not, what's one day?'" translated the professor, and with the king for an escort we crossed the shallow lake to the log cabin of Matti Jumppinen (page 258).

The Jumppinen homestead covers only a couple of acres cut out of the dense forest. A shy teen-age boy, repairing a handmade boat, ducked his head in confusion, blushing when we spoke to him. The dwelling was of



Laplanders Love Red in Houses and Clothing

The retreating German Army in 1944 burned almost every house in Finnish Lapland, but the inhabitants, accustomed to doing their own carpentry, have built more homes than the enemy destroyed. South, near the Arctic Circle, workmen can get local timber, but in the far north trees are so small that lumber must be imported.

← Tradition's costume for Lapp children often includes a pompon for boys and a scarlet bonnet for girls (opposite page, upper). Rubber boots are a modern innovation: parents find them cheaper and better than reindeer-skin shoes.

Coffee's Aroma → from Saucer and Cup Fills a Home at Nilpa

Lapp women roast and grind coffee fresh for every pot and add a generous pinch of salt. Fancy-labeled bottles hold cream; the lamp burns kerosene.

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Photographs by Joan and Frank Sher,
National Geographic Staff







Herdsman Wears Breeches and Shoes from His Own Deer. Moccasinlike *mutukas*, here worn by Matti Jumppinen, the author's host at Menesjärvi, are soled with thick skin from the animal's head.

red clapboard. We knocked and entered.

Kaapin Jouni stepped just inside the door and folded his arms. We looked into a combination living room and kitchen about 15 feet square. The log walls were hung with tanned reindeer hides. A bunk was built into one wall. A coffee-pot steamed merrily on an iron stove.

A man in Lapp dress sat on the bunk, carving a spoon of reindeer horn. A plump woman, wearing a scarlet bonnet and a long cotton dress with a fringed shawl, ground coffee in a small mill. Two children played on the floor, and three fierce-looking dogs eyed us curiously.

Warm Welcome in a Simple Home

The man crossed the room to shake hands with Kaapin Jouni. Solemnly he touched each of our hands in turn. Then Kaapin Jouni walked to the woman and shook her hand. We all followed suit; then the children. Sixteen handshakes completed, the host spoke to Professor Soisalo.

"Matti Jumppinen bids you welcome," the professor translated. "He asks that you make his home your own."

Mrs. Jumppinen put some coffee in the pot, adding a generous pinch of salt. Matti showed us the rest of his house. A small bedroom, with three hide-covered bunks, completed the ground floor. A ladder led to a dormitory, with four piles of reindeer skins on the floor. While we waited for the coffee to settle, our host told us how he lived.

"I'm a reindeer herds-



A 78-year-old Fisherman Sits for His First Portrait

On the Teno River, far north of the Arctic Circle, Antti Paltto lives by salmon fishing. His nets, spread between birch poles and weighted with heavy rocks, sometimes yield a thousand pounds of fish a year. Although he had never seen a camera before, Antti showed no surprise when Jean Shor's Polaroid camera produced his picture in one minute. "Why should it take longer?" he asked.

man," he said, scraping the little spoon. "I have about 150 animals in the forest. I turn them loose in May and round them up in September.

"We keep two cows and four sheep and grow a few potatoes. But most of our food comes from reindeer and fish. We eat about two reindeer apiece each year."

His wife served the coffee, strong, boiling hot, and delicious, in little bowls of birch. Then she resumed her sewing.

"At the September roundup," Matti continued between noisy sips, "we bring our animals together in one big corral. The dogs help. I have 10. They're better than 20 men. When we get the animals corralled, we separate them into individual herds.

"We earmark the fawns and geld the young males. For fresh meat we kill a 2-year-old buck. We eat meat three times a day. In winter the flesh freezes within a few minutes. In summer we smoke it over birch chips."*

The new road, Matti told us, has improved living conditions.

"We get better prices for our animals," he said, "and the things we buy cost less. It's

easier to get to Inari for church in the summer. I hope the traffic will scare the wolves and bears. They got 10 of my reindeer last year."

Matti's wife, Inga, was shy about talking, but alone with Jean and Professor Soisalo she described her pioneer existence.

Year's Coffee Equals Five Reindeer

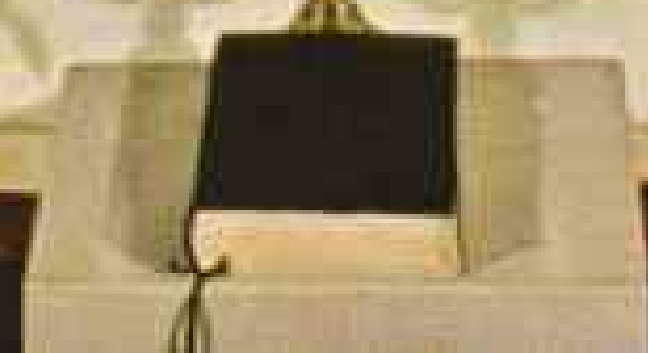
"We make almost everything we need," she said. "We buy cloth, cooking pots, salt, and coffee—lots of coffee. *Yi!* Coffee is so dear now. But the men won't work without it. I like it, too. But so dear! More than 500 Finmarks [\$2.16] a pound. Every year I think we drink the value of five reindeer. Is it so with you? . . .

"I make all of our clothes," Inga went on proudly, "even our shoes. I weave my own wool and make my own *moni* to sew leather garments and shoes. See, I have some here."

Suoni is a sturdy thread made from reindeer sinew. Inga took a long thong, held the end between her teeth, and deftly stripped it to hairlike fibers. These she braided tightly, rubbing each piece against her plump cheek to remove the kinks.

"Matti made the hand loom I use to weave belts and trim," she said, producing a long, comblike device beautifully carved. "It's

* See "Lapland's Reindeer Roundup," 14 illustrations in color, by Göran Algård and William J. Storz, NATIONAL GEOGRAPHIC MAGAZINE, July, 1949.



reindeer bone, too. But you must be tired of reindeer this and reindeer that. I never thought about it before, but I guess we use some part of that animal every hour of the day."

Inga started for the door. Professor Soisalo, who had been translating as she talked, looked puzzled.

"The literal meaning of what she just said is: 'I'm going out to hammer some stockings,'" he said. "We'd better go watch."

Inga walked to one of the outbuildings and returned with an armful of dried grass. Taking a handful, she sat on the ground and beat it mercilessly with a wooden mallet. When each handful had been pounded silky soft, she twisted it into a neat hank (page 274).

"We stuff our shoes with this instead of wearing stockings," she told Jean. "It keeps our feet drier and warmer in the winter. But it must be only this kind of grass, and you must beat it just enough."

A Finnish friend later told us that all members of a Lapp family and their visitors put their "stockings" in a pile each night, helping themselves from the same stack in the morning.

"Lapp Nylons" Are Warm and Cheap

"These 'Lapp nylons' are comfortable," he said. "The air space around your feet is better than tight stockings in the real cold. And temperatures sometimes drop to 50° below up here."

Inga suggested that we have dinner and stay the night. I glanced at my watch and was amazed to find it was nearly 11 p.m. Yet it was as bright as a spring morning. I asked the professor to apologize for our having stayed so late.

"It isn't late," he replied. "It's still two weeks before sunset! Now that it doesn't get dark, these people often sleep only two or three hours a night. In the winter, when it's dark 24 hours a day, they may sleep as much as 14 to 18 hours at a time."

Dinner brought arctic trout, broiled on

green birch sticks. We ate them with our fingers while Inga ladled a savory reindeer stew into birch bowls. There were yellow berries for dessert. After dinner Kaapin Jouni told tales of long ago, when Lapp shamans, or wizards, performed mysterious feats.

A Shaman's Prediction Comes True

"When I was a boy," began Kaapin Jouni, who is 80 years old, "there were still shamans in Sáme Áednam [Lapland]. They could foresee the future, tell what people were doing in faraway places, and cure the sick. The magic drums were forbidden, but they were kept in secret places and brought out when needed.

"Some of the drums were very beautiful. I remember one made from a birch log, the sides carved with scenes from a bear hunt and the head made from a fawn's skin. There were mysterious designs painted in blood on the drumhead."

Kaapin Jouni closed his eyes as he talked.

"My grandfather asked a shaman for news of my uncle, who had gone far north to fish. The shaman took this drum and beat it with a reindeer horn. A piece of steel tied to the drumhead danced about.

"Faster and faster he beat, until his eyes were glazed and his mouth hung open. Then he fell to the floor in a trance. He lay motionless for an hour, his jaw loose, his eyes like glass, making strange sounds like an animal. When he awoke he left the tent and stared for a long while at the moon. Then, looking tired and ill, he returned.

"'My spirit entered a great white wolf,' he said, 'and I ran far to the north, across frozen waters and through great forests. On the shore of the ocean I saw your son. He is well now, although he has injured his arm. He has caught many salmon and will return in the spring!'

"And my uncle did return, with many fish. And he had cut his arm, a long, ugly gash. But it had healed, and he was well."

Matti Jumppinen cleared his throat.

"The last shaman in these forests died three years ago," he said. "He was a *noíta*—a good shaman. Many years ago, when I lived in another village, I asked him what my future would be. He spread his *peski* [outer coat] over his head for 30 minutes.

"When he came out, he told me I was not happy in my village, which was true. 'In a year,' he said, 'you will move to Menesjärvi. There you will meet a beautiful girl and you

← Lapp Family Scene Suggests the Nativity

Twice a year the Lutheran Church at Inari observes "Lapp Sunday," when people come from great distances to attend formal worship. Rebuilding of this church, burned by the Germans, was financed with American gifts sent by the Lutheran World Federation (page 264). The painting, by Finnish artist Väinö Gabriel Saikko, hangs over the altar.



Reindeer Herder, Like a Texas Cowhand, Keeps Lasso Supple

Laplanders braid reindeer-skin lariats, called *uoponki*; reindeer fat, rubbed well into the leather strips, keeps them flexible. They are used to cut out a deer from the herd when the family needs cash, food, or skins for clothing.

Roping style differs from that of the American West: all the coils are huddled at one time in the hope of snarling the animal's horns. At shedding time the antlers sometimes come off on the rope.

Lasse Valkeopää, wearing summer dress in his hand-hewn log cabin at Nilpa, owns a fairly sizable herd of 80 reindeer. He rounds them up twice yearly from their forest pastures, identifying his own animals by earmarks. Bucks sell for about \$30; does bring \$20.

Each member of Lasse's family, eating meat at every meal, consumes about two deer a year.

Every male Lapp carries a *pubbo*, or knife; Lasse's has a reindeer-bone handle and sheath. Only the handle's knob protrudes, lest the knife catch on a branch and slip unnoticed to the ground.

Prized White Pelts Make Winter Dress.

One reindeer in a thousand possesses the white skin for which dress-conscious Lapps pay premium prices.

This outer coat pulls over the head and reaches to the calves. Here Lasse wears his lariat over his shoulder; he can strip it over his head and throw it accurately in a single sweeping motion.

© National Geographic Society





Reindeer-skin Tepee: Portable Summer Home for Lapps When Following Their Herds

A burning brand kindles Lasse Valkeapää's pipe; wife Inger and young Lasse welcome the fire's warmth. Hooks and chains are used for smoking reindeer meat, mainstay of Lapp diet.

will marry her and raise fine children and be a very happy man.' And it has all come true."

Everyone smiled, and Inga looked at the floor, trying hard to control a very pleased expression.

Matti's father took from the fire a big iron kettle in which simmered a thick mass of porridge, fish, and reindeer blood. Calling the dogs, he took them outside for their supper. When he returned, he told us why Lapp dogs are treated almost as part of the family.

"When Säme Ädnam was new," he mused, "all the animals could talk. The Säme [Lapps] needed help in herding their reindeer. They asked many animals to aid them, but all refused until they asked the dog.

"I will help you," said the dog, 'on condition you feed me well and treat me kindly.' And so it has been ever since."

"The Little Man Who Sang"

The Jumppinens insisted that Jean and I occupy the downstairs bedroom. The reindeer skins were comfortable. We dozed off as Kaapin Jouni climbed to the dormitory, singing in a cracked monotone an old Lapp song:

The old man, the old man,
The little man who sang all the time.
He had two wives and he left them both,
And the seat of his pants was torn.

We visited every one of the eight homes in Menesjärvi. Multiply the life of Matti and Inga by seven, and you have the life of the village. Seven, because the eighth family is different.

Erkki Jumppinen, a distant cousin, lives across the lake. Before the war he was a reindeer herdsman.

He fought the Russians from 1939 until 1944. Four times he was wounded. And before he was released with a 60-percent disability pension of about \$10 a month, Erkki made a decision that changed his whole life.

"The forest life was fine," he said, "but I wanted to improve my standard of living and help my people. I decided to open a store here, to buy reindeer and sell the things my people need at fair prices and without the long walk to Inari."

Erkki spent long months in the hospital after his last wound and studied 12 hours a day. He learned mathematics and business methods and acquired a fondness for reading. He returned to Menesjärvi and married. In 1948 his dream came true. On borrowed

money he opened a little store. Today Lapps walk and ski 50 miles to do business with him.

"I sell salt, sugar, coffee, tobacco, and a few other necessities," he said. "I buy reindeer and sell them at Inari. A good young male is worth about \$30. Does average \$20. My prices and my profits are low, but I've paid off my loan, and I have a good business now."

Erkki's wares are neatly displayed on shelves of raw wood in a back room. His spotless kitchen has linoleum on the floor and an enormous brick oven built into one wall.

The living room might be that of an American family. Chairs are factory-made, well upholstered. A radio brings music and daily newscasts. And there is shelf after shelf of books. Most are by Finnish authors, but there are translations of John Galsworthy, Alexander Dumas, and Mark Twain. Proudly Erkki showed us copies of the NATIONAL GEOGRAPHIC MAGAZINE.

"I am teaching myself to read English," he said. "When I have learned, I will teach others. People here are interested. Some day they will live as others do. We Lapps must progress with our country."

Erkki and his wife no longer wear the simple Lapp dress. Their clothes are modern. Only on Sundays does Erkki slip a tunic over his shirt and tie, and his wife dons her fringed shawl (page 271).

In other ways the old customs prevail. Erkki ate with us, but his wife entered the living room only to serve us. When we had coffee in the kitchen, she withdrew to a back porch.

"Lapp Sunday" Comes Twice a Year

Jean and I could have spent the summer happily on the quiet lake, but there was more to be seen farther north. On a Sunday in July we drove to Inari for "Lapp Sunday."

The Lapps are devout Christians, most of them belonging to the Lutheran Church. Since churches are few, they attend formal worship only twice a year, once in summer and once in winter. These Lapp Sundays are looked forward to eagerly. People come from miles around, old friendships are renewed, and the day has the aspect of a country fair (page 270).

The minister welcomed us to his peak-roofed wooden church. "We are grateful to Americans," he said. "They gave us this building."



Housing Is No Problem When a Skin Tepee Goes Up in 15 Minutes

Most of Finland's herdsmen own snug log cabins, but when reindeer run short of grazing near home, the forest people seek new pastures and live in tents near by. Dogs are trained to help with the herding; they are destroyed when too old to work, for Lapps regard speedy death as an act of kindness.

"We were surprised to find the floor of this tent on Lake Nilpa littered with orange peels," the authors write. "Such delicacies are extremely expensive so far north. Our host told us that he had sold many reindeer the previous year and had a little cash surplus. 'The district nurse said oranges would be good for the children,' he said, 'so we spent our money on them.'"

On the wall of the foyer hangs a bronze plaque:

This church was built with the gifts of American Christians represented by the United States National Committee of the Lutheran World Federation. 1950-52.

At the service women sat on one side of the aisle, men on the other. Afterwards the streets were crowded with bright costumes. One Lapp family drove proudly off in a tiny

German car. Others thronged the lake shore, where an enterprising pilot sold 5-minute amphibian flights for \$2. Younger Lapps led the way, but we saw one stooped couple in their seventies timidly climb aboard.

North we drove again, this time to Karigasniemi, on the banks of the Inari. Another five miles and we were at the Teno Koti inn. Here, 200 miles north of the Arctic Circle, the road ends.



As in a Museum Tableau, a Family Crosses the Soggy Tundra to Better Grazing Lands

Lapp herdsmen sometimes travel 100 miles on foot to reach new pastures. Families own no land, but long-established custom reserves certain areas for each herd. A single animal requires several acres of forest to get enough spiky reindeer moss. Hay grown in summer on small meadows feeds the herds when snow is too deep for grazing. Reindeer carry the family belongings during migration.

While we waited for our boat, a big tourist bus pulled up. Vacationers unloaded their baggage and mothers shouted to unruly children. The bus driver sat down beside us to have a chat.

"Going north by boat?" he asked.

"All the way to the Arctic Ocean, if we can make it," replied Jean.

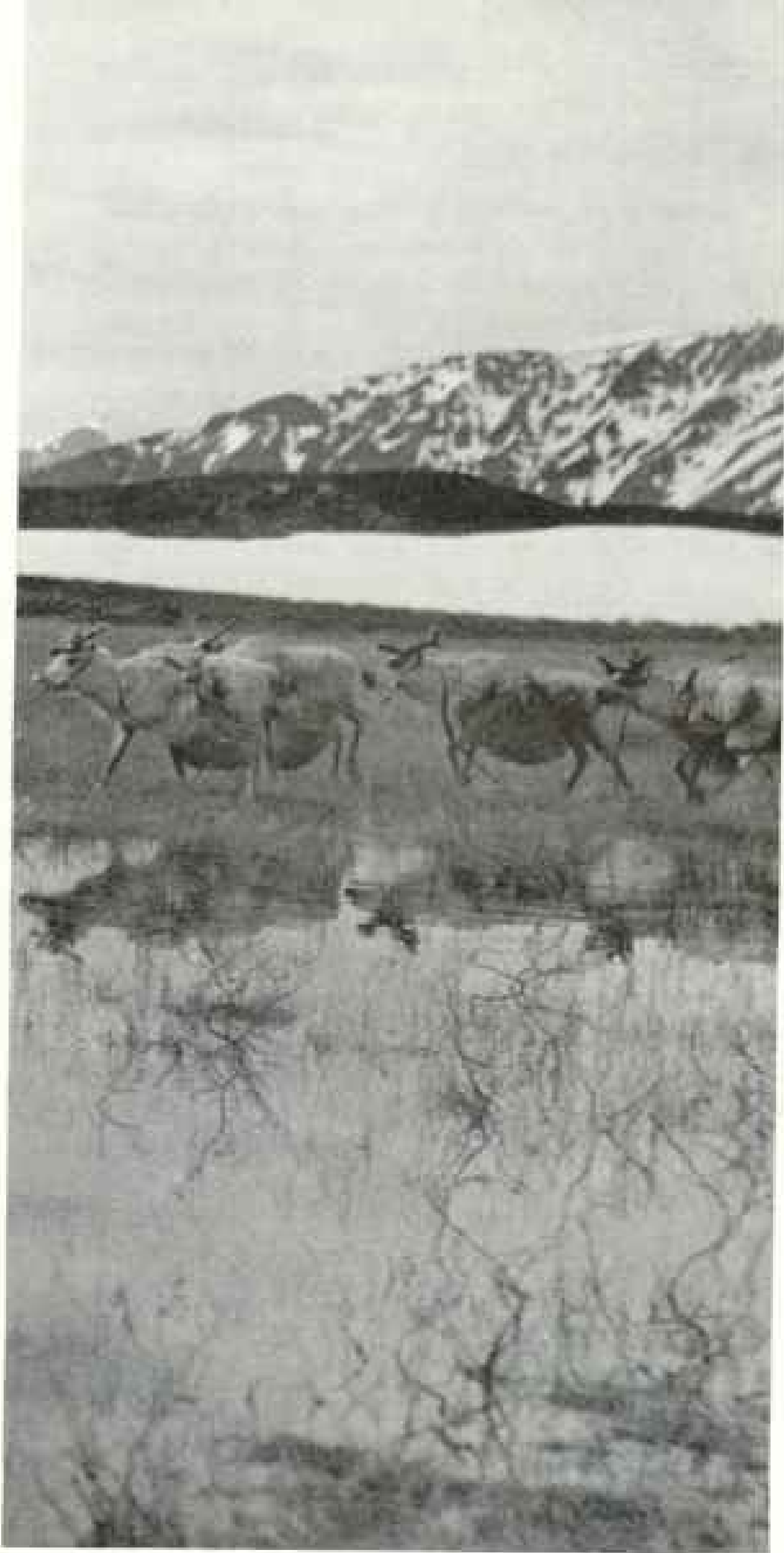
"Too bad you're here in summer," said the driver. "That boat ride is a little rough. Come back in November and I'll take you in the bus."

"Can they build a road all the way north so soon?" I wondered.

"Who needs a road?" the driver laughed. "In winter, when the Teno freezes solid, we use it for a highway. A special bus with snow wheels runs on a regular schedule."

Contrary to popular opinion, the driver told us, the winter opens up the north country. In October, when the sun disappears until mid-March, northern Lapland freezes solid. Then rivers and streams become highways for buses and automobiles, and Lapps in their little canoe-shaped sleds travel swiftly over the frozen snow behind fleet-footed reindeer (page 280).

"This run gets exciting in the winter," the



driver said. "A couple of years back I met a pack of wolves. I took off the highway after them, right over the snow. Ran down three and collected a nice bounty.

"Don't care much for the bears, though. They're big and mean. I met one last year between Inari and Ivalo. Sound asleep in the track. Snow was banked too high to get around him. I stopped and honked."

The driver chuckled.

"We sat there an hour and a half," he went on. "Finally I edged the bus forward and nudged him. That woke him. He stretched and sort of yawned, seemed surprised and not particularly pleased. He growled and cuffed the fenders a couple of times; left long claw marks.

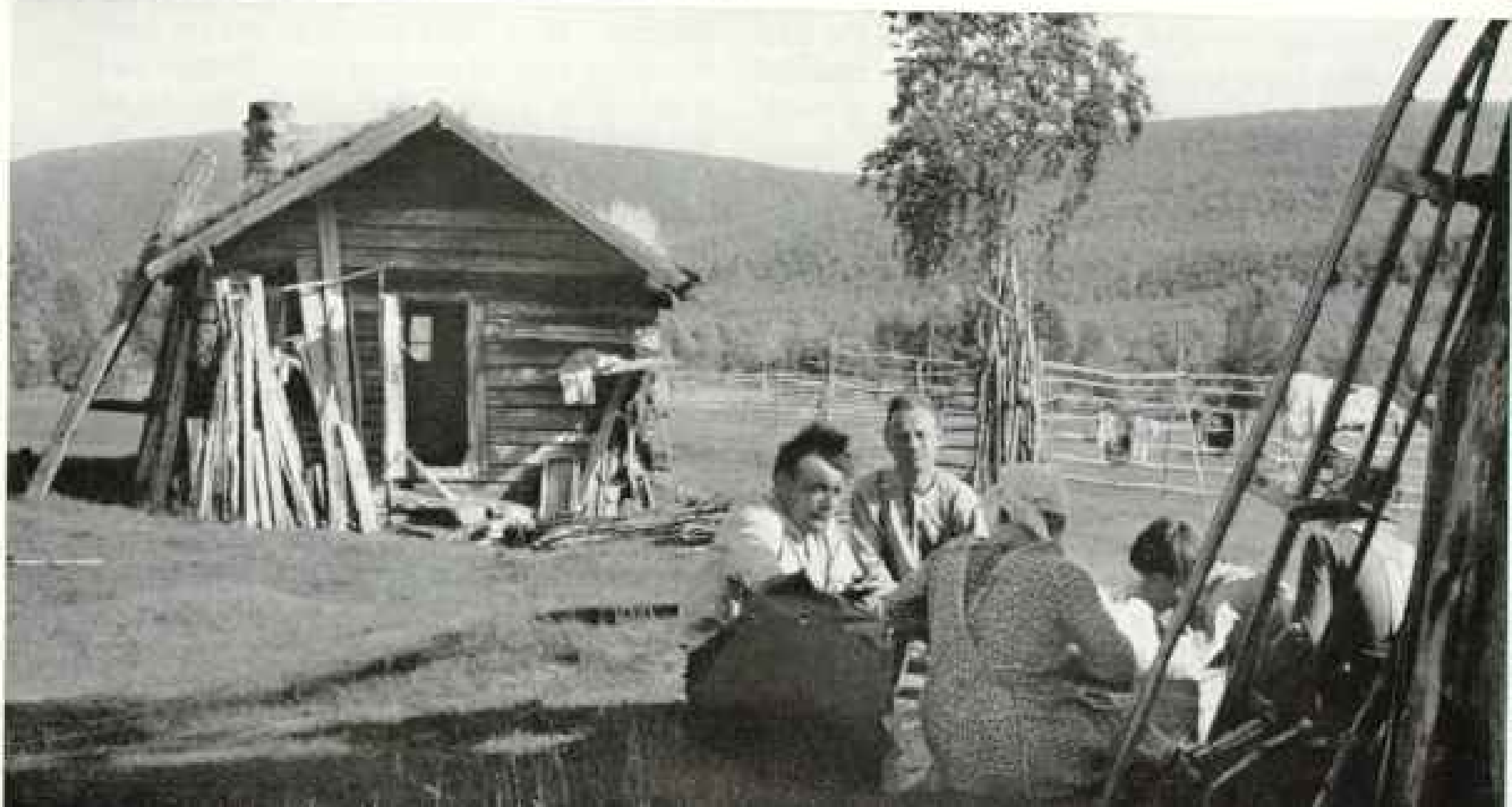
"Then he walked around the bus, standing on his hind legs to look inside each window. Well, he finally wandered away, and we got into Ivalo all right. But some of those windows had been cranked shut so tight we couldn't get them open until spring!"

An outboard motor sputtered around the river bend. The boatman beached his craft and sprang ashore. He was short and solidly built, wearing a black cap, hand-knit turtle-neck sweater, heavy breeches, and wrinkled Russian-style soft leather boots. His boat, 30 feet long and narrow, with a high, curved prow, was powered by a big 2-cylinder outboard of Swedish manufacture.

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Summer Sun Moves Dining Room Outdoors

Jouni Guttorm, a Lapp member of the Finnish border guard, enjoys alfresco lunch with his family outside their sod-roofed log home. Ironshod sled leaning against the tree hauls hay from the pasture.



"This is Arvid Niva," said the professor. "He was a truck driver in Petsamo before the Russians took it. Now he's the best boatman on the Teno."

Niva loaded our gear in the boat, talking as he worked.

"He says the river is the lowest it's ever been, and falling by the hour," Professor Soisalo explained. "It's almost impossible to run some of the rapids. We may get stranded."

It was after midnight when we shoved off. For five hours we churned down the racing current, dodging jagged rocks and weaving through boiling rapids. Twice submerged rocks sheared the pin on the propeller shaft, and we pulled ashore to replace it. Half a dozen times we grounded on sand bars. The professor, who was wearing waders, leaped overboard to help Niva get us afloat.

Near Teno Koti we saw occasional farms cut out of the forest. They grew less frequent as we ran north. Finally we were in unbroken wilderness, with log houses 10 miles apart. At 7 a. m. we rounded a wide bend and pulled ashore at Levjokstua, on the Norwegian side of the river. A log hotel stood at the top of a little rise.

Sunshine Ruins a Night's Sleep

"Sleep well?" I asked Jean, who had scarcely stirred during the 40-mile journey.

"Terrible," she said. "First time I ever had the sun in my eyes all night!"

For a week we waited. Niva, whose home was three miles downstream on the Finnish bank, told us the river was too low to continue our journey north. Jean and I spent the time with Lapp families; Professor Soisalo returned each evening with handsome catches of arctic grayling and salmon.

Fresh salmon has always been one of my favorite dishes. Here, served only a few hours out of the icy Teno, it was superb. But after days of grilled salmon for breakfast, boiled salmon for lunch, and baked salmon for dinner, I seemed to lose some of my enthusiasm. I mentioned this to the professor.

"Like any other delicacy," he said, "it palls. In Finland when a farmer engages a farmhand, he has to agree not to feed him salmon more than five times a week."

The post boat came on our seventh day of waiting. The pilot, his clothes soaking wet, told us he had been aground a dozen times on his route from Karigasniemi.

"Go back while you can," he warned. "If the river gets any lower, even the fish will be walking. It's a long walk back."

Deciding to return and come back later, we left at midnight. The Teno had dropped two inches since noon. The trip was a nightmare. Our heavily loaded craft grounded frequently, and the low water made the rapids more than usually treacherous. Even Niva wore a worried look as he crouched in the stern, his eyes fixed on the swirling water ahead.

Gamble in Frigid Waters

The river narrowed, and, swinging wide to avoid a Lapp fish trap, we headed straight into a boiling stretch of white water. Jagged rocks whipped past on either side, and troubled eddies revealed their hidden counterparts just below the surface. Niva drove the thin-skinned boat steadily upstream, maneuvering with courage and skill. Suddenly the propeller shaft pin snapped on a concealed rock. We lost way and swung broadside to the current.

Niva grabbed a birch pole and thrust it to the river bed, straining to hold the prow upstream. Slowly, relentlessly the pole bent like a giant bow. Then it broke with a pistol-like report.

The boat began to spin, and Niva leaped into the freezing water, waist-deep as he struggled to keep us off the rocks. Professor Soisalo and I joined him, tugging against the surging current.

It was not a pleasant situation. Two thousand dollars' worth of camera equipment and film representing a month of work were in our baggage. More important, if we lost our footing, the chances of reaching shore through that frigid water seemed slim. And then as we watched, Niva's face turned ashen gray. He bent over the boat as he fumbled in a shirt pocket, pulled out two tablets, and popped them into his mouth.

"What's the matter?" I shouted to Professor Soisalo.

"I thought I told you," came the answer. "He has a very bad heart. Must be having an attack. Those are nitroglycerin pills."

Fortunately, the tablets worked. Niva recovered, maneuvered the boat to shore, and repaired the shaft. Wet and a little shaken, we returned to Karigasniemi. A day later the river was impassable.

Going back to Rovaniemi by car, we waited for rains to bring the river up. There we met



The Abacus, a Primitive Calculating Machine, Helps Lapp Children Do Their Sums

Finland works hard to wipe out illiteracy among the forest people; even pays room and board for their children at school. Many youngsters ski 50 miles to spend winter week ends at home. To preserve Lapp language and culture, the Government is now building schools where lessons will be taught in native dialect.

Reino Sarvola, Lapland's Inspector of Social Welfare. He was leaving on an inspection trip up the "thumb" of the Lapland mitten, where a rock in a lonely lake marks the border of Norway, Sweden, and Finland. We crowded into his little *Volkswagen* and rode 150 miles to Ropi, where we rented a clumsy boat and rowed to the village of Nilpa, home of a dozen Lapp families.

Living in a Lapp Tepee

There was no room for guests in the crowded Lapp cabins, but our host pitched a tepee for us and we spent pleasant days sharing the village life. Jean worked with the women as they spun wool and sewed reindeer-skin garments, and I sat with the men as they braided their rawhide reindeer lassos and walked with them through the woods where their beasts ran free.

This reindeer is a remarkable animal. It

ranges over northern Europe, Asia, and North America. Our species is called the caribou. It is a big, graceless brute (the bulls weigh more than 300 pounds), and both sexes have elaborate antlers, which they shed yearly (page 280).

Cows produce calves after their first year. Perhaps one in a thousand is white.

Reindeer hair is hollow, and the beasts swim easily and rapidly. They're at their best, however, on snow. They pull a sled 10 miles an hour on long hauls and do 20 miles an hour for a 10-mile stretch. One fine animal, the Lapps told us, once covered 400 miles in two days.

There are a quarter million reindeer in Finland. Twenty females are the minimum for a practical herd.

"The Lapp herds are threatened by a new technique in forestry," a Finnish official told us. "We've found that if you fell a forest of



Lapland Youths Blend Old and New in Their Costumes

These boys, gathered at Inari for semiannual "Lapp Sunday" (page 264), are gradually abandoning the distinctive dress of their fathers. On festive occasions they don brightly colored tunics, but ordinarily they wear Finnish dress. Cap and checked golf hose are something new. Many sons of forest families have moved to town, married Finnish girls, and found jobs in woodworking and pulp plants.

unusable trees and burn the area, the new trees grow fast and straight. That's fine for the pulpwood people, but the burning destroys the moss on which the reindeer feed."

The Lapps themselves seem little worried. They have never given much thought to the future.

"In many ways," Sarvola told us, "the Lapps resemble your American Indians.

"Their ancient religion was similar to some Indian beliefs. They put food and fire-making implements in coffins. And old people who were too weak for the annual migration were taken to a high place, put in a sled, and permitted to slide over a precipice. They

called it *säälkeskoute*—the 'blessed journey.'"

We drove back to Rovaniemi a week later, happy to find a steady rain falling and more expected. The river was rising. Professor Soisalo had returned to Helsinki, but Erkki Aalto, Jr., English-speaking son of the power company president who had lent us the car for our first trip, offered to accompany us. Back we hastened to Teno Koti inn and greeted Niva as an old friend. Assured that his heart was giving him no trouble, we set out again for the Arctic Ocean.

Plants Lose Color in Arctic Night

A foot of water makes an amazing difference in the face of a river. Niva still kept a sharp watch, but the sand bars had disappeared, and our progress was rapid.

We stopped for the night at Niva's snug home. His wife led us into a kitchen-living room gay with geraniums, asters, lobelia, and begonia.

"We keep as many flowers as we can in the summer," she said. "I get lonely for them during the winter. Every year the sun is gone from October until March 15. Last spring

I climbed the big hill back of the house just to get a glimpse of its first rays!"

In the winter, Mrs. Niva told us, her plants lose all their leaves. Each year about a third of them die.

"They look so sad by December," she said, "I'm tempted to throw them all away. First the leaves drop off. Then the plants turn an unhealthy white, like ghosts. But when the sun comes back, most of them perk up. I feel the same way—sometimes I just don't know how I'm going to get through that 5-month-long night."

There are many Finns like Arvid Niva in Lapland. Some are from Petsamo, others from

far south in Karelia. When the Russians seized Karelia in 1945, nearly half a million Finns were given a choice: they could stay under Russian rule, or they could seek new homes and new lives in free Finland.

"Not a Finn remained in Karelia," an official told us in Helsinki. "More than 477,000 left their homes. They were taken in by the rest of the country, given land, and everyone was taxed to help make up for their losses.

"Many of them are living in the forests of western Finland; others have homesteaded in Lapland. But they're free, and in Finland, and that's what counts."

The river was still too low to clear the rapids downstream, and we waited a few days, hoping for a rise. We spent the time with Lapp fishermen, trolling for salmon which grow to 60 pounds in the frigid waters. Our luck was bad, but we made good friends and each day grew fonder of the carefree Lapps.

One of Niva's neighbors was Antti Palto, an active little man who fished long hours each day despite his 78 years (page 259). Visiting with him one day, I asked him if he had any children.

"Not yet," came the answer.

And there was Kirsti Utsi, a wonderful old lady in her seventies, even smaller than Kaapin Jouni, who trudged by one day with a long pair of skis over her shoulder and explained that she had borrowed them from a friend last winter and was walking 30 miles to return them. When she found that we were Americans, she jokingly insisted that we take her home with us.

"You could put me in your pocket," she quipped.

A remarkable Lapp was Jounni Guttorm, who worked for the Finnish Cus-

toms at Karigasniemi and was spending his vacation with his family on the Teno (page 267).

Jounni joined the Finnish Army in 1939 as a boy of 16. He spoke only the mountain Lapp dialect. In the army he learned Finnish and was taught to read and write. Then, in 1942, he was wounded. His body was so badly shattered that he was forced to spend two years in hospitals.

"I couldn't lie idle," he told us, "so I studied languages. First I learned Swedish. Then I learned German; English next. Now I'm studying French."

A War Hero Leads His People Toward a Better Life

Disabled by wounds while fighting the Russians, Erkki Jumppinen studied in the hospital and, when peace came, opened a store in his native Menesjärvi. Lapps come from 50 miles around to sell reindeer and buy salt, tobacco, and coffee. His radio, only one in the village, furnishes news bulletins for the entire populace (page 264). Many of the north people paint as a hobby; portrait on the wall is the work of Mrs. Jumppinen.



Jounni's English is easy to understand, but since it was learned from books, it sometimes has an unusual quality. One day, pointing to a bull, he told us of the time the animal had charged his sister.

A Bull Story in Book English

"I was working with my brothers," he began, "when my sister called: 'You should come as soon as possible, as I am in need of assistance.' I said to my brothers: 'As soon as we possibly can, it is necessary for us to assist our sister. The bull is at she.' So as soon as possible we went to our sister and gave her aid. We found her well. We struck the bull."

Came a day when Niva decided the river was high enough to continue our journey. We walked five miles through the forest and met him below the worst rapids. An easy day's run brought us to Utsjoki, where we found a room in one of the village's four homes.

We knew that the weather station here sometimes registers 7 a.m. summer temperatures of 78° F., one of the highest in Europe. We asked a resident if he had an explanation.

"Easy," he replied. "The sun has been up all night!"

The next morning we said goodbye to Niva and bounced over eight miles of logging track on a lumber truck to Nuorgam, on the Norwegian border, where the owner of a leaky boat agreed to try to run the rapids to Tana, at the river's mouth.

Taxi Ride to the Arctic

For 10 miles after we entered Norwegian territory all went well. The river grew wider and more shallow, and an occasional log cabin stood on the bank.

Then the rapids became rougher. Frequently we scraped bottom. A cluster of houses appeared on the east bank, and the pilot swung the boat in to shore.

"Can't go any farther," he said. "Water's too low. Have to put you ashore here."

"But you can't do that," I protested. "It's 20 miles to Tana, and we've got 200 pounds of baggage. We can't carry that load. What will we do?"

"Well," said the boatman, "you could call a taxi."

"This is no time for joking," I said. "We have to get to the fjord."

"I'm not joking," he replied. "This is Skipagurra, and that log building is the post

office. They have a telephone. There's a road from here to Tana, and you can get a taxi in a few minutes."

Erkki made the call. An hour later we were in a shiny new American sedan rolling north over an excellent gravel road. And so it was that we reached the fjord in a Chevrolet (page 279).

Tana Fjord stretches north into the Barents Sea, an arm of the Arctic Ocean. We rented a sturdy little fishing craft and chugged steadily north until the islands fell away behind us. Ahead lay only the heaving expanse of gray water stretching across the top of the world. Late in the afternoon we returned, climbed the hills above the little harbor, and sat comfortably in the 80° F. sunshine, picking wild blueberries and gazing out at misty reaches of the northern sea (page 278).

Community Singing on a Bus

It was a 5-minute taxi ride back into Tana, a modern village with shops, restaurants, electric lights, and a comfortable hotel. I found it very pleasant, but Jean seemed dissatisfied.

"Soft beds and plumbing are all very well in their place," she said, "but when you said we were coming to the shores of the Arctic Ocean, I expected blubber and maybe even an igloo. I feel gypped."

A 2-day ride on a Norwegian bus took us back to Karigasniemi. Though the Finnish side of the river is unbroken wilderness, the Norway side has excellent roads and comfortable hotels. Our bus was a delightful surprise. It stopped for the passengers to swim, halted frequently for picture taking, and the conductor passed out songbooks and led the passengers in community singing. And as we rolled over the last five miles, the conductor and driver raised their voices in a sentimental duet.

Our friend Jounni Guttorm, in the uniform of a Finnish border guard, greeted us at the Karigasniemi customs post. The formalities were quickly over. Jounni walked a little way with us.

"There is a Lapp way of saying goodbye," he smiled, as he shook our hands for the last time. "I have translated it carefully. I hope my English says what my heart feels. It is this: 'May God's sun shine for thee, and the peace of God go with thee and bring thee back unhurt.'"



When Stores Are 50 Miles Away, a Lapland Mother's Work Is Never Done

This Teno Joki family, like those of pioneer America, fills its own needs: members ply skills of log hewing, carpentry, and garment making. Whirling wheel holds this youngster fascinated as mother spins wool from her own sheep.



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↑ **Heavy Wooden Rake Makes Hard Work on a Tiny Lapp Farm**

A Laplander, handicapped by a scarcity of soil, seldom tills more than 60 square yards. One hay crop a year during the short growing season provides supplementary winter fodder for his reindeer herd. This man stacks hay on a vertical rick for curing.

↓ **"Lapp Nylons" of Grass May Not Be Sheer, but They're Warm**

This housewife cures sedge grass, *Carex sylvatica*, pounds it until soft, twists it into hanks, and stuffs it into her leather *mutukas* for stockings. Jean Shor tried the grass, reported: "Warm, all right, but it tickles my feet."





On the Shores of Menes Järvi, a Lapp Couple Welcomes a Famous Visitor

Most Laplanders refuse to tell how many reindeer they own, but Kaupin Jouni (right), "king of the Lapps," boasts that his herd numbers more than 3,000. Feathers stuff three of the points of his "hat of the four winds." "I use it for a pillow when I sleep out," he told the Shors. The fourth point serves as his purse.



← Little Hands Eagerly Help Mother with the Daily Chores

This Lapp family on the Teno River owns a cow, and the mother sells butter to her neighbors. Churn is home-made from well-seasoned pine. The mother turns out all her own clothes and those of her daughter. Only her Swedish sneakers and the youngster's rubber boots came from a store.

→ A Lapp youngster sits on a wooden bench in her home at Nilpa, intent on weaving a belt. The trim on her cuffs and hat was woven on this same comblike loom, elaborately carved from reindeer bone.

Lapp girls learn weaving early; they work without patterns, frequently carrying in their heads two dozen or more intricate designs.

Fringed shawls, silken neck scarves, and jewelry delight the heart of a Lapp girl; she frequently wears half a dozen necklaces at a time.

Southern Lapps sometimes employ an old-time decorative art using tin: fine wire of tin and lead, laboriously handmade, is twisted with reindeer sinew and embroidered on garments.

© National Geographic Society



Grandma's Sharp Teeth Split Reindeer Sinew for a Sturdy Thread

Inga Kaltopoa needs plenty of time and patience when she makes thread. She tediously splits dried sinews into hairlike fibers, braids them tightly, and rolls the resulting *nuoni* between palms and against cheek until smooth and round. With bone needles she uses the tough strands for sewing *matukas*, or shoes.

"When Inga finished a length of *suoni*," writes Mr. Shor, "she tossed it to me with a smile and invited me to break it. I wrapped it around my hands, pulled gently, then hard. Then I got mad, gave a real pull, and cut two fingers. I never did break the thong."

Foot and headboard of the bed, of Finnish design, push together in daytime to save space. Sideboards telescope and the mattress rolls up.

The box on which Inga rests her feet while working has been in the family for many years; once it was her hope chest.

Endochromes by Jean and Frank Shor,
National Geographic Staff



Tana Fjord, Stretching North to Barents Sea, Marks Journey's End

Jean Sher and Erkki Aalto, Jr., bask in the warm sun on a slope washed by waters from the Arctic Ocean. Expecting ice and freezing weather 300 miles north of the Arctic Circle, the authors were surprised to find daytime temperatures as high as 80° F. and nights only moderately cool.

An offshoot of the Gulf Stream System, here known as the Norwegian Current, sweeps around North Cape and gives Lapland temperate summer climate. Crops grow quickly in 24-hour sunshine. Wild blueberries cover the spongy tundra. "We found them larger and sweeter than the New England variety," say the authors.

© National Geographic Society





**"Mission Accomplished,"
Reports Franc Shor**

Turned back at first by low water and dangerous rapids in the Teno River, the Shors finally reached Norway's Tana, amazed to find they could travel the last 20 miles by taxi over well-graded roads. A Norwegian post bus returned them to the Finnish border.

© Kodakfilm.com by Jean and Franc Shor,
National Geographic Staff

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Reindeer Sled Carries Nurse on Winter Rounds

North of the Arctic Circle the sun disappears in October, not to shine again until March. During this prolonged night forest people sometimes sleep 14 to 18 hours at a time. In summer, when the sun never sets, they may sleep only two or three hours a night.

Snow covers much of Finnish Lapland during the winter. Then Laplanders find travel easy and quick. Trucks and buses use frozen rivers for highways.

This government nurse at Enontekiö drives a reindeer hitched to a Lapp *pulkka*. Only a single rein controls the animal, and the canoe-like sled is difficult to balance on its one runner.

Finland's government medical program provides care for all Lapps. Nurses and doctors make regular rounds even in the most remote districts.

© National Geographic Society



He's a One-animal Social Security Plan for Lapps

Finland contains a quarter million reindeer, mostly domestic animals. These all-important beasts provide food, clothing, household utensils, cash income, and transportation for residents of the far north. In winter the splay-footed beasts pull Lapp *pulkkas* 10 miles an hour on long trips, easily reach twice that speed on shorter stretches.

The beasts dig through shallow snow to graze on reindeer moss in winter. They swim well and rapidly, buoyed up by hollow hair. Both males and females have horns, which they shed yearly.

North America's caribou is a close relative of the reindeer.

Reproduction by Boris Saville

First in History to Settle in Mainland North America Without Known Human Aid, the Cattle Egret of the Old World Suddenly Appears in Several States

BY ROGER TORY PETERSON

THE United States has a new bird citizen. Strangely enough, it appears to have come from the Old World by way of South America by the power of its wings and the wind alone. The newcomer is the cattle egret, a beautiful member of the heron family.

For centuries the cattle egret (*Bubulcus ibis*) has been a familiar sight in southern Spain, in Africa, and in the warmer parts of Asia. Dancing attendance on grazing herds, it catches grasshoppers and other insects stirred up by cattle, water buffalo, and such wild animals as the elephant and hippopotamus; sometimes it picks parasites from their hides. Often travelers see these alabaster birds standing ornamentlike on the broad backs of pachyderms (page 287).

Found First in British Guiana

In the New World the cattle egret was unknown until 20-odd years ago, when it appeared suddenly in South America. Just how it made the transatlantic jump, and exactly when, no one knows. All we are sure of is that cattle egrets appeared about 1930 in British Guiana, there to find herds of Brahman cattle and native herdsmen just as in India, where the species is abundant.

The birds prospered, and within two decades the flocks had increased and spread to Surinam, Venezuela, and Colombia. Oddly enough, their nesting places in South America have not yet been located.

How did they come? Could they be descendants of birds that had escaped from some zoo, perhaps the one at Georgetown, British Guiana? We ornithologists have no evidence to prove such a hypothesis. Did someone deliberately introduce them from abroad? Not likely, for surely there would be some record of such a project.

Did the first European or African cattle egrets reach South America as stowaways, perhaps on a cattle boat? Even this is unlikely, for a number of avian hitchhikers would have had to make the journey to provide a nucleus for successful breeding.

The most plausible theory, it seems, is

that the birds were wind-borne. The Atlantic is only 1,770 miles wide between the bulge of Africa and northern South America, and the birds are good flyers. Assisted by strong winds from the east, they could conceivably have covered the distance before they were completely exhausted.

Early in 1937, we know, a flock of fieldfares (north European counterparts of the American robin) were caught in a wind while trying to cross from the mainland of Europe to England for the winter. They landed in southwest Greenland, pocketed in a corner where birch trees around fjords made existence possible. They are still nesting there, and the Eskimos have given them a name almost as long as the birds—*orpingmiutarssuaq*.

If the cattle egret likewise came to the New World on its own two wings and the wind, it is the only Old World bird in history to establish residence on the mainland of the Americas without human aid. All the other foreign birds which have taken up residence here within historical times were introduced by man.

Bird Sought Abroad Turns Up at Home

So far as was known, however, the cattle egret had not reached North America when I went to Spain in 1952 to work with Guy Mountfort, secretary of the British Ornithologists' Union, on data for our *Field Guide to the Birds of Britain and Europe* (page 285).

One bird which I particularly wanted to see and study in Spain was the cattle egret. Little did I know that in my absence the bird I had gone 3,000 miles to observe would suddenly appear in my own country, the United States.

The story begins in Massachusetts. William H. Drury, Jr., of Cambridge, had been in the Guianas several years before, but cattle

The Author

Roger Tory Peterson, one of the outstanding ornithologists of our time, is the author and illustrator of notable works on the birds of North America and Europe. For two decades he has been associated with the National Audubon Society as staff member, editor, and lecturer. In 1950 Dr. Peterson was awarded the John Burroughs Medal for exemplary nature writing.

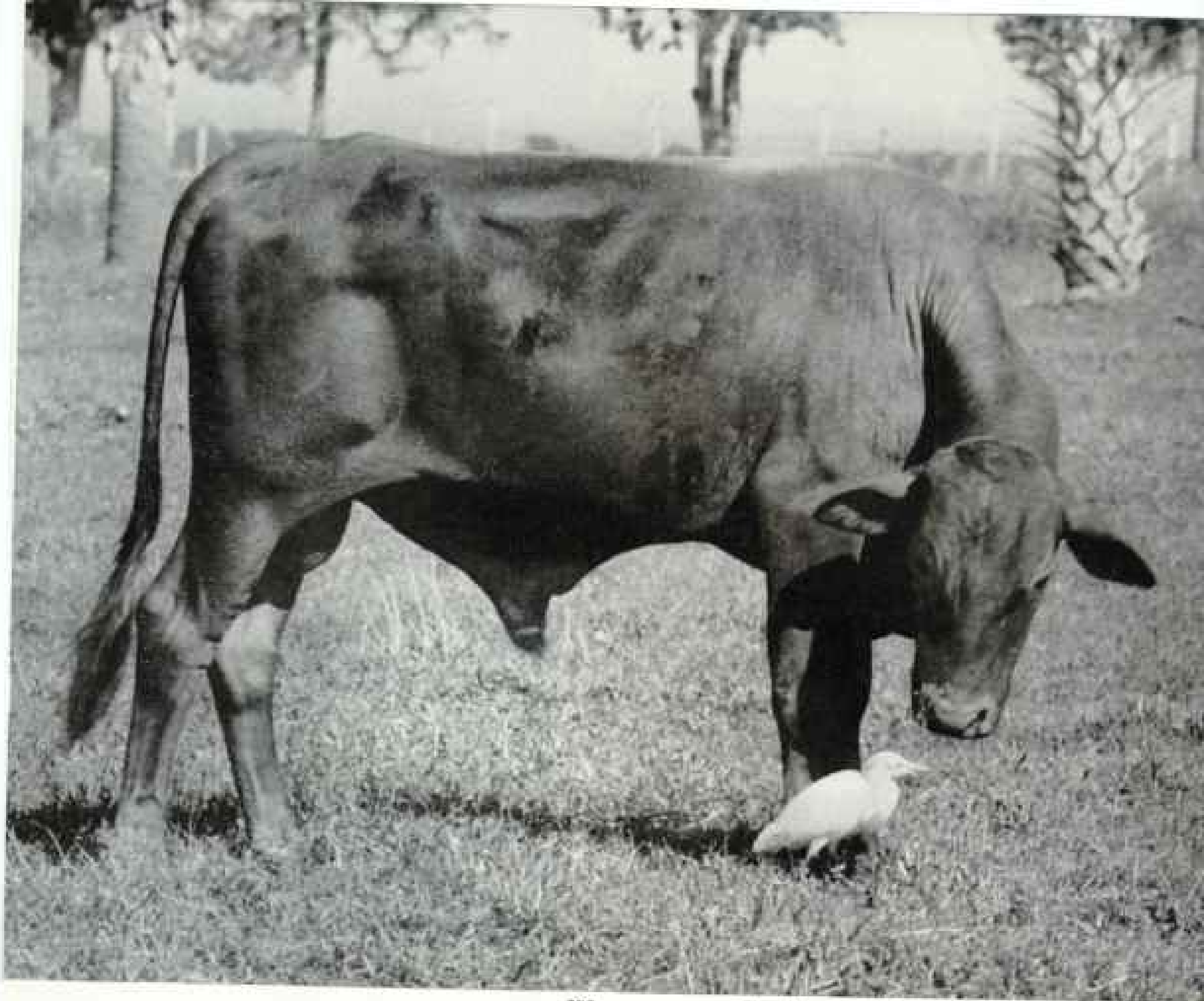


Harassed Egrets, Reduced to a Solitary Egg, Stand Double Guard Against Raiders

The cattle egret, *Bubulcus ibis*, flocks in great numbers in Asia and Africa, and in southern Spain. A member of the heron clan, it usually nests in trees. These parents are trying to raise a family in a marsh nest near Vejer de la Frontera, Spain, where egg-robbing farmers sometimes leave not even one egg out of a clutch of four or five.

At the time the cattle egrets made their dramatic appearance in the United States, the author was studying the species in Spain. He reports: "The cattle egrets, standing on twiggy nests in which they were just beginning to lay pale greenish-blue eggs, were still at the peak of nuptial beauty. At the mating season these birds are not snow-white like other egrets; they develop tawny-colored plumes on backs, breasts, and crowns. Bills are suffused with red, and legs and eyes become a garish puce pink.

"Later in the season the red flush leaves the yellow bill and the pink fades from the legs; then the egrets lose their buffish plumes and become quite white. However, the yellow bill, together with the birds' comparatively small size, is quite enough for identification."



An Old World Bird Forms a Partnership with a New World Bull in Florida

At times, walking with neck thrust forward in a weaving motion, the cattle egret resembles a white domestic goose as it follows grazing animals, feeding on insects stirred up by their hoofs and heads. Cattle pay the birds little heed, though an annoyed beast may shake his head if an egret approaches too near his face.

egrets were not in his mind when he started out on the morning of April 23, 1952, to check ducks and other spring migrants in the Bay State's Sudbury Valley. With him were Allen Morgan and Richard Stackpole.

At Heard Pond, on the Erwin farm, they found a glossy ibis, a dark heronlike bird with a downward-curved bill, which they watched through a telescope. This discovery was certainly enough to highlight one day; it was the first record of a glossy ibis in the Sudbury Valley in 102 years.

Air Power Helps Bag a "First"

As they started to leave the farm, Morgan noticed a bird settling among a herd of heifers near the barn. At first he thought that it was a snowy egret, remarkably early for spring; but the binoculars proved otherwise. Drury, scarcely crediting his eyes, correctly identified the bird as a cattle egret.

Ornithological tradition demands that the first record of a new species in any geographical area be substantiated by a specimen. Since this was a "first" for North America, Morgan, who possessed a Federal collecting permit, decided to secure the bird.

Rushing to the nearest telephone, the men called Ludlow Griscom, dean of New England field ornithologists, urging him to come to see the bird before they collected it.

Griscom advised them to take no chances. "Don't wait till I get there. Collect the bird now for the scientific record."

But the problem was not solved so simply. The bird, in characteristic fashion, stayed so close to the cattle that there was real danger of shooting a heifer instead of a heron.

Two shots went wide; the bird lost not a feather. Then, alarmed by these unfriendly actions, it took wing over the orchard and toward the next farm. There, thought the

hunters, black Aberdeen-Angus cattle would act as decoys. But a brief reconnaissance found neither herd nor heron.

It was still early in the morning—about 6. The frustrated ornithologists aroused a sleeping friend who owned a small plane. With air support they soon located the missing bird. They shouted instructions from the low circling plane to a car below, directing a ground party to their quarry. After several attempts, using both a car and a tractor as blinds, they officially added the cattle egret to the North American list. Later the specimen was placed in the Museum of Comparative Zoology at Harvard.

Skeptical ornithologists at first assumed that the bird had escaped from some near-by zoo, but a quick check of possible sources revealed no clues. Then came news from New Jersey. Soon after the Massachusetts affair a cattle egret was discovered on the McPherson farm at Cape May. Later a second bird appeared there. Bird watchers by the hundreds, from Philadelphia, Washington, New York, and even farther away poured in by car and train to see these two distinguished visitors.

Then on June 1, Louis A. Stimson, touring the northwest shore of Florida's Lake Okechobee, discovered 10 cattle egrets in groups of four and six.

"Snowies" Prove to Be Cattle Egrets

In London I told this surprising ornithological news to Richard Borden, noted wildlife photographer and a former colleague of mine at the National Audubon Society and the National Wildlife Federation.

Facetiously I suggested that perhaps I had disturbed the birds so much in Spain that they had jumped across the ocean! Quite seriously, I predicted that someday the cattle egret would nest in the United States.

"If you ever see a small egret walking around the feet of cows," I advised Dick, "be sure to look twice at it."

"That reminds me," he replied. "I photographed some snowies feeding among cows in Florida this spring."

At my suggestion he looked carefully at his film again on returning to the United States. To his delight, he discovered that he had not photographed snowy egrets at all but had unknowingly captured a record of the cattle egret.

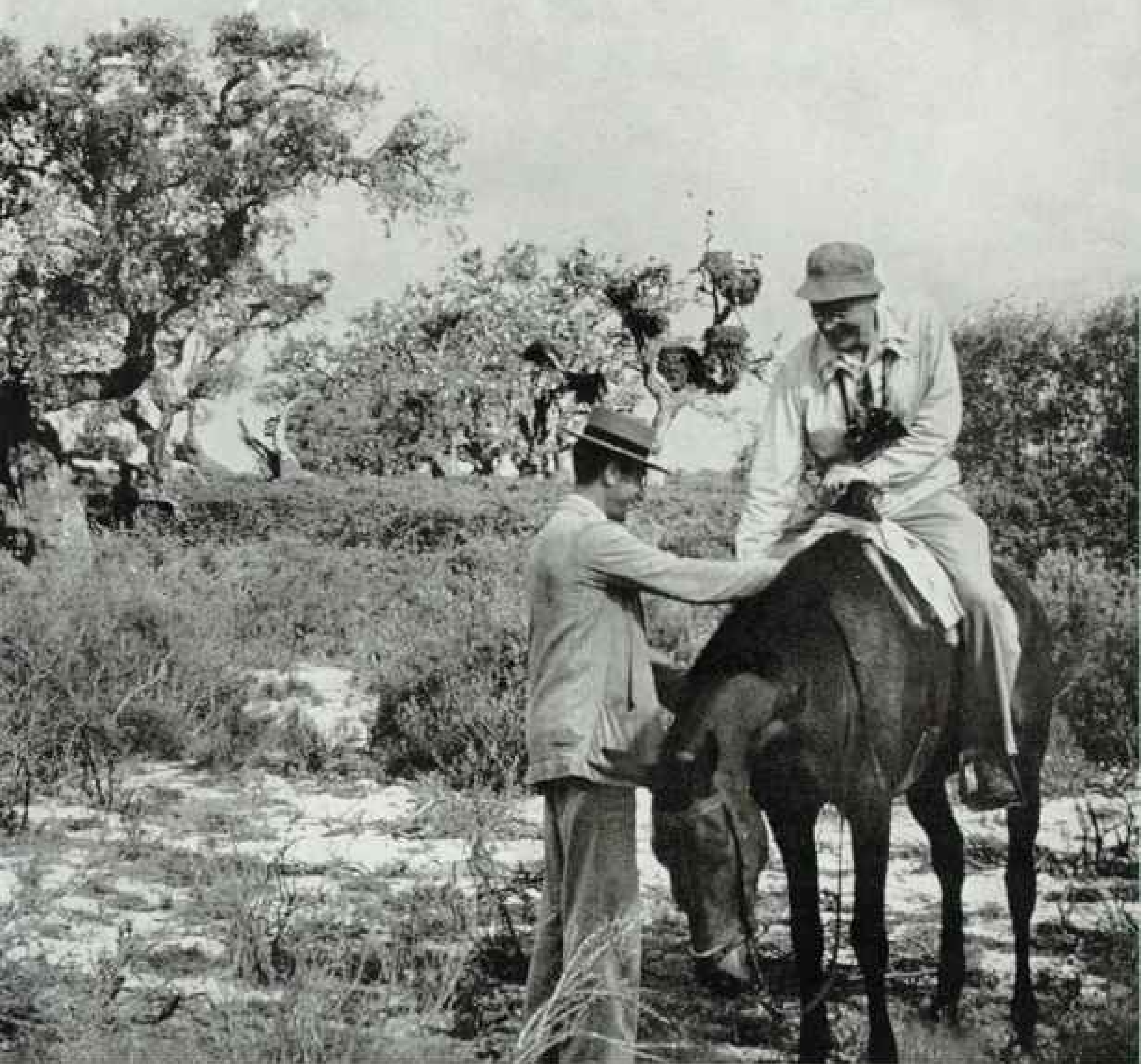
Borden's movies were taken on March 12, 1952. Evidence indicates that the birds may have arrived in Florida even before that. Willard E. Dilley of Homestead, Florida,



saw a couple of cattle egrets east of Clewiston in the early 1940's, but did not report them because he assumed they had escaped from captivity.

There were other sight records during 1952, indicating an outright invasion by the species. One bird even turned up near Chicago.

James Fisher, English ornithologist and I ran into the cattle egret in two places on a 30,000-mile ornithological tour of North America in 1953. In Newfoundland, Leslie Tuck, a Dominion Wildlife Officer, showed us the skin of an egret that had come aboard a trawler on the Newfoundland Grand Banks, 300 miles from St. John's, late in October, 1952. Tuck assumed it to be an American egret, but when he drew the specimen from the tray, I knew



Like Flowering Trees, Cork Oaks Blossom with Birds in Andalusia

Sky streamers of egrets commuting from distant feeding grounds led the author and Guy Mountfort, British ornithologist (on horseback), to this huge rookery in Spain's Guadalquivir River marshes. A bird sanctuary, the heronry is patrolled by paid guards, one of whom helps Mountfort dismount. Cattle egrets make up more than half the 4,000-bird colony. A dozen pairs of storks nest in the stubby tree above the *guarda's* head. Showy-flowered *cistus* shrubs, resembling American sagebrush, blanket the sandy fields.

that something was wrong. The bird had a yellow bill and black legs; that added up to American egret if one used the *Field Guide*. However, the bird was much too small for an American; it measured no bigger than a snowy.

Was it a cattle egret? There was a telltale touch of buff on the crown; yet the legs were blackish. Every cattle egret I had seen in Spain had reddish or yellowish legs; I did not know at the time that the juvenile could have blackish legs.

When the bird was sent to the National Museum of Canada in Ottawa, my suspicion was confirmed. It was indeed a cattle egret.

Fisher and I, continuing our ornithological odyssey, arrived in Okeechobee, Florida, on the evening of May 5 and immediately telephoned to Audubon wildlife warden Glenn Chandler.

"What are the chances of seeing cattle egrets?" we asked.

"Excellent," he replied. "Sam Grimes and



Lined Up as If to Board a Hippo Ferry, Egrets Sun Beside a Murky Jungle Pool

Africa's cattle egret population has boomed in the last 20 years. In a city park in Natal birds are as tame as chickens. This species now breeds on all continents except manless, cowless Antarctica.



A Topside Passenger Watches Sharply: His Boat May Suddenly Submerge

In the veld country, big-game animals replace cattle as the egrets' companions. Occasionally the birds feed on small fish and tadpoles, but prefer an insect diet; sometimes they pick parasites from the hides of beasts.



An Ever-hungry Trio, Mouths Agape, Awaits Return of Food-laden Parents

These cattle egret nestlings at Lake Okeechobee, Florida, are the first ever photographed in the United States (page 290). Fuzz gives way to feathers before the birds desert their rude twig nest.

I were out at the rookery on King's Bar today, and we found a nest."

The prediction I had made the year before had come true.

To First Known New World Nest

The next morning Chandler took us to the fish camp where the patrol boat was docked. On our way, two or three miles out of town, we passed a broad meadow where a small herd of cattle grazed among herons. Snowies will sometimes consort with cattle, but our binoculars showed that these were not snowies. They were cattle egrets—14 in all. I tried to approach with movie camera and tripod, but the birds were too skittish for close-ups. Nevertheless, I felt tremendous satisfaction in seeing the birds on American soil.

On the island where Chandler guards a big colony of ibises and herons, we plowed laboriously through acres of lavender water hyacinths toward thickets of low willows. Birds erupted from the bushes by thousands: little blue and Louisiana herons, snowy egrets, American egrets, white and glossy ibises. This

area, in fact, is the nesting place of most of the eastern glossy ibises in the United States.*

We followed a jungle trail through dense herbage and knee-deep water to a little clearing. Chandler pointed with his machete to a platform of sticks.

"I think that's it," he said. "There was just one egg yesterday; now there are two."

About here on the previous day Sam Grimes had spotted the first nest discovered in the New World. He had watched the parent birds approach it after much enthusiastic strutting, caressing, and guttural small talk in the willow tops. However, intervening vegetation had prevented him from getting satisfactory photographs of them on the nest.

Intending to disturb the birds as little as possible, I erected my burlap hiding place in shallow water 30 feet away and settled down to what I expected would be a long wait. Less than 15 minutes after my companions had started back to the boat, the herons and

* See "Wildlife of Everglades National Park," by Daniel B. Beard, NATIONAL GEOGRAPHIC MAGAZINE, January, 1949.

Alarmed, a Female → Cattle Egret Lifts Halfhearted Plumes

Cattle egret feathers, ordinarily relaxed, can be erected at will. As the breeding season approaches, white plumes on crown, back, and breast will turn a buff color (page 287); hence the name "buff-backed heron" by which the bird has been known in Europe.

The cattle egret averages a foot and a half from crown to ground, roughly the same size as the snowy egret (below), its closest North American relative. But the immigrant lacks the slender grace and delicate plumage of the American native. The cattle egret's stocky yellow bill and pink eyes contrast with the snowy's dark spikelike bill and eyes of gleaming yellow. The snowy wears yellow slippers on black legs; his cousin may have yellowish, reddish, or blackish legs and feet, but they are never two-toned.

Samuel A. Grimes



← Lacy Finery Often Cost the Snowy His Life

Although the native American snowy egret feeds chiefly on small fish, it occasionally searches for insects among grazing cattle and at a distance may be mistaken for the cattle egret (above).

Caught in active courtship display, this male poses before a moonflower vine backdrop at East River in the Everglades National Park.

In the late 19th century, milliners avidly sought this bird's feathers for high-style hats and ornaments. The filmy, upward curved aigrettes sold for \$52 an ounce, more than the price of gold at that time.

The beautiful heron was almost exterminated; now protected through efforts of the National Audubon Society, the bird is familiar again along southern lakes and shores of the United States.

Allen D. Cruikshank,
National Audubon Society



Grazing Herd in a Sumatran Field Flushes Insects for Egret Companions

Like living satellites, the birds match step with pasturing cattle, snatching grasshoppers, flies, and beetles; or they ride aboard, seeking parasites. Occasionally they fly ahead of grass fires to catch fleeing insects.

ibises settled in the dense thickets on all sides of me. Coarse croaks played counterpoint to the bubbling *wulla-wulla-wulla* of the snowies and the rasping of the chicks. A Louisiana heron went to its own nest five or six feet from the twiggy platform on which my 6-inch telephoto lens was focused.

Then through the coarse fabric I saw a white bird swing in and walk deliberately down the long branch to the two blue eggs. This was it! I pushed the button on my camera and ran off 10 feet of film. Eagerly I peeped through a slit in the blind to confirm the identification. My heart dropped: the bird had black legs and bright-yellow feet. The owner of the nest was only a snowy!

I was certain at the time that the cattle egrets were nesting near by, perhaps within 100 yards. But to determine just which nest was theirs would have required too much time, especially since black clouds were piling up to the west. We had to leave fast.

Sam Grimes, returning three weeks later, discovered three cattle egret nests and photographed birds on them (page 288). He reported that the nest I photographed was indeed that of a snowy egret. The cattle

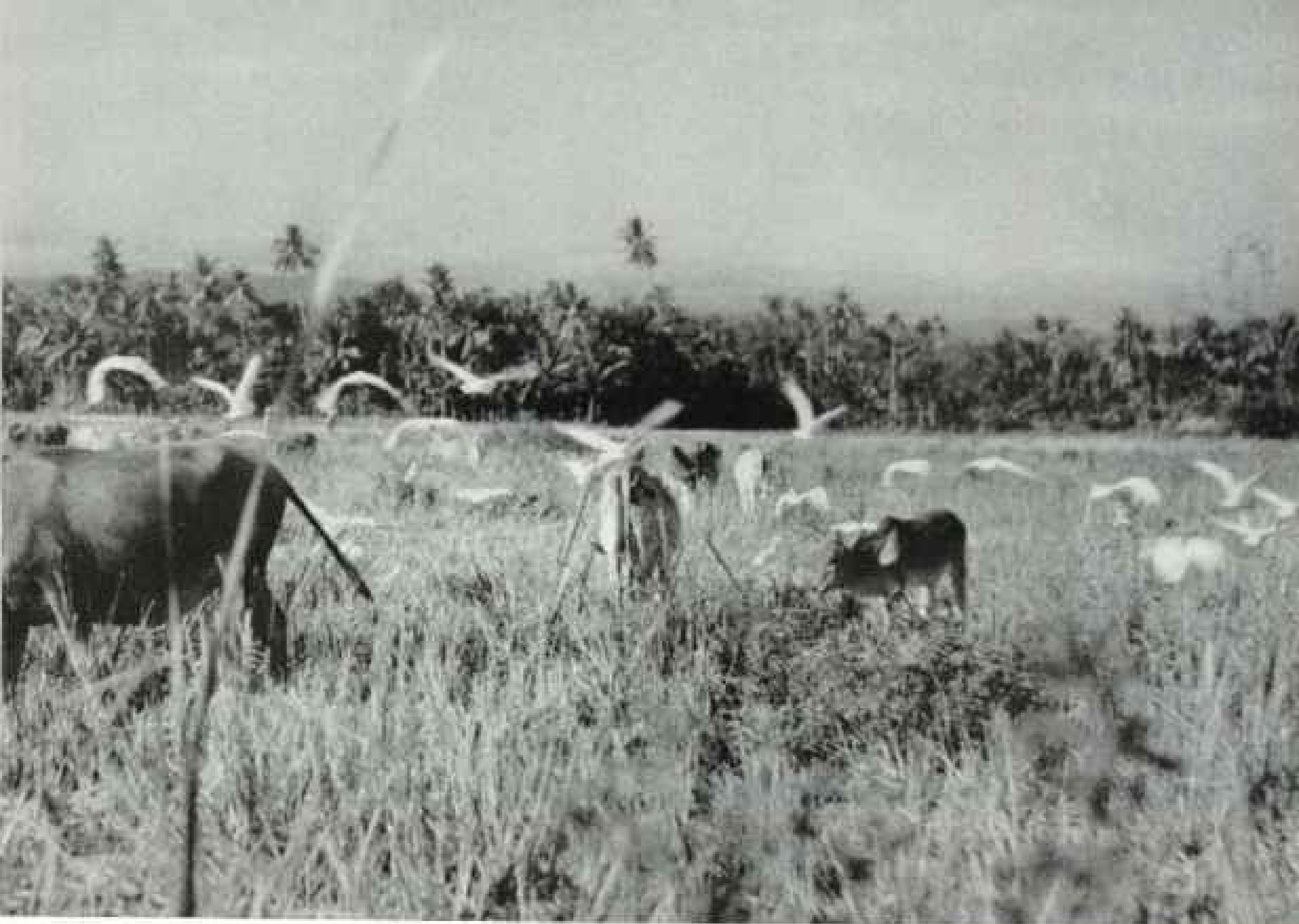
egret's nest, only about five feet away, had apparently fallen from its support before our arrival. He found the flimsy remnants in the water.

During the summer of 1953 the cattle egrets returned to McPherson's farm at Cape May. This time there were four. Two more followed them. Then Virginia and Maryland were added to the list of States where the species had been seen.

More Than 100 Wintered in Florida

As 1953 drew to a close, naturalists in Florida watched with keen interest to see whether the birds would leave the State. Cattle egrets in other parts of the world travel distances that mystify students of migration.

None of the birds were seen in their usual haunts around the north end of Lake Okeechobee after the end of August. On the other hand, they were seen with increasing frequency farther south in the State. On November 21 Louis Stimson counted 152 on the south side of Lake Okeechobee, a far greater number than was believed to exist in Florida. Either they had enjoyed a phenomenal nesting success or they had been augmented by others



Flurried Birds Desert Cattle-back Perches for a Distant Palm Sanctuary

The south Asian cattle egret, almost identical with the European subspecies, has been observed as far north as Japan. Both varieties are highly sociable, feeding and nesting in flocks.

from South America. Another careful check by Stimson on January 23 showed that at least 122 birds had stayed through the winter. A few birds probably did take off across the water, several stopping briefly at Key West.

In November, the month Queen Elizabeth paid her royal visit to Bermuda, the first cattle egret also arrived there and was photographed. The distance from the Florida mainland to Bermuda is roughly 1,000 miles. That particular bird, incidentally, came to a sad end; it drowned in a rain barrel early this year.

At about the same time, another wanderer, possibly wind-borne along the coast, finished its long journey in a poultry yard in Brownfield, Maine, and the farmer shot it.

Texas Prairies an Ideal Home

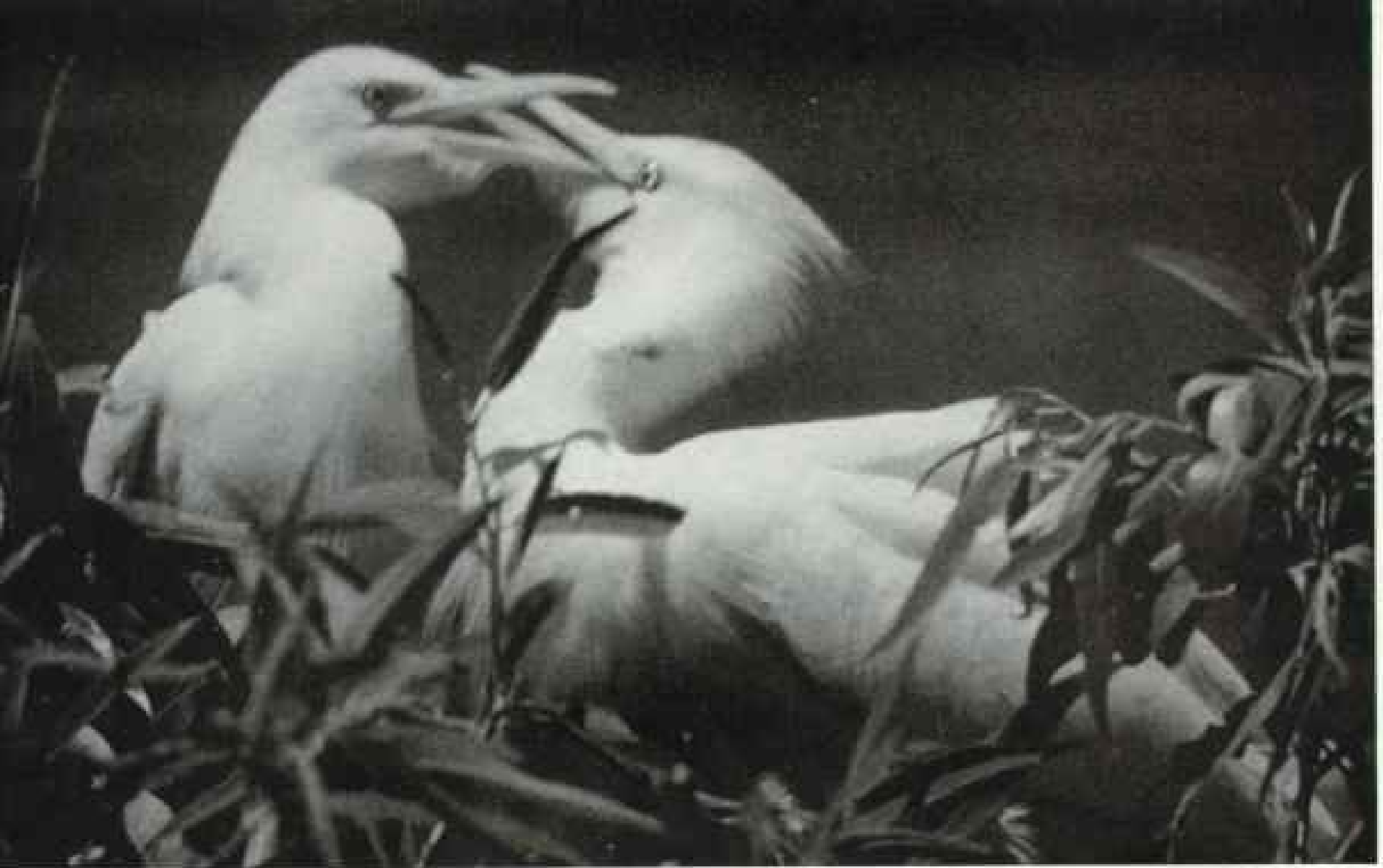
And so the records accumulate: the invaded territory expands. What will the future hold for the cattle egret in North America? I believe it will do extremely well when it reaches the coastal prairies of Texas. The veldlike, semiarid terrain, oak clumps, thicket-lined rivers, and hybrid Brahman livestock are made to order for the cattle egret's needs. So is much of the Rio Grande Valley as far up as

New Mexico. If the bird reaches California, it should do well throughout the central valleys.

But somehow I should not expect the cattle egret to breed in the northeastern States nor in the upper Midwest, even though plenty of cows in both places would provide foraging company. It is significant that this pioneering species, although resident in Spain, has never established itself in the low country of the Netherlands, which supports nearly 5,000,000 cattle, not even in southern France. Undoubtedly thresholds of climate or vegetation determine the breeding limit.

In England on a number of occasions in recent decades groups of cattle egrets have been released at the Whipnade Zoo, 30 miles north of London. Although they wandered far and were reported from at least 13 counties in England and even from Iceland, they never became established. They just disappeared. These liberated birds, however, were of the Indian race, *Bubulcus ibis coromanda*, not the geographically closer Spanish form.

The last 20 years have seen a remarkable boom in cattle egret population both in Egypt and in South Africa. Dr. Herbert Friedmann, Curator of the Division of Birds at the United



Cattle Egrets, Resplendent in Nuptial Plumage, Court in a Florida Bush

Like all herons, cattle egrets carry out an age-old mating ritual that varies little. Loud chatter, strutting, billing, preening of feathers, and crossing of necks mark the courtship performance. These immigrant birds now nest in the United States (page 288); they have been seen in at least half a dozen eastern States.

States National Museum in Washington, D. C., told me that when he visited South Africa in 1924 he saw only one bird. In 1950, a quarter century later, he observed thousands, often hundreds at a time. In a city park in Natal he found them as tame as chickens. The spread has been well documented in Natal and eastern Cape Province.

Population "Explosion" Puzzles Scientists

Biologists are abuzz with conjecture about this world-wide "population explosion." The cattle egret has now established beachheads on every continent save Antarctica, where there are no cows.

It was a new bird for Australia in 1948 when Herbert G. Deignan of the National Geographic Society-Smithsonian Institution expedition spotted hundreds from the air in northern Australia's Arnhem Land. He corroborated his discovery by collecting several specimens for the U. S. National Museum.

Some people contend that these are descendants of 18 birds liberated in 1933 in the Kimberley area of western Australia in the hope that they would control cattle ticks. But those birds (of unknown sex) quickly disappeared.

Deignan believes that the birds in northern

Australia more likely are immigrants from across the water. He points out that they have recently been reported by farmers in southern New Guinea. Since Deignan's discovery similar reports have circulated elsewhere in Australia, one from as far south as Melbourne.

What will be the effect of the cattle egret on America's native herons? Will it compete? Is it a good or bad acquisition?

After experiences with such introduced species as the house sparrow and starling, we naturally view exotic birds with a jaundiced eye. But the environment for the cattle egret—pastures and cattle—is man-created, introduced from the Old World into the New. The bird is merely completing the picture.

The cattle egret's food habits, with accent on insects, are mostly different from those of other herons. Although it shares heronries with snowies and ibises, there is no basic conflict. All seem to benefit. And the larger the colony the less it apparently suffers from predators.

The cattle egret, beautiful and beneficial, is a fine addition to American avifauna. Conceivably the day may come when it will be as familiar to many Americans as the starling or the ring-necked pheasant.

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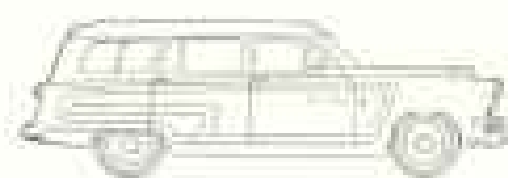


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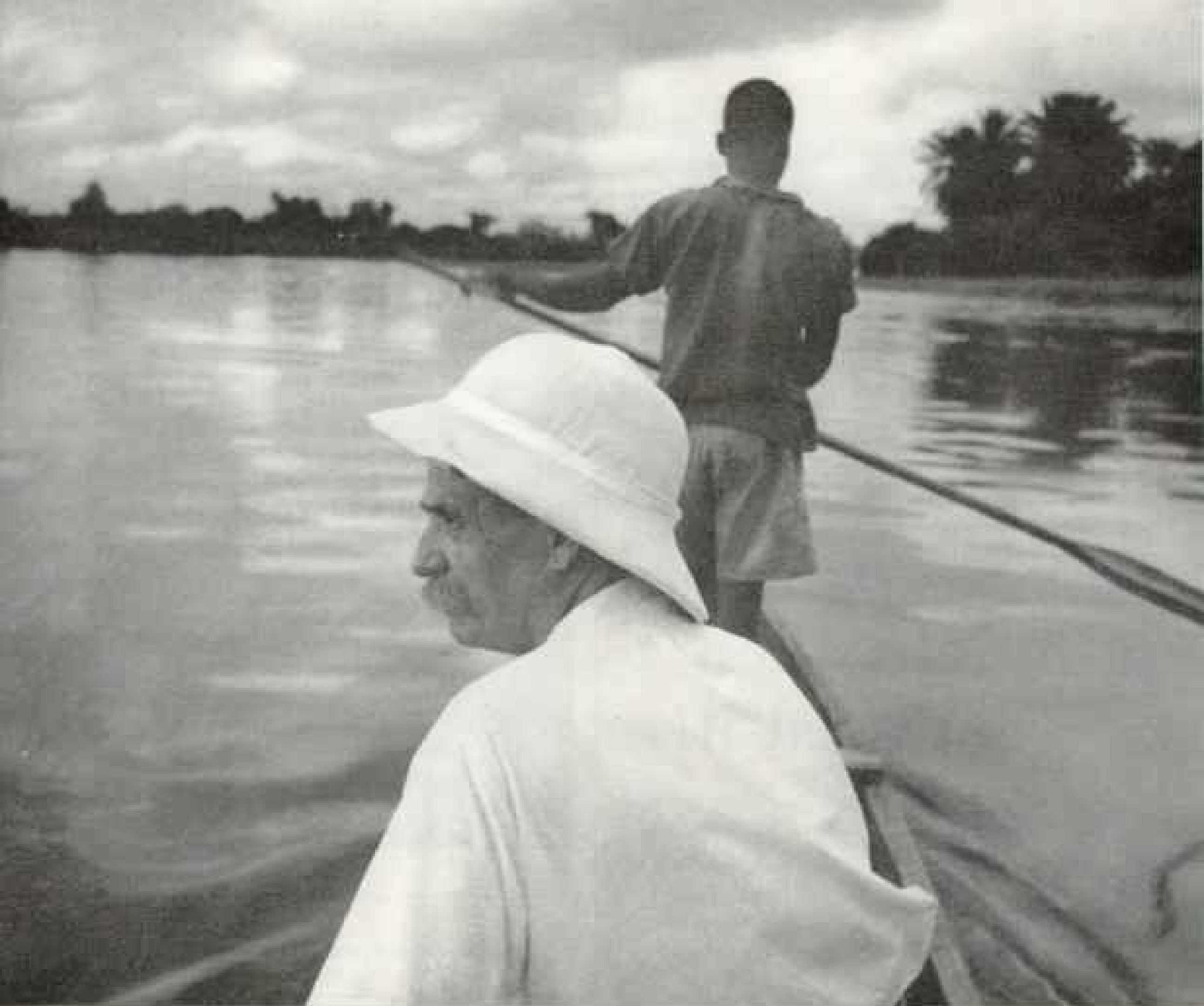
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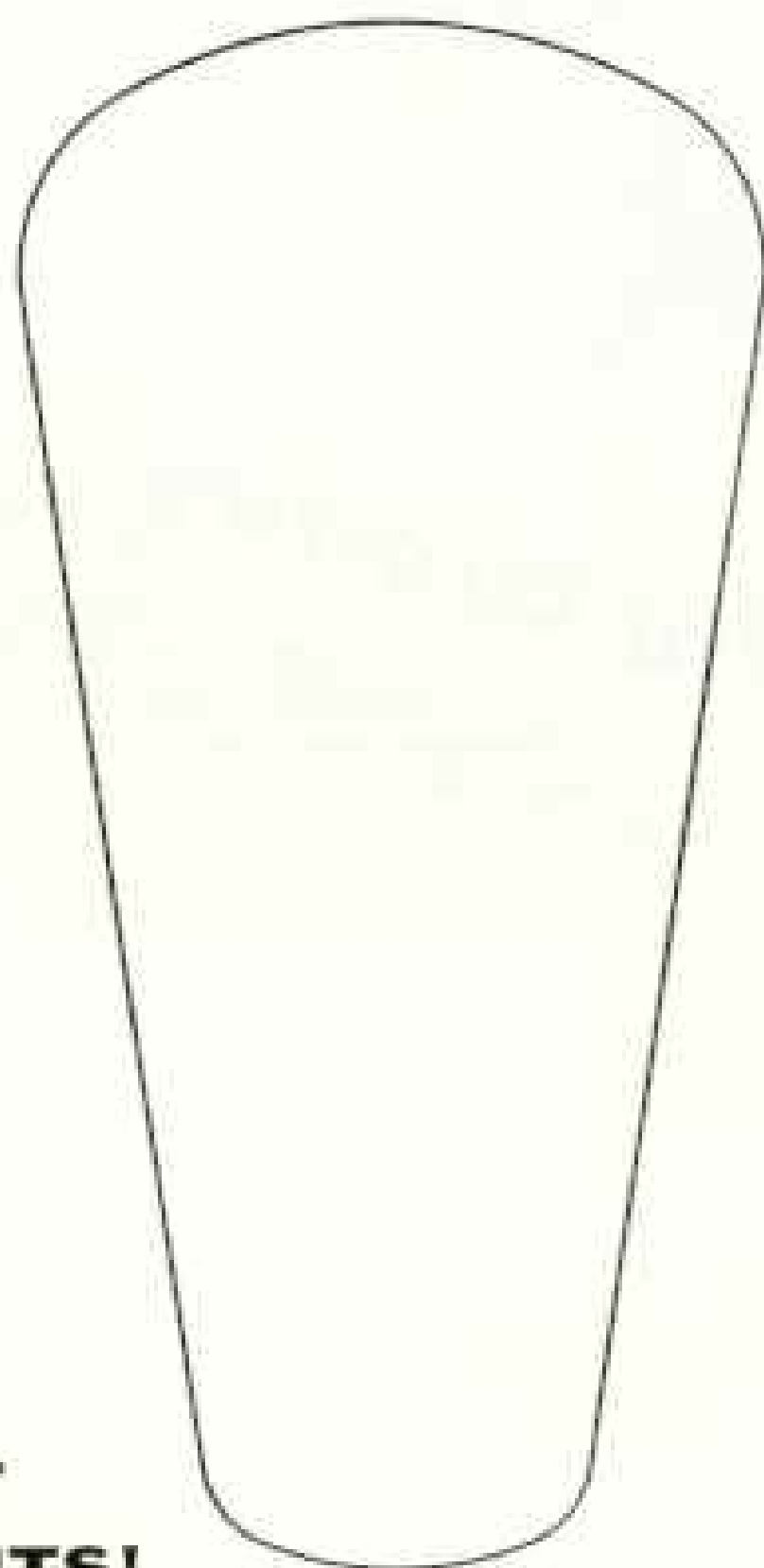
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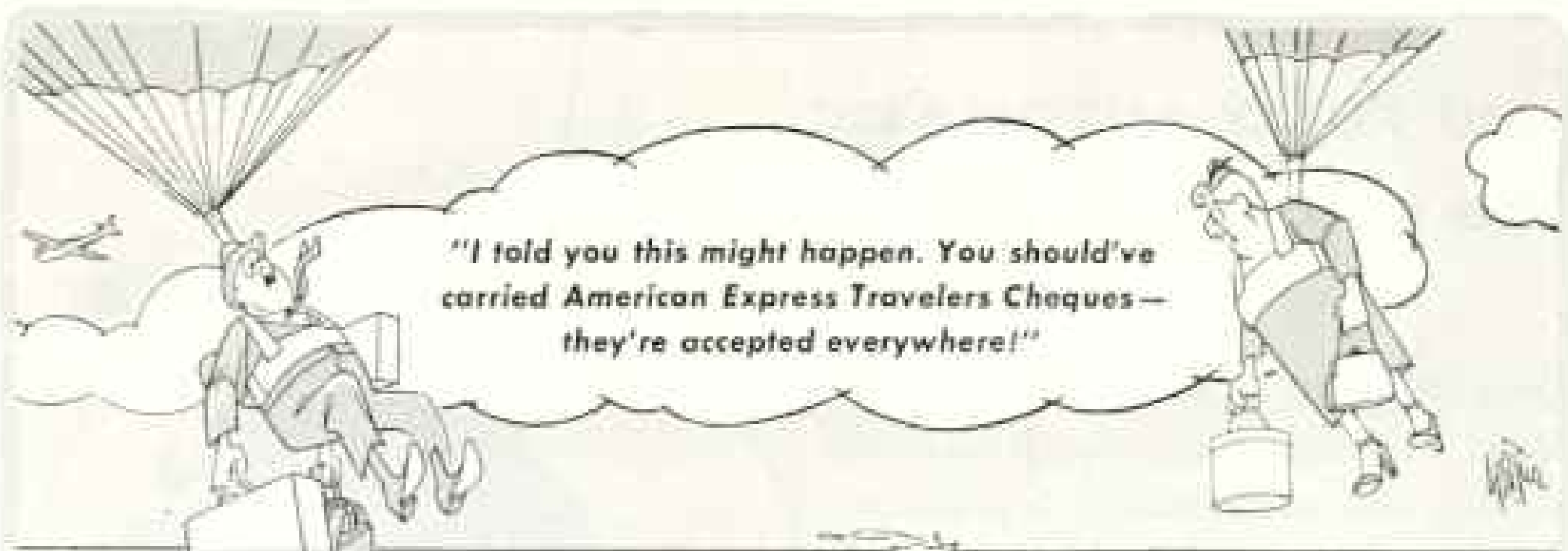
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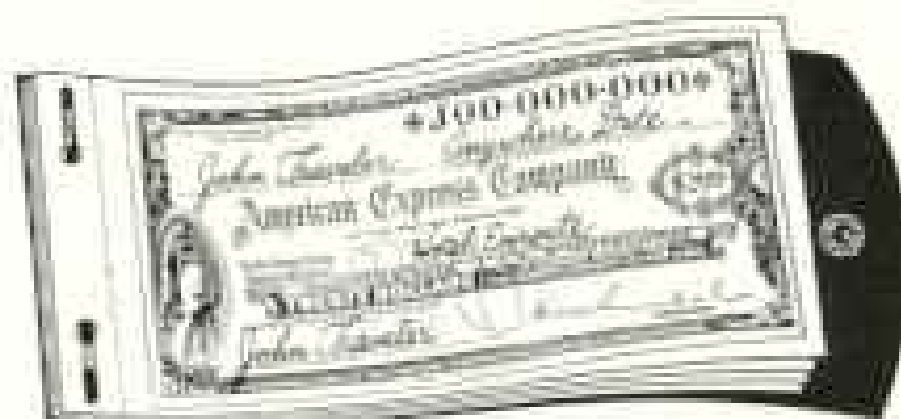
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There are, of course, several drugs that may be helpful in treating high blood pressure, and others of promise are under study. In addition, special diets . . . for example, those in which salt is restricted . . . are often beneficial. Surgery, also, may be helpful when other measures fail.

Successful control of hypertension, however, still depends mostly on whether or not the patient learns to live on good terms with high blood pressure. For example, many victims can keep their blood pressure from rising still higher . . . and may even lower it . . . simply by controlling their weight through proper eating habits.

Since the majority of people who develop high blood pressure are of the so-called "high-strung type," it is most important for them to learn to avoid *sustained* tension which tends to elevate

blood pressure and perhaps keep it at an excessively high level. Avoiding tension usually involves a change in attitude and perspective toward what we must do, rather than ceasing or drastically curtailing normal activity.

Those suffering from hypertension should see their doctor for regular check-ups and treatment. This will enable the doctor to detect possible complications early, and to take steps to help correct them.

It is also wise for those who do *not* have hypertension to arrange for periodic health examinations, including a check on blood pressure. This is especially important for those who are *middle-aged and older*, are *overweight*, or have a *family history of hypertension*.

Did you ever hear the expression, "To live a long life, learn to saunter instead of gallop"? There's a lot of truth in it for everyone . . . especially for those with high blood pressure. In fact, many people today who have this ailment can expect to live long and useful lives simply by reducing the tension in everyday living.

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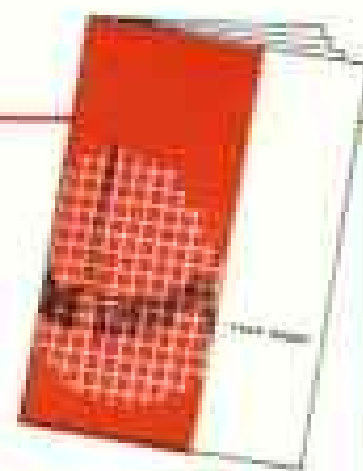
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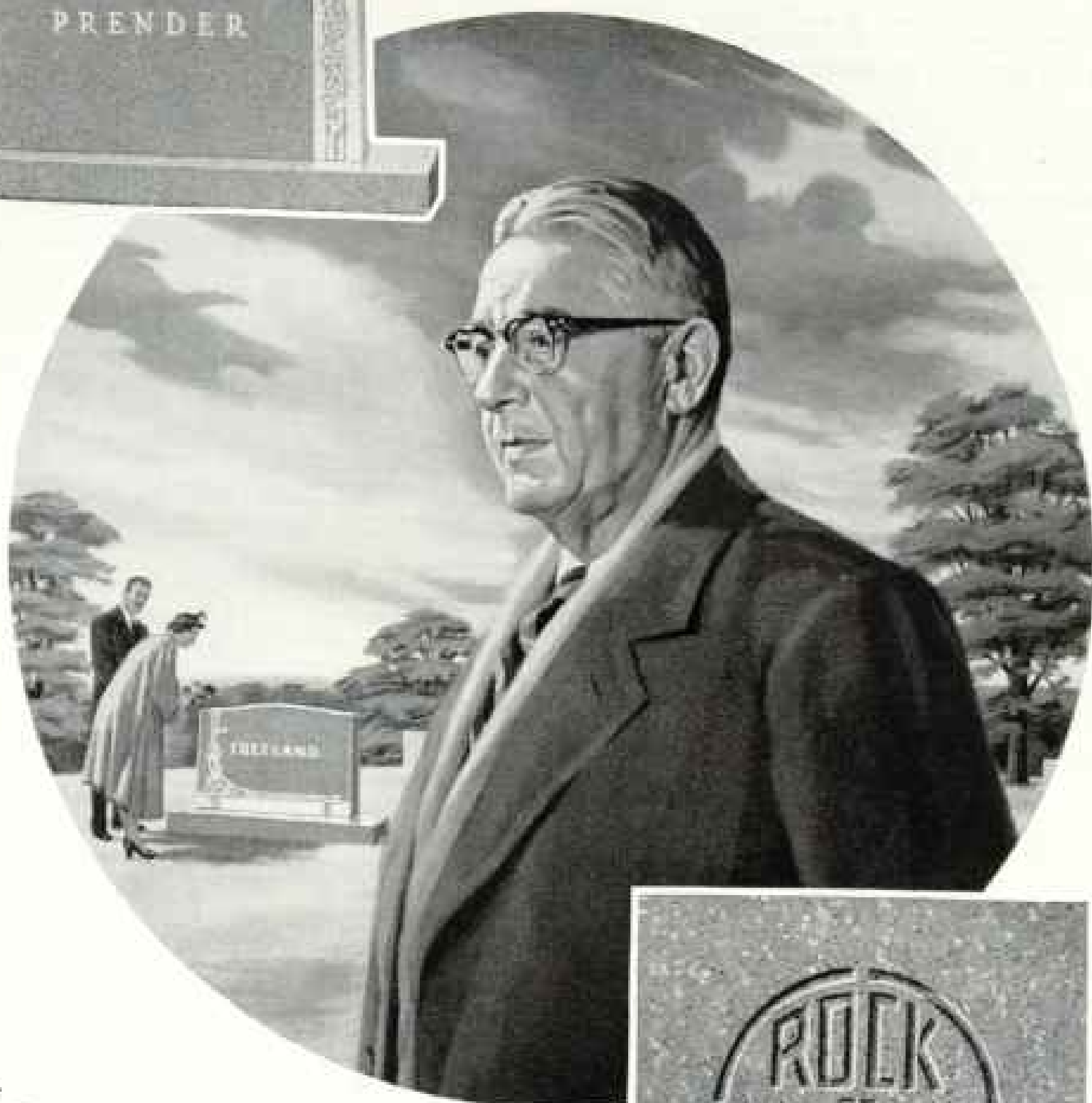
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