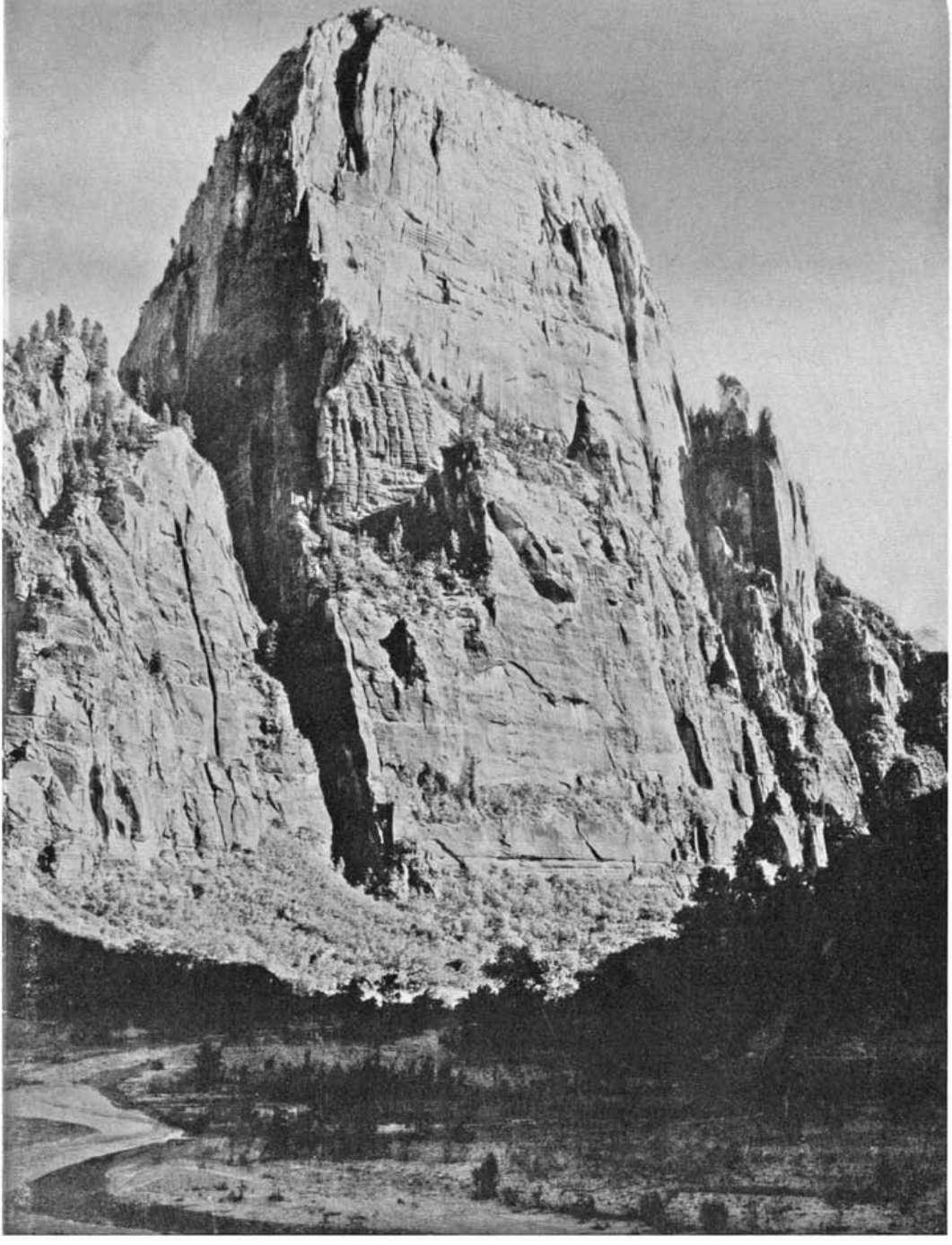
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ZION

NATIONAL PARK • UTAH

JOHN TY
LI



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Historic Events

1776 Father Escalante in search of route to Pacific crossed Virgin River near Hurricane.

1826 Jedediah Smith, fur trader, with a party of about 16 men exploring the region, traversed Virgin River.

1847 Brigham Young and his band of Mormons founded Salt Lake City and began the colonization of Utah.

1858 The colonization of Utah's "Dixie" begun by the Mormons.

1858 Zion Canyon discovered by Nephi Johnson, a Mormon scout.

1861 Joseph Black explored the canyon and 1 or 2 years later was followed by a few settlers who farmed in the canyon, which they called "Little Zion."

1872 Maj. John Wesley Powell visited the region and gave name "Mukuntuweap" to north fork and "Parunuweap" to east fork of Virgin River.

1909 Mukuntuweap National Monument established by Presidental proclamation.

1914 Frederick Vining Fisher visited Zion Canyon and gave names to many of the outstanding formations, such as Great White Throne and Angels Landing.

1917 Wylie Way Camp, first tourist accommodations, constructed.

1918 Monument enlarged and the name changed to Zion by Presidential proclamation.

1919 Monument changed to a national park by act of Congress.

1923 President Warren G. Harding visited the park on June 27.

1930 East Rim road and tunnel completed and dedicated.

UNITED STATES DEPARTMENT OF THE INTERIOR . . . . . J. A. Krug, *Secretary*

NATIONAL PARK SERVICE . . Newton B. Drury, *Director*

ZION NATIONAL PARK • *UTAH*

Open All Year



ION NATIONAL PARK, located in the heart of the spectacular desert and canyon country of southern Utah, has as its chief feature the great multicolored gorge, Zion Canyon. The sandstone cliffs, rising sheer to form the canyon walls and encircle the valley, are awesome; but it is the vivid coloring which most amazes. The deep red of the Vermilion Cliffs is the prevailing tint. Two-thirds of the way up these marvelous walls and temples are painted varying shades of red; then, above the reds they rise in startling white, sometimes surmounted by a cap of brilliant red.

Formation of Zion Canyon[1]

Zion Canyon, the best known example of a deep, narrow, vertically walled chasm readily accessible for observation, was made by the north fork of the Virgin River, the stream which now flows through it. Before the Virgin began to flow there was no canyon. During the long period since its course was established the river has slowly deepened its channel and extended it headward until its original shallow valley has become a long narrow trench between towering walls. Though now deeply entrenched in the rocks of the Kolob Plateau, the river maintains substantially its original pattern. It flows in the same direction, and the curves and straight stretches of its present walls duplicate the meanders of the stream when it flowed some 5,000 feet above its present level.

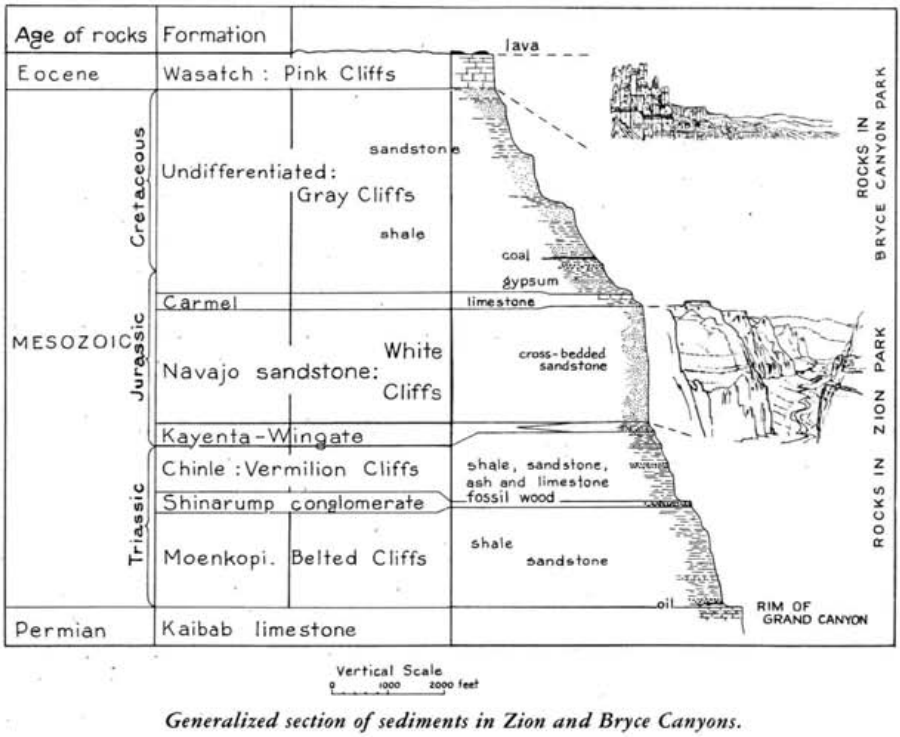
For many thousands of years the Virgin River and its tributaries have been busy with two tasks, namely, deepening their channels and transporting material weathered from the canyon walls. At present the Virgin carries away from the park each year about 3,000,000 tons of ground-up rock at an average rate of 180 carloads a day. For such effective work the many-branched river seems incompetent. But though relatively small in volume, this stream system falls from 50 to 70 feet per mile (nine times the fall of the Colorado in Grand Canyon) and is at work on rock, chiefly sandstone, that disintegrates with exceptional ease. Many tributaries are on bare rock, little re-

[1]Section on General Information Relating to the Geology of Zion and Bryce Canyon National Parks in circular of information for Bryce Canyon National Park.

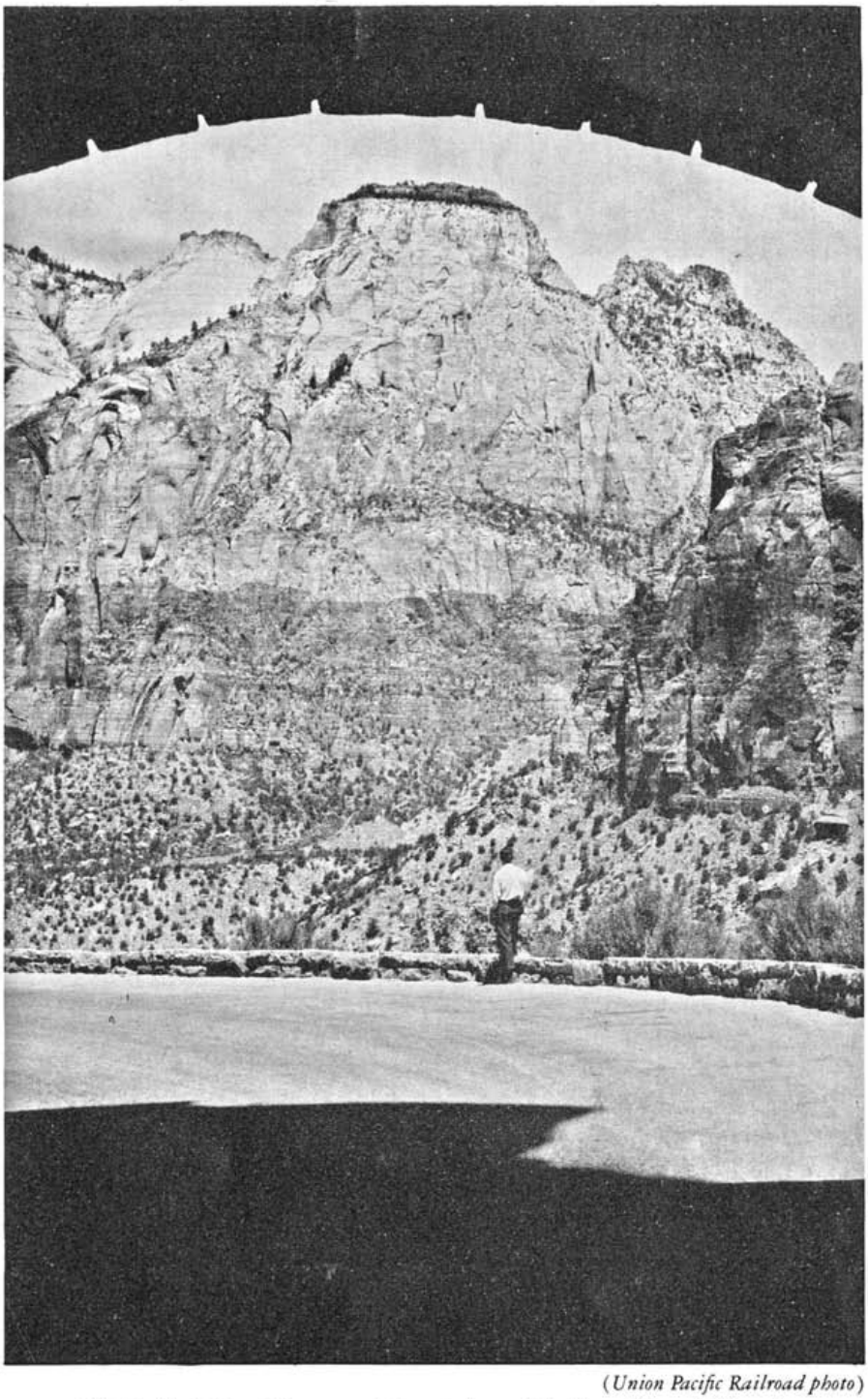
tarded by vegetation, and are fed by short but violent showers. Consequently, they are brought to flood stage not only seasonally but with each period of heavy rainfall. Because they flow only in response to showers, the smaller tributaries are unable to cut channels as deep as the perennial master stream. From their mouths high on the canyon walls, they descend as waterfalls.

Though they are primarily responsible for the depth and position of the canyons, the Virgin River itself and the other streams heading on the adjoining plateaus are only incidentally concerned with the detailed carving that makes Zion Canyon unique. The walls are retreating in consequence of ground water which emerges as springs and seeps, rain which falls directly into the canyon, water that spills over the rim, frost and tree roots which pry off slabs, and chemical agencies which weaken the rock by the removal of the cement about individual grains. Continuous sapping at or near the contact of the porous Navajo sandstone and the more impervious underlying beds has developed alcoves in the canyon walls at Wiley Retreat, the Stadium, Weeping Rock, Emerald Pool, Birch Creek, Oak Creek, and elsewhere.

In the development of the amazing variety of architectural features on the canyon walls, the composition and structure of the Navajo formation have served as controlling guides. In addition to the bedding planes—horizontal, oblique, and curved surfaces—the Navajo has developed parting planes (joints) that



Generalized section of sediments in Zion and Bryce Canyons.



(*Union Pacific Railroad photo*)

The Sentinel viewed from one of the windows of the Mount Carmel Tunnel.

extend downward for short distances or pass through the formation from top to bottom. These bedding planes and joints determine the shape and size of the blocks that spall off from the towering cliff walls. Unlike that of humid regions, this type of erosion progresses from below upward; it causes the canyon to widen and still retain its vertical walls.

Wildlife

With the lower reaches of the park extending into the desert regions to the southward, and the northernmost portions reaching into the spruce-covered highlands, Zion offers the visitor a wide variety of wildlife forms. Among the larger mammals, the mule deer are especially numerous and can frequently be observed along the floor of Zion Canyon in late evening. A few bighorn are present but spend their time in the relatively inaccessible canyons, hence are seldom seen. Other mammals, such as the mountain lion, bobcat, coyote, and fox, are resident within the park, but are rarely encountered because of their timidity. Ground squirrels and chipmunks are numerous and frequently tame. It is wisest to enjoy them without actual contact, however, for some rodents have been known to carry dangerous diseases.

Several species of birds are resident on the floor of the canyon, the best known being the spurred towhee, robin, canyon wren, and yellow warbler. Among the ponderosa pines back of the canyon rims are such colorful songsters as the western tanager, Audubon's warbler, and western warbling vireo.

Of absorbing interest are the many varieties of harmless reptiles in the canyon. Lizards, such as the blue-bellied swift and brown-shouldered uta, are commonly observed around the brush-covered slopes, while the Boyle's kingsnake and wandering gartersnake are to be found in the dense vegetation near the river.

Park Season

Each season of the year is distinctive in Zion. In winter, the colored cliffs stand out in startling contrast to the snow-covered levels and slopes; in spring, melting snows cascade over the cliff faces in foaming white waterfalls. Summer brings with it the greens of the valley as a foreground for the colorful formations; and in autumn when the skies are deepest blue, the trees of the valley floor and slopes take on variegated hues.

Although Zion Lodge is open only during the summer season, the Camp Center, with cafeteria, store, and housekeeping cabins, and the public campground at the south entrance are operated the year 'round.

How to Reach Zion

Zion National Park is reached from Cedar City, Utah, on the Union Pacific System. From this point motorbus service is provided by the Utah Parks Co. Passengers traveling on main bus lines may transfer to Utah Parks Co. buses at Cedar City. On advance notice, connections can be made with the Santa Fe Trails System at Mount Carmel Junction.

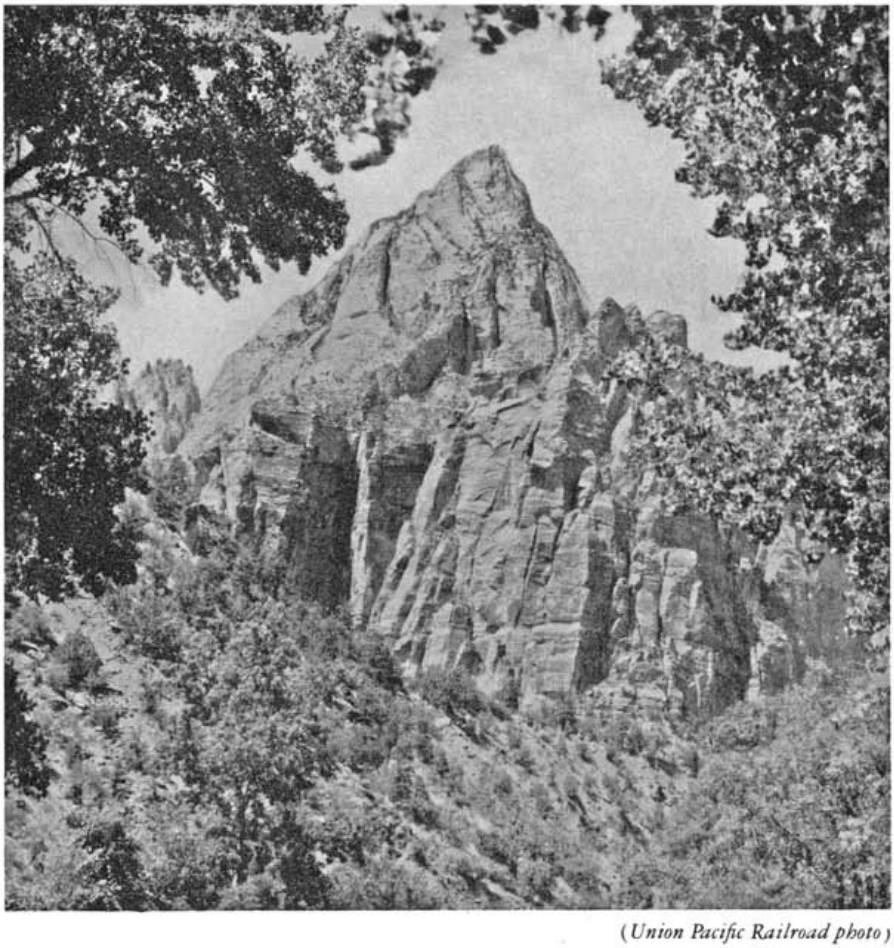
Motorists on the Arrowhead Trail, United States Highway No. 91, from the north may turn off at Anderson Junction, 33 miles south of Cedar City, and those from the south may

turn off at Harrisburg Bench Junction, 10 miles north of St. George, and reach Zion over State Route No. 15. Motorists on United States Highway No. 89 should turn off on State Route No. 15 at Mount Carmel Junction, entering Zion by the east entrance.

High-speed, de luxe airplane service from all points in the United States to Salt Lake City is available through United Air Lines. Service is also available from Los Angeles by Western Air Lines, with stops at Las Vegas, Nev., and Salt Lake City, Utah.

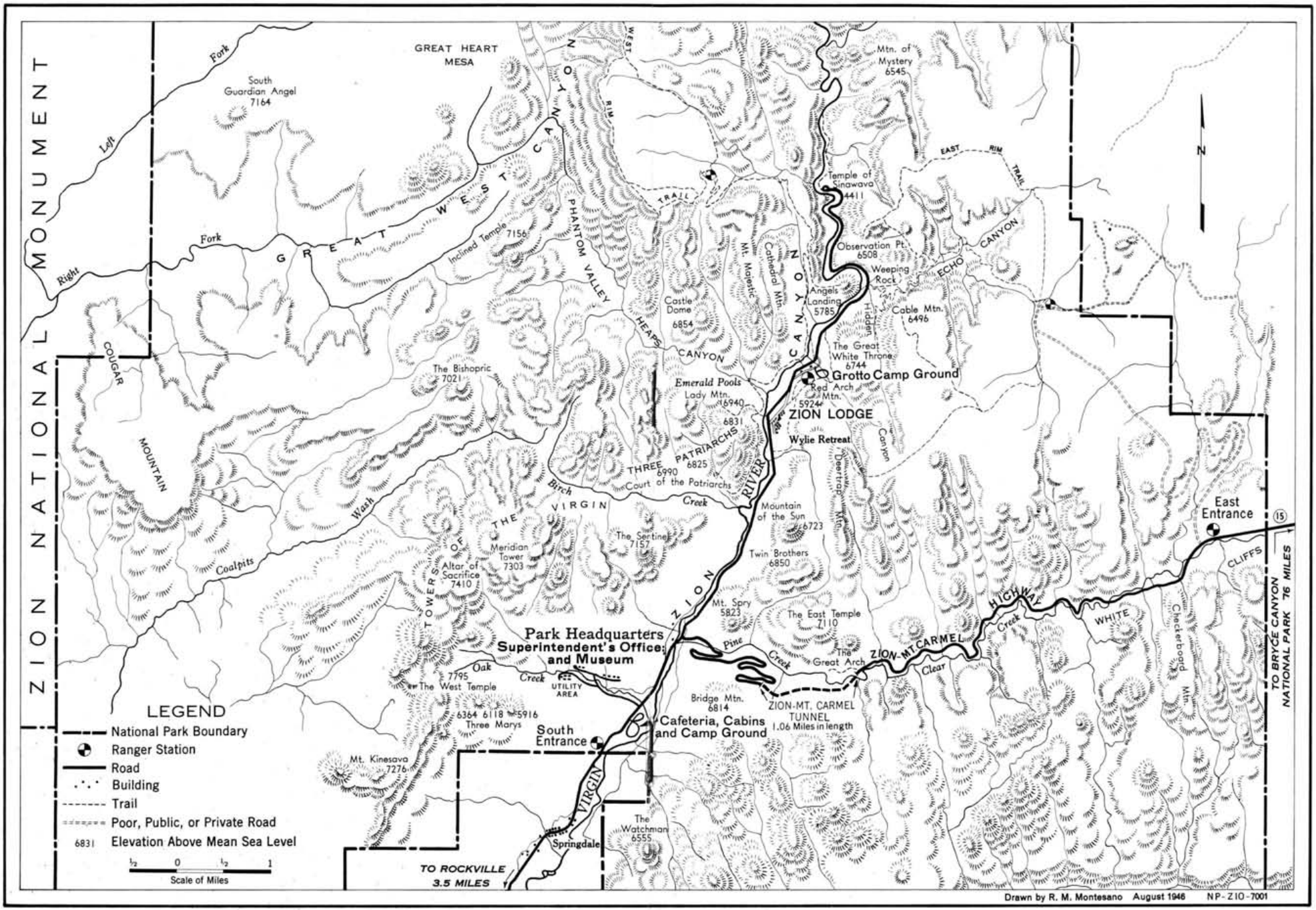
Roads in the Park

There are 20 miles of improved roads in Zion National Park. One road leads from the park's entrance to the Temple of Sinawava, a distance of 8 miles. No one has really seen Zion Canyon until he has made a trip over this road. Visitors in closed cars should make frequent stops so that they may get out and enjoy the magnificent view.



(Union Pacific Railroad photo)

Overhanging trees frame the formation known as Twin Brothers.



Map of Zion National Park

Within the park also is a stretch of the remarkable Zion-Mount Carmel Highway, 11½ miles in length. Running east from the Virgin River Bridge, this road forms a connecting link between United States Highways Nos. 91 and 89. Of special interest along this highway is the Zion Tunnel, started in 1927 and completed in 1930. Its total length is 5,607 feet. While the tunnel is the most spectacular portion, other sections are of even greater scenic interest.

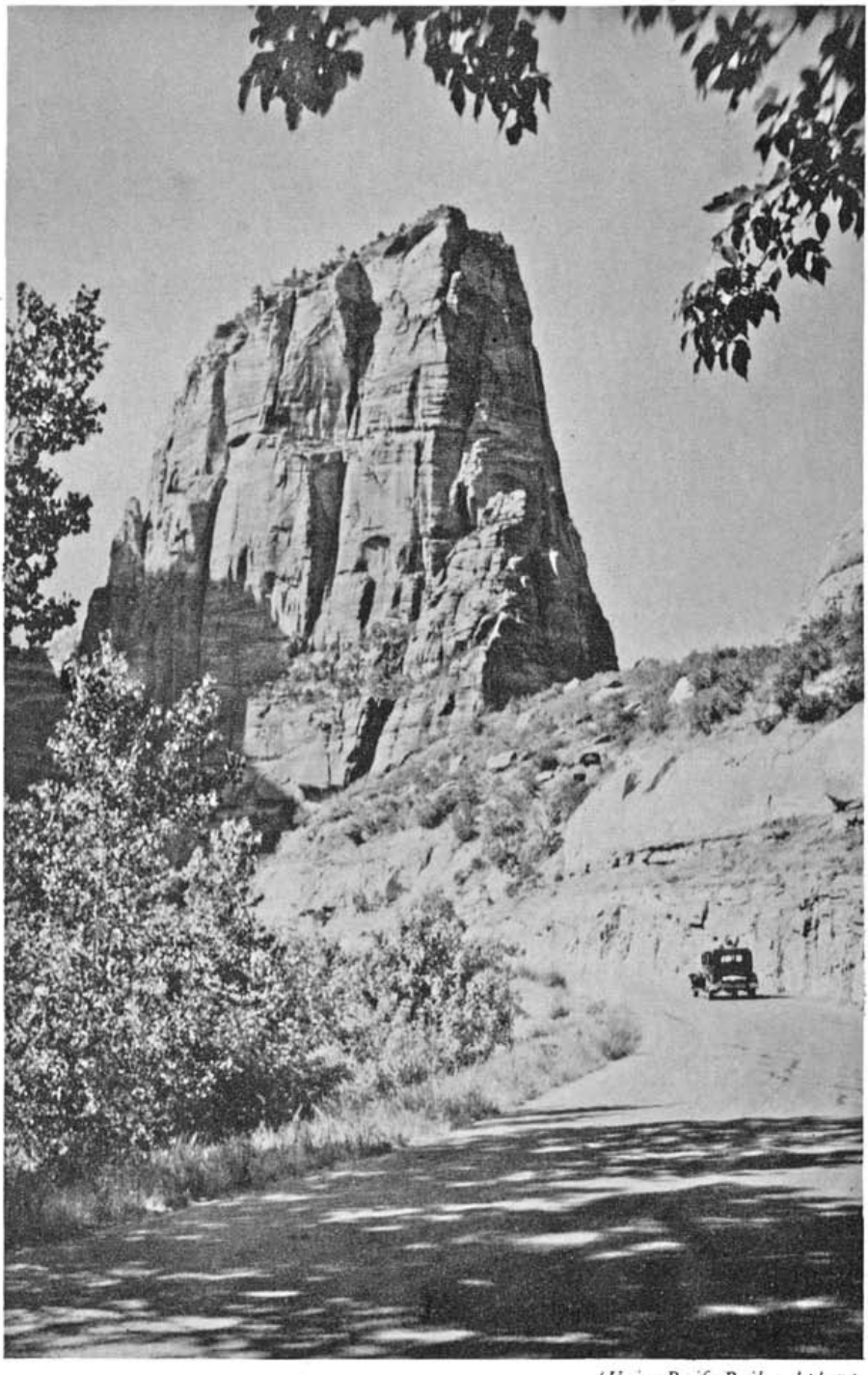
The Trail System

Approximately 26 miles of trails lead to the more important sections of the park which are not reached by roads. These trails are well maintained and can be used at all seasons of the year, with the exception of those to the rims of the canyon which are closed by snow during the winter months.

The most popular of the footpaths, which have been constructed at different levels in the canyon, is the one extending a mile up the canyon from the end of the road at the Temple of Sinawava to the beginning of the Narrows. Other short and interesting trails recommended for easy hiking include Weeping Rock, Emerald Pool, and Great Arch.

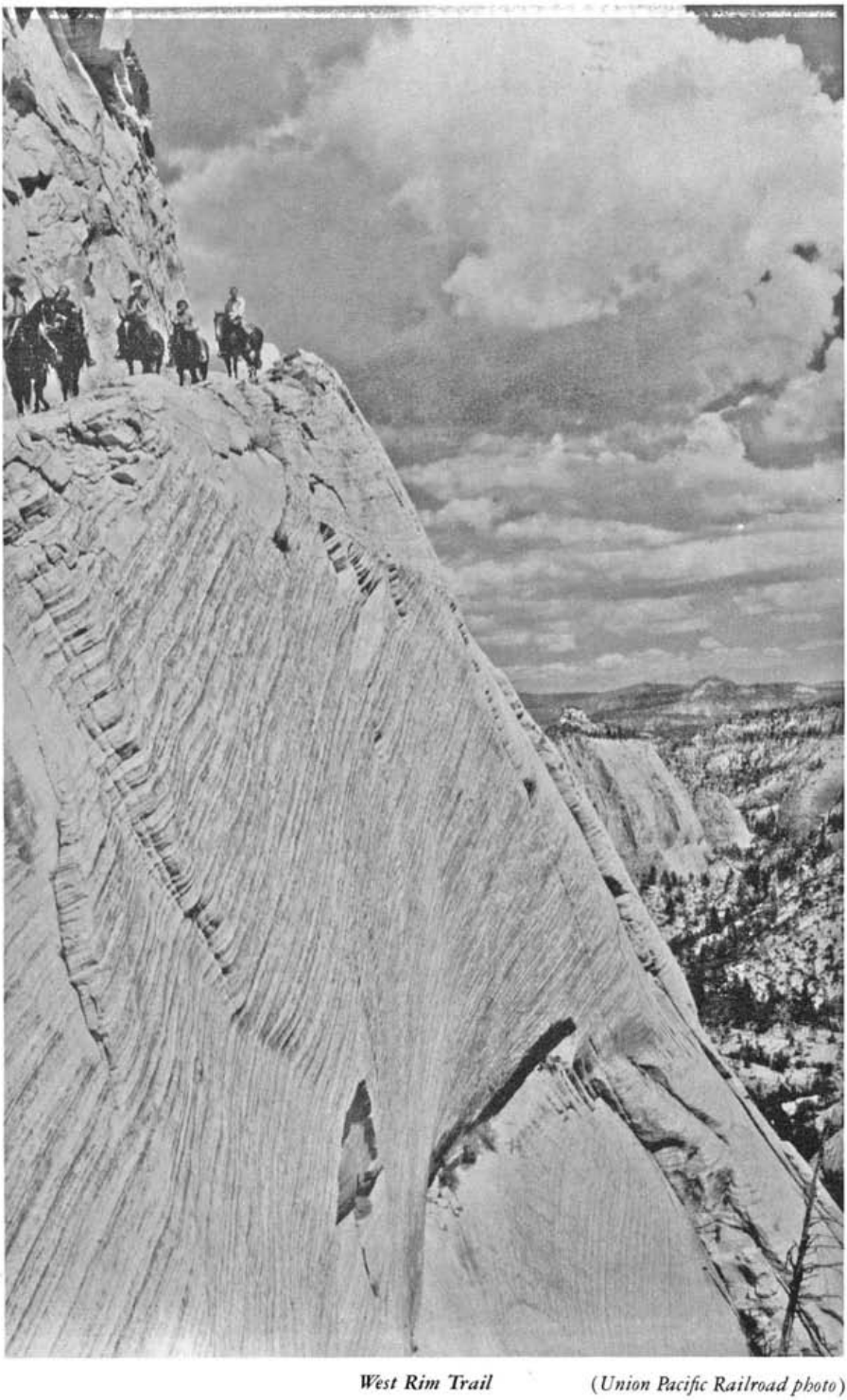
Below are listed a few trail distances. These data are for trails at their best. Since the weather affects the condition of trails, inquiry should be made before attempting any of them.

Name of trail	*Length one way*	*Starting point*	*Aver. time (round trip)*	*Remarks*
The Narrows	1 mi.	Temple of Sinawava	2 hrs.	Easy, no steep grades. All-weather trail. Fine view of river flood plain. Trailside exhibit near Temple of Sinawava.
Weeping Rock	¼ mi.	Weeping Rock parking area	½ hr.	Easy surfaced trail. Water drips from overhanging cliff; springs issue from it. Hanging gardens; travertine deposits.
Emerald Pool (lower)	1 mi.	Zion Lodge or Grotto Campground	2 hrs.	Cross river on foot bridges. Small pool formed by 2 falls. Loop or 1-way trail.
Emerald Pool (upper)	1½ mi.	do.	3 hrs.	½ mi. above lower pool. Mostly easy walking; few steep grades. Loop or 1-way trail.
Great Arch	½ mi.	Parking area, upper end of large tunnel	1 hr.	Mostly easy walking. Excellent view of Pine Creek Narrows and west side of canyon.
Hidden Canyon	1 mi.	Parking area, Weeping Rock	2½ hrs.	Fairly strenuous; steep grades, switchbacks. Cross foot bridge, climb to East Rim Trail sign, follow to turn-off into Hidden Canyon.
East Rim	3½ mi.	do.	5 hrs.	Fairly strenuous foot and horse trail. Carry water, lunch. Cross foot bridge and climb to East Rim Trail sign.
West Rim	6¼ mi.	Grotto Campground	8 hrs.	Strenuous foot and horse trail. Carry water, lunch. Cross river on foot bridge.
Angels Landing	2½ mi.	do.	4 hrs.	Fairly strenuous; steep climb. Half of trail hard-surfaced. Cross foot bridge over river. Excellent view of canyon.
Lady Mountain	2 mi.	Zion Lodge	4½ hrs.	Strenuous mountain climb even for experienced hikers. Cross foot bridge over river. Carry water.

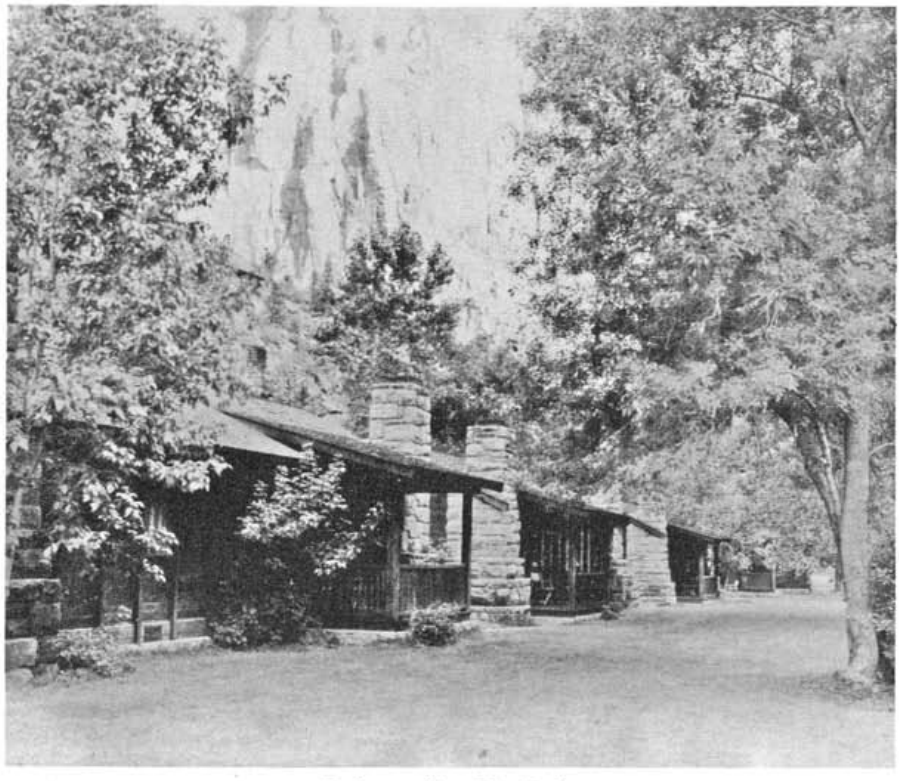


(*Union Pacific Railroad photo*)

Angels Landing, rising 2,500 feet above the canyon floor.



West Rim Trail (*Union Pacific Railroad photo*)



De luxe cabins, Zion Lodge

Administration

Zion National Park, containing 94,241 acres of Federal lands, is one of the areas of the National Park System owned by the people of the United States and administered for them by the National Park Service. In these areas the scenery and the objects of historic, prehistoric, and scientific interest are carefully preserved and displayed for public enjoyment.

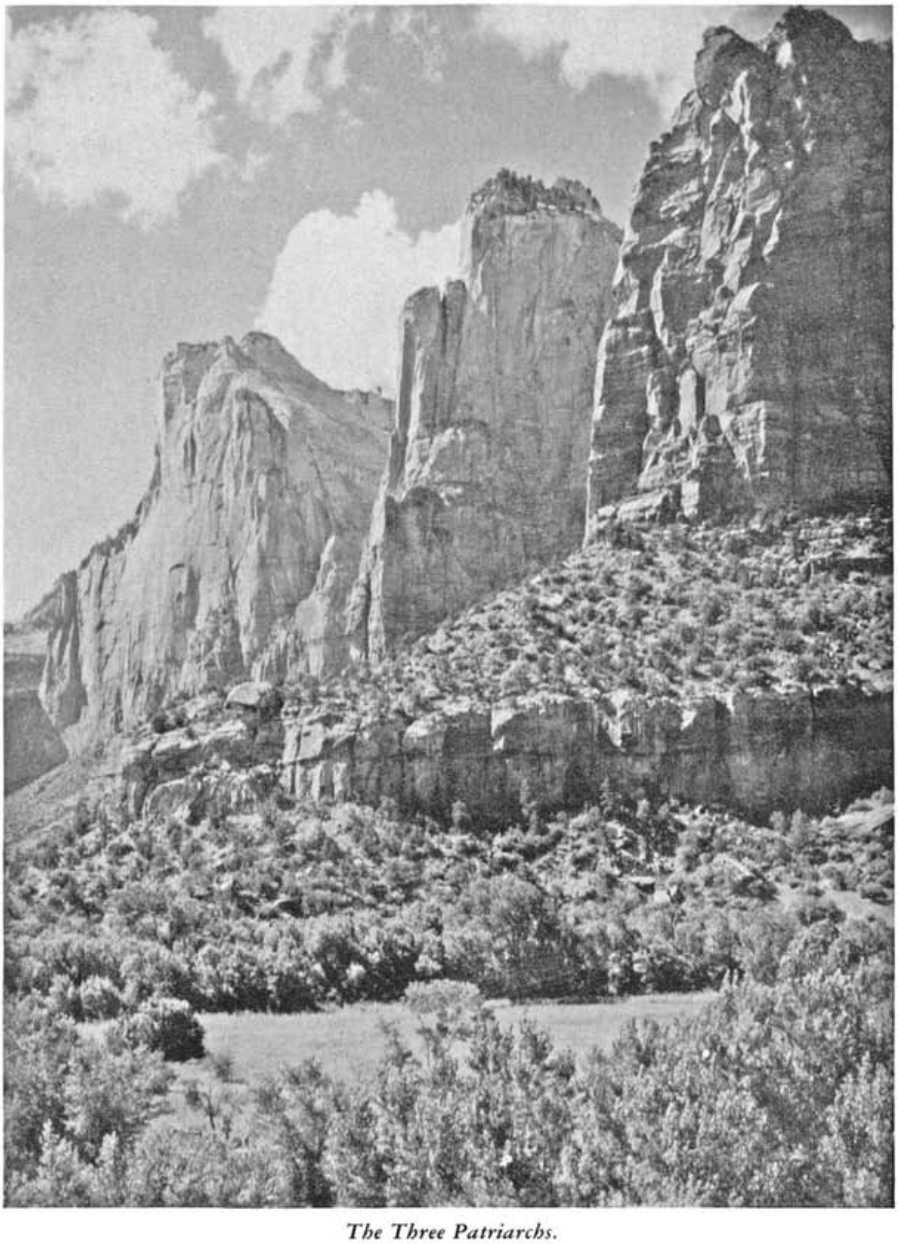
The representative of the National Park Service in immediate charge of Zion National Park is the superintendent, whose post office address is Springdale, Utah. All comments regarding service in the park should be addressed to him.

Naturalist Service

During the summer season ranger naturalists conduct parties into the field to interpret the natural features of the area several times daily, leaving the Temple of Sinawava according to schedules posted by the naturalist service. Evening lectures on the natural features of the park are also given daily by ranger naturalists. Schedules of nature walks, lectures, and other activities are posted in public places throughout the park. All visitors are urged to avail themselves of this free service.

Museum

The National Park Service has established an official information



The Three Patriarchs.

office and museum at park headquarters which is open daily throughout the year. Here park visitors may secure information and publications regarding this and other national parks free of charge. The museum exhibits are arranged to give a general idea of the outstanding features of Zion National Park. These exhibits cover such subjects as geology, biology, archeology, and history.

Free Public Campgrounds

Free public campgrounds are maintained throughout the year for visitors carrying their own equipment. Camping is limited to 30 days a year for each party.

Accommodations and Expenses

An attractive lodge is operated by the Utah Parks Co. from about May 30 to September 25. It consists of a central building and a number of cabins. Rates (European plan) start at $2.25 per day for 1 person in "standard" cabins; $6 per day for 1 person in the "de luxe" cabins (private bath, porch, and fireplace). Meals in the lodge dining room are table d'hôte: breakfast, $1; luncheon, $1; and dinner, $1.75. Children under 8 are allowed half rate for meals.

There is also a cabin development, which is open all year. Here may be found a cafeteria, food store, and sleeping and housekeeping cabins. Rates for sleeping cabins with private shower and toilet start at $3.50 per day for 1 person.

Transportation

Motorbus transportation and all-expense tours to Zion, Bryce Canyon, and the North Rim of Grand Canyon National Parks, the Kaibab Forest, and Cedar Breaks National Monument are furnished by the Utah Parks Co., Cedar City, Utah, during the summer season and by special arrangement throughout the remainder of the year. An automobile trip from Zion Lodge to the Temple of Sinawava is offered for $1 during the summer season.

Saddle Horses

Saddle horses may be hired for $2.50 for 2 hours or less, $4 for 2 to 4 hours, $6 for 8 hours. Escorted trips to the East or West Rim of Zion Canyon are made daily; the cost is $6 per person. Escorted half-day horseback trips to The Narrows or Angels Landing are $4. Special guide service, when available, may be obtained for $6 a day or $4 for a half day or less. Riding outfits for women may be rented at the lodge.

Rates shown are those authorized for 1947. They are subject to change, but the latest approved rates may always be obtained from the superintendent or park concessioner.

Post Office and Communication Service

Zion Lodge is provided with post office and telegraph service. Long-distance telephone service is available at both the lodge and cafeteria. The summer post office address is Zion National Park, Utah; during the remainder of the year it is Springdale, Utah.

Miscellaneous Services

In the lodge, fountain service is available. A full line of photographs is on sale and laboratories are maintained for developing and printing. Curios and post cards are sold here.

Garage service, including storage, repairs, tires, batteries, gasoline, and oil, is provided during the lodge season.

A registered nurse is on duty at the lodge during the season.

Rules and Regulations

[Briefed]

Park Regulations are designed for e protection of the natural beauties d scenery, as well as for the com- rt and convenience of visitors. The llowing synopsis is for convenient ference and general guidance of sitors;

Preservation of Natural Fea- res.—The parks are established imarily for preservation of natural ıtures. It is a violation of the law destroy or disturb flowers, trees, imals, etc., or to write on or other- se deface rocks and other natural ıtures. Hunting and the use of earms are also prohibited.

Camping.—Camp only in estab- hed campgrounds. Keep your camp :a clean. BE CAREFUL WITH RE. Picnicking in the galleries of on Tunnel is not permitted. Lunch- g and picnicking prohibited, ex- pt in public auto camp. Camping nited to 30 days.

Disorderly Conduct. — Proper nduct is required of all visitors for e benefit of others who are entitled get the fullest enjoyment from the rk.

Pets.—If you are carrying a dog, t, or other pet, you may take it into d through the park provided it is all times kept tied or confined thin the car. Pets are not permitted public buildings or on trails.

Trails.—Do not attempt to make ort cuts; to do so you may endan- r yourself as well as others using trails. Before attempting more dif- ficult trails seek advice from a park ranger.

Mountain Climbing.—Mountain climbing away from established trails may not be attempted without per- mission of the superintendent.

Automobile Regulations.—(a) *Permit.*—A charge of $1 for each auto- mobile is made at Bryce Canyon and Zion National Parks. One permit is good for both parks, and is good for the remainder of the year in which issued. House trailer fee, $1.

(b) *Careful driving.*—The roads in the park are built purely for scenic purposes, not as high-speed thor- oughfares. Observe speed limits and the usual rules of the road; keep to right; do not park on curves; pass cars going in the same direction only when the road ahead is clear and the vision unobstructed. Maximum speed limit, 35 miles per hour.

(c) *Lights.*—Because of mile-long highway tunnel, your car must have its lights in proper condition before you will be permitted to enter Zion National Park.

Penalties.—Maximum penalty for violation of park regulations is $500 and/or imprisonment for 6 months.

The park rangers are employed to help and advise visitors as well as to enforce regulations. When in doubt, ask a ranger. A complete copy of the park rules and regulations is on file in the superintendent's office.

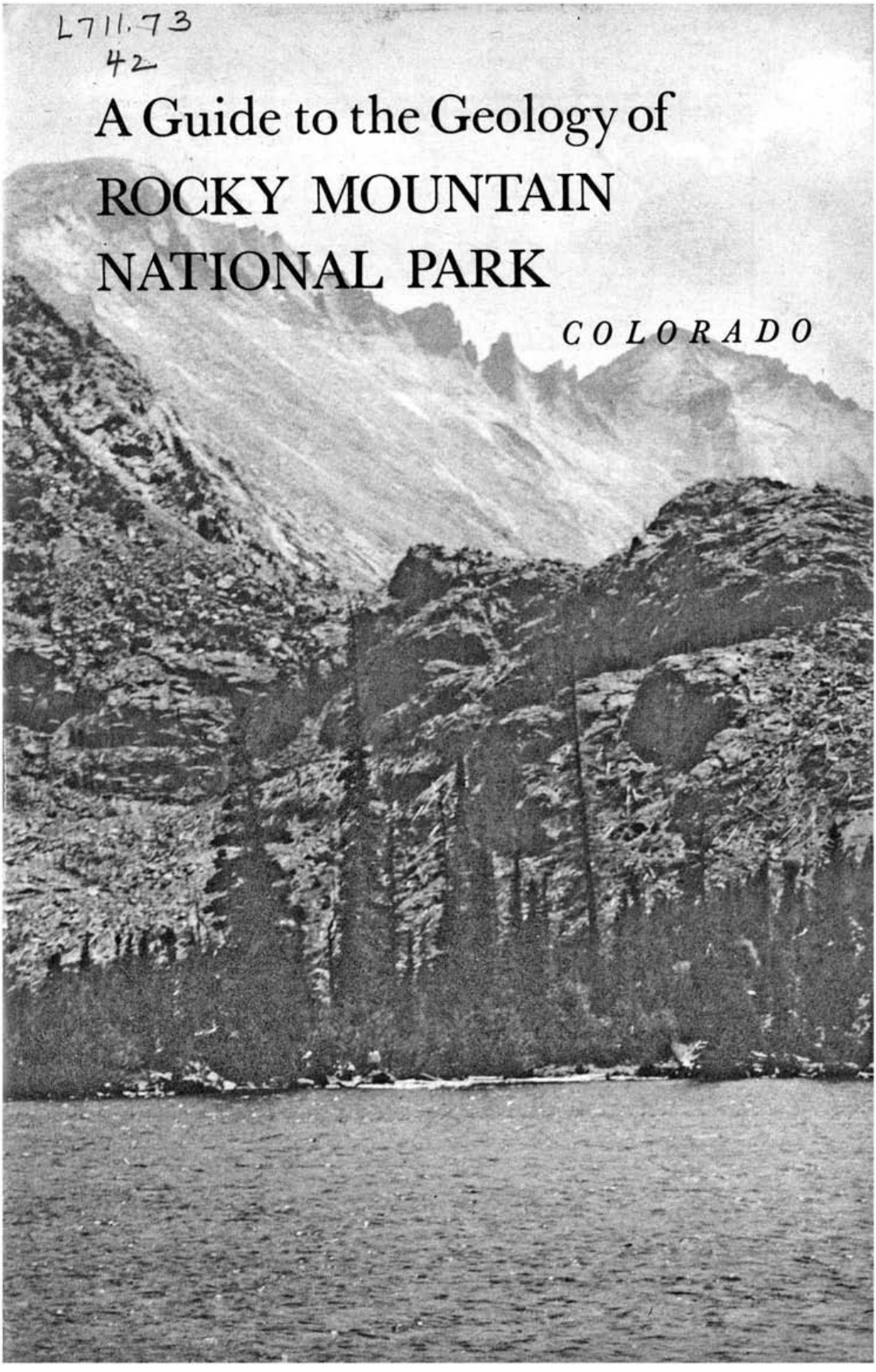
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A Guide to the Geology of ROCKY MOUNTAIN NATIONAL PARK

COLORADO



For sale by the Superintendent of Documents, Washington, D. C. Price 10 cents

A Guide to the Geology of ROCKY MOUNTAIN NATIONAL PARK

[*COLORADO*]

By Carroll H. Wegemann

Former Regional Geologist, National Park Service

UNITED STATES DEPARTMENT OF THE INTERIOR

HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE · NEWTON B. DRURY, *Director*

UNITED STATES

GOVERNMENT PRINTING OFFICE

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INTRODUCTION

WERE WE composing a history of this country we would select certain events as markers of time—the Gold Rush, the War between the States, the Custer Massacre—and would point to the wagon ruts of an old trail, a ruined fort, or a cavalry sabre as relics of these events. Were all written history and tradition lost, we would still know, from the marks of the trail across the plains that a great migration had taken place, that the ruined fort indicated a battle, and that the old sabre, picked up on the Little Bighorn, meant the presence of cavalry.

So it is with the history of the earth, which we call geology. A great volcanic eruption took place long before the coming of man. We do not need tradition to tell us of the event; we see the crater and the hardened lava flow.

Most of us take the world for granted. We do not stop to consider the forces which produced the familiar landscapes nor the series of events which the hills and the rocks record. But for him who observes closely, and carefully pieces together his scattered observations, there gradually unfolds a picture of earth history so vast in its span of time that it staggers imagination. If the information presented in the following pages affords the visitor to Rocky Mountain National Park a brief glimpse of this history, revealing to him the origin of the grand scenery which he admires, it will have accomplished its purpose.

Major divisions of time and their approximate duration	Dominant life	Events in Rocky Mountain National Park	
Cenozoic Era 60,000,000 years	Ice Age or Age of Man Mammals	Erosion cuts canyons and lowers plains forming present Rockies Lava flow and regional uplift Erosion levels First Rockies Uplift of First Rockies	
Mesozoic Era 140,000,000 years	Reptiles	Deposition of marine and fresh water sediments	Cretaceous Period Jurassic Period Triassic Period
Paleozoic Era 400,000,000 years	Amphibians First land animals and plants First fishes Shell fish	Deposition of Permo–Pennsylvanian and Permian sediments Erosion levels mountains Deposition of Fountain Formation Mountains uplift The region was a land area throughout much of the Paleozoic and there were no deposits before those of the Fountain Formation of the Pennsylvanian Erosion levels mountains	
Pre-Cambrian Era 1,400,000,000 years	Primitive sea life	Mountain uplift, intrusion of granite Deposition in an ancient ocean of sediments which were later changed to schists	

Figure 1.—Geologic Time Scale

A Guide to the Geology of Rocky Mountain National Park

BASIC FACTS ON GEOLOGY

AT THE outset we must know a few basic facts which we will use in our examination of the park. The features of the earth's surface, such as mountains, hills, and valleys, have been carved largely by the action of water and ice. Incredible as it may seem, streams can wash away entire mountain ranges. Their rushing waters first cut deep valleys, then widen their floors, then, through the action of tributaries, cut away the divides between, until at last the mountainous surface is reduced almost to a plain. If the process is interrupted by uplift of the land before the plain is completed, and the streams thereby given more fall, the cycle begins all over again with the renewed cutting of deep valleys.

Obviously, streams can work more rapidly in soft rock than in hard. The same stream may excavate a broad plain in easily eroded beds in the same time in which it can cut only a narrow gorge across a mass of granite. The excavation of the plain leaves the granite rising in hills or mountains above the stream-cut lowland.

Rocks may be divided into three great classes: Igneous, or those cooled from a molten state; sedimentary, or those deposited by water, wind, or ice; and metamorphic, or those formed by heat and pressure from the other two. The sedimentary rocks are derived from the igneous rocks through weathering and erosion, and, although originally deposited in horizontal layers, may later be folded into mountains by pressures within the earth. They and the igneous rocks are altered, by these pressures and the intrusion of molten rock, to coarse-grained gneiss and finer grained schist. The schists, in particular, which in Rocky Mountain National Park are formed from ancient sediments, can be distinguished by innumerable sparkling flakes of mica, which lie parallel to each other and cause the rock to split into thin layers.

Life has evolved slowly through the ages. That the remains of plants and animals may have become buried in the muds, limes, and sands, which later hardened into shales, limestones, and sandstones, is evident. As layer upon layer of sediment was deposited, animals which lived in

very ancient times were buried near the base of the series, whereas those which lived in later periods were buried near the top. It is possible, therefore, to determine the relative age of certain rocks by the fossils which they contain.

There was a time when the highest forms of life were shellfish, and later periods in which fishes and amphibians developed. All of these are grouped in the era of the Paleozoic or Old Life. The Paleozoic was succeeded by the Mesozoic or Middle Life in which reptiles, including the dinosaurs, were the dominant forms. This was succeeded in turn by the Cenozoic or Recent Life which is called the Age of Mammals.

The eras that have just been named are the ones concerning which we know most, for the record of the rocks is comparatively complete; but they account only for the last one-fourth of the earth's history. Before the Cambrian, which is the lowest division of the Paleozoic, the vast pre-Cambrian eras stretch into the dim past for perhaps 1,400,000,000 years (fig. 1).

Such estimates of the earth's age are not mere guesses. The discovery of radium has given a measure of time. Radioactive minerals undergo a very slow but constant change, the end product being lead. It is possible with such a mineral, which has been only partly changed to lead, to compare the weights of the lead and the unaltered mineral and to estimate the time required to make the change, thus determining the age of the deposit.

THE OLDEST ROCKS OF THE PARK

WITH THE foregoing brief outline of geology we are now in position to examine with greater interest the park which is the object of our study.

The oldest rocks of this region are dark schists which carry innumerable sparkling flakes of black mica. At one time these rocks must have been deeply buried within the earth for they have been so changed by heat and pressure that their original nature is not easily determined. They represent the sediments of an ocean which covered this region almost a billion years ago, a time so vast that the human mind fails in comprehension of it.

Judging from exposures along Thompson Canyon on the Loveland Road, these beds are thousands of feet in thickness. In their formation enormous amounts of rock were eroded from some ancient land by streams and piled layer upon layer on a sea floor which sank slowly as the weight upon it increased. In that remote period there was no plant life upon the land to protect it against the fury of the floods, and erosion and deposition were probably more rapid than they are today. The beds which are now at the surface were thus buried by overlying sediments at depths of thousands of feet. Since their burial erosion has removed the sediments which once covered them, thus exposing them to view.

THE FIRST MOUNTAINS

AGES OF deposition were followed, near the close of the pre-Cambrian era (fig. 1), by uplift of the ocean floor caused by forces within the earth which are but little understood. The sea receded and mountains began to rise where it had been. They were not the Rockies but ranges vastly older. The uplift took place very slowly, so slowly in fact that the only indication of it was an occasional earthquake as some rock bed cracked under the irresistible pressure of the folding. There may have been volcanic eruptions when molten rock from some reservoir deep within the laboring earth found its way to the surface, but there was no life upon the land to be conscious of such disturbances.

That molten granite was injected into the ancient sediments is known, for it can be seen today in the light-colored bands and stringers which penetrate the dark schist. In some places the granite has pushed aside the older rock or has enveloped fragments of it in its mass until it appears, to the casual observer, as if the granite were the original rock and the schist the intruder. There are excellent exposures of both rocks on Longs Peak, and the granite has been called Longs Peak granite (fig. 2). These ancient rocks form the bedrock over most of Rocky Mountain National Park, the lava flows of Specimen Mountain being the one exception.

THE DESTRUCTION OF THE FIRST MOUNTAINS

Uplift and intrusion were followed by a long period in which, through millions of years, the solid rock of the mountains was slowly disintegrated



Photograph by Carroll H. Wegemann

***Figure 2.*—Longs Peak from the east. At the foot of the 1,500-foot cliff Chasm Lake occupies the bed of a glacial cirque, or collecting basin of a former glacier. Another cirque lies in the valley to the left. The white bands of rock on the walls of this valley are granite which, as molten rock, was forced between the layers of the darker beds. These dark rocks may be almost one billion years old.**

and washed away by the agents of weathering and erosion. Streams cut deep mountain canyons which were widened into valleys, and the mountains between slowly lowered until their towering summits were reduced to a rolling plain. The formation by erosion of such a plain must have taken place at comparatively low elevation, otherwise the streams would have had sufficient fall to continue the deepening of their valleys and to produce a rough hilly country rather than a plain.

There is good evidence that a rolling plain was produced. In the foothills of the mountains the rock beds, originally horizontal, have been turned up on edge by the mountain folding so that their edges can be examined. The top of the pre-Cambrian rocks on which the younger sedimentary rocks lie is here seen to be a plane surface which cuts across the old schists and granites and is obviously erosional.

NATURE OF PALEOZOIC DEPOSITS INDICATES PRESENCE OF SECOND MOUNTAINS

THIS REGION appears to have been one of the last parts of the old plain to be covered by the advancing seas, for the rocks, which, at the mouth of Thompson Canyon rest upon the ancient schists, are of the age known as Pennsylvanian or late Paleozoic. These Pennsylvanian beds dip away from the mountains and are overlain by progressively younger beds which outcrop farther east. The Pennsylvanian beds are of brick-red sandstone and conglomerate and are named the Fountain formation. They apparently represent sand and gravel washed out of mountain canyons and spread by streams along a seacoast at the base of the mountains. A range of mountains, therefore, must have been uplifted at that time. That the mountains were of considerable height is shown by the thickness of the deposits derived from them. It is from the nature of these beds that the presence of the mountains is inferred. Other evidence is lacking, for erosion entirely destroyed these mountains by the middle of the Mesozoic era at which time the entire area was covered by the Cretaceous sea.

THE ROCKY MOUNTAINS

WE NOW come to a consideration of the formation of the Rocky Mountains, which are entirely distinct from the older mountains of the pre-Cambrian and Paleozoic, their only relation to the earlier ranges being that they were formed along the same zone of weakness in the earth's crust. It would have been possible to omit, in this brief account, all mention of the earlier mountains had it not been that their formation,

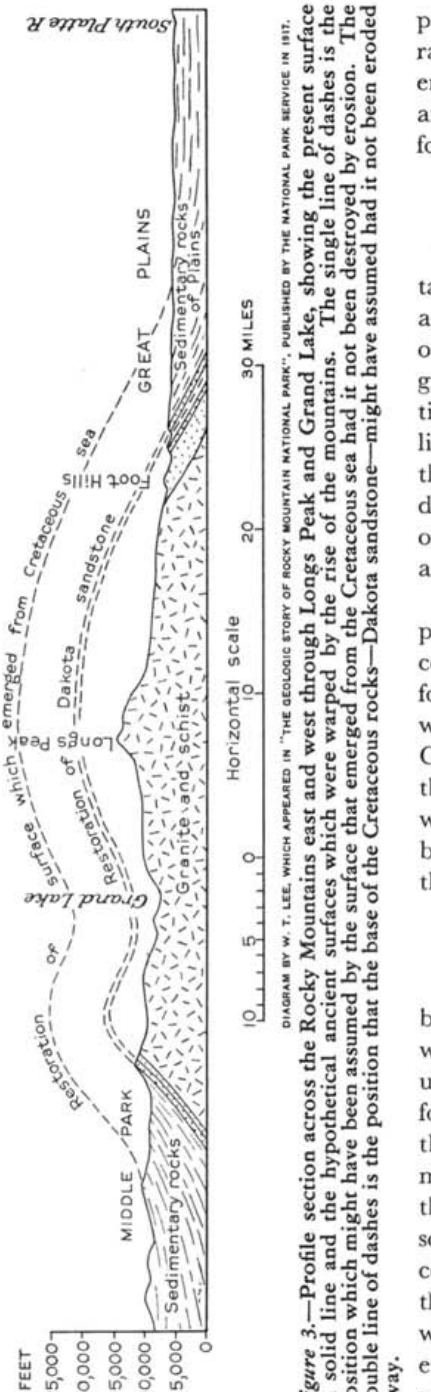


Figure 3.—Profile section across the Rocky Mountains east and west through Longs Peak and Grand Lake, showing the present surface in solid line and the hypothetical ancient surfaces which were warped by the rise of the mountains. The single line of dashes is the position which might have been assumed by the surface that emerged from the Cretaceous sea had it not been destroyed by erosion. The double line of dashes is the position that the base of the Cretaceous rocks—Dakota sandstone—might have assumed had it not been eroded away.

particularly that of the pre-Cambrian ranges, explains the origin and presence at the surface of so large an area of the schists and granites which form the principal rocks of the park.

TIME AND FORM OF THE MOUNTAIN FOLDING

The growth of the Rocky Mountains began about 60,000,000 years ago at the close of the Mesozoic era or the Age of Reptiles. In fact, the great changes in climate and vegetation produced by the mountain uplift may have had much to do with the extinction of the cold-blooded dinosaurs and the rapid development of the smaller but more intelligent and warm-blooded mammals.

The uplift of the mountains took place very slowly but was of magnificent proportions. It assumed the form of a great fold or arch (fig. 3) which involved not only the pre-Cambrian schists and granites but the thousands of feet of sedimentary beds which had been deposited upon them by the seas that repeatedly covered the region.

EROSION FOLLOWED BY REGIONAL UPPIFT

No sooner had the first Rockies begun to rise than erosion began its work of destruction. During the uplift and in the long period which followed, some 10,000 feet, or a thickness of almost 2 miles of sedimentary rock, was washed away from the top of the arch, until the ancient schists and granites which formed the core were uncovered and carved by the mountain streams. This core was bordered on either side by the eroded edges of the sedimentary beds which were left dipping away from



Photograph by Carroll H. Wegemann

***Figure 4.*—Ancient erosional plain (the Upper Flattop peneplain) southeast of Iceberg Lake on Trail Ridge Road. This plain is believed to have been formed at a much lower altitude, by streams, and to have been raised to its present elevation of 12,000 feet by the last uplift of the region. Terra Tomah Peak on right, Stones Peak in center, and Longs Peak in left distance. Note slight terracing of surface below road at left due to sliding of the wet soil on sloping bedrock.**

the axis of the great arch of which they had formed a part.

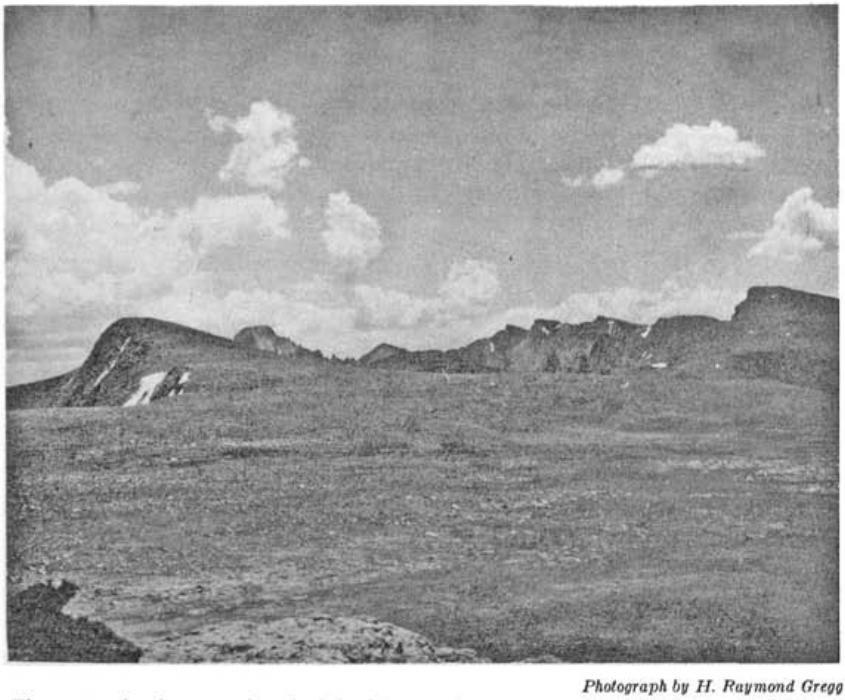
The final result of this erosion was the formation of a rolling plain of moderate elevation, above which rose low, rounded mountains 1,000 to 2,000 feet in height. The disintegrated rock which was washed away by the streams was spread as a blanket of sand and clay east of the mountains and today forms part of the rocks of the Great Plains.

The erosion of so vast an amount of rock by streams may seem fantastic, but figure 3, page 5, illustrates the evidence upon which the statement is founded. It will be noted that the thickness of the sediments upturned along the flanks of the range can be measured. Most of these sediments belong to the Mesozoic era and, since they have much the same characteristics on both sides of the range, they probably were put down in the same body of water rather than in two separate seas divided by a land barrier. In other words, there were no mountains here when these sediments were laid down, and consequently the sediments were deposited across what is now the range. As they are 10,000 feet thick on the sides of the present range, they probably had about the same thickness over what is now the crest, and inasmuch as they are not found on the crest of the mountains, the entire 10,000 feet of rock must have been removed by erosion. The time required for so gigantic a task as the removal of a lofty mountain range is difficult to comprehend. It may well have been many millions of years.

The evidence that a rolling plain was developed by the erosion of the Rockies after their first uplift can be seen on the mountains themselves.

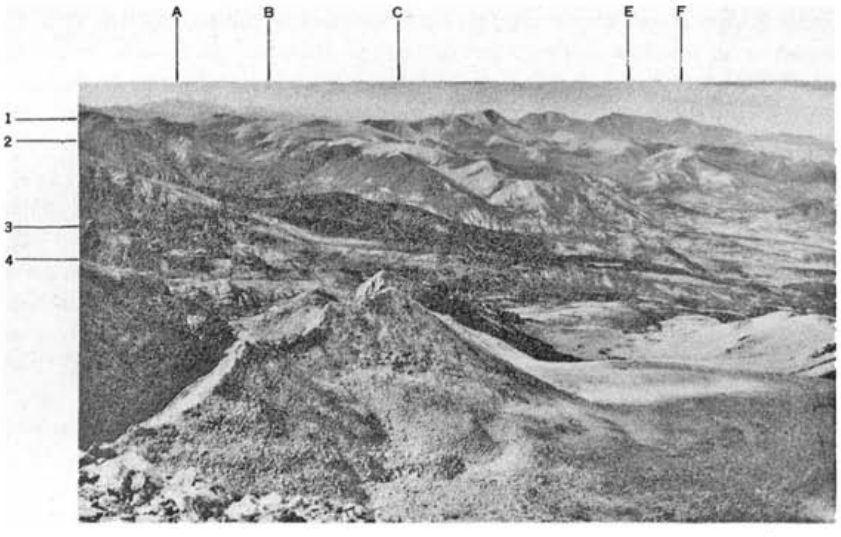
Trail Ridge Road above timber line traverses a rolling upland (fig. 4) which is in marked contrast to the rugged canyons cut into it from the east. Part of this upland surface forms the top of Flattop Mountain (fig. 5) and for this reason the entire rolling upland has been called the Flattop peneplain, the term meaning almost a plain. There are really two surfaces, an upper and a lower, closely related in origin (p. 10). They are evidently erosional and appear to have been cut by streams which were flowing at a lower elevation and consequently had but little fall. As the surfaces now stand from 11,500 to 12,000 feet above the sea, they must have been raised from the lower level at which they were formed to their present elevation by a series of uplifts which did not greatly fold or distort them. These uplifts affected not only the Rockies but also the adjacent Great Plains.

In observing the Upper Flattop surface one should try to forget the deep canyons which now dissect it and imagine the old surface as it must have been before the uplift which brought it to its lofty position and inaugurated the present cycle of canyon cutting. That the surface had not been entirely leveled to a plain, at least where the former mountains stood, is evident. Rounded hills perhaps 2,000 feet in height, the stumps of these mountains rose above this surface and are today represented by the higher summits of the range.



Photograph by H. Raymond Gregg

Figure 5.—**Ancient erosional plain (Upper Flattop peneplain) from Flattop Mountain, elevation 12,200 feet. Longs Peak in distance at left and Halletts Peak in left foreground, with snow at head of Tyndall Glacier.**



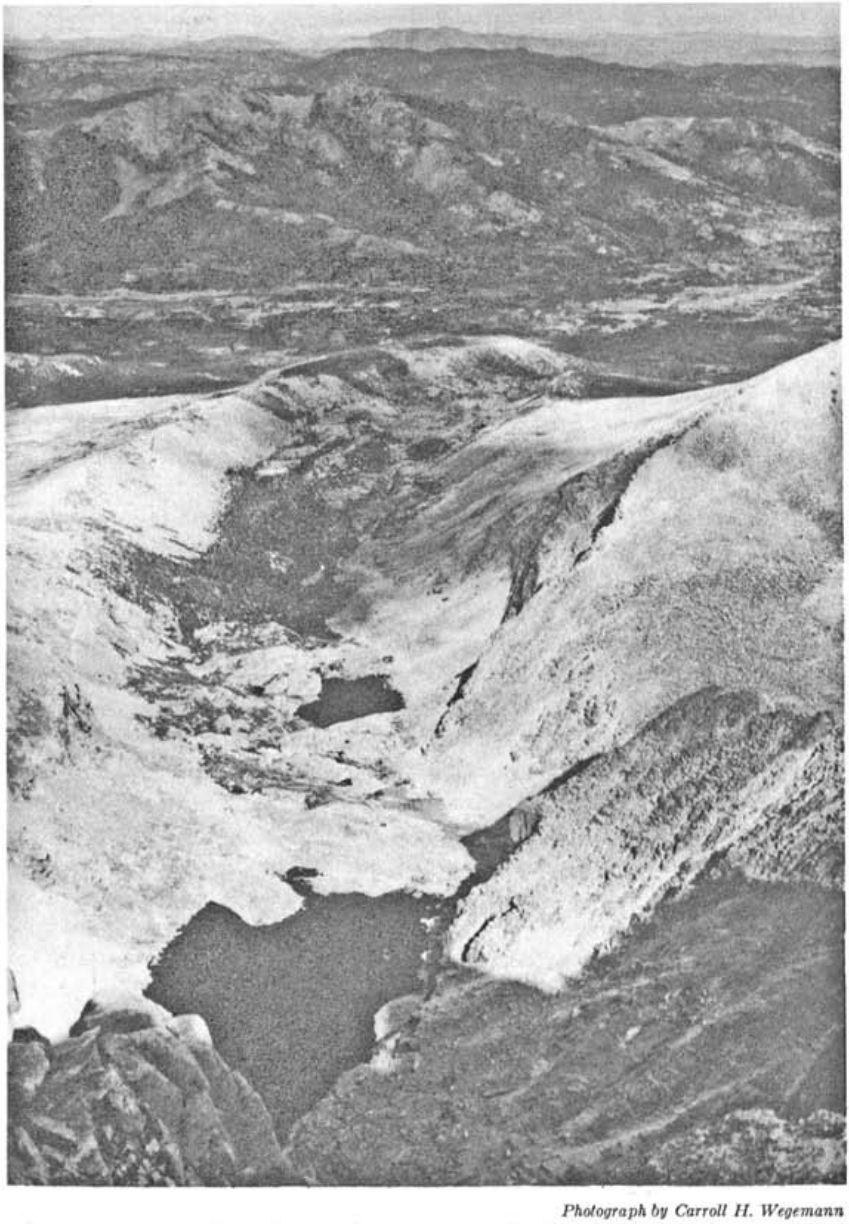
Photograph by Carroll H. Wegemann

Figure 6.—View northwest from Longs Peak. To the right is the Mummy Range (C. F), and to the left in the distance the Never Summer Mountains (A). Between them, above timber line, is the smooth rolling surface of Trail Ridge, the higher part of which (B–1), is part of the Upper Flattop peneplain (p. 7). The southeast end of the ridge (C–2) at timber line is a lower erosional surface corresponding to the bench at the head of Forest Canyon (p. 24). This surface can be traced northeast along the crests of the ridges (E–2, F–2). Sloping surfaces in lowland on right are glacial moraines (F–3) on one of which lies Bierstadt Lake (E–4).

It is possible that the present elevation of some of these hills above the old surface has been increased by faulting or bending of the surface during the long period of uplift to which the region has been subjected. For example, the peculiar flat top of Longs Peak, which is considered by some authorities to be part of the old surface, lies some 2,000 feet above that surface and may owe its elevation to greater movement in the vicinity of the peak than has taken place in the adjacent area.

EVIDENCES OF INTERMITTENT UPLIFT

As to the nature of the uplift which followed the formation of the Upper Flattop peneplain some interesting observations may be made. About three-fourths of a mile northwest of Iceberg Lake on Trail Ridge Road the highway turns abruptly to the northeast. From the observation point at the turn there is an excellent view to the southwest across the head of Forest Canyon (see p. 24, point 1.0 mile). On the southwest side and extending to the rim of the canyon is a broad bench at an elevation of about 11,500 feet or about 500 feet below the average level of the higher plain. This lower level appears also on the southeast end of Trail Ridge just above timber line (fig. 6, C–2) and on the crests of several ridges southeast of the Mummy Range (fig. 6, E–2). It is evidently an erosion surface, similar to that of Flattop, and has been termed by Van Tuyl and Lovering



Photograph by Carroll H. Wegemann

Figure 7.—Chasm Lake and valley from Longs Peak. The valley was once occupied by a glacier which excavated the cirque in which the nearer lake lies and deposited the great lateral moraine on the left up which the trail runs. From this trail the view shown in figure 2 was taken. Note that the distant mountains rise to a common level which represents one of the old erosion surfaces described on page 10.

(p. 32) the Lower Flattop surface. Its presence may be interpreted as follows: After the formation of the Upper Flattop surface the general region was raised gradually about 500 feet. This uplift increased the fall of the streams and enabled them to begin the erosion and destruction of the Upper Flattop surface which they themselves had made. Their work progressed rapidly in the soft rocks east of the mountains, but proceeded more slowly in the mountain granites. The streams had already deepened their valleys as much as fall would permit, and were widening the valley floors through side cutting in their winding channels, when renewed uplift forced them to begin once more the deepening of their valleys. The bench at the head of Forest Canyon is part of one of the broad valley floors formed after the initial uplift.

During the many millions of years which have elapsed since the formation of the Flattop surface the cycles of uplift and erosion have been repeated a number of times. In Rocky Mountain National Park remnants of several erosional surfaces are preserved in the level tops of certain mountains and plateaus. For example, the summits of Deer Mountain (fig. 15) and The Needles are parts of an old erosion surface which now stands at an altitude of about 10,000 feet. The plateau west of Gem Lake, north of Estes Park, and the top of Prospect Mountain just south of the village are parts of another erosion surface which has been raised to 9,000 feet. The even-topped summits 10 miles east of Longs Peak (fig. 7) are at the same level. The top of Castle Mountain represents a surface 300 feet lower at 8,700 feet. Each of these surfaces marks a pause in the great uplift which has raised the Rockies and the western Great Plains to their present altitudes.

Today a comparatively recent uplift, which began sometime in the Pliocene and may even now be continuing at intervals, has given the streams power to deepen the mountain canyons, and at the same time plane down the soft rocks of the lowland, which lies east of the mountain front. The mountains tower above the lowland because their rocks are hard and resistant to erosion, and because the broad uplift of the region has given the streams power to wash away the soft rocks of the lowland.

THE GREAT ICE AGE

WE HAVE now brought our history of the park down to a series of events which took place in comparatively modern times, geologically speaking; that is, within the last million years. This epoch is called the Ice Age, or the Pleistocene.

About one million years ago the climate of the earth grew cold—just why is not known. Probably it was owing to a combination of causes, one of which may have been a variation in the amount of the sun's heat due to sun spots. It was cold enough so that in regions of heavy snowfall,

like that around Hudson Bay, the snows of one winter did not entirely melt in the following summer. Snow fields began to accumulate, and as they grew in depth the snow was turned to ice by compaction.

CONTINENTAL GLACIERS

The great fields resembled the present ice caps of Greenland and the Antarctic. They were thousands of feet thick, and the ice at the base, unable to support the weight of the ice above, was squeezed out in all directions, gradually spreading until it covered much of the northern part of the continent. These great ice sheets were known as continental glaciers. The force of their flow was determined by the thickness of the ice in their areas of accumulation; they could not move into the higher altitudes and so never reached Colorado.

There were five separate cold periods and five different advances of the ice sheets, separated by extended warm periods in which the glaciers melted back or entirely disappeared. These interglacial periods had durations of from 25,000 to 325,000 years.

The last or Wisconsin Ice Sheet as it is called, melted away only 25,000 years ago, and the world today may be experiencing an interglacial period. In this case another ice advance is to be expected sometime in the distant future.

VALLEY GLACIERS

At the time that the great ice sheets were spreading over the northeastern part of North America, valley glaciers accumulated in the mountain gorges of the Rockies and moved down these stream-cut valleys as rivers of ice. They were in no way connected with the continental ice sheets, except that they accumulated during the same cold periods and presumably can be correlated with them. To these ancient ice rivers is due much of the magnificent scenery of the present mountains, particularly the perpendicular cliffs, towering peaks, and the beautiful lakes which lie between.

Only two of the possible five different advances of the valley glaciers can be definitely recognized in the park by differences in the weathering and decay of the gravel and boulders which the ice carried frozen in its mass and which were deposited when the ice melted. This is true because the last glaciation destroyed all evidences of the earlier advances, except in places where the earlier glaciers extended beyond the limits of the last advance of the ice. But we are getting ahead of our story; we should begin by describing the accumulation and flow of valley glaciers.

Snow will accumulate to the greatest depths where the snowfall is greatest and where the temperature is sufficiently cold to prevent melting. Such conditions are found near the heads of mountain valleys. Here, even in the comparatively mild climate of the present, the snow is drifted by the strong

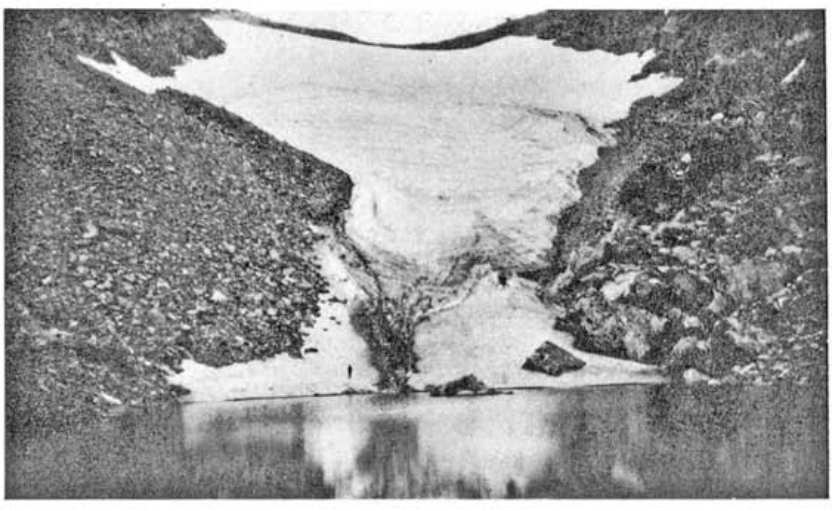
west winds of winter into the heads of valleys east of the divide where it feeds such modern glaciers as Tyndall and Andrews. If you have time by all means visit these glaciers which lie about 5 miles from Bear Lake. You may need horses, but the trip is well worth while.

Let us assume that you have climbed up the trail to the Flattop peneplain, covered with its angular boulders, and stand on the edge of the cirque of either Tyndall or Andrews Glacier. The cirque is the great bowl-shaped depression cut by the ice at the head of the valley. In it the snow accumulates and by its own pressure is hardened into ice. As the snow and ice increase in depth, their weight proves too much for the strength of the ice at the base and this is squeezed outward and begins its flow down the steep valley floor. Bear in mind that the valley was first cut by streams and that the glacier is merely taking advantage of the channel thus prepared for it.

On the valley floor underneath the ice are loose rocks and boulders. The great weight of the ice above presses the basal ice around these until they are enveloped by it and carried down the valley as the ice advances. As they are scraped along over the bedrock they grind and polish it, leaving long scratches which indicate the direction of the ice flow. The grinding rocks are themselves ground smooth on the side which is down, and occasionally, striking some obstruction, may be turned over in the moving ice and ground on another side. Thus, instead of being rounded as in a stream, they are ground with angular sides or facets and are termed "faceted boulders." The grinding of the rocks upon each other produces a white powder or "rock flour" which gives to the waters that flow from the melting ice a peculiar white chalky appearance. Upon reaching the first lake below the glacier the coarser particles settle out and the remaining suspended particles cause the water to appear blue in color.

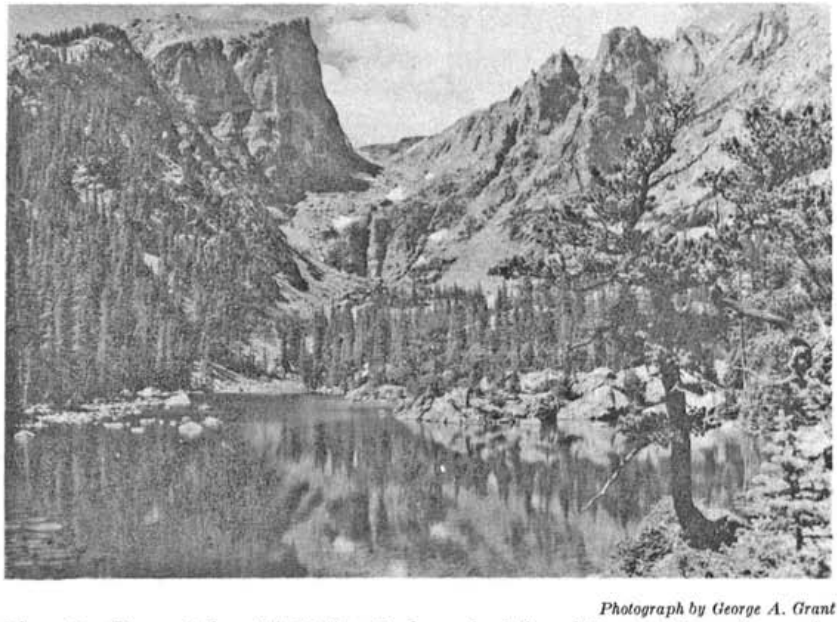
As the glacier grinds down the valley, sweeping away projecting points of rock and straightening its course, the cliffs are undercut and rock slides pour masses of earth and rock fragments upon the surface of the ice. As the ice continues its flow it comes into lower and warmer altitudes until finally the point is reached at which the ice melts as rapidly as it advances. Here the load of boulders, gravel, and sand which it carries is piled in a ridge along its melting front. Such a ridge is called a terminal moraine. The material which is plowed up and dumped along the sides of the glacier is called the lateral moraine (fig. 7).

If the general climate grows warmer after a terminal moraine is formed, the ice front melts back until it stands at a higher altitude. At this point where melting and rate of advance just balance, another terminal moraine is built. Such a moraine is called a recessional moraine. Most of these moraines form natural dams across the valleys, producing the lakes for which this mountain country is famous (fig. 16). Where several recessional moraines are present a series of lakes may be formed, such as the series in the valley below Tyndall Glacier (fig. 9). At the foot of Andrews Glacier is the lake of figure 8. The recessional terminal moraine forming the dam



Photograph by Carroll H. Wegemann

Figure 8.—Andrews Glacier from the terminal moraine below the lake. This small glacier extends but little beyond the cirque or rock basin in which its snow and ice accumulate. That the movement of the ice is greater in the center than on the sides is shown by the curved lines formed by dust upon the surface.



Photograph by George A. Grant

Figure 9.—Dream Lake with Hallett Peak on the left and Flattop Mountain on the right. In the center is the valley below Tyndall Glacier. This was originally stream-cut but has been reshaped by the glaciers of the Ice Age. Note that the valley is U-shaped in cross section, that it has been smoothed and straightened by the grinding away by the ice of projecting points of rock, and that its floor is covered with glacial boulders.

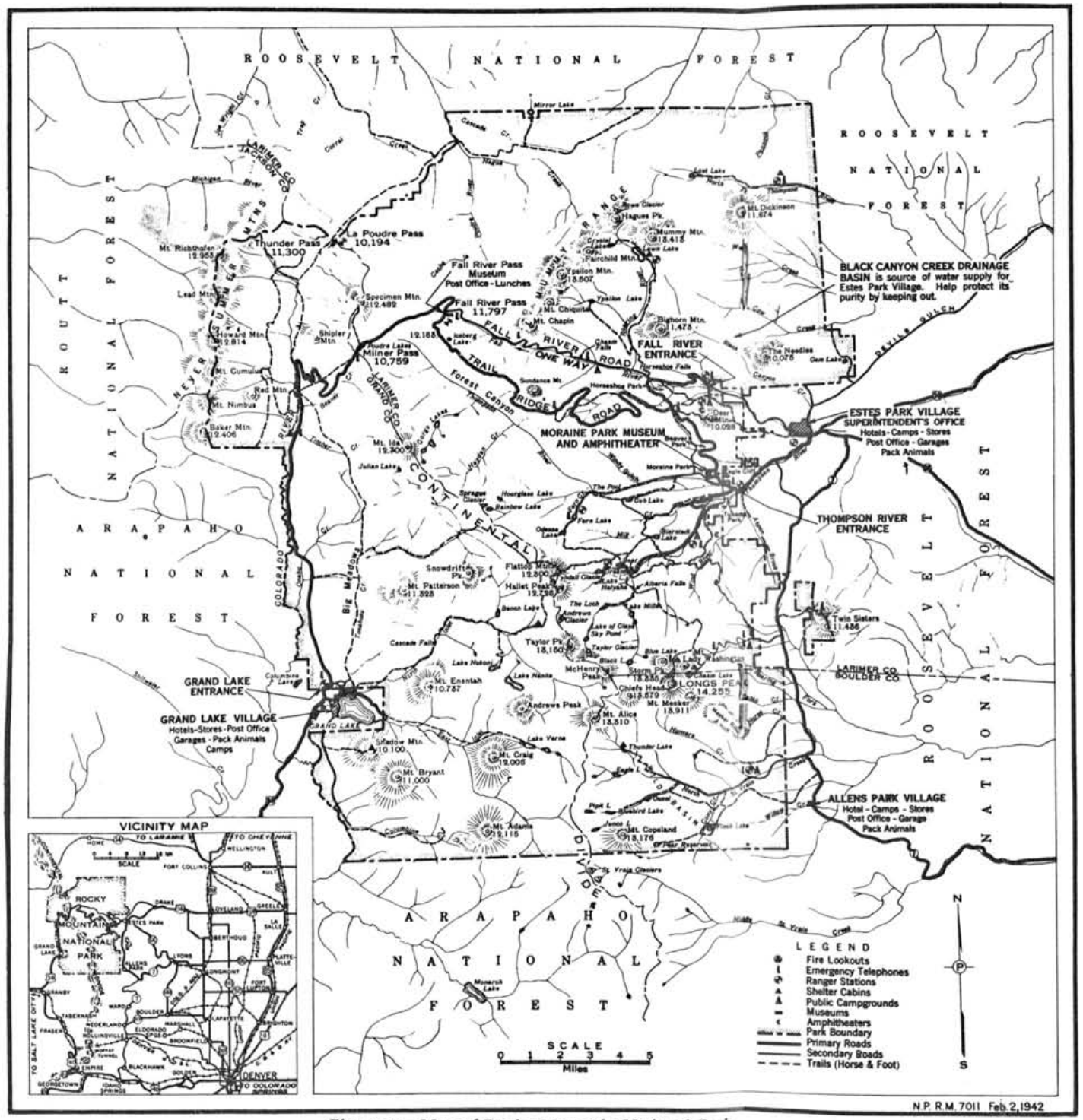


Figure 10.—Map of Rocky Mountain National Park.

Points of Interest Along Park Roads

THE TRAVELER, without knowledge of geology, should read what has gone before if he would understand fully the descriptions starting on page 18, road logs. One fact in particular has been stated several times and should be kept constantly in mind: the mountains and valleys have been carved by water and ice, and in the process thousands of feet of rock have been removed from the surface so that, with the exception of the lava flows, the bedrock now at the surface was at one time deeply buried within the earth.

We are now prepared to apply our knowledge in examining points of interest as we drive along the major park roads. A convenient place of beginning is the Thompson River Entrance on the east side of the park. Set your speedometer at 0.0 at the checking station, which is about 3.5 miles southwest of the town of Estes Park. (See Road Logs, p. 18.)

of sand, gravel, and boulders which impounds this lake can be clearly seen from the cliff above the glacier.

The peculiar shape of the valleys below Tyndall and Andrews Glaciers may be noted. Although originally stream cut, they no longer have the typical V-shape of stream-cut canyons, but are U-shaped in cross section. This shape is typical of glaciated valleys and is due to the gouging action of the ice, which lowers the floor of the valley at the same time that it grinds out its sides (fig. 9).

Let us now turn our attention to the surface of the ice itself. Dust and dirt have accumulated on it and, as the ice moves, these have been concentrated in streaks which bend downward near the middle of the glacier showing that the flow is more rapid in the middle than on the sides because of friction against the rock walls (fig. 8).

The valley floor beneath the glacier is apparently uneven, and the ice therefore moves forward over a series of levels and steep slopes like a river cascading over rapids with smooth reaches of water between. This peculiarity of glaciers is much more apparent on long glaciers than on such small ones as we are examining, and it is responsible for the formation of cracks or crevasses which occur where the ice breaks as it flows over the crests of the steep slopes. These crevasses, where covered and concealed by drifting snow, are extremely dangerous to one traversing the surface of a large glacier. They lead downward to depths of 50 feet or more and in some places open into ice caves through which sweep streams of water formed from the melting ice.

Irregularities in the rock floor over which the glacier moves may be caused by differences in hardness of the bedrock or by the presence of zones of fractures in the ancient rocks of the mountains. Such zones weaken the rocks and make them less able to withstand erosion. Water from the melting ice on warm days seeps into the fractures and on freezing tends to loosen fragments of the rock. These fragments are plucked out by the pressure of the moving ice, thus lowering the valley floor in the fracture zones more than in the unfractured rock and causing the steep inclines. Where two glaciers join, the increased amount of ice below the junction increases the erosive power of the glacier and produces the same effect.

Mention has been made of the cirque or basin-like depression at the head of a glacier. Apparently this is formed by the plucking action of the ice, just described. It is the point at which the glacier begins its work, and it is the last retreat of the shrinking mass of ice as it melts away when the climate changes. In brief, it is the point at which glacial action is longest continued. As the ice plucks out more and more of the loosened rock fragments which its freezing waters pry apart, the glacier eats its way back into the mountain at the head of the valley and in doing so produces a cliff by undermining. After the ice entirely melts away the peculiar shape of the basin or cirque thus formed is apparent.

One of the finest examples of such a cirque is that above Chasm Lake

on the northeast side of Longs Peak (fig. 2). The vertical cliff which forms the wall of this cirque is more than a quarter of a mile in height. During the Ice Age, Longs Peak was surrounded by several glaciers, the cirques of which cut back into the mountain on all sides. The spectacular scenery of the peak's lofty cliffs is due entirely to this cutting by ice. Another fine example is the cirque on Sundance Mountain to be seen from Trail Ridge Road just above Rainbow Curve (fig. 11). These are cited merely as examples, for cirques are to be seen almost everywhere in the higher parts of the park.

Whether the glaciers of today date back to the Ice Age is a difficult question to answer. They may be the last remnants of those ancient rivers of ice, slowly dying in the warmth of the present climate; or, due to some change in temperature or wind direction, they may be newly arrived in the valleys left vacant by their predecessors. One likes to believe that the first interpretation is the true one.



Photograph by Carroll H. Wegemann

Figure 11.—Sundance Mountain from Trail Ridge Road above Rainbow Curve. The basin cut into the mountainside is the cirque or gathering basin of a former glacier. In its formation water freezing in crevices of the rock pried off fragments by its expansion and these, enveloped by the glacial ice, were carried away as the ice moved. The cirque was thus constantly enlarged and the great cliff at its back maintained by rock falls due to undercutting. Most of the cliffs in the park are the work of former glaciers.

Road Logs

THOMPSON RIVER ENTRANCE TO DEER RIDGE JUNCTION

Miles

0. 0 Thompson River Entrance, Rocky Mountain National Park. Just beyond the entrance the road to Bear Lake turns abruptly left, crossing Thompson River to Camp Woods in Tuxedo Park. Keep straight ahead on road to Moraine Park. The gravel and boulders on the right belong to the moraine of a glacier older than the last or Wisconsin stage of glaciation. This glacier flowed down the Thompson Valley and spread its deposits beyond the limits of the later glacier (see p. 19, point 2.4 miles).

0. 1 Steep grade around the base of Eagle Cliff. Dark schist with intrusions of white pegmatitic granite (granite containing large crystals) is exposed in road cut on right. Note the shining crystals of black mica in the schist which lie in parallel planes and cause the rock to cleave readily in those planes. The granite has been intruded in thin layers along the cleavage planes of the schist and in places has broken across them. At bend in road is exposed a mass of granite which has welled up into the schist and is disintegrating due to the breaking down by weathering of the feldspar crystals which are present in it. Just beyond, a lense of pink and white granite from 2 to 6 feet thick has been intruded between the planes of the schist and dips to the east. Its color is due to the presence of both pink and white feldspar crystals.

0. 3 Crest of terminal moraine of the great glacier which during the Wisconsin or last stage of the Ice Age covered Moraine Park.

0. 5 Road follows base of terminal moraine which is banked against the foot of Eagle Cliff. Here the advance of the ice was halted by the cliff, and the gravel and sand carried by the glacier were deposited in a ridge as the ice melted.

0. 7 Junction with road to Stead's Ranch. Keep right. To the south rises the pine-covered south lateral moraine of the former Thompson Glacier. Its height indicates the height of the glacial ice which decreased toward the east as the ice melted in the warmth of the lower altitude. At the end of the former glacier the lateral merges with the terminal moraine.

To the north, beyond the groves of aspen, stretches the pine-covered north lateral moraine, its western end banked against the mountain at the mouth of the canyon down which the ice flowed. The top of this moraine, like that of the south lateral, slopes to the east, the inclined line of its crest being plainly visible against the mountain side.

The flat valley of Moraine Park (fig. 12) was the melting basin of the glacier and was occupied as the ice melted back by a glacial lake. The waters of this lake, impounded by the terminal moraine, were later drained away when the outlet cut through this natural dam. The present stream swings in broad meanders across the flat which was the lake bed, because it does not have enough fall to give direction to its waters. Rising from the flat in the distance is a rock island which the glacier was unable to destroy, although it ground down the west side to a gentle slope.

Around the east side of the lake the road follows what appears to be an old lake



Photograph by Carroll H. Wegemann

Figure 12.—**Moraine Park from the museum. The even-topped pine-covered ridge on the left is the south lateral moraine, or deposit of boulders, gravel, and sand, left by the former Thompson Glacier. Its height indicates the height of the glacial ice. The flat is the bed of a former lake, impounded as the glacier melted, by the terminal moraine which the glacier threw across the valley. Note the U-shaped gorge, in distance on right, down which the glacier moved.**

Miles

terrace or shore line formed by the waves when the lake stood at its initial high stage before the lowering of its outlet. As the outlet was deepened and the waters drained away, the lake established a new and lower shore line leaving the old terrace dry, to be cut away, in part, by the waves and stream erosion.

1. 1 Moraine Park Museum, on right, contains exhibits illustrative of Indian life, pioneer history, wildlife, and glacial geology.

1. 4 Begin climb of north lateral moraine (Wisconsin stage or last glacial advance) of Thompson Glacier. The open air amphitheatre is on the south side of the road.

1. 9 Road curve on crest of moraine.

2. 1 North base of lateral moraine (Wisconsin stage).

2. 3 Cross Beaver Brook.

2. 4 Road emerges from aspen grove in Beaver Park. Ahead are scattered pine trees growing on a low gravel and boulder ridge which is the north lateral moraine of an earlier glacier than that of the Wisconsin stage, the moraine of which has just been crossed. The older glacier was larger than its successor. It flowed down the Thompson Valley and occupied Moraine Park, but all evidence of it has been obliterated by the later glaciation except in Beaver Park and Tuxedo Park, where its moraines lie outside the area covered by the later ice. The gravel in these old moraines is very much weathered. In fact some of the stones can be crumbled in the fingers. The gravel has obviously been subjected to weathering for a period several times as long as that to which the practically unweathered gravel in the moraines of the last ice advance was subjected. The old lateral moraine can be traced for a short distance down the valley until it merges with the old terminal moraine which turns south and is banked against Eagle Cliff. The road follows the south side of the old moraine to the west.

2. 7 Curve to the right across the old moraine which is so low at this point as to be scarcely recognizable.

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2. 8 Dirt road leads left to Upper Beaver Park. Keep to the main road.

3. 1 Sharp curve to left on shoulder of Deer Mountain. From this point an excellent view can be had of the several moraines just described.

3. 3 Rock cut. A light-colored granitic dike containing large crystals of shiny mica, which separate in thin sheets, is well exposed on left and can be seen also on right. The dike represents molten rock which was intruded into the older rock at great depth and cooled so slowly that the large crystals had time to form before the molten rock solidified. Erosion has lowered the surface and exposed the granite.

4. 6 Second rock cut is through rusty colored granite which here stands in a ridge because it is harder than the rock on either side. From this point one may view the even-crested north and south moraines of the last Thompson Glacier. Longs Peak is the highest flat-topped summit dominating the skyline on the south.

DEER RIDGE JUNCTION TO FALL RIVER PASS VIA FALL RIVER

5. 3 Deer Ridge Junction. The left road is the usual route taken to Fall River Pass via Trail Ridge. The right road leads to the same pass by way of Horseshoe Park and Fall River. It is a narrow winding mountain road, but is safe for experienced mountain drivers. Beyond Chasm Falls it is open only to cars going up. By taking it one can make a circle trip, returning down Trail Ridge to Deer Ridge Junction. For this circle trip over the Fall River Road keep right. If you decide to take the Trail Ridge Road, keep left, and turn to page 29, point 5.3 miles using the left-hand mileage column and reading the descriptions of the various points in reverse order. In other words, read up on the pages.

5. 9 In the road cut on left large glacial boulders are seen resting on poorly exposed bedrock which originally formed the south side of the Fall River Valley. When the glacial ice moved down this valley it deposited its lateral moraine against the bedrock and the road cut has exposed the basal boulders. Some of these have been moved to protect the bank against erosion, but their position still marks the base of the moraine. Just beyond, the road crosses Hidden Valley Creek, the origin of which will be described from Rainbow Curve (see p. 27, point 9.3 miles) on the Trail Ridge Road.

6. 8 Base of lateral moraine on south side of Horseshoe Park. The flat valley, like that of Moraine Park, is the bed of a glacial lake impounded by a terminal moraine which crosses the valley 2 miles farther down. This stop is on an old lake terrace built by the waves when the lake stood at one of its higher stages.

6. 9 Edge of terrace, against which the waves broke after the lake level had been lowered by the deepening of the outlet through the terminal moraine.

7. 1 Cross Fall River. Just ahead the road forks. Take left road up valley, leaving Route 34.

7. 5 Fall River Lodge.

7. 8 Roaring River. The rapid fall of such side streams is due to lowering of the Fall River Valley by the last glacier. This left the mouths of the side valleys, which contained smaller glaciers or no glaciers at all, "hanging" so that their waters now reach the main valley by a series of cascades. It is evident that the valley of Fall River must have been lowered some 400 feet by the gouging of the glacial ice.

8. 5 Point of granite on right projects into valley. Below this point the road follows the foot of the north lateral moraine of the Fall River Glacier. In the narrow valley above, however, there is no moraine because the ice was so confined and flowed under such pressure between the granite walls that no gravel was dropped along the base of the cliffs. Nevertheless, some morainal material was banked high up on the valley sides.

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9. 0 Road to Endovalley Campground. Keep right.

9. 4 Chiquita Creek. Before the last glacier had deepened the valley of Fall River and thrown its lateral moraines across the mouths of its side streams, Chiquita Creek joined the main valley without a fall like any normal stream. Now, due to the work of the glaciers of the Ice Age, it cascades down to the main valley in a series of falls. The rock is coarse reddish granite.

9. 6 The granite ledge just above the road has been smoothed and polished by the stones frozen in the base of the glacial ice and ground across it by the glacier's flow.

9. 7 Pot hole on right next to road. This circular hole 2 or 3 feet in diameter was drilled by stones revolving in a whirlpool in some side stream which probably flowed at this level during, or just after, the last glaciation. Note that the main stream is several hundred feet below.

10. 0 First switch-back.

10. 2 Glacial polish on ledge just above road similar to that at 9.6 miles.

10. 4 Chasm Falls. The beautiful waterfall is about 25 feet in height and is drilling, at its foot, a pot hole similar to that at point 9.7 miles. From this the water drops about 5 feet into a second hole, the half-round side of which may be seen in the cliff above the water. About 20 feet downstream from the base of the main fall the remains of a third pot hole are to be seen. It is evident that the stream is literally drilling out its narrow gorge in the solid rock by revolving loose boulders in its whirlpools. As the cataract recedes, the upstream side of the last pot hole is cut away so that the half-round hollows in the walls of the gorge are all that remain.

There is glacial polish on the rock ledge just above the parking area.

10. 7 Here a perpendicular face of granite, some 20 feet long and 12 feet high, rises above the road. Its top is rounded and polished by the gravel and sand frozen in the ice of the former glacier. The rock was jointed or cracked during the uplift of the mountains and, after the polishing of the upper surface, large blocks were broken off along joint planes and carried away by the moving ice, leaving the smooth face of the joint exposed. This was later polished by the ice.

11. 0 Glacial polish is visible about 150 feet above the road showing the height of the former glacier.

11. 8 In line with the road is Mount Chapin. The banding of the old dark schist and the lighter granite, which as molten rock was intruded into the schist when both lay deep within the earth, is plainly seen. Mountain uplift and erosion have brought the rocks to the surface and erosion working along joint planes has carved the peculiar spires and pinnacles.

11. 9 Granite broken into blocks by joints. These were produced by the pressures and strains under which the rocks were placed during the mountain uplift.

14. 0 Surface of schist and intrusive granite beside the road. These rocks have been ground smooth by the glaciers for they formed the floor of the old glacial valley. The present stream flows in a gorge which it has cut since glacial time, leaving part of the old valley floor as a bench along which the road has been built.

The schist and granite were at one time so deeply buried within the earth that the pressure upon them from all sides exceeded the crushing strength of the rock. Under such conditions no crevasses could form and during earth movement the rocks bent and flowed like thick tar. Note that much of the bending took place after the intrusion of the light granite. At one point a band of granite has been folded and the fold, by continued lateral pressure, has been overturned, broken, and one side thrust over the other. This type of thrust-folding and faulting is characteristic of the mountain building which took place at the end of the Meso-



Photograph by Carroll H. Wegemann

Figure 13.—Canyoncito from Fall River Road. There is glacial polishing on the surface of the rocks to the right, but the rugged gorge shows no sign of glacial action. It is evident that the gorge has been cut in the 10,000 years since the ice melted from this part of the valley

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zoic era when the Rockies were first formed. It often happens that a single rock may show in miniature a type of folding which is characteristic of an entire mountain range.

14. 2 Canyoncito (fig. 13). This little canyon has been cut by the stream in the valley floor since the retreat of the last glacier. Note that glacial grinding is evident on the terrace over which the road runs, but that there is none in the little canyon. If we assume that the glacial ice began to melt back from the valley below Horseshoe Park some 25,000 years ago and retreated steadily to the cirques of Fall River Pass, then it may have left this part of the valley some 10,000 years ago. If this reasoning is correct, it has required about 10,000 years for the stream to cut Canyoncito.

15. 2 Willow Park. This meadow was the bed of a small lake impounded by a terminal moraine which marked a pause in the retreat of the glacial ice. Such a moraine is known as a recessional moraine.

In the next mile are numerous intrusions of coarse-grained granitic rock known as pegmatite. The molten rock, deep within the earth from which these intrusions solidified, probably contained, under great pressure, much steam which made it thinly fluid. It cooled slowly deep below the surface, giving the large crystals time to grow.

17. 0 Large mass of pegmatitic granite several hundred feet wide which has been intruded into the schist.

From this point an excellent view is to be had of three cirques or basins in which glacial snow and ice accumulated at the head of Fall River. From these the great glacier flowed down the valley.

NOTE.—*Left hand column of figures below is for the use of travelers coming up from Poudre Lakes.*)

5 18. 4 Parking area at store and museum on Fall River Pass. The cirques previously mentioned lie to the south, and beyond them the ridge is capped by the remnants

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of an old lava flow which is better exposed at Iceberg Lake (see p. 25, point 2.0 miles).

FALL RIVER PASS TO POUDRE LAKES

There is not time on this circle trip to drive to Grand Lake, but if you have an hour to spare turn right on the road to Grand Lake, and use the right hand column of figures in log. Drive down as far as Poudre Lakes on the Continental Divide. If you do not care to take this trip but wish to go east down Trail Ridge Road, turn to page 24, point 0.0 miles in right-hand column.

4.0 18.9 Overlook. Specimen Mountain, 3 miles to the west across Cache la Poudre River, appears to be an extinct volcano and the probable source of the lava previously mentioned. The mountain is situated on the Continental Divide 2 miles north of Poudre Lakes and can be reached by a trail from the Lakes. Erosion has long since destroyed the old crater, which stood above the highest point of the present mountain.

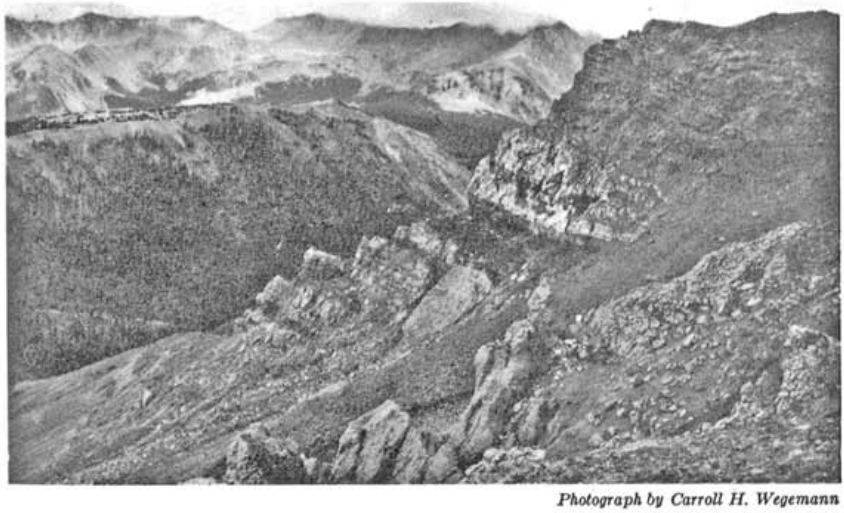
That the mountain was a volcano may be inferred from the nature of the rocks which are exposed on its top and sides. Like many volcanic cones, the mountain is built up of alternating layers of black volcanic glass (pitchstone), lava, white volcanic ash, mud flows, breccia, and pumice (fig. 14). Notes on the formation of these rocks follow:

Volcanic glass is produced when molten rock flowing out upon the surface is chilled so quickly that mineral crystals do not have time to form in it.

Ordinary *lava* is cooled more slowly, but not slowly enough for the rock to become completely crystalline like granite, which is cooled very slowly far below the surface.

Volcanic ash is rock dust blown out by the terrific explosions of the eruption.

Mud flows are formed when this dust is washed out of the atmosphere by the torrential rains which frequently accompany the eruption, the rains being due



Photograph by Carroll H. Wegemann

Figure 14.—Volcanic Rocks of Specimen Mountain, and the Never Summer Range, Specimen Mountain is an extinct volcano, its sides, as shown in the foreground, formed by black pitchstone or volcanic glass, white volcanic ash, fragments of rock blown out by the explosions, and mud flows. The ancient crater has been destroyed by erosion.

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to the condensation of clouds of steam emitted from the volcano.

Breccia is formed of fragments of the sides of the crater, blown out during the explosions.

Pumice is lava charged with gas, the bubbles of which expand when the pressure upon the lava is reduced as it reaches the surface. The resulting small cavities when filled with air cause the pumice to float on water.

All these rocks are to be seen on Specimen Mountain, mute reminders of a time, in the distant past, when volcanoes were active in this region.

The mountain was probably named for the opal, agate, and delicate crystals of topaz which are found lining some of the small cavities in the volcanic deposits.

1.2 21.7 Exposed on the south side of the road, about 400 feet beyond the end of the retaining wall, is greenish gray soft rock which represents an old mud flow from the volcano. At higher and lower levels along the road are the ancient rocks of the pre-Cambrian era, and it is evident that the valley of the Cache La Poudre and the lava flow at Iceberg Lake present interesting relationships. Assuming that lava flowed from Specimen Mountain to Iceberg Lake, it could not have done so had the valley of the Cache La Poudre been present at the time of the flow. It is possible that the lava at Iceberg Lake flowed from a vent other than that of Specimen Mountain, but there is no evidence of such a vent. A possible explanation is that the volcanic deposits from Specimen Mountain completely filled an old valley which had been cut in pre-Cambrian rocks at the location of the present valley of the Cache La Poudre; that, in one of the last eruptions of the volcano, lava flowed across this fill to what is now Iceberg Lake; and that subsequent erosion excavated the present valley in the filling of the former valley. exposing some of the old mud flows which were part of the filling and the much more ancient rocks which formed the south side of the old valley. The mud flows, therefore, are merely a veneer partly covering the more ancient rocks.

0.0 22.9 Parking area at Poudre Lakes. These lakes are on the Continental Divide although in a valley much lower in elevation than Fall River Pass. A glance at the park map will show that because of peculiarities of stream development the highest mountain peaks are not always along the Continental Divide.

(NOTE.—If you have entered the park from the west, set your speedometer at 0.0 at the parking area at Poudre Lakes and read paragraphs in reverse order up to 4.5 in the left-hand column of figures. At Fall River Pass reset at 0.0 and continue as below.)

Returning to Fall River Pass, reset the speedometer at 0.0 and use the right-hand column of figures. The left-hand column is for the use of those driving in the opposite direction.

TRAIL RIDGE ROAD BETWEEN FALL RIVER PASS AND DEER RIDGE JUNCTION

22.9 0.0 Road junction just southwest of museum and store at Fall River Pass. If you are traveling east, keep right on Trail Ridge Road.

21.9 1.0 Overlook on curve. To the west, across the head of the valley of the Colorado River, rise the Never Summer Mountains, 7 miles away. This overlook is at 12,000-feet elevation on the Upper Flattop peneplain, an old erosion surface formed not far above sea level and raised to its present elevation during the last uplift of the region. Directly to the south, across Forest Canyon, rises the cone of Mount Julian, the next prominent point to the west being Mount Ida, the long northwest slope of which merges with the Upper Flattop surface. Across the canyon and extending to its very rim is a bench about 500 feet below the Upper Flattop surface, the origin of which was described in detail on page 10. It represents

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the beginning of a lower erosion surface which was cut by the stream after the initial uplift of about 500 feet had taken place. Its presence records a considerable pause in the uplift of the land before further elevation finally brought the mountains to their present height.

20. 9 2. 0 Iceberg Lake. The rock which forms the wall of the cliff back of the lake is reddish brown and differs in appearance from the old pre-Cambrian rocks seen at other points on the road. It is the same lava flow which was observed south of Fall River Pass.

Looking north along the ridge, which is a continuation of the cliff, it will be noted that there is pre-Cambrian rock next to the lava and that it forms the north end of the ridge, being rather poorly exposed in, and below, the north point on the skyline. Across the highway, just south of Iceberg Lake, pre-Cambrian rock is also exposed. The pre-Cambrian, therefore, borders the lava on both sides. It is evident that the molten lava which solidified to form the rock of the cliff must have flowed down a valley cut in the older rock.

Southeast from Iceberg Lake there is an excellent view of the Upper Flattop peneplain (fig. 4). When it was formed it was not quite a plain, for above it rose a line of low rounded mountains, the remnants of the first Rockies. The Mummy Range to the northwest was part of the line. The northwest side of this range shows the old erosion surface merging with the mountain slope. This surface is, however, being rapidly destroyed by the streams which are cutting canyons into it from the east. Farther to the south the group of mountains—Ida, Julian, and Terra Tomah—appear to have been one rounded mountain rising above the plain before the erosion of water and ice cut the canyon of the Gorge Lakes into its heart. Stones Peak may have been part of the same mass before it was separated from it by the cutting of the gorge of Hayden Creek, the next gorge to the east.

On Trail Ridge, about half a mile to the southeast, where the road follows the narrowest part of the ridge, the slopes on either side look as if they were roughly terraced. The soil is but a few feet thick and rests on a sloping surface of bedrock. In the spring when the snow melts, or during heavy rains, the soil becomes saturated with water which not only increases its weight but makes it slippery. Masses of soil, bound together by plant roots, tend to slide gradually for a few inches, or a few feet, down the slope, breaking away from the turf above and overlapping the turf below, thus producing the terraces.

18. 6 4. 3 Rock Cut, 12,110 feet elevation. To the southeast is the gorge of Hayden Creek. Directly south across Forest Canyon the view is up the canyon of the Gorge Lakes. There are six of these lakes in the canyon proper. One, at an elevation of 12,400 feet, is the highest lake in the park. It occupies an old glacial cirque, the cliffs of which shelter it from the sun's rays so that it is never free of ice. The gorge itself was originally cut by streams but has been entirely reshaped by the ice of former glaciers. It contains numerous cirques. Its rugged outlines are in marked contrast to the old erosion surface which, as already mentioned, forms the summits of the surrounding mountains. Nor is it difficult to reconstruct in imagination the shape of the rounded mountain mass before erosion gashed it with cirques and canyons. The landscape of the old plain with its low mountains must have been monotonous. The spectacular scenery of today is due to the comparatively recent uplift of this region and to stream and ice erosion.

15. 6 7. 3 Road crosses to Hanging Valley on north side of Trail Ridge. There are three stone cabins north of road. To the south, across Forest Canyon, is a view of Hayden Creek with several abandoned glacial cirques, the collecting basins of former glaciers, near its head. West of its mouth a great cirque has been cut into the side of Terra Tomah, partly destroying the old erosion surface which forms the top of this mountain.

Miles

14. 9 8. 0 The bark on the spruce, fir, and pine trees at timber line where exposed to the wind-driven snows of winter and the sand blasts of dry weather is worn off the windward side.

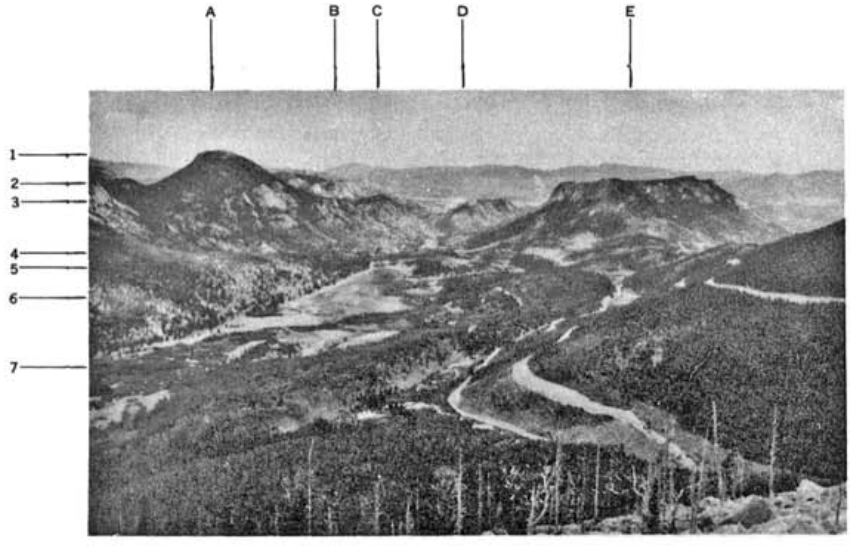
14. 0 8. 9 Guard wall. To the west is Sundance Mountain with a remarkably fine example of a glacial cirque cut into its eastern flank (fig. 11). To the north across Fall River Valley the switchbacks on the Fall River Road are visible.

13. 6 9. 3 Rainbow Curve affords a magnificent panorama. To the north lies the Mummy Range. Its peaks, northeastward from Fall River Valley, are: Mount Chapin, Mount Chiquita, Ypsilon Mountain, Fairchild Mountain, and Hagues Peak, with Mummy Mountain southeast of Hagues. Note on Ypsilon Mountain the banding of the dark schist and the white granite which, as molten rock, was intruded into it when both lay deep within the earth.

Below lies Horseshoe Park in the broad valley of Fall River. Beyond the treeless meadow in the distance, which is a former lake bed, a low wooded ridge crosses the valley (fig. 15, C–4). This is one of the terminal moraines of the Fall River Glacier (Wisconsin stage). It was this natural dam which impounded the lake waters and through which the outlet finally cut its channel, draining the lake and leaving several small ponds in the irregularities of its bed.

On either side of the meadow rise the abrupt gravel slopes of the lateral moraines, 800 feet in height, the tops of which indicate the height of the ice in the valley (fig. 15, A–4). They slope eastward to the point where they merge with the crest of the terminal moraine (see p. 29, point 8.2 miles).

From the north end of the terminal moraine the north lateral moraine can be traced to the point where it crosses the valley of Roaring River. This valley also



Photograph by Carroll H. Wegemann

Figure 15.—Horseshoe Park from Rainbow Curve, Trail Ridge Road. A–1, Big-Horn Mountain; A–4, crest of north lateral moraine of former Fall River Glacier, slopes east; B–2, The Needles, part of an old erosional surface at 10,000 feet elevation; B–6, bed of former lake impounded by terminal moraine; C–3; McGregor Mountain; C–5, terminal moraine of Fall River Glacier; C–7; south lateral moraine which merges at east end with terminal moraine; D–3 Castle Mountain, part of old erosional surface at 8,700 feet elevation; D–7, beaver pond in Hidden Valley; E–2, flat top of Deer Mountain, part of same erosional surface as that of The Needles.

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was occupied by a glacier, but one which apparently lacked the cutting power of the longer and straighter Fall River Glacier. It was unable to lower the bed of its valley as rapidly as did the glacier of Fall River, and the mouth of the side stream was left hanging 400 feet above the bed of the major stream to which it falls by a series of cascades. It is probable that the glacier of Fall River continued its flow longer than its smaller tributary, for it seems to have thrown its north lateral moraine across the Roaring River Valley. After the glaciers disappeared the stream was able to cut away part of this obstruction.

Note that almost no morainal gravel or sand was deposited on the point of Bighorn Mountain which projects into the valley and which felt the full force of the ice movement. The ice did drop its load, where it was moving with less power, in the more sheltered parts of the valley both above and below this point.

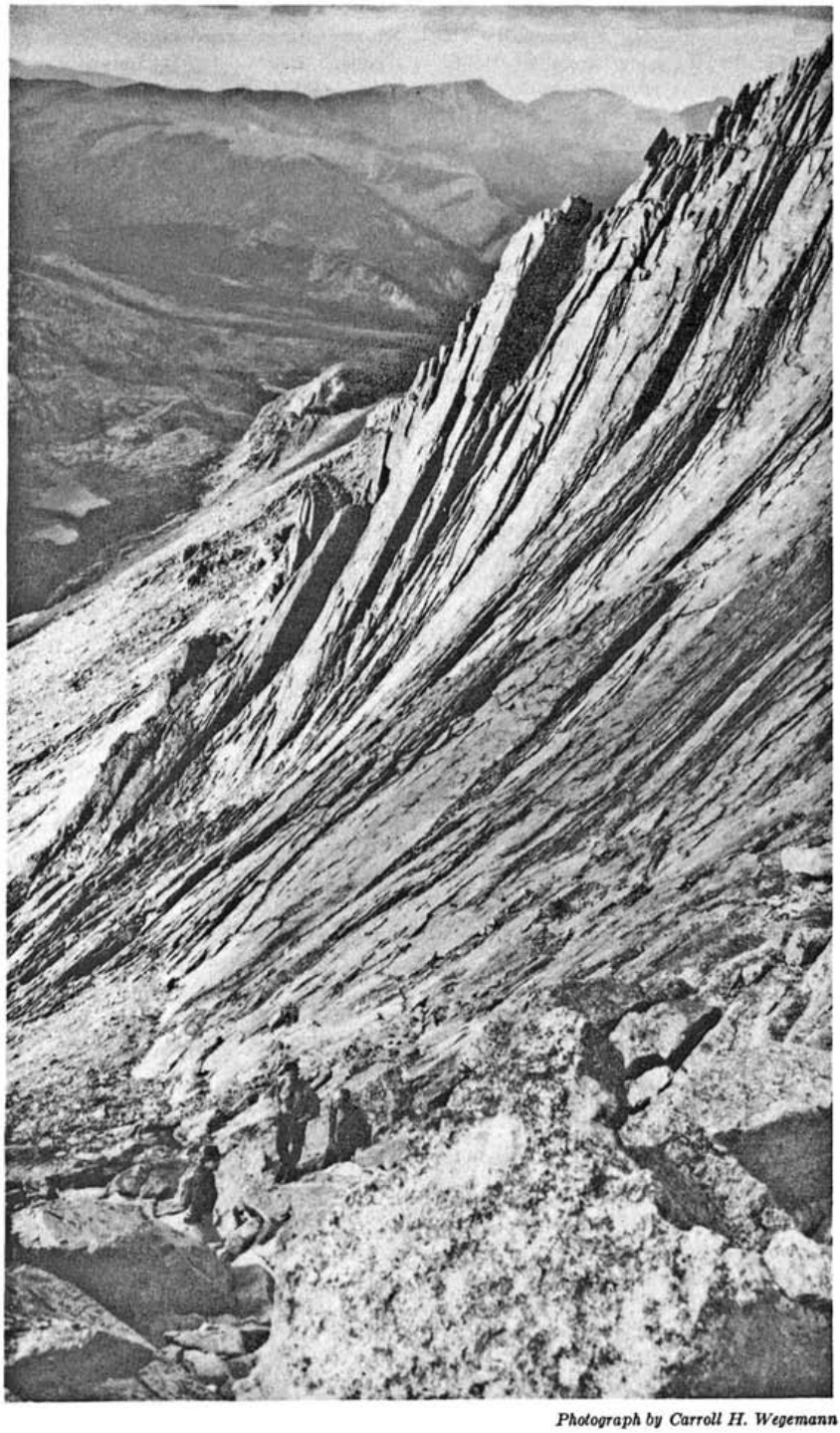
Turning now to the south lateral moraine (fig. 15, C–7), it is evident that this also threw a dam across the mouths of the side valleys coming in from the south. These valleys did not carry glaciers. Their waters were impounded by the moraine, back of which the road now runs, and were forced to flow eastward south of the moraine. The moraine is lower in this direction and the stream, which is called Hidden Valley Creek, at length reached a point where its waters could overflow the barrier and cascade down the moraine to the floor of the main valley. This little stream is crossed on the road from Deer Ridge Junction to Horseshoe Park. The beaver have built several dams across the stream back of the moraine, their ponds (fig. 15, D–7) being plainly visible from this point.

The flat-topped mountain in line with the road is Deer Mountain, along the base of which the road from Deer Ridge Junction to Beaver Park is located. Its top and the top of The Needles are parts of an old erosion surface similar in origin to the Flattop peneplain, but formed somewhat later. A remnant of a still lower plain of erosion is to be seen on the top of Castle Mountain, beyond and just to the left of Deer Mountain. As explained on page 10, these old erosion surfaces were formed, when the region stood at lower altitudes, by stream which had reached their limit of down cutting and were widening their valleys. These erosion surfaces have been for the most part destroyed by the streams which produced them, after further uplift gave the streams more fall and enabled them once more to deepen their valleys.

12. 7 10. 2 Sign 2 miles above sea level.

10. 7 12. 2 A dike several feet wide of dark rock known as dolerite has been intruded into the lighter granites and is well exposed at the side of the road. The same dike is believed to have been encountered in the Colorado-Big Thompson Diversion Tunnel which passes under the Front Range. The molten rock that formed the dike was forced into a fissure which apparently extended in a straight line for several miles. What appears to be the same dike can be seen on the south side of Mount Chapin.

9. 3 13. 6 Many Parks Curve. The description of the Fall River Valley as given from Rainbow Curve (see p. 26, point 9.3 miles) applies equally well here. Note the excellent view of Longs Peak to the southeast and of Moraine Park shut in on north and south by the great timbered ridges of its lateral moraines. At the eastern end of Moraine Park rises Eagle Cliff. From the flat floor of the park rises the little granite island which is noted from point 0.7 miles. (See p. 18.) The treeless area to the north of Moraine Park is Beaver Park, bordered on its north side near the lower end by a narrow tree-covered ridge. This ridge is the lateral moraine of an older glacier which once flowed down the Thompson Valley. (See description at point 2.4 miles, p. 19.) This lateral moraine can be traced farther west by the thin line of trees which divides Upper Beaver Park.



Photograph by Carroll H. Wegemann

Figure 16.—West side of Longs Peak with Glacier Gorge below.

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7.8 15.1 Curve into Hidden Valley. To the north lies the south lateral moraine of the Fall River Glacier which has dammed Hidden Valley and forced its waters to flow east as Hidden Valley Creek along the south side of the moraine. The road also follows the moraine.

7.6 15.3 Beaver dams.

6.8 16.1 Cross Hidden Valley Creek. The gravel and sand of which the moraine is built are exposed in the road cut on the left.

6.0 16.9 Hidden Valley Creek has cut through a low point in the moraine on the left and drops by a series of cascades (not visible from this road but noted at point 5.9 miles (page 20) some 400 feet to the bed of Horseshoe Park.

5.3 17.6 Deer Ridge Junction. This completes the circle trip. You may return to Estes Park by the paved road to the right or by Route 34 to the left. If the latter route is taken, set the speedometer at 5.3 miles.

DEER RIDGE JUNCTION TO FALL RIVER ENTRANCE VIA HORSESHOE PARK

5.3 Deer Ridge Junction. Take road to left (north). For details of the log between this point and point 7.1 miles below see page 20.

7.1 Junction in Horseshoe Park with road to Fall River Pass. Keep right on Route 34.

7.3 Sheep Lake, a shallow pond in a depression in the floor of the ancient lake. Just beyond, the road climbs to one of the old lake terraces described at point 6.8 miles, page 20. There is another terrace 25 feet higher. These terraces are old shore lines formed when the former lake stood at high levels.

8.2 Terminal moraine (Wisconsin stage) which impounded the ancient lake until the outlet cut its channel through it, draining the lake waters.

8.4 Studio of David Stirling.

8.8 East base of terminal moraine.

8.9 Road follows, and cuts into, a north lateral moraine of what appears to be a glacier older than the Wisconsin, and which extended some distance farther down the valley than did the Wisconsin ice.

9.2 Fall River Entrance to Rocky Mountain National Park.

9.3 Side road to Bryson Cottages crosses the valley on recessional moraine.

9.5 Small meadow, probably the bed of a former lake, lies between two recessional moraines which here cross the valley. McGregor Mountain on north shows, in its bare dome-shaped crest, the typical weathering of granite, the surface of which spalls off in convex slabs.

9.8 Fish hatchery and bridge.

11.0 Approximate end of glaciation. Below, the valley narrows abruptly and is apparently unglaciated.

13.9 Estes Park.

BEAR LAKE ROAD

A short but interesting drive is that to Bear Lake. Set your speedometer at 0.0 miles.

0.0 Thompson River Entrance to the park. Take left hand road inside entrance and cross Thompson River to Camp Woods.

Miles

0. 4 Tuxedo Park. Road follows the outside base of the south lateral moraine of the Thompson Glacier (Wisconsin stage). South of this moraine the surface of Tuxedo Park is covered by very old morainal deposits of a glacier much older than the Wisconsin as shown by the disintegrated condition of the morainal gravel. This glacier was wider than was the Wisconsin Glacier and its deposits, therefore extend beyond those of the Wisconsin ice.

0. 5 In repairing a washout on the north side of the road at this point in 1935, human bones believed to be those of a woman were found several feet below the surface. They are said to have been scattered and mixed with charcoal and rested on a bed of white sand which may have been glacial outwash. The body was apparently cremated on the surface of the outwash from the glacier and the remains later covered by material washed down from the morainal ridge to the north. The information is insufficient to warrant positive conclusions, but the bones were probably very old. The skull is preserved in the Moraine Park Museum.

1. 5 Across the stream flat to the left is the terminal moraine of the former Bartholf Glacier which flowed down the valley of Glacier Creek.

1. 7 Stream cuts through this moraine.

2. 0 Fork. Keep left, crossing Mill Creek, and climb the east slope of the terminal moraine of Bartholf Glacier.

2. 5 Crest of moraine.

2. 9 West base of terminal moraine. Road follows the south side of the north lateral moraine of the Bartholf Glacier.

3. 3 Fork. Take left road to Glacier Basin Campground, a broad treeless flat which was the melting basin of the Bartholf Glacier. From this flat there is a commanding view of the Continental Divide and of the high, even-topped ridge formed by the north lateral moraine of the Bartholf Glacier.

The ridge ends on the west against the side of Flattop Mountain for which the Upper Flattop peneplain has been named. From this observation point it is difficult to appreciate fully the flatness of the mountain's top.

The first sharp peak on the skyline to the left of Flattop Mountain is Hallett Peak and in the cirque to the right of it lies Tyndall Glacier.

Left, or south of Hallett Peak, is Otis Peak, and just left and back of the latter, but hidden from view in the gorge, lies Andrews Glacier.

Note that the smooth side of Otis Peak slopes to the north and that a similar surface on Hallett Peak slopes to the south. These smooth surfaces appear to be the sides of one of the old erosion valleys cut in the Flattop peneplain after the initial uplift of that surface when the bench was formed at the head of Forest Canyon (see point 1.0 mile, p. 24). A similar surface appears on Thatchtop Mountain which is the second peak south of Otis and is nearer this point. To the right of Thatchtop and farther away is Taylor Peak and between them is the glacial valley of Loch Vale, U-shaped in cross section, containing a series of glacial lakes and Taylor Glacier hidden from view at its head.

East of Thatchtop Mountain lies Glacier Gorge, and east of that is Half Mountain against which rests the west end of the south lateral moraine of the Bartholf Glacier which rims Glacier Basin on the south. Beyond the long even crest of the moraine rises in majestic grandeur the flat summit of Longs Peak, 14,255 feet in elevation. Its perpendicular cliffs are the walls of ancient cirques.

Returning from Glacier Basin Campground to the main road, reset the speedometer at 3.3 miles. Turning left (west), continue the log. On the right rises the long ridge of the north lateral moraine of the Bartholf Glacier.

3. 6 Road cuts across a jutting point of this moraine.

Miles

4.0 Road to Sprague's Lodge. Keep straight ahead.

5.1 Trail to Bierstadt Lake which is on top of the great accumulation of moraine lying north of the Bartholf Glacier.

6.1 Prospect Canyon. The old tunnel, driven in a futile search for minerals, is at the edge of an intrusive dike, here poorly exposed. Prospect Canyon is a small but abrupt gorge cut by the stream since the retreat of the glaciers from the valley.

6.9 Glacier Gorge parking area, from which road climbs moraine.

7.2 View of head of Glacier Basin Valley, its surface strewn with the deposits of former glaciers. These deposits have been trenched by recent streams since the retreat of the ice.

7.7 Parking area at Bear Lake. This beautiful body of water occupies a depression between the rock cliffs which rise on its west side and the moraines of various ice advances on the north and east and south. It lies in the line of flow of the former Tyndall Glacier.

This is the end of the road and you must return down the valley by the same road up which you came.

CONCLUSION

We have come to the end of our study of the geology of Rocky Mountain National Park. We might continue our investigations indefinitely, always finding some new point of interest to attract our attention and to open up new lines of thought. Future work will undoubtedly add much to our knowledge and change some of our conclusions. Let us hope, however, that these changes will not be vital to the main facts of our story and that the reader under the guidance of this booklet, has been led along the right trails in his study of one of the most interesting areas on the American Continent.

ACKNOWLEDGMENTS

In the preparation of this guide to the geology of Rocky Mountain National Park the author has drawn upon the writings listed below. Particularly is he indebted to F. M. Van Tuyl, Ernest E. Wahlstrom, and Ross L. Heaton with whom time was spent in the field. To David H. Canfield, Superintendent of Rocky Mountain National Park, and to H. Raymond Gregg, Park Naturalist, thanks are due for hearty cooperation and assistance.

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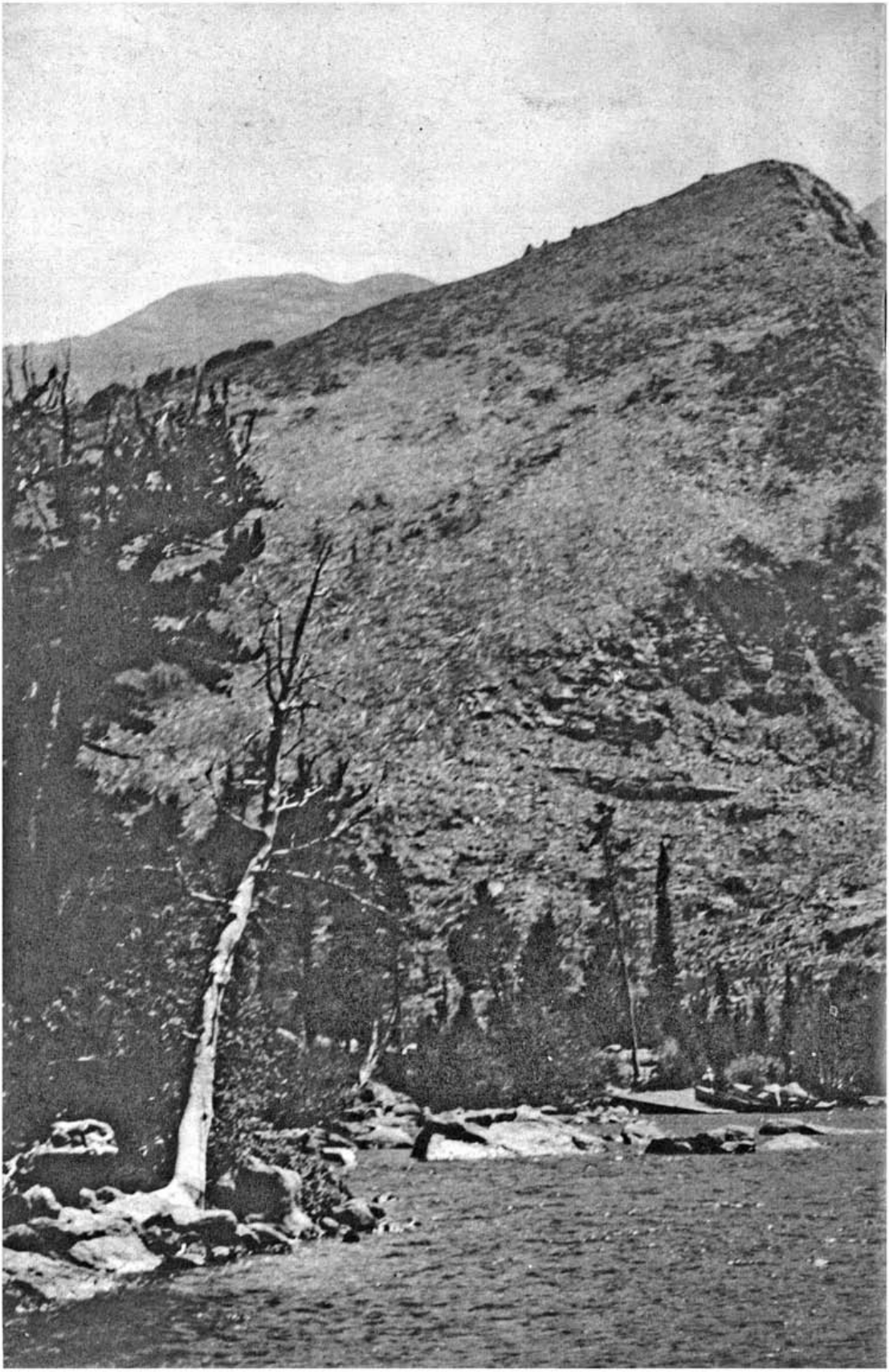
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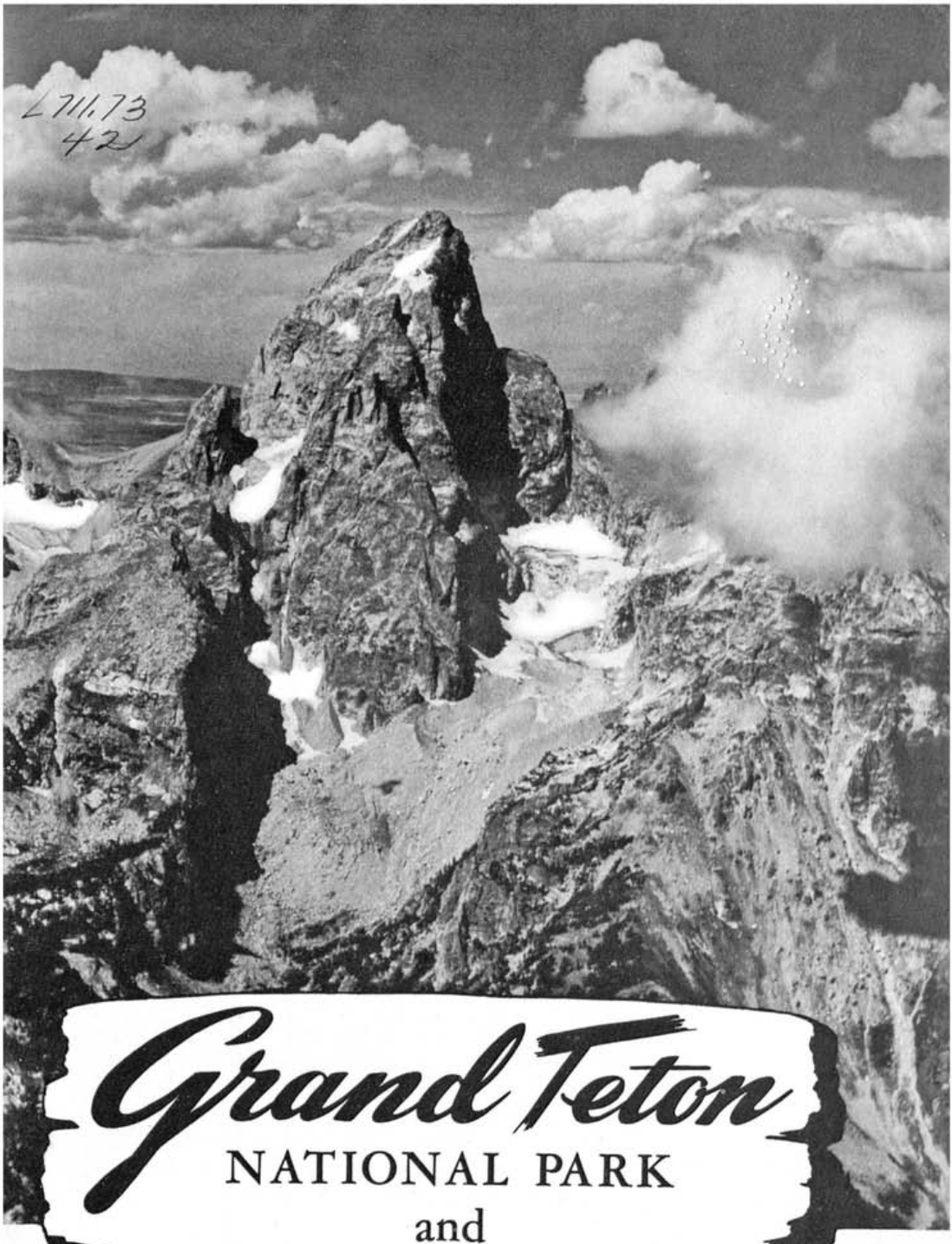
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Grand Teton
NATIONAL PARK
and
Jackson Hole
NATIONAL MONUMENT
WYOMING

Historic Events

1807–8	Discovery of the Tetons by John Colter.
1811	The West-bound Astorians crossed Teton Pass.
1810–45	"The Fur Era" in the Rocky Mountains, which reached its height between 1825 and 1840.
1829	Capt. William Sublette named Jackson Hole after his partner in the fur trade, David Jackson.
1832	Rendezvous of fur trappers in Pierre's Hole; Battle of Pierre's Hole.
1842	Michaud attempted an ascent of the Grand Teton.
1860	Jim Bridger guided Capt. W. F. Reynolds' expedition through Teton country.
1872	William H. Jackson, with Hayden geological survey party, took first photographs of Tetons.
1877	Hayden survey party of Orestes St. John made geological studies in the Tetons.
1879	Thomas Moran painted the Teton Range.
1884	The first settlers entered Jackson Hole.
1897	Teton Forest Reserve created.
1898	The first major Teton peaks scaled (Buck Mountain and Grand Teton).
1909	The Upper Gros Ventre landslide.
1925	The Lower Gros Ventre landslide.
1927	The Gros Ventre flood.
1929	Grand Teton National Park established and dedicated.
1930	The last major Teton peaks scaled (Nez Perce and Mount Owen).
1943	Jackson Hole National Monument established.

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The Grand Teton and Glacier (*Copyright Harold Mapes*) *Cover*

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UNITED STATES
DEPARTMENT OF THE
INTERIOR
J. A. Krug, *Secretary*

NATIONAL PARK SERVICE
Newton B. Drury, *Director*

Grand Teton

NATIONAL PARK

and

Jackson Hole National Monument

WYOMING

Season June 15 to September 15

Grand Teton National Park, established by an act of Congress on February 26, 1929, embraces the most scenic portion of the Teton Range of Wyoming, with an area of approximately 150 square miles, or 96,000 acres. It varies from 3 to 9 miles in width and is 27 miles in length.

In addition to its majestic peaks and canyons, Grand Teton National Park includes 5 large lakes and many smaller bodies of water, glaciers, and snowfields, and extensive forests of pine, fir, and spruce. Much of the park area is above timber line, the Grand Teton rising to 13,766 feet, more than 7,000 feet above the floor of Jackson Hole.

The great array of peaks which constitutes the scenic climax of this national park is one of the noblest in the world. Southwest of Jenny Lake is a culminating group of lofty peaks whose dominating figure is the Grand Teton, the famous mountain after which the park is named.

Adjoining Grand Teton National Park on its east and north boundaries is Jackson Hole National Monument, established by Presidential proclamation on March 15, 1943. This area, containing 222,929 acres, 173,065 acres of which are Federally owned land, was set aside as a national monument because of its outstanding geologic, historic, biologic, and scenic values.

Within its boundaries are found Jackson, Emma Matilda, and Two Ocean Lakes in the northern portion and the Snake River cutting its channel from the outlet of Jackson Lake east and south through the valley.

Two prominent land features, Signal Mountain in the north central portion of Jackson Hole and Blacktail Butte in the central portion, supply excellent viewpoints of the valley and surrounding ranges of mountains.

Grand Teton National Park and Jackson Hole National Monument together preserve a mountain range and valley that are one in framing a landscape of grandeur and majesty that is unique in America and one that has long been famous for its matchless scenery. These preserves are units of the National Park System owned by the people of the United States and administered for them by the National Park Service of the Department of the Interior for the use and enjoyment of all people.

The Tetons are viewed at their best from Jackson Hole and, here too, is found the supplement to the geologic story of the Teton Range.

When the Tetons were uplifted as a fault block, then eroded and sculptured into their present rugged form, the valley of Jackson Hole was lowered as a fault trough and partly filled with the eroded materials from the surrounding mountains. These deposits of glacial moraines, outwash plains, and changing stream courses tell much of the geologic history of the area.

History of the Region

The Tetons are remarkably rich in historic traditions. The Grand Teton itself has been referred to by an eminent historian as "the most noted historic summit of the West."

Up to 1,800 Indians held undisputed sway over the country dominated by the Three Tetons. Jackson Hole was literally a happy hunting ground, and, while the severe winters precluded permanent habitation, during the milder seasons, bands of Indians frequently came across the passes into the basins on warring or hunting expeditions.

The Tetons probably first became known to white men in 1807–8, when the intrepid John Colter crossed the range on the memorable journey which also made him discoverer of the Yellowstone country. In 1811, the Astorians, under Wilson Price Hunt, entered Jackson Hole and crossed the range on their expedition to the mouth of the Columbia.

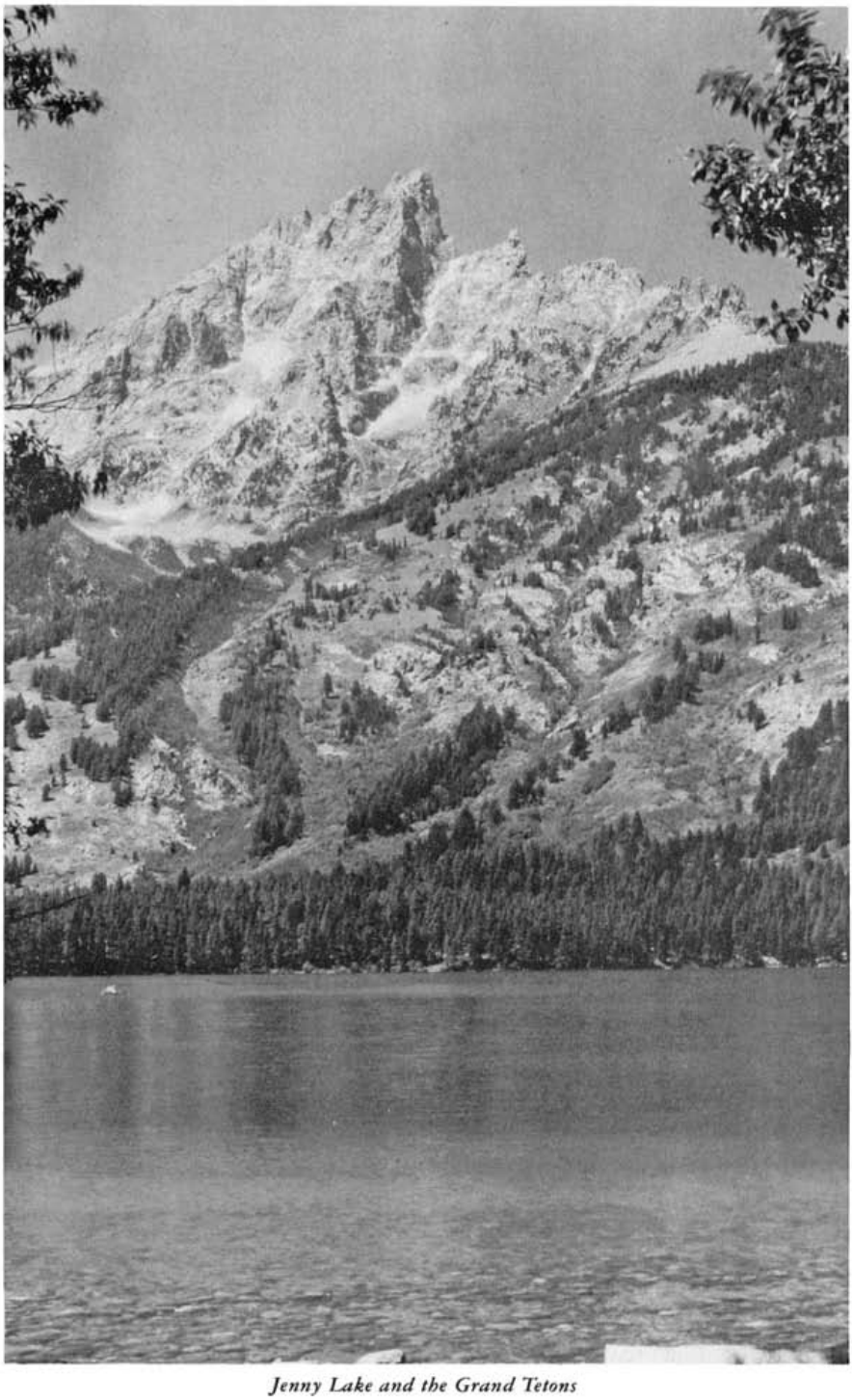
The decades that follow are frequently referred to as the "Fur Trade Era," for the Teton region became the scene of intensive exploration and trapping activities by both British and American interests. The picturesque name of "Jackson Hole" dates back to 1829, when Capt. William Sublette named it for his fellow trapper, David E. Jackson, who was especially fond of this beautiful valley or basin as we call it today.

Jackson Hole, as a favorite habitat of the beaver and other fur bearers, played an important part in the "winning of the West," for here the fur trappers and traders of that day not only hunted out the trails and passes which opened the transmountain country to Americans, but also found a practical base of operations for their expeditions to gather the valuable furs of this mountain region.

Jackson Hole was important as a crossroads of Trapper Trails of the "Fur Trade Era," for here six major routes converged as the spokes of a wheel upon their hub. Leading into this valley the Mountain Men found the old Indian Trails over the Conant Pass from the northwest, Two Ocean Pass from the northeast, Togwotee and Union Passes from the east, South Pass and Hoback Canyon from the southwest, and the Teton Pass from the west.

By 1845 the romantic trapper of the "Fur Trade Era" vanished from the Rockies. During the next four decades the valleys near the Tetons were largely deserted, except for wandering bands of Indians who occasionally drifted in. But the frontier was relentlessly closing in, and one Government expedition after another passed through the Teton country or near it. The most important of these were the Hayden surveys of 1871, 1872, 1877, and 1878. These parties named many of the park's natural features, including Leigh, Jenny, Taggart, Bradley, and Phelps Lakes, and Mount St. John.

In the middle eighties came the first settlers. They entered by the Gros Ventre River and Teton Pass,



Jenny Lake and the Grand Tetons

and settled first in the south end of the valley. The story of the homesteader has been one of isolation, privation, and hardships, met, however, with persistency and indomitable courage.

The Teton Range

The Teton Range may be described as a long block of the earth that has been broken and uplifted along its eastern margin, thus being tilted westward. Movement of this sort along a fracture is what the geologist terms "faulting." The total amount of uplift along the eastern edge of the block amounts to more than 10,000 feet. Doubtless this uplift was accomplished not by one cataclysm but by a series of small faulting movements distributed over a very long period. Probably the time of faulting was as remote as the middle of the tertiary period (the period just before the ice age, the latest chapter of the earth's history).

Very impressive is the contrast between the east and west sides of the Teton Range. From the east, the Jackson Hole basin, one views the precipitous side of the mountain block as it has been exposed by uplift and erosion. From the west, the Idaho side, is seen the broad top of the block, which is gently inclined toward the west. In the eastern front, furthermore, one sees the ancient, deep-seated crystalline rocks (gneiss, schist, granite, etc.) belonging to the earliest known geologic eras, the pre-Cambrian. In places on the top of the block as, for example, the Head of Death and Avalanche Canyons, inclined layers of limestone, quartzite, and shale belonging to the less ancient Paleozoic era are found. These layers formerly covered the entire block, but they have been worn away from half of the area, thus exposing the underlying crystallines. The west and north flanks of the range are overlapped by relatively young beds of lava that are continuous with those covering eastern Idaho and the Yellowstone plateaus.

Jackson Hole

Jackson Hole, which adjoins the park, is encompassed on all sides by mountain barriers. It is 48 miles long, for the most part 6 to 8 miles wide, and embraces an area of more than 400 square miles. The north portion of the valley has been included in Jackson Hole National Monument. The floor of the valley slopes from an altitude of 7,000 feet at the north end to 6,000 at the south. Jackson Hole lies a few miles west of the Continental Divide, and occupies the central portion of the headwaters area of the Snake River. Mountain streams converge radially toward it from the surrounding highlands, and the Snake River receives these as it flows through the valley.

Jackson Hole as a fault trough has largely been excavated by the Snake River and its tributaries from shale formations which once extended over the region to a depth of several thousand feet. The more resistant rocks surrounding the region were reduced less rapidly and have been left standing in relief as highlands.

The Work of Glaciers

The glaciers of the ice age, or Pleistocene period, played a leading role in developing the extraordinary scenic features of the park. Just as the streams now converge toward Jackson Hole, so in ages past glaciers moved down toward, and in many



A part of the Jackson Hole Elk Herd

instances into, the basin from the highlands to the east, north, and west.

The precipitous north slopes of the mountain peaks, the knifelike ridges or aretes, the Matterhorn-like towering peaks, and the smooth polished rock of the canyon floors and walls are results of glacial action.

Some of the glaciers have completely disappeared, leaving in the cirques or amphitheaters beautiful alpine lakes. As the glaciers reached the valley floors and then receded, they dropped their accumulated load of rock materials, building the morainal dams at the canyon mouths, and forming Phelps, Taggart, Bradley, Jenny, Leigh, and Jackson Lakes.

The floor of Jackson Hole is a cobble-strewn flat or out-wash plain, which originated when the streams issuing from the glaciers deposited the rock materials they carried.

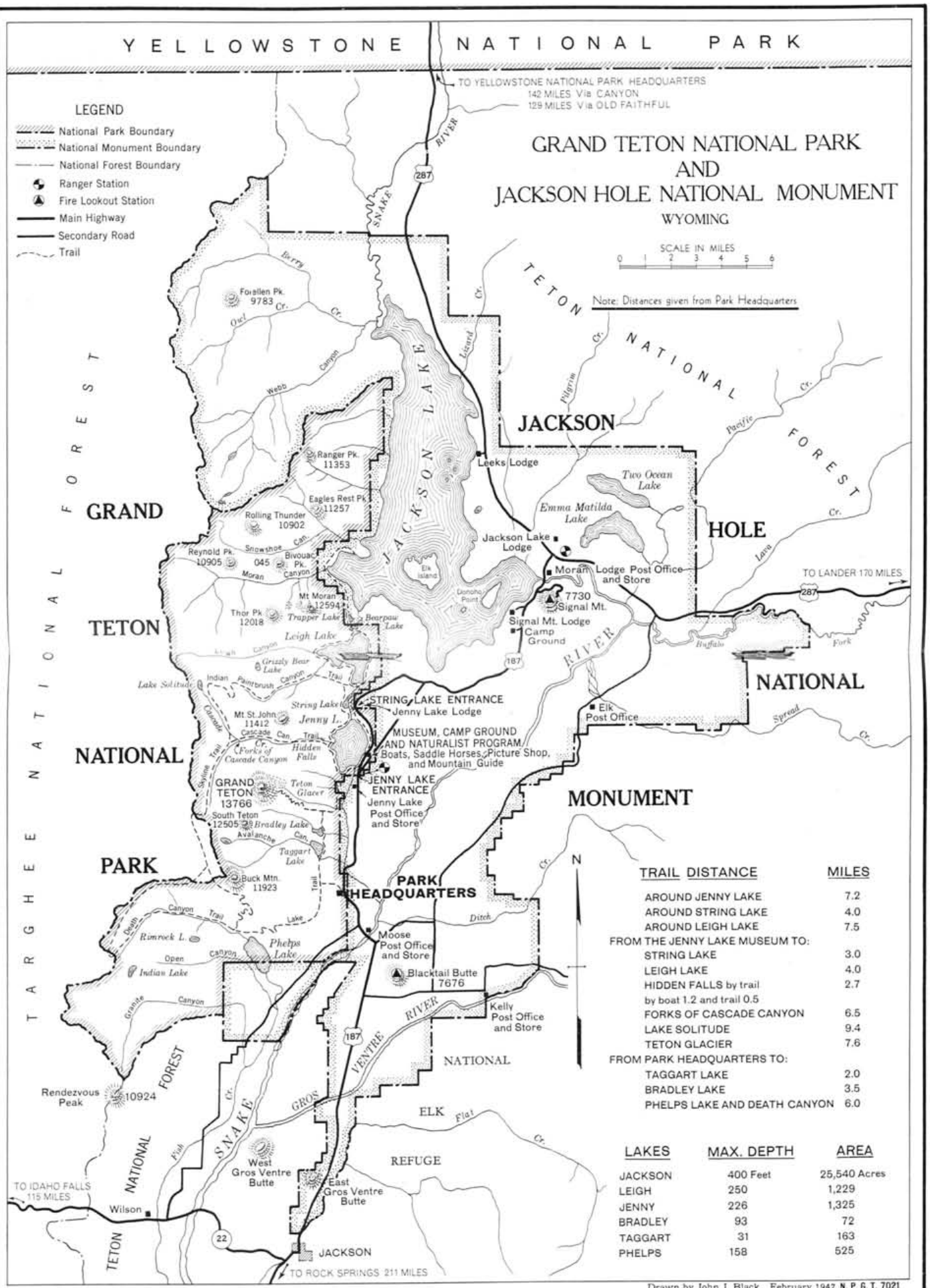
Wildlife

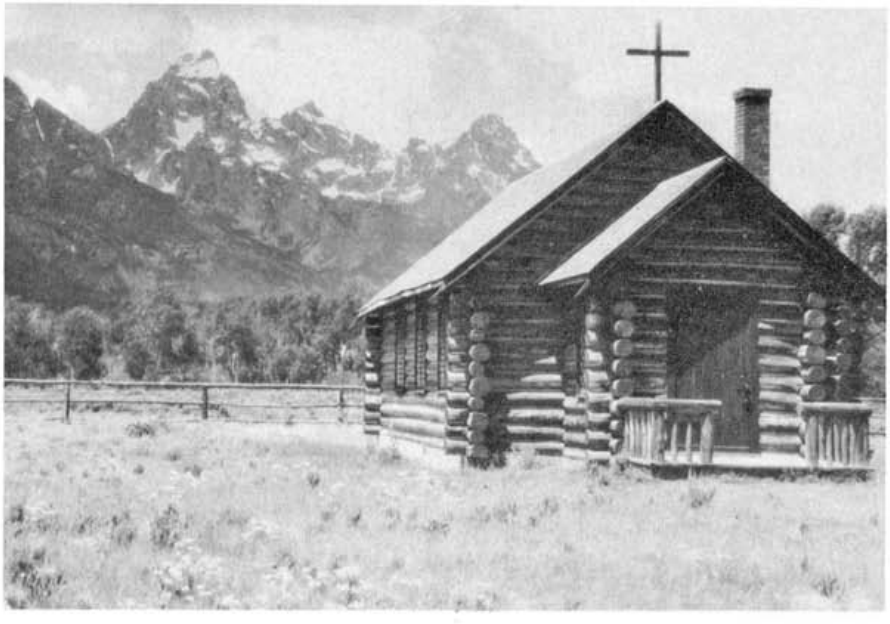
For many years the Jackson Hole country has been famous for its big game, and for those who wish to see wild animals in their natural habitat, the expenditure of a little time off the main road will satisfy their desire.

In the park itself Shiras' moose is the most common big game animal; it is frequently seen in the smaller ponds and marshy meadows. The moose is the largest member of the deer family, but is not as wary as other deer. Mule deer are increasing in the park and environs, and, though quite shy, are often seen along the trails by hikers and horseback riders.

The elk or wapiti have been the most important big game animals in Jackson Hole since the occupancy of white men. In the spring they leave the low country and the Elk Refuge near the town of Jackson and move toward the highlands to the north and east. Scattered small bands summer in the Teton Range. When snowfall comes in the high country, the elk return once more to the refuge.

Small herds of bighorn, or Rocky Mountain sheep, range in isolated sections of the park.


YELLOWSTONE NATIONAL PARK
TO YELLOWSTONE NATIONAL PARK HEADQUARTERS
142 MILES Via CANYON
129 MILES Via OLD FAITHFUL
LEGEND
National Park Boundary
National Monument Boundary
National Forest Boundary
Ranger Station
Fire Lookout Station
Main Highway
Secondary Road
Trail
GRAND TETON NATIONAL PARK
AND
JACKSON HOLE NATIONAL MONUMENT
WYOMING
SCALE IN MILES
0 1 2 3 4 5 6
Note: Distances given from Park Headquarters
TARGHEE NATIONAL FOREST
GRAND
TETON
NATIONAL
PARK
JACKSON
HOLE
NATIONAL
MONUMENT
TETON NATIONAL FOREST
NATIONAL ELK REFUGE
Foraillen Pk. 9783
Ranger Pk. 11353
Eagles Rest Pk. 11257
Rolling Thunder 10902
Reynold Pk. 10905
Bivouac Pk.
Mt Moran 12594
Thor Pk 12018
Trapper Lake
Bearpaw Lake
Leigh Lake
Grizzly Bear Lake
Lake Solitude
Mt St.John 11412
String Lake
Jenny L.
Hidden Falls
GRAND TETON 13766
Teton Glacier
South Teton 12505
Bradley Lake
Taggart Lake
Buck Mtn. 11923
Rimrock L.
Phelps Lake
Indian Lake
Rendezvous Peak 10924
Jackson Lake
Leeks Lodge
Two Ocean Lake
Emma Matilda Lake
Jackson Lake Lodge
Moran
Lodge Post Office and Store
7730 Signal Mt.
Signal Mt. Lodge
Camp Ground
Elk Island
Donohue Point
Elk Post Office
STRING LAKE ENTRANCE
Jenny Lake Lodge
MUSEUM, CAMP GROUND AND NATURALIST PROGRAM
Boats, Saddle Horses, Picture Shop, and Mountain Guide
JENNY LAKE ENTRANCE
Jenny Lake Post Office and Store
PARK HEADQUARTERS
Moose Post Office and Store
Blacktail Butte 7676
Kelly Post Office and Store
West Gros Ventre Butte
East Gros Ventre Butte
TO LANDER 170 MILES
TO IDAHO FALLS 115 MILES
Wilson
JACKSON
TO ROCK SPRINGS 211 MILES
TRAIL DISTANCE MILES
AROUND JENNY LAKE 7.2
AROUND STRING LAKE 4.0
AROUND LEIGH LAKE 7.5
FROM THE JENNY LAKE MUSEUM TO:
STRING LAKE 3.0
LEIGH LAKE 4.0
HIDDEN FALLS by trail 2.7
by boat 1.2 and trail 0.5
FORKS OF CASCADE CANYON 6.5
LAKE SOLITUDE 9.4
TETON GLACIER 7.6
FROM PARK HEADQUARTERS TO:
TAGGART LAKE 2.0
BRADLEY LAKE 3.5
PHELPS LAKE AND DEATH CANYON 6.0
LAKES MAX. DEPTH AREA
JACKSON 400 Feet 25,540 Acres
LEIGH 250 1,229
JENNY 226 1,325
BRADLEY 93 72
TAGGART 31 163
PHELPS 158 525
Drawn by John J. Black February 1947 N. P. G. T. 7021



Church of the Transfiguration at Moose

Bears are found in the mountains and canyons. They are not very numerous in the park.

Beavers, martens, minks, weasels, coyotes, marmots, conies, and rabbits are found within the park. Ground squirrels and chipmunks are numerous. More than 100 species of birds may be identified by the careful observer.

Trees and Plants

In several respects the flora of the Tetons is unique. The high mountains have constituted a barrier to plant migration which many forms could not cross; hence the range limit of a number of species is found here. Representatives from north, south, east, and west are in the region, this being the limit, in many instances, of their distribution. There are many plants typical of the central Rockies, and a few known only to this range. Four life zones are recognized within the park, all occurring in a distance of less than 15 miles. Plants migrating from other regions have grown equally well in each zone.

The flowering period begins in the park as soon as the ridges and flats are free of snow in May, and it continues until about August 15 in the Arctic-Alpine zone. Hence, plants of at least one zone and usually of several may be seen blooming at any time in the spring or summer.

The evergreen trees, of which the lodgepole pine, limber pine, whitebark pine, Engelmann spruce, and alpine fir are most common, form an appropriate frame for the majestic Teton peaks and are reflected in the lakes which they encircle.

How to Reach the Park and Monument

By automobile.—Jackson Hole National Monument and Grand

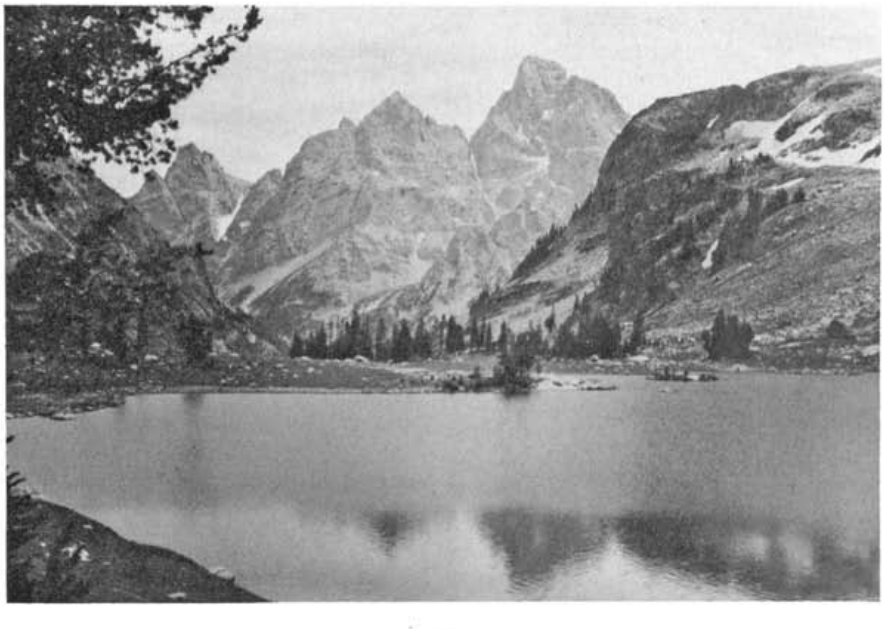
Teton National Park may be reached from the east via United States Highway No. 287 using Togwotee Pass over the Wind River Range; from the south over United States Highways Nos. 187 and 189 using the Hoback Canyon route; from the southwest via the Grand Canyon of the Snake River or United States Highway No. 89 or from the west over Teton Pass using Wyoming Highway No. 22 and Idaho Highway No. 33 from the junction with United States Highway No. 191 near Sugar City, Idaho.

Entrance to the region from the north is through Yellowstone National Park via its south entrance using United States Highway No. 89 along the Snake River and Jackson Lake shore to its junction with United States Highways Nos. 187 and 287 near Moran, Wyo., in Jackson Hole.

By Railroad and Bus.—The nearest terminal of the Union Pacific System is at Victor, Idaho. By bus Victor is reached via Teton Stages from Idaho Falls, Idaho, which is served by Inter-mountain Transportation Co. and Union Pacific Stages, Inc. Regular bus service is maintained between Victor and Moran via the Teton Transportation Co. The park may be reached from the south by buses of the Burlington Transportation Co. from Rock Springs and Evanston, Wyo., to Jackson, Wyo., thence Teton Transportation Co. to Moran. Inquire at any concentration point for rates and schedules.

By Airplane.—Western Air Lines provides passenger, mail, and express service to Grand Teton National Park at an airport located about 9 miles north of Jackson, Wyo., and 8 miles south of park headquarters. Stops are made at Idaho Falls and Pocatello in Idaho, and at Logan in Utah, and West Yellowstone, Mont.,

The Tetons as seen from Lake Solitude



and connections are made at Salt Lake City with United Air Lines' main transcontinental line and at Butte, Helena, and Great Falls in Montana with Northwest Airlines.

Trails

An unbroken wilderness a few years ago, Grand Teton National Park is now penetrated by 90 miles of trails which are among the finest in the national park system. These trails, suitable alike for travel afoot or on saddle horses, are 3 to 4 feet wide, free of boulders, and of grade so moderate they may be followed by old or young with full safety and a minimum of physical exertion. While the trails are traversable during the greater part of the summer, some of them may be blocked by snow early in the season. Those visitors expecting to climb the high trails should inquire at park headquarters or the museum at Jenny Lake for information regarding their condition.

The Lakes Trail runs parallel to the mountains, following closely the base of the range and skirting the shore of each large body of water from Leigh Lake at the north to Phelps Lake at the south. Trails completely encircle Leigh and Jenny Lakes.

The Teton Glacier Trail extends up the east slope of Grand Teton to Surprise and Amphitheater Lakes, unfolding matchless panoramas of the surrounding country. Amphitheater Lake, at the end of the trail, occupies a protected glacial cirque and is the starting point of the climb to Teton Glacier.

The Indian Paintbrush Trail starts near the outlet of Leigh Lake and follows up the bottom of Indian Paintbrush Canyon to connect with the Cascade Canyon Trail by way of Lake Solitude, a lakelet of rarest beauty near the head of the north fork of Cascade Canyon. The wealth of wildflowers along this trail gives the canyon its name, and one may see big game, especially moose, near the lakes and swamps.

The Cascade Canyon Trail passes through a chasm whose walls rise sheer on either side for thousands of feet. By this trail one penetrates into the deepest recesses of the Tetons, skirting the bases of several tall peaks. The north fork of Cascade Canyon Trail leads to Lake Solitude and the South Fork Trail leads to the Limestone Wall and the Skyline Trail.

The Death Canyon Trail traverses the full length of a canyon which in its lower portion is of profound depth and grandeur, as awesome as its name, and then emerges above into broad, sunny meadows.

The trail up the North Fork of Death Canyon leads to the south end of the Skyline Trail near Buck Mountain.

The Skyline Trail is that portion of the trail from the head of South Cascade canyon to the head of the North Fork of Death Canyon and passes through a part of Alaska Basin and to the west of the Limestone Wall at the head of Avalanche Canyon. The former trail along the east face of the Wall has been destroyed by rock slides and has been abandoned.

Mountain Climbing

Among American climbers no range enjoys higher rank than the



Grand Teton from a high mountain slope

Tetons, and its growing fame abroad is evidenced by increasingly large numbers of foreign mountaineers who come here to climb. Leading mountaineers rank many of the Teton climbs with the best in the Alps and other world-famous climbing centers.

Persons inexperienced in mountain climbing are requested to acquire the services of a mountain climbing guide or attempt climbs only when accompanied by experienced climbers. Since 1931 authorized nongovernment guide service has been available in the park. In view of the difficulties one encounters on the Teton peaks and the hazards they present, all prospective climbers are urged to make use of the guide service. If venturing out unguided, climbers should under all circumstances consult rangers or guides for full information relative to routes and equipment. Failure to heed this caution has, in the past, led to accidents and even fatalities. Climbing parties are required, under all circumstances, to report at either park headquarters or Jenny Lake Museum before and after each expedition, whether guided or unguided. *Climbing alone, without a companion, is not permitted.*

The climbing season varies with the weather and the amount of snow in the range, it is at its best during July, August, and early September. In most cases it is advisable to allow 2 days for an ascent of Grand Teton. Mount Owen, or Mount Moran, and 1 day for other major peaks. Jenny Lake camp ground is the logical outfitting point for most expeditions. The majority of ascents require ice axes, rope, and hobbed boots or climbing shoes. Guided parties may arrange to rent equipment from the guide.

Fishing

Grand Teton National Park offers splendid opportunities for fishing. Fish may be taken with artificial fly during most of the summer, but the lake or mackinaw trout in Jackson and Jenny Lakes must be caught with heavy tackle by means of trolling. Other species in park waters are the cutthroat trout (also known as native blackspotted) and the brook or speckled trout. The park waters are stocked through the cooperation of the United States Fish and Wildlife Service.

A Wyoming fishing license is required for fishing in park or monument waters. The bag limit is 6 fish for a day's catch and not more than 2 days' catch (12 fish) in possession at any one time.

Boating

At the south end of Jenny Lake the Teton Boating Co. maintains motorboat and rowboat service. Six or more persons may make a trip around Jenny Lake for 50¢ each. Rowboats may be rented for 50¢ an hour or $2 a day. Motorboats, with a driver, are $2 an hour, and $12.50 a day; without a driver, $1.50 an hour and $6 a day.

Accommodations and Miscellaneous Services

There are no overnight accommodations in the park. These are supplied by the several ranches, dude ranches, and lodges in the Jackson Hole National Monument and at the town of Jackson.

Mount Moran as seen from the east shore of Leigh Lake



Meals are served at most of the ranches. A complete list of accommodations may be obtained from the office of the superintendent.

Well-developed camp grounds are available at Jenny, String, and Jackson Lakes. These camps are supplied with running water, sanitary facilities, and cooking grates. There are also many camping sites away from the main camp grounds suitable for overnight stops for hikers or pack outfits. Supplies, including fishing tackle, may be procured at Jenny Lake, Moose, Jackson, or Moran. Cabin accommodations may be found outside the park in Jackson Hole.

Guide Service.—At Jenny Lake there is an authorized official mountain climbing guide who will guide climbing parties to the summits of the major peaks. He gives instructions in mountain climbing at frequent intervals during the climbing season.

Information concerning rates for all climbs may be obtained from the superintendent of the park or from the mountain climbing guide.

Winter and early spring skiing is possible in the park and skiing guides, ski equipment, and instructions in skiing are available at Jackson, Wyo.

Saddle Horses.—At the south end of Jenny Lake, near the outlet of the lake, the park saddle-horse operator maintains an excellent string of saddle and pack horses with good equipment for short or long trips. One may rent saddle horses without guides, but only to ride over well-defined trails in designated areas. Discretion as to the ability of patrons to ride, or to go unguided, rests with the concessioner; however, the concessioner is not responsible for accidents.

Rates for saddle horses will be supplied by the concessioner or the superintendent of the park.

Photographs.—The Crandall Studios maintain up-to-date picture shops at Jenny Lake and Moran. Photographs of the surrounding country, enlargements, paintings, moving pictures, and souvenir postcards are sold. Laboratories are maintained for developing, printing, and enlarging.

The latest rates for these services, approved by the Director of the National Park Service, are on file with the superintendent and the park concessioners.

Administration

The representative of the National Park Service in immediate charge of the park is the superintendent, with office at park headquarters: address, Moose, Wyo.

Naturalist Service

The park museum is located at Jenny Lake, which is the focal point for all naturalist activities. In it are housed exhibits pertaining to the history, geology, fauna, and flora of the Teton-Jackson Hole country. The collection devoted to mountaineering is in many respects unique. Adjacent to the museum is an open-air amphitheater where campfire talks on geology, wildlife, and other subjects related to the park are given every evening at dusk. Nature walks, auto caravans, and all-day hikes are conducted by members of the naturalist division.

An information desk is maintained at the museum, and rangers are there at all hours of the day to answer inquiries. Information service is also maintained at park headquarters.

RULES AND REGULATIONS

[BRIEFED]

"We would that you should stay here awhile, to be acquainted with us, and yet more to solace yourselves with the good of these delectable mountains."

The following synopsis of park regulations is for the general guidance of visitors. Complete rules and regulations may be obtained at the office of the superintendent and at other points of concentration throughout the park.

Preservation of Natural Features.—It is a violation of the law to destroy, injure, deface, or disturb any buildings, signs, equipment, trees, flowers, vegetation, rocks, minerals, animals, or birds.

Camping.—Camps should be kept clean; rubbish and garbage burned; and refuse placed in cans provided for this purpose. If no cans are available, refuse should be buried. No camping or fires permitted outside designated camp grounds, except by permission of superintendent.

Fires.—Fires should be lighted only when necessary and when no longer needed should be *completely extinguished.* Smoking or building of fires may be prohibited by superintendent when hazard makes such action necessary.

Hunting.—Hunting within park boundaries is not permitted. Unsealed firearms are prohibited within the park, except with written permission of superintendent.

Fishing.—The limit for a day's catch is 6 fish. The possession of more than 2 days' catch (12 fish) at any one time is forbidden. Fishing in any way other than with hook and line, the rod or line held in hand, is prohibited, and the use of fish eggs or fish as bait is not allowed. A State fishing license is required.

Mountain Climbing.—All mountain climbers must report at a ranger station before and after making ascent of any peak. No solo climbs are permitted.

Automobiles.—Drive carefully at all times. Speed limit is 25 miles per hour on park roads, and 15 miles per hour within the camp ground areas. All accidents should be reported at nearest ranger station or office of superintendent. Entrance fees are collected for automobiles, house trailers, and motorcycles at the Grand Teton National Park entrances.

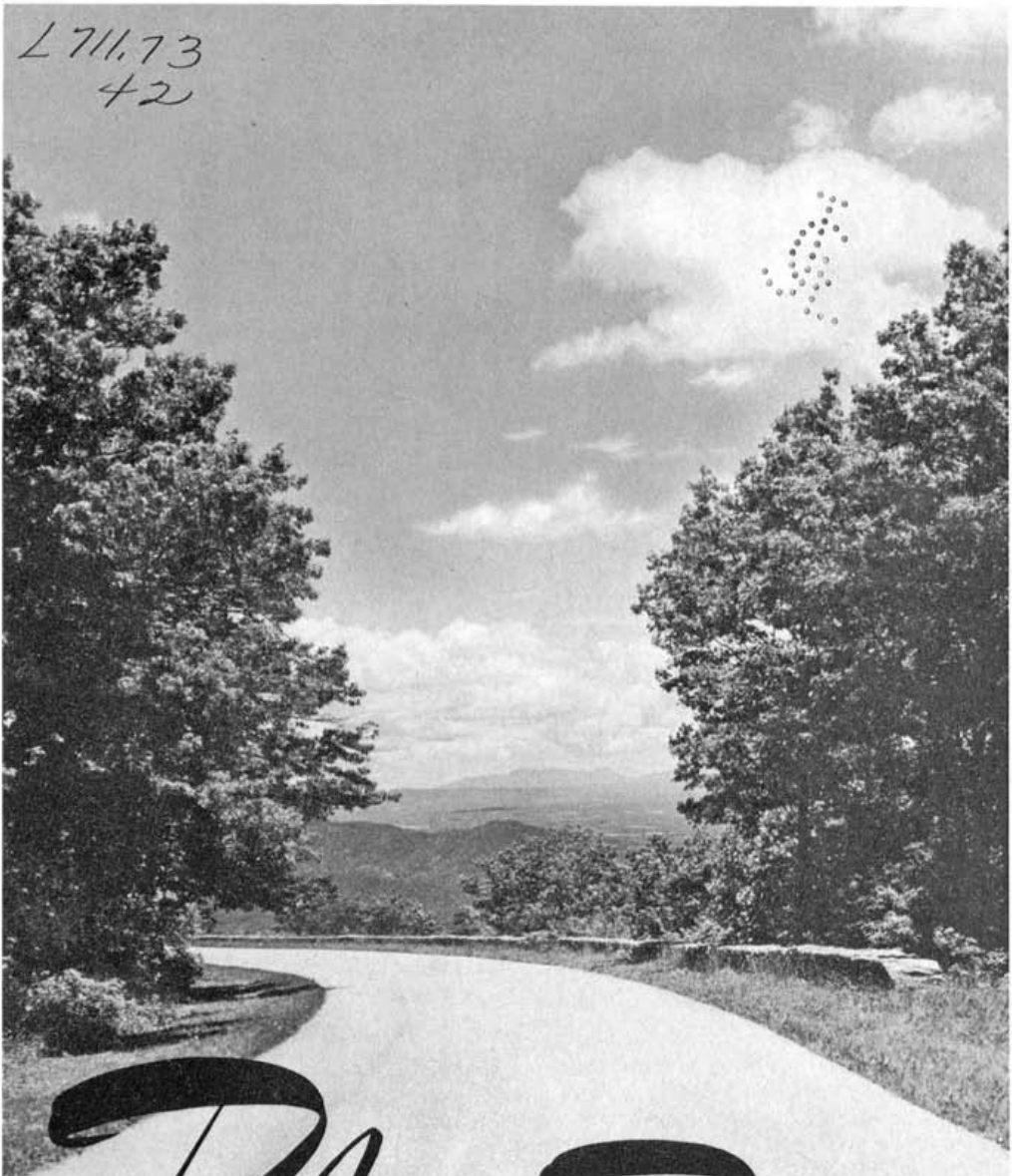
Dogs and Cats.—Dogs and cats may be taken into the park, but should be crated or on leash while within park boundaries.

Penalties.—The penalty for violation of the rules and regulations is a fine not exceeding $500, or imprisonment not exceeding 6 months, or both, together with all costs of the proceedings.

Revised 1947.

U.S. Government Printing Office: 1947 O-F-741128

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Blue Ridge PARKWAY

VIRGINIA - NORTH CAROLINA

Blue Ridge Parkway is part of the National Park System, which is owned by the people of the United States and administered for them by the National Park Service of the Department of the Interior.

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Regional Map . . . . . *Back Cover*

REGULATIONS

While on the Blue Ridge Parkway, please remember the following regulations. Enforcement of them is a part of the Parkway Rangers' job, but they are eager also to help you enjoy your visit. The regulations are for your protection and for the protection of your property—The Parkway.

Since fire is the forest's greatest foe, build fires only in places provided, and be cautious generally.

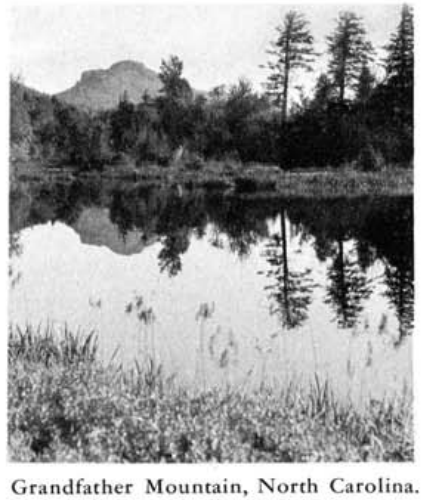
Drive carefully. Speed zones are posted. Not all the guard rail has been built.

The Parkway is for passenger cars. Commercial vehicles may not be used on it.

Park only in parking areas along the way—not on Parkway shoulders unless in emergency.

The flowers, the game, the woods, the land belong to everyone; please be careful not to damage them.

Address inquiries to: Superintendent, Blue Ridge Parkway, P. O. Box 88, Roanoke, Va.



Grandfather Mountain, North Carolina.

UNITED STATES DEPARTMENT OF THE INTERIOR, J. A. Krug, *Secretary*
NATIONAL PARK SERVICE, Newton B. Drury, *Director*



Fox Hunters Paradise Overlook, North Carolina.

BLUE RIDGE PARKWAY

VIRGINIA–NORTH CAROLINA

Blue Ridge Parkway, high road through Virginia and North Carolina, designed especially for the leisurely tourist, represents a new conception in roads. It is not an express parkway of the type built about the big cities, but a quiet way through a distinctive part of the American scene—a road intended for gypsy-like travel on the ride-awhile, stop-awhile basis.

You travel the Southern Highlands, a land of forested mountains exquisite during the flower of spring, cool in the green summer, colorful in the red autumn. The stretches of woodland, the clustered mountains, and the views out to the lowlands are enlivened by the fields and pastures of highland farms, where split rail fences, weathered cabins, and gray barns compose the "hill culture."

Not all is completed of this scenic parkway, the first of its kind to be developed by the Nation; but long portions are paved and were enjoyed by more than a million visitors in 1946.

Among the national parks in the East are Shenandoah, in northern Virginia, and Great Smoky Mountains, in North Carolina and Tennessee. One of the purposes of the Parkway is to connect these wilderness areas over a mountainous distance of nearly 500 miles. The Parkway, about two-thirds completed, leads through an "elongated park" which protects a roadside of varied highland character. The roadway slopes are naturalistically planted in many places with rhododendron, azalea, white pine, and other native species. Parking overlooks to the side are convenient balconies. Along the Parkway at intervals are recreational areas with picnic grounds, campgrounds, trailer sites, and hiking trails which lead to exhibits of unspoiled nature and to spots of native folk lore.



Native Flame Azalea.

The Four Seasons

The four seasons are definite in the southern mountains, each with qualities which set it apart. The Parkway motor road is open the year round, but is not recommended for winter travel. The recreational areas are open April 15 through October 31.

Spring is the favorite season of many in the Blue Ridge, for nowhere is there a greater show of native flowers. In mid-April the shadblow blooms, lacy white on the hillside; but the real procession starts in early May,—pink azalea, dogwood, redbud. In mid-May the flame azalea appears like fire through the undergrowth. Banks of purple rhododendron, native of certain areas in Virginia and prevalent in North Carolina south from Bluff, are next to bloom (late May to mid-June). The mountain-laurel is everywhere and breaks during June. The white to pink rhododendron comes later in June and lingers well into July. There are many spring and summer blooming shrubs and ground flowers in the wild places along the Parkway. Among these is the galax,—glory ground cover of the Southern Appalachians.

Summer in the Blue Ridge is a refuge from the warm temperatures, the altitude accounting for as much as five degrees of coolness per thousand feet. The eastern mountains, forest covered, are notable for their summer greenery. The intermittent highland valleys are a changing color pattern of growing corn, buckwheat, rye.

Autumn comes to the highlands later than you might think. The sumac, gums, the famous southern sour-wood turn brilliant red early in October, but are usually not joined by the colorful display of the hardwoods until the last part of the month, even early November.

Winter sometimes comes suddenly to the Blue Ridge. Travel then becomes uncertain at best. Ice storms, persistent fogs, and blustery winds make it so. There are many times when the mountains are clear and beautiful, but we advise local inquiry about travel conditions during the winter months before venturing on to the Parkway.

What to Do and Where

Motoring.—Blue Ridge Parkway is meant to serve this American pleasure. In the course of a motor trip along the Parkway, plans should include a stop at one of the several recreational areas for a picnic lunch. Here comfort stations and drinking water will be found. In these areas we suggest a leg stretcher along an easy trail, or there are short trails leading from many of the parking overlooks to selected vantage points.

Picnicking.—Picnic areas, ideal for the family group, include parking areas, tables, fireplaces, drinking water, and refuse cans. These areas are designated on the maps by the Parkway emblem.

Tourist Facilities.—Gas stations are not ready on the Parkway proper, but you will find them located within a short distance of the Parkway on the more important State highways.

At Cumberland Knob, near the Virginia-North Carolina line, there is a pleasant sandwich shop operated during the travel season by National Park Concessions, Inc. Except for this, eating places and overnight accommodations on the Parkway have not yet been built. For information about accommodations and points of interest in the Blue Ridge Parkway vicinity, we suggest you write to the Virginia State Chamber of Commerce, Richmond 19, Virginia; or the North Carolina Travel Council, P. O. Box 826, Pinehurst, North Carolina.

Camping.—At Rocky Knob in Virginia and Bluff in North Carolina are trailer sites and campgrounds. There you will find tent platforms, individual fireplaces, garbage receptacles,

Picnic Grounds, Cumberland Knob, North Carolina.





Highland Pastures, Rocky Knob, Virginia.

drinking water, and comfort stations. Camping supplies are not available. Length of stay is not limited.

Hiking.—Trail systems have been developed in each of the Parkway recreational areas. At Bluff there are more than 20 miles of foot trails, and in each of the other areas from 3 to 5 miles. Grades are easy and can be walked comfortably.

Photography and Painting.—The Parkway opens to you a photogenic and paintable country. Flowers, mountains, valleys, streams, wildlife, and the hill farms are fine subjects.

Fishing.—This is trout country. Rainbow and brook trout haunt many streams up and down the Parkway. State licenses are required. Outside the Parkway boundary State laws apply. Within the Parkway boundary special regulations, covering creel limit, bait, and season, prevail. The season in North Carolina lasts from April 15 through August 31, and in Virginia from April 20 through July 31.

Golfing, Swimming, Tennis.—Facilities for this type of active sport are not provided on the lands of Blue Ridge Parkway, but the Parkway is a convenient way to reach resort areas where there are fine mountain golf courses, tennis courts, saddle horses, lakes, and swimming pools.

Several State areas and forests and portions of the national forests, through which the Parkway winds, have many recreational developments within easy reach of the Parkway.

The Mile Posts

Along paved sections of the Parkway you will observe numbered mile posts. Zero marker is at Rockfish Gap just south of Shenandoah National Park, and each mile is numbered progressively southwestward on the Parkway. Thus each Parkway mile is identified by a specific number.

Special Information



Interpretive signs carrying the squirrel gun and powder horn symbol will be found at various points along the Parkway where there is a legend, old building, or place of scientific interest.



Entrances

At the entrance to each of the recreational areas along the Parkway you will find a large carved wooden sign bearing the Parkway emblem. This is also the designation used on the maps herein to locate the recreational areas now ready for use.

Elias Mabry Mill on the Parkway, Virginia.



Shenandoah National Park—Roanoke, Virginia

The Parkway is under construction through much of its northernmost sector, shown on the facing page. The way through is maintained for those who wish to pioneer these sections on a crushed stone surface. Most advanced are the 27 Parkway miles from Rockfish Gap to Tye River Gap, paving of which is expected to be completed late in the summer of 1947.

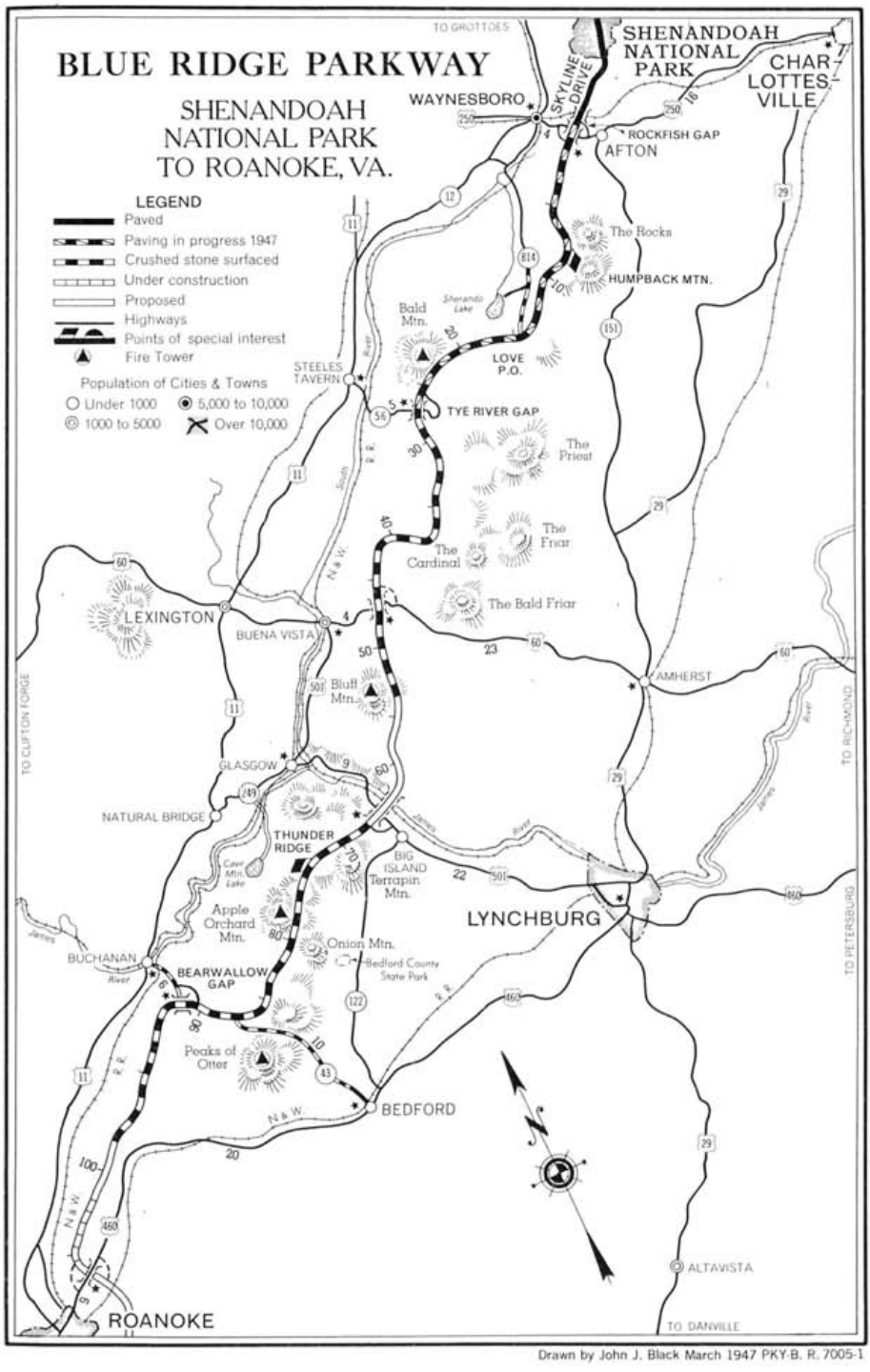
North of the James River the Parkway winds through large sections of the George Washington National Forest. This scenic route is very spectacular where it crosses the high cliff sections of Humpback Mountain. Purple rhododendron blooms here in early June. Through this region, too, are glimpses of isolated mountain farm groups, as well as distant views to the fertile "bread basket of the Confederacy" in the Shenandoah Valley of Virginia.

The Parkway section south of the James River to Roanoke features the lowest point on Blue Ridge Parkway, 670 feet elevation, where it will cross the river, and Thunder Ridge, where it climbs to almost 4,000 feet. South a few miles are the famed Peaks of Otter. This spectacular section lies partly through the Jefferson National Forest.

The famous Appalachian Trail, making its way from Maine to Georgia, touches the Parkway at many points. For detailed information, write the Appalachian Trail Conference, 808 Seventeenth Street, NW., Washington 6, D.C.

Shenandoah National Park conserves a large section of the Virginia Blue Ridge (74 miles southwest of Washington, D. C.). Well known for the Skyline Drive, a road wholly within that park but connecting with the Blue Ridge Parkway at Rockfish Gap, Shenandoah also has many miles of developed foot trails and varied tourist accommodations. For complete information address the Superintendent, Shenandoah National Park, Luray, Virginia.

Mile Post		*Elevation*
0	Rockfish Gap-Junction Blue Ridge Parkway and Skyline Drive of Shenandoah National Park.	1,909
6	Humpback Rocks, craggy rock outcropping. Foot trail from parking area to the Rocks.	3,210
15	Sherando Lake (George Washington National Forest). Swimming, fishing, picnicking. Turn on VA–814 for 3½ miles.	1,500
27	Tye River Gap. To U S 11 five miles on VA–56	2,969
45.6	U S 60 crossing. Parking grade dead-ends 7 miles south	2,312
63.7	Junction U S 501 and Parkway section southward	670
74.7	Thunder Ridge Parking Area. One minute walk to superb view of Arnolds Valley.	3,485
76.7	High point on the Parkway in Virginia. Apple Orchard Mountain (El. 4,229). Forest Service fire tower.	3,950
80	Purple rhododendron blooms early June.	
83.8	Wilkerson Gap. Foot trail to summit Flat Top Mountain takes 1¾ hours. Trail down south side of mountain to vicinity Big Spring on VA–43 (one mile off Parkway) takes 1 hour.	2,511
86	Peaks of Otter. Sharp Top (El. 3,875). Flat Top (El. 4,001). Recreational area under development. VA–43 to Bedford.	
90	VA–43 to Buchanan. Parkway closed to south. ROANOKE (Magic City). Western Virginia's largest city. Population 70,000. Parkway headquarters.	1,000

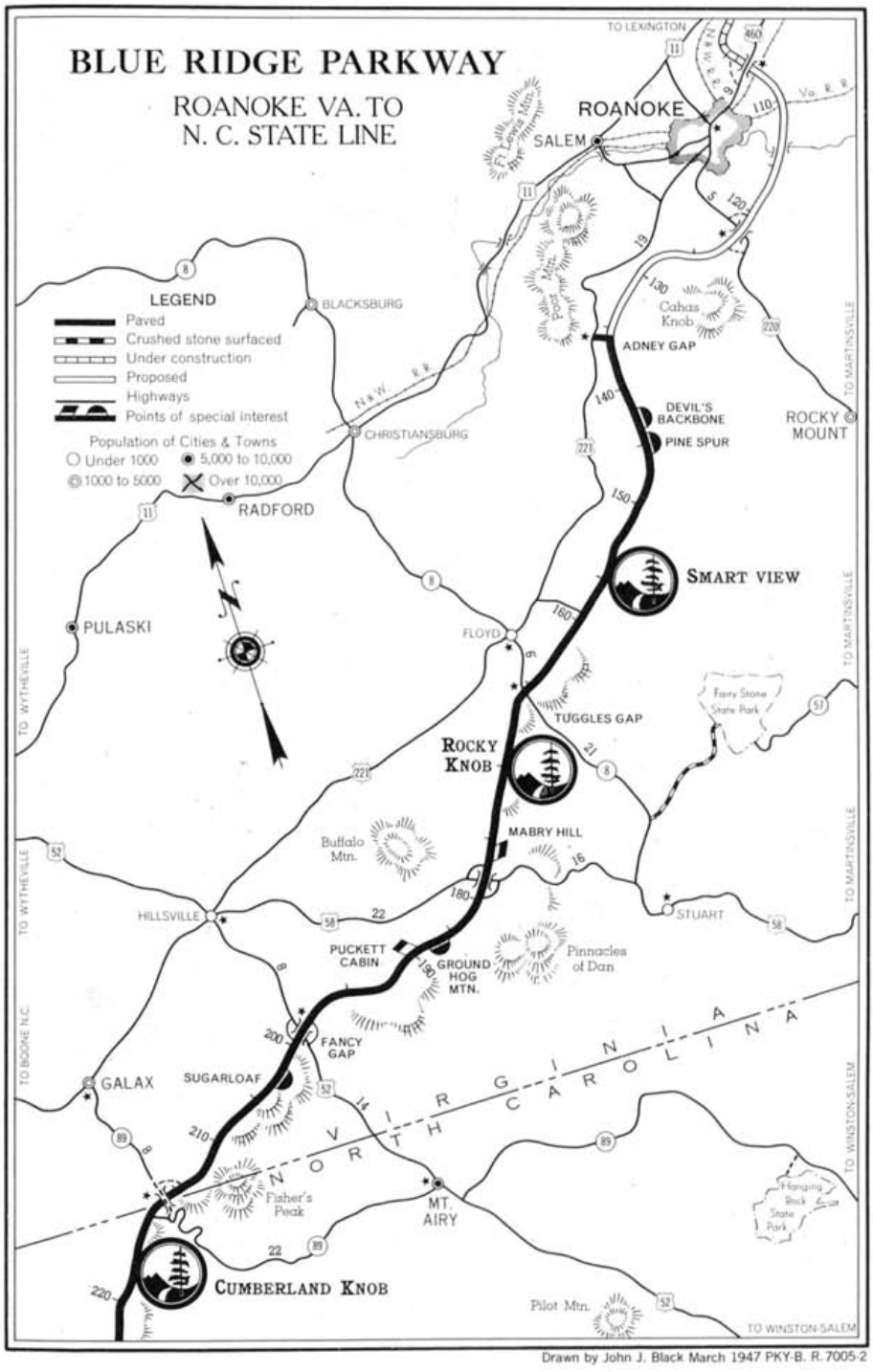


Drawn by John J. Black March 1947 PKY-B. R. 7005-1

Roanoke, Va.—North Carolina State Line

From Adney Gap (19 miles south of Roanoke by way of U S 221) the Parkway is paved south to the State Line and beyond to Deep Gap near Boone and Blowing Rock. Fifteen miles of Parkway, southernmost in Virginia just above the State Line, will be under pavement repair during the early part of 1947—traffic to be maintained. This section of Parkway through lower Virginia is notable for its pictures of mountain farming. The Blue Ridge here is a high rolling plateau which breaks in a sharp escarpment toward the east and the lower Piedmont. The Parkway generally follows the crest, which is the water divide between Atlantic and Gulf drainage, affording occasional fine views over the low country. In other places the Parkway recedes into wooded and pastoral valleys of quiet charm. Only the first 35 miles have been landscaped. Note the contrast.

Mile Post		*Elevation*
136	Adney Gap. Terminus 140 mile paved section to Deep Gap, N. C.	2,690
144	Devils Backbone Parking Overlook. Fine view over farming region	2,685
144.8	Pine Spur Parking Overlook. Named for the white pine which is the tree depicted on Parkway emblem.	2,703
150	Magnificent flame azalea; blooms mid-May.	
154.5	 Smart View, 500 acres, hiking trails, large picnic grounds, comfort stations, drinking water. The cabin home of T. T. Trail, immediately adjacent entrance road, is picturesque. Rim trail in this area is part of Appalachian Trail system. Smart View is center of Parkway's dogwood bloom in early May.	2,500
164	Fine azalea show. Also mountain laurel in late May.	
165.2	Tuggles Gap. VA–8, turn-off for Fairy Stone State Park 16 miles. Swimming, boating, picnicking.	2,752
167 to 170	 Rocky Knob, 4,000 acres. Picnicking, camping, trailer sites, hiking, comfort stations, drinking water, fishing 5 miles of Rock Castle Creek. Foot trail from Saddle Parking Overlook (Mile 168) to summit of Rocky Knob (El. 3,570) takes 10 minutes, continues along rim to Grassy Knoll (Mile 170). Fine for flame azalea late in May.	3,225
176.1	Mabry Mill, grist and sawmill, wheelwright and blacksmith shops, illustrating typical mountain "industrial plant," fascinating and ingenious. Buildings will later be opened for inspection.	2,855
189.2	Groundhog Mountain Parking Overlook, high point affording 360° view. Fire tower, simulating old tobacco barn, operated by Virginia Forest Service. Examples of various types of old chestnut rail fences, such as snake, post and rail, and buck.	3,030
189.9	Puckett Cabin, home of Arlena Hawks Puckett, storied midwife of the local hills.	2,850
199.5	Fancy Gap, U S 52, where local products, such as cabbage, are gathered to be trucked down the mountains.	2,920



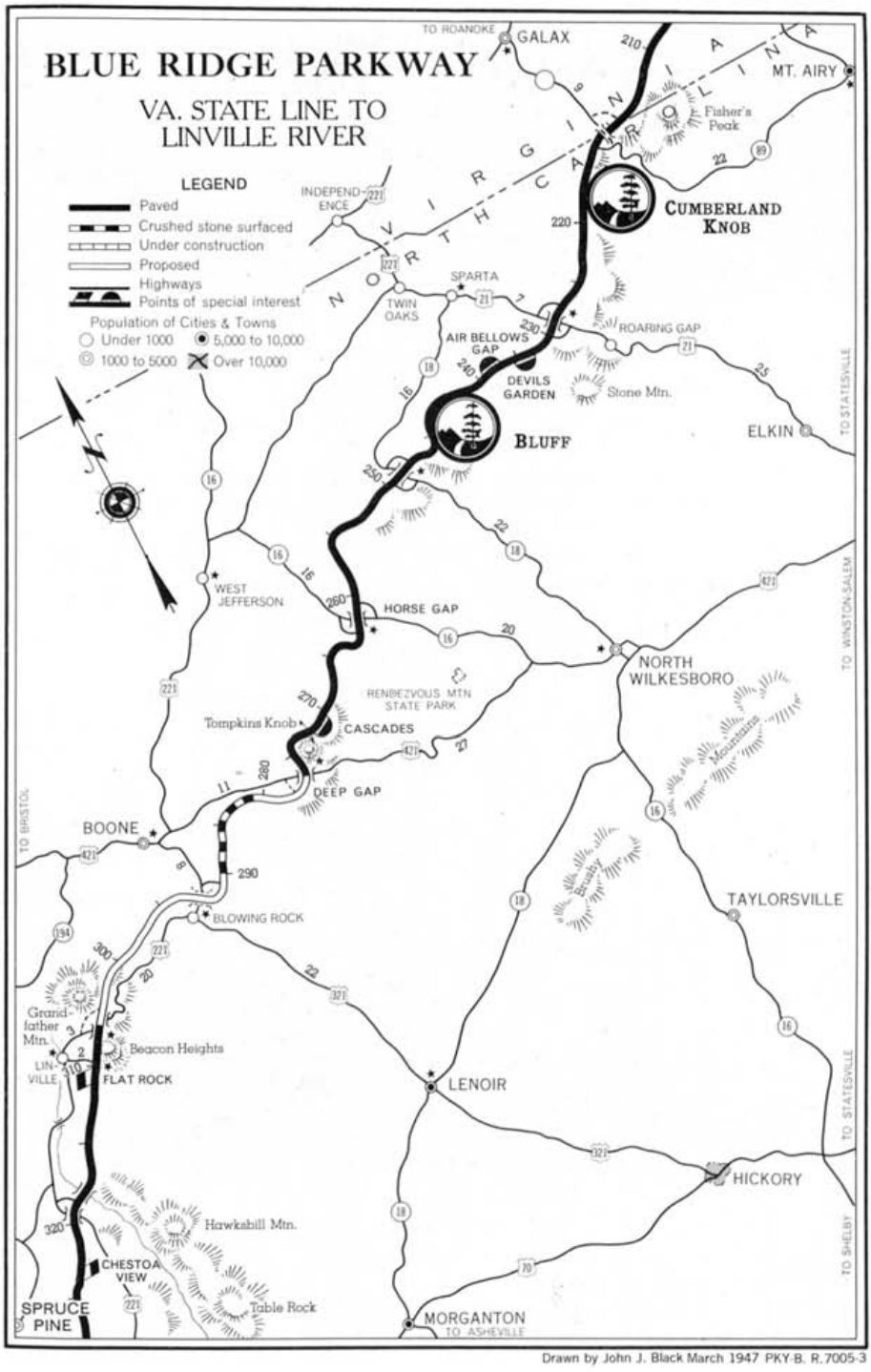
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Virginia State Line—Linville River

The northerly 60 miles shown finished on the map facing this page, like the section north toward Roanoke, thread a country remarkable for its mountain fields and pastures; but the country is more rugged, the Blue Ridge becoming more defined and higher. It is completed as to landscaping between the State Line and Bluff. A sandwich shop is open at Cumberland Knob.

Sixty miles of Parkway are available southward from Linville. From Deep Gap, near Boone, it is not far to Blowing Rock and Linville, resort towns at the edge of Grandfather Mountain. This "patriarch" is one of the oldest, shaggiest mountains of the Appalachians. The road across Grandfather, U S 221, is known as the Black Bear Trail (Yonahlossee in the language of the Cherokee).

Mile Post		*Elevation*
216.9	North Carolina-Virginia State Line	2,547
217.5	 Cumberland Knob, 1,000 acres, sandwich shop (sandwiches, drinks, soups, picnic box lunches), picnic area, comfort stations, drinking water. 15-minute loop trail to Cumberland Knob (El. 2,855). Loop trail into Gully Creek Gorge, 2 hours.	2,740
218.6	Fox Hunters Paradise Overlook and Parking Area. 10 minutes by trail to the Paradise, where old-time hunters listened to their hounds.	2,805
219	Fine display of pink azalea; blooms early May. Flame azalea blooms mid-May.	
228	Fine beds of pink azalea; blooms early May. This section also fine for mountain-laurel in early June.	
238 to 245	 Bluff, 6,000 acres—picnic grounds (Mile 241), campgrounds (Mile 239), trailer sites, comfort stations, drinking water, 20 miles of trail. This area affords fine examples of bluegrass downs, terminating in precipitous cliffs. Purple rhododendron in meadows and on trails late May. At Mile 238.5 is the picturesque Carolyn Brinegar Cabin. Be sure to visit Wildcat Rocks (Mile 241.1), from which you may look down 1,500 feet upon what was once the homestead of the Caudill family, dramatic exhibit of isolated mountain life. 10-minute trail to Fodderstack Mountain.	3,710
271.9	Cascades Parking Overlook. Woodland trail along a mountain stream to cascades tumbling several hundred feet. Delightful 8-minute walk.	3,570
276.5	Deep Gap, temporary terminus 140-mile paved section to Adney Gap, Va. Between Deep Gap and Beacon Heights the Parkway is not open. Use State roads U S 421 and U S 221 through Boone and Blowing Rock for connection.	3,140
307.4	Beacon Heights. Make inquiry at Linville or Blowing Rock for entrance to Daniel Boone Boy Scout Trail over the seven peaks of Grandfather Mountain for which the larger part of a day must be allowed.	3,140
310.7	Flat Rock Parking Area. 10-minute trail to superb prospect of Linville Valley and Grandfather Mountain. Easy climb and most worth while.	3,995
319.1	Linville River Parking Area. Here is one of the Parkway's largest stone arch bridges, three spans of 80 feet each. Fishing in Linville River under State laws.	3,250



Drawn by John J. Black March 1947 PKY-B. R.7005-3

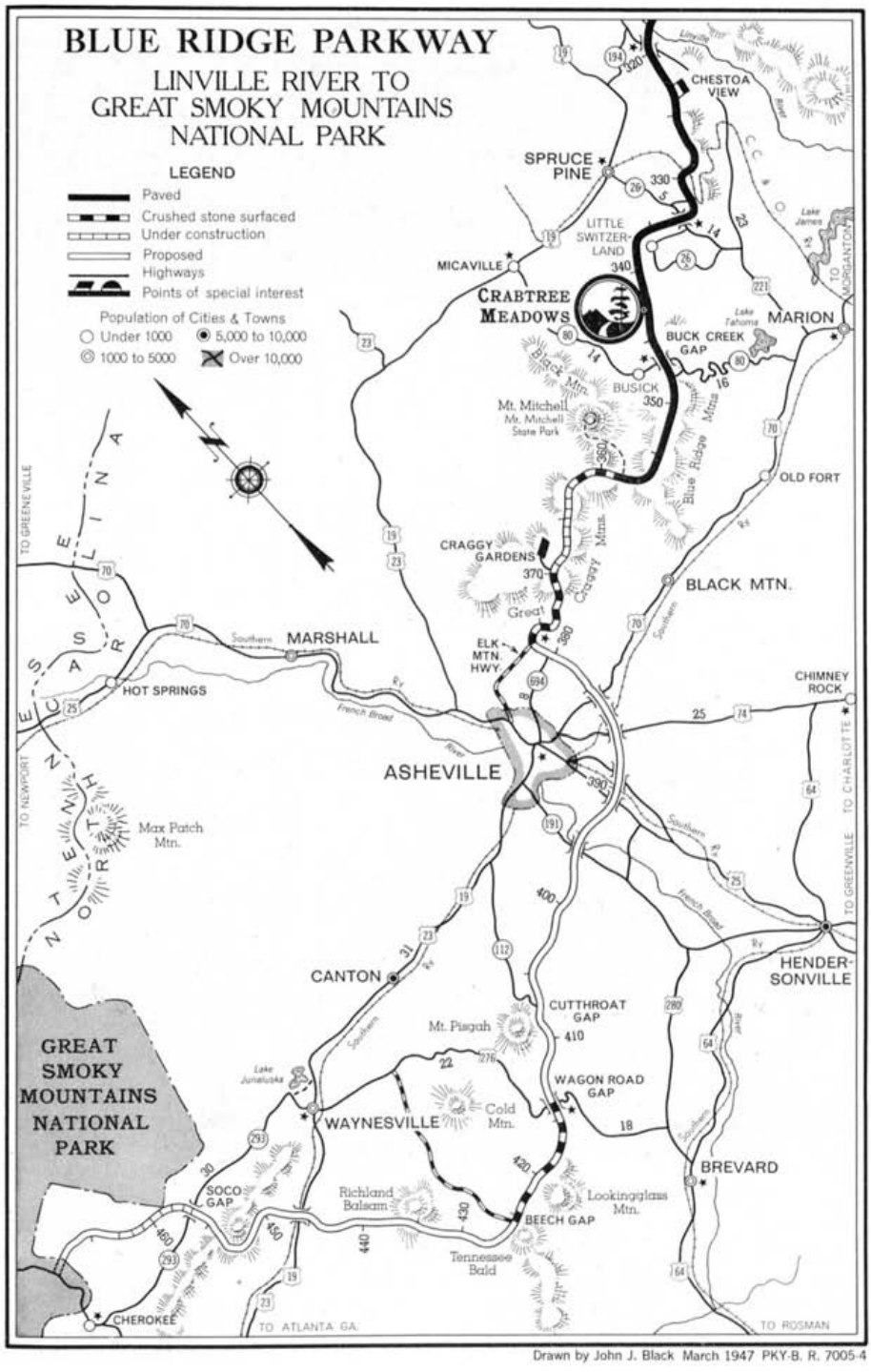
Linville River—Great Smoky Mountains National Park

The Parkway between Linville Falls and Asheville traverses one of the great mountain sections of North Carolina where the Blue Ridge, the Blacks, and the Craggy Mountains merge. Mount Mitchell, 6,684 feet in elevation, and the highest peak in the East, is prominent from the Parkway. The large holdings of the Mitchell Division of the Forest Service and the Asheville Watershed have protected the area from despoliation. The 20 miles between Miles 330 and 350 will be paved during the summer of 1947. This section will be open for travel, but there may be short delays. Note—Parkway not open beyond Mile 357.

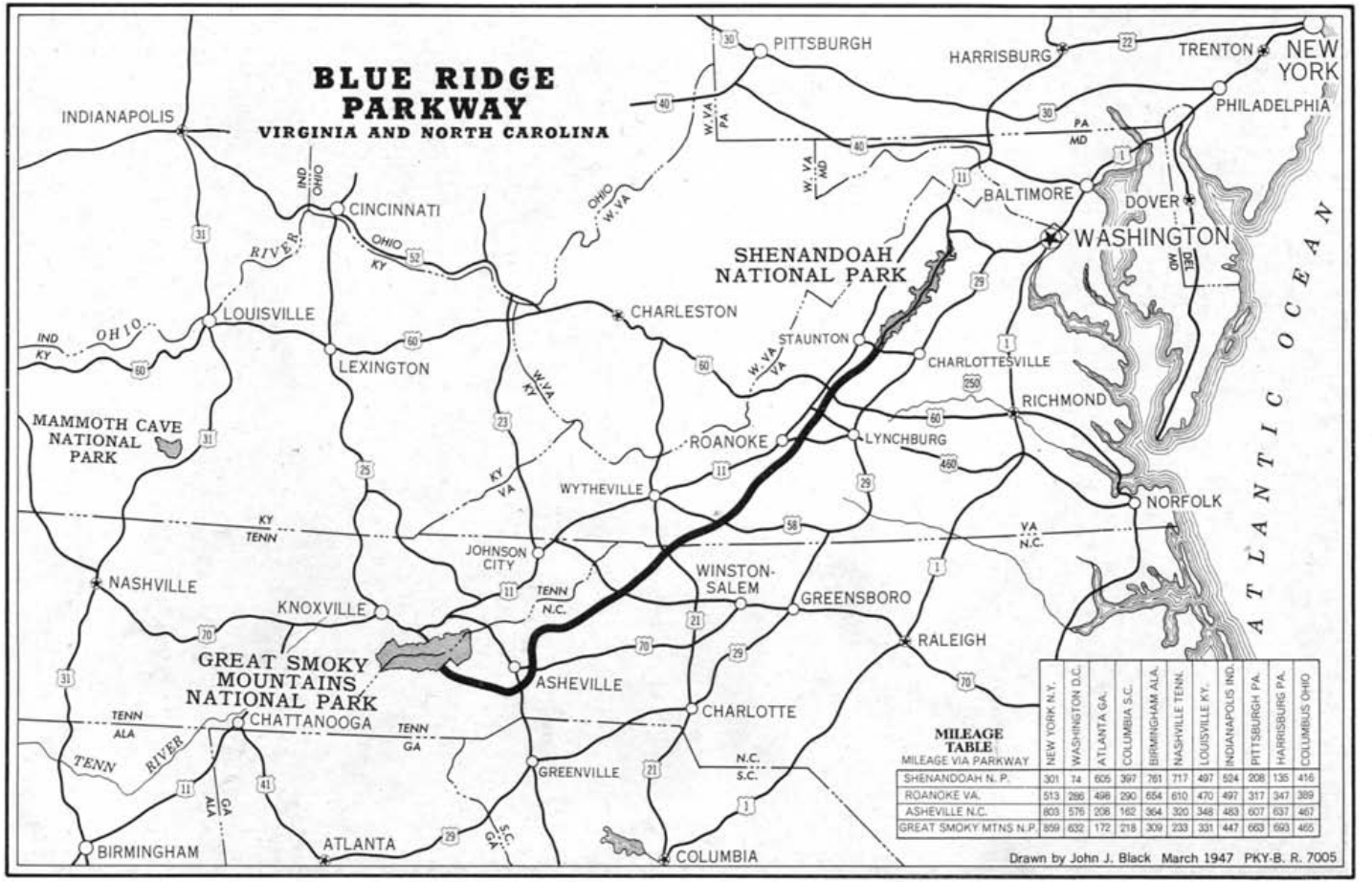
Mile Post		*Elevation*
323.2	Chestoa View offers an unusually fine view from one of the many vertical cliffs on Humpback Mountain.	4,110
341	Crabtree Meadows, 160 acres lying within the Pisgah National Forest and now partially developed. Hiking, picnicking, and comfort stations available summer of 1947. The half-hour walk to Crabtree Falls is not to be missed.	3,735
357.8	Swannanoa Gap, Mount Mitchell State Park. 4.8 miles on spur road. Road under construction; make local inquiry.	5,185
370	Bee Tree Gap, turn off for Craggy Rhododendron Gardens. Forest Service development. The peak of the rhododendron bloom is in mid-June. Make inquiries in Asheville for highway connection to Parkway from the city. ASHEVILLE, a leading city in the South. Population, 50,000.	4,769
410	Mount Pisgah. The Forest Service Pisgah motor road, Cutthroat Gap to Wagon Road Gap, is still open, and 5 miles of Parkway, graded with loose gravel, extend beyond Wagon Road Gap and are available for a "preview".	
470	The Great Smoky Mountains National Park, where the Parkway will one day terminate, is located equally in North Carolina and Tennessee. Its 460,000 acres of mountainous wilds may be viewed from paved roads and many wilderness trails. Tourist accommodations are in nearby towns. Inquire Superintendent, Great Smoky Mountains National Park, Gatlinburg, Tennessee.	

Parkway through Devils Garden, North Carolina.





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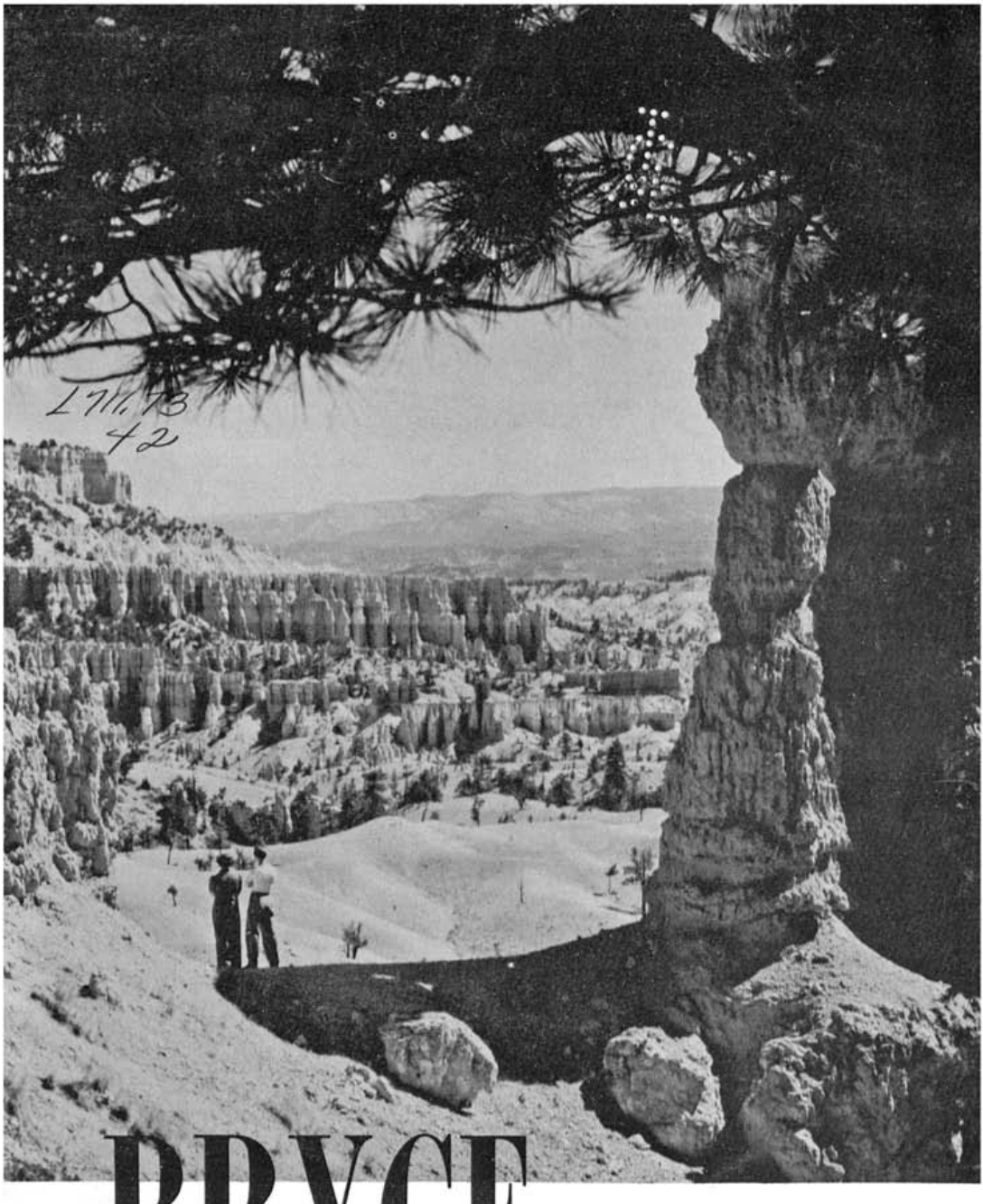


MILEAGE TABLE
MILEAGE VIA PARKWAY

	NEW YORK N.Y.	WASHINGTON D.C.	ATLANTA GA.	COLUMBIA S.C.	BIRMINGHAM ALA.	NASHVILLE TENN.	LOUISVILLE KY.	INDIANAPOLIS IND.	PITTSBURGH PA.	HARRISBURG PA.	COLUMBUS OHIO
SHENANDOAH N. P.	301	74	605	397	761	717	497	524	208	135	416
ROANOKE VA.	513	286	498	290	654	610	470	497	317	347	389
ASHEVILLE N.C.	803	576	208	162	364	320	348	483	607	637	467
GREAT SMOKY MTNS N.P.	859	632	172	218	309	233	331	447	663	693	465

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BRYCE CANYON

NATIONAL PARK • UTAH

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Historic Events

1866 Capt. James Andrus in command of a military expedition from St. George, Utah, crossed the Paria River a few miles south of Bryce Canyon.

1872 A. H. Thompson, Geographer of the Powell Survey, sketched the topography of the Pink Cliffs eastward to Rainbow Point and ascended Table Cliffs. Lt. W. L. Marshall, topographer, and G. K. Gilbert and E. E. Howell of the Wheeler Survey mapped, described, and illustrated for the first time the features of the park north of Campbell Canyon.

1874–76 Scattered settlements established in the Upper Paria Valley. Ebenezer Bryce, for whom the park is named, ranged cattle in the area. The region that includes Bryce Canyon National Park studied by Capt. C. E. Dutton. View from Sunset Point described (1876) by T. C. Bailey, Deputy U. S. Surveyor.

1877 Cannonville and Henrieville founded.

1905 The Paunsaugunt Plateau, which includes the park, set aside as a national forest.

1923 Bryce Canyon National Monument established by Presidential proclamation.

1924 Act of Congress authorized the establishment of Utah National Park.

1928 Bryce Canyon National Park established; name changed from Utah National Park to Bryce Canyon National Park.

UNITED STATES DEPARTMENT OF THE INTERIOR . . . . . J. A. Krug, *Secretary*

NATIONAL PARK SERVICE . . Newton B. Drury, *Director*

Bryce Canyon

NATIONAL PARK · *Utah*

OPEN ALL YEAR



BRYCE CANYON NATIONAL PARK includes some of the most interesting exposures of the Pink Cliffs formation, whose rocks are among the most colorful of any forming the earth's crust. The major beauty spots of the area are found where forces of erosion have cut back into the plateau, forming amphitheaters or wide canyons filled with pinnacles and grotesque forms.

Most of the park area, with some 30 miles of Pink Cliffs, can be seen from Rainbow Point, at the southern end of the park. Included in this panorama are such beautiful amphitheaters as Black Birch Canyon, Agua Canyon, and Willis Creek. In addition, there are magnificent views across "the land of the purple sage" to Navajo Mountain, 80 miles to the east, and to the Kaibab Plateau and the Trumbull Mountains to the south, the latter 99 miles distant.

In reality Bryce is not a canyon; rather it is a great horseshoe-shaped bowl or amphitheater cut by water erosion into the Paunsaugunt Plateau and extending down a thousand feet through its pink and white marly limestone. The character of the area is well indicated by the Paiute Indian name, "Unka-timpe-wa-wince-pock-ich," which is translated as, "red rocks standing like men in a bowl-shaped canyon." The largest amphitheater is 3 miles long and about 2 miles wide, and is filled to the brim with myriads of fantastic figures cut by weathering influences, chiefly by water, wind, and changes in temperature. Domes, spires, and temples predominate, decorated in all the colors of the spectrum, but principally with reds, pinks, and creams.

The canyon was first reserved as Bryce Canyon National Monument by Presidential proclamation June 8, 1923. Later legislation authorized its establishment as Utah National Park, when certain conditions regarding land acquisition had been met. The act of September 15, 1928, changed the name to Bryce Canyon National Park and nearly doubled the area contained in the monument. The park now embraces more than 36,000 acres under Federal jurisdiction.

Bryce Canyon National Park is one

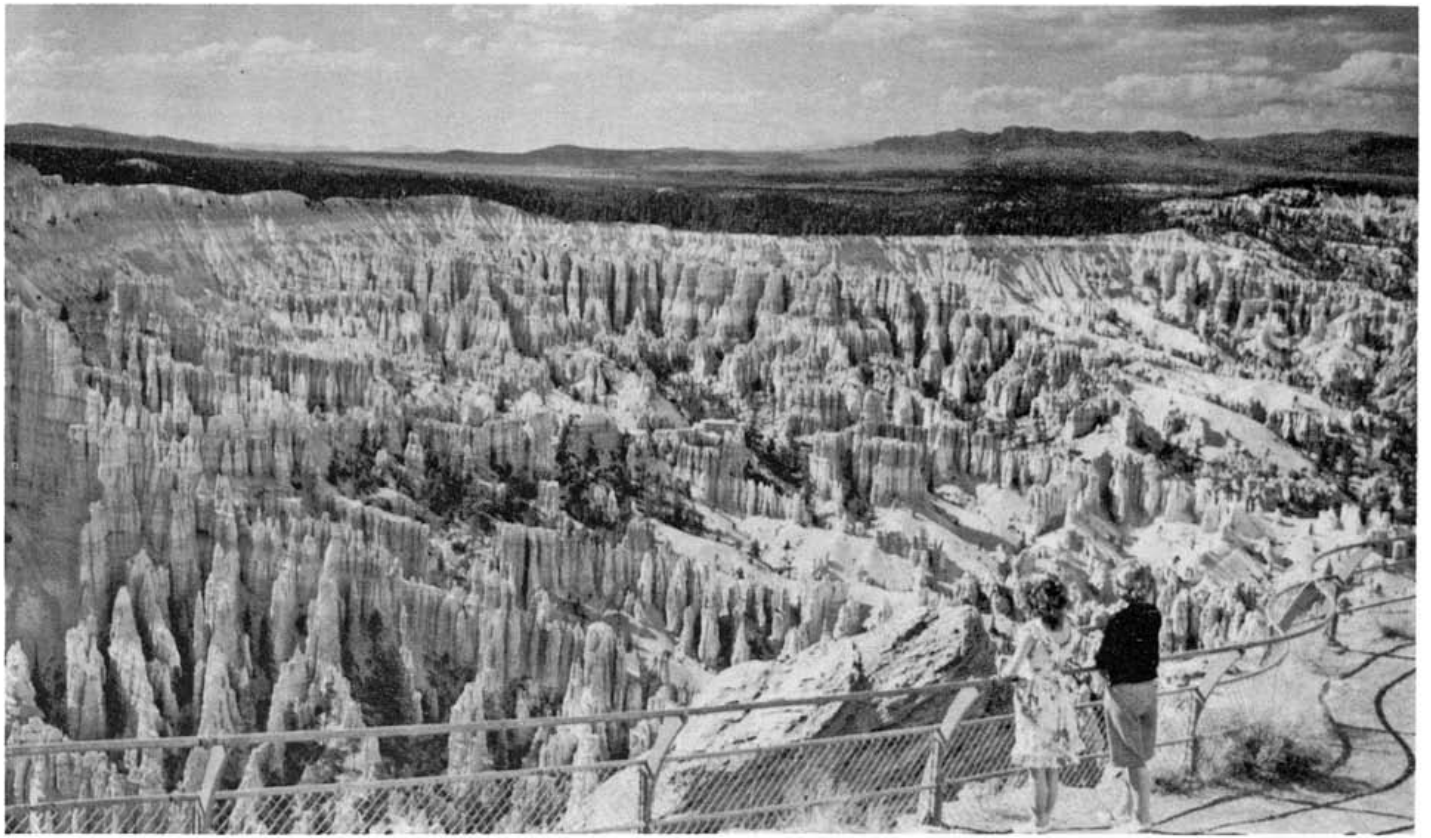
of the areas of the National Park System owned by the people of the United States and administered for them by the National Park Service. In these areas the scenery and the objects of historic, prehistoric, and scientific interest are carefully preserved and displayed for public enjoyment.

General Information Relating to Geology of Bryce Canyon and Zion National Parks[1]

Regional Features.—In Zion and Bryce Canyon National Parks the type of scenery peculiar to the plateaus of southern Utah and northern Arizona attains its most complete expression. Layer upon layer of shales and sandstones have been carved into architectural forms, astonishingly alike for size and color. The long stretches of even skyline seen on approaching the parks from Cedar City (west), Panguitch (north), and Grand Canyon (south) give an impression of extensive flat surfaces that terminate in lines of cliffs, but viewpoints within the parks reveal a ruggedness possessed by few other regions. The canyons are so narrow, so deep, and so thickly interlaced, and the edges of the strata so continuously exposed that the region seems made up of gorges, cliffs, and mesas intimately associated with a marvelous variety of minor erosion forms. The parks might be considered as mountainous regions in which departures of many thousand feet from a general surface are downward rather than upward.

The canyons and adjoining terraces are spectacular illustrations of erosion. They show with diagrammatic clearness the work of running water, rain, frost, and wind, of ground water and chemical agencies active throughout a long period of time. The horizontal tables and benches, broken by vertical lines that in distant view appear to dominate the landscape, are normal features of erosion of plateau lands in an arid climate. The tabular forms are the edges and surfaces of hard strata from which softer layers have been stripped. The vertical lines mark the position of fractures (joints)—lines of weakness which erosion enlarges into grooves and miniature canyons. As they entrench themselves in horizontal layers of rock that vary in resistance to erosion, the master streams and their tributaries are developing stairlike profiles on their enclosing walls. Cliffs in resistant rocks and slopes in weak rock constitute risers and treads that vary in steepness and height with the thickness of the strata involved. Thus near the south entrance to Zion Park the edge of a layer of hard conglomerate is a vertical cliff, its top a platform. Above this platform a long slope of shale, broken by many benches developed in hard beds, extends upward to the great cliff faces of West Temple and the Watchman. In front of Zion Lodge a slope of weak shales leads upward to a cliff of resistant sandstone above which a slope of shale extends to the vertical wall of Lady Mountain. In Bryce Canyon the rim road is on the highest tread of a giant rock stairway that, as viewed from Rainbow Point, leads downward in steps 30 to 400 feet high to the flat lands 3,000 feet below.

[1]Condensed from an article by H. E. Gregory, U. S. Geological Survey.

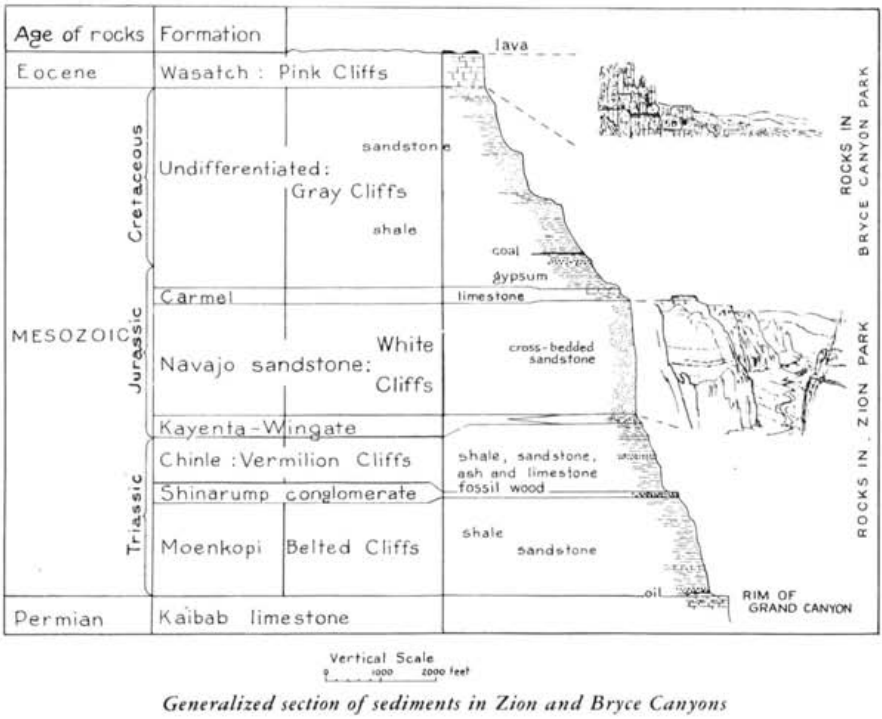


View of multicolored formations from Bryce Point (*Union Pacific Railroad photo*)

The streams at work in the parks, though relatively small, have steep gradients, including rapids and waterfalls, and are supplied with disintegrated rock material swept from the ledges by torrential rains about as fast as formed. They are therefore powerful agents of erosion, especially in times of flood. The fresh, sharp, angular profile of mesas, ridges, and canyon walls and the extensive areas of bare rock are maintained by the rapid down-cutting and prompt removal of rock waste. The resulting land forms reflect the aridity and the topographic youth of southern Utah and contrast strongly with the rounded hills, the broad valleys, the plant-covered slopes, and the deep soils of more humid regions.

Geologic History.—A large part of geologic history is revealed in the canyon walls of Zion and Bryce Canyon National Parks. Just as Grand Canyon is the best known record of ancient geologic history, Zion Canyon records most clearly the events of medieval geological time, and Bryce reveals much of modern geologic history. The story of Zion begins where that of Grand Canyon ends, and ends where Bryce begins. The rocks exposed in these three national parks incorporate the records of a billion years.

A study of the rocks of Zion and Bryce Canyon shows that during the last 200,000,000 years the region comprising the parks has witnessed many changes in landscape and climate. At times it was covered by the sea, at other times broad rivers traversed its surface, and at still other times it was swept by desert winds. Most of the rocks were laid down by water as gravel, sand, mud, and limy ooze.



Generalized section of sediments in Zion and Bryce Canyons

They have been converted into solid rock by the weight of layers above them and by lime, silica, and the iron that cement their grains. Embedded in the rocks are fossil sea shells, fish, trees, snails, and the bones and tracks of land animals that sought their food on flood plains, in forests, or among sand dunes. The most conspicuous remains are those of dinosaurs—huge reptiles that so dominated the life of their time that the Mesozoic is known as the "age of dinosaurs."

The accumulation of some 8,000 feet of strata (Mesozoic and Tertiary) on top of 4,000 feet of older (Paleozoic) beds, which are exposed in Grand Canyon, may be considered the first of three major events in the development of the marvelous landscapes of the Zion-Bryce region; it provided the material from which the huge scenic features were later carved. The second event was a regional uplift which elevated the previously low-lying top beds of the series (Wasatch, Pink Cliffs) to a height of nearly 2 miles above sea level. As a result of this movement, the earth's crust was broken into huge rectangular blocks by north-south fractures or faults. Three of these great faults can be seen in the vicinity of the parks: The Hurricane fault in the Hurricane Cliffs, west of Zion; the Paunsaugunt fault in the cliffs of Bryce; and the Sevier fault along the Mount Carmel Road between the two parks.

In consequence of the uplift the third major event, the present cycle of erosion, was initiated. The streams became strong and swift and so were able to cut deeply into the underlying rock and carry away the land waste. In this process the streams have removed many cubic miles of rocks, which, if replaced, would fill the present canyons and build up their bordering land to the level of the lofty Markagunt and Paunsaugunt Plateaus. The gigantic features of Zion and Bryce Canyon National Parks mark a stage in the process of erosion that began long ago and which, if continued without interruption, will convert the present rugged landscape into plains near sea level.

Distinctive Features of Bryce Canyon. — In its regional setting Bryce Canyon National Park is the southeastern border of the extensive Paunsaugunt Plateau. It comprises two areas of strongly contrasted topography that meet in a line that marks the rim of the plateau and the top of its bordering cliffs. Back from the rim the plateau surface on which the park buildings and the automobile roads have been constructed is generally flat land traversed by broad, shallow valleys in which erosion is inconspicuous. Below the rim erosion has produced a region of remarkable ruggedness. It might naturally be supposed that the beautiful amphitheater at the head of Bryce Canyon had been carved by waters pouring down from the plateau above. But the plateau streams contribute nothing; they flow away from the rim. The chief sculpturing agents are the rain and snow that fall directly into the canyon. In producing the amazing variety of erosion features the streams have been aided by frost that pries fragments from the cliffs and by chemical agencies that decompose the rock and supply its vivid color.

The development of the park landscape was made possible by move-

ments within the earth's crust which brought originally low-lying strata to an altitude exceeding 8,000 feet. Streamways on the flat top of this uplifted block were little affected, but with greatly steepened gradients streams around the borders of the newly made plateau became powerful. The Paria and its swiftly flowing tributaries have cut deeply into the face of the Paunsaugunt and carried billions of tons of ground-up rock to the Colorado. At the present time erosion by Bryce Creek, Yellow Creek, Willis Creek, Podunk Creek, and many smaller streams, is causing the plateau face to retreat northwestward, and these streams are taking into their drainage areas channels that formerly carried waters northward to Sevier River.

The drab colored landscape along the southeast border of the park has been developed in alternating beds of shale, coal, and sandstone (Cretaceous age); in the resulting erosion forms, slopes, mounds, rounded ridges, and valleys with inclined or steplike sides predominate. The brightly colored rocks that form the topmost cliffs and terminate abruptly in such headlands as Steamboat Mountain, Bryce Point, and Rainbow Point are resistant limestones of Tertiary age (Wasatch formation). They erode as vertical walls (Pink Cliffs), which weathering has developed into the astonishing display of architectural forms that make Bryce Canyon distinctive.

How to Reach Bryce

In going to Bryce private motorists should leave the main highway, United States Highway 89, 7 miles south of the town of Panguitch, Utah. Turning to the east, the road follows up Red Canyon, a brilliantly colored little gorge which is often mistaken for Bryce Canyon itself. The approach to Bryce is unusual; no evidence of the canyon is visible until the visitor walks on to the rim and suddenly has revealed to him the great sight in all its breath-taking beauty. Improved highways make Bryce Canyon Park easily accessible, except during the winter.

Travelers by rail may reach the park over the Union Pacific System to Cedar City, Utah, thence by motorbus to Bryce.

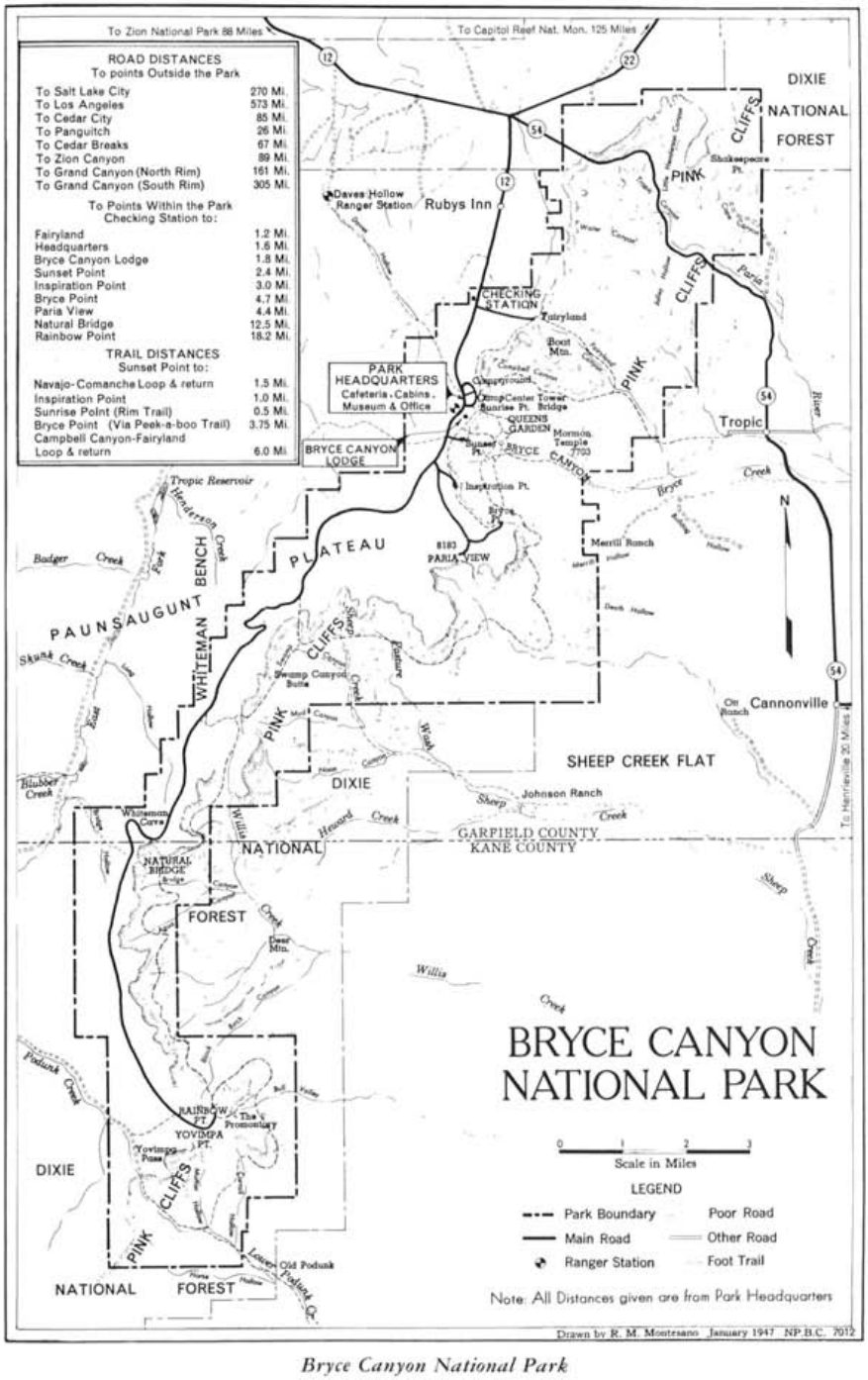
Main bus lines operate from Salt Lake City and Los Angeles to Cedar City, where passengers going to the park may transfer to busses of the Utah Parks Co. On prior notice, connections may be made with the Santa Fe Trails System at Marysvale or Panguitch.

High-speed de luxe airplane service from all points in the United States to Salt Lake City is available through United Air Lines. Service is also available from Los Angeles by Western Air Lines, with stops at Las Vegas, Nev., and Salt Lake City.

Roads and Trails

The National Park Service has completed an excellent road, which follows the high rim the full length of the park plateau, with short spurs to scenic viewpoints. Twenty miles of paved road now lead to Inspiration Point, Bryce Point, Paria View, the Natural Bridge, and Rainbow Point.

The roads are open during spring, summer, and fall, and efforts are made to keep those in the vicinity of head-



Bryce Canyon National Park

quarters open throughout the winter, except for brief periods during and immediately following storms.

A series of fine horseback and foot trails has been built in the interesting area under the rim. Inquiry should be made before attempting a trip, as stormy weather sometimes makes the condition of these trails uncertain. Trails lead into Queen's Garden, the Silent City, Fairyland, Wall Street, Peek-a-boo Canyon, and other more remote points—each with its well-named peculiar and distinctive forms. Trails are all easily traveled; horseback trips can be arranged in half- or full-day units to suit the individual.

Administration

Bryce Canyon National Park is administered as a unit with Zion National Park and Cedar Breaks and Zion National Monuments. The representative of the National Park Service in immediate charge is the superintendent of Zion National Park, whose post office address is Springdale, Utah. All comments regarding service in the park should be addressed to him.

Information concerning the park is available at the Bryce museum, located near the public auto camp and cafeteria.

Naturalist Services

Each evening illustrated lectures are given by members of the staff, who also conduct short hiking trips into Bryce Canyon every day of the summer season, according to schedules posted by the naturalist service.

Visitors are urged to use these facilities, which are provided free of charge by the Government.

Free Public Campgrounds

An attractive public auto camp, maintained by the Government, is open from about April 15 to November 15; however, these dates vary according to weather conditions. Pure water and sanitary conveniences are provided, and groceries and campers' supplies may be purchased at the Bryce Camp store. Camping is limited to 30 days a year for each party.

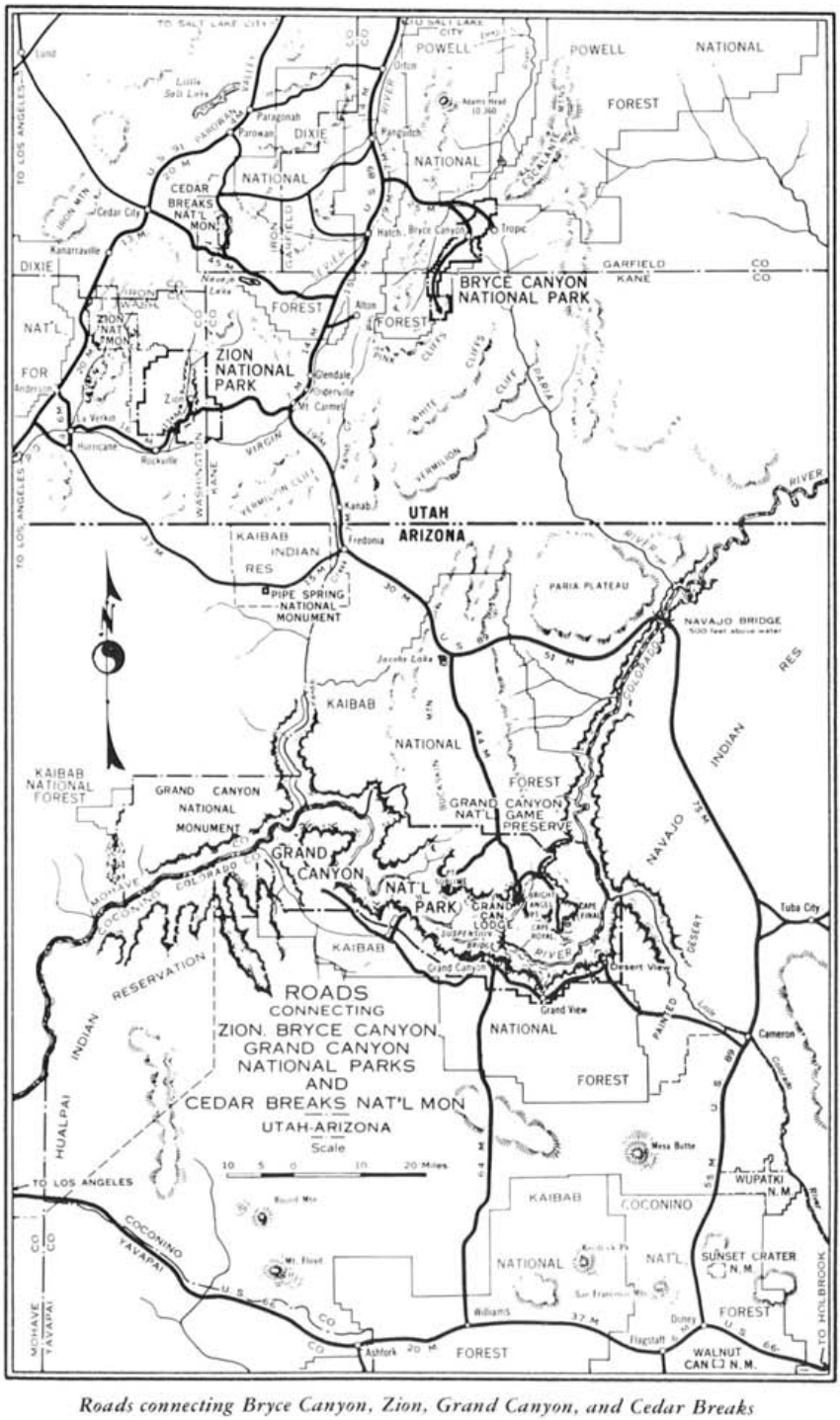
For those not carrying their own equipment and desiring to visit the park after the closing dates of the lodge and camp, there are camps near the park where accommodations can be found at any time of the year.

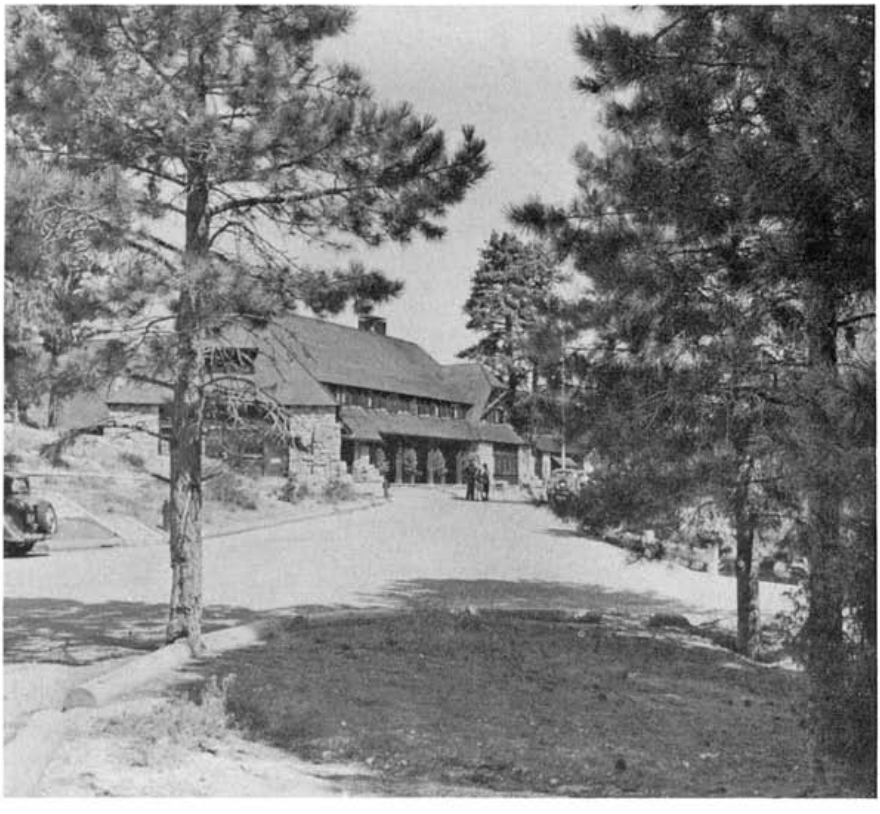
Accommodations and Expenses

An attractive lodge is operated by the Utah Parks Co. from about May 30 to September 25. It consists of a central building and cabins. Rates (European plan) are $2.25 per day for 1 person and $3.50 for 2, in "standard" cabins; $6 per day for 1 person, $7.50 for 2, and $9 for 3, in "de luxe" cabins (private bath, porch, and fireplace).

Meals in the lodge dining room are table d'hôte: Breakfast, $1; luncheon, $1; and dinner, $1.75. Children under 8 are allowed half rate for meals.

There is also a cabin development which is open from about May 1 to October 30. Here are available a cafeteria, food store, and sleeping cabins. The cabins are $2.75 and $3 per day for 1 or 2 persons and $4 for 3 or 4. They are equipped with electricity,


ROADS
CONNECTING
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GRAND CANYON
NATIONAL PARKS
AND
CEDAR BREAKS NAT'L MON
UTAH-ARIZONA
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PRESERVE
KAIBAB
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RES
KAIBAB
NATIONAL
FOREST
PARIA PLATEAU
NAVAJO BRIDGE
UTAH
ARIZONA
TO LOS ANGELES
TO SALT LAKE CITY
DIXIE
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PAINTED
DESERT
WUPATKI
N.M.
SUNSET CRATER
N.M.
WALNUT
CAN N.M.
TO HOLBROOK
Tuba City
Cameron
Desert View
Grand View
Mesa Butte
Williams
Flagstaff
Ashfork
Kanab
Hatch
Tropic
Alton
Orton
Panguitch
Parowan
Cedar City
Kanarraville
Hurricane
Rockville
Springdale
Virgin
Fredonia
Jacobs Lake
Little Colorado River
Grand Canyon
Colorado River
Navajo Lake
Bryce Canyon
Adams Head
10,360
WHITE CLIFFS
VERMILION CLIFFS
PINK CLIFFS
CLIFF DWELLERS
BUTTE
IRON MTN
IRON SPRINGS
WASHINGTON
KANE
VIRGIN
KANAB
PARUNUWEAP
PARAGONAH
LITTLE SALT LAKE
SEVIER
SEVIER RIVER
PARIA
RIVER
COLORADO
RIVER
MOHAVE
COCONINO
YAVAPAI
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SR 64
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SR 89A



Bryce Canyon Lodge (*Union Pacific Railroad photo*)

running water, double beds, table, sink, shelves, and chairs.

Transportation

Motorbus transportation and all-expense tours to Zion, Bryce Canyon, and the North Rim of Grand Canyon National Parks, the Kaibab Forest, and Cedar Breaks National Monument is furnished by the Utah Parks Co., Cedar City, Utah, during the summer season and by special arrangement during the remainder of the year. An automobile trip from Bryce Canyon Lodge to Inspiration Point, Bryce Point, Paria View, Natural Bridge, and Rainbow Point and return is offered for $3 per person during the summer.

Saddle Horses

Saddle horses may be hired for $2.50 for 2 hours or less, $4 for 2 to 4 hours, and $6 for 8 hours. Daily escorted trips into the canyon cost $4, and those to Natural Bridge are $6. Special guide service, if available, may be obtained for $6 a day or $4 for a half day or less. Riding outfits for women may be rented at the lodge.

Rates shown are those author-

ized for 1947. They are subject to change, but the latest approved rates may always be obtained from the superintendent or park concessioner.

Post Office and Communication Service

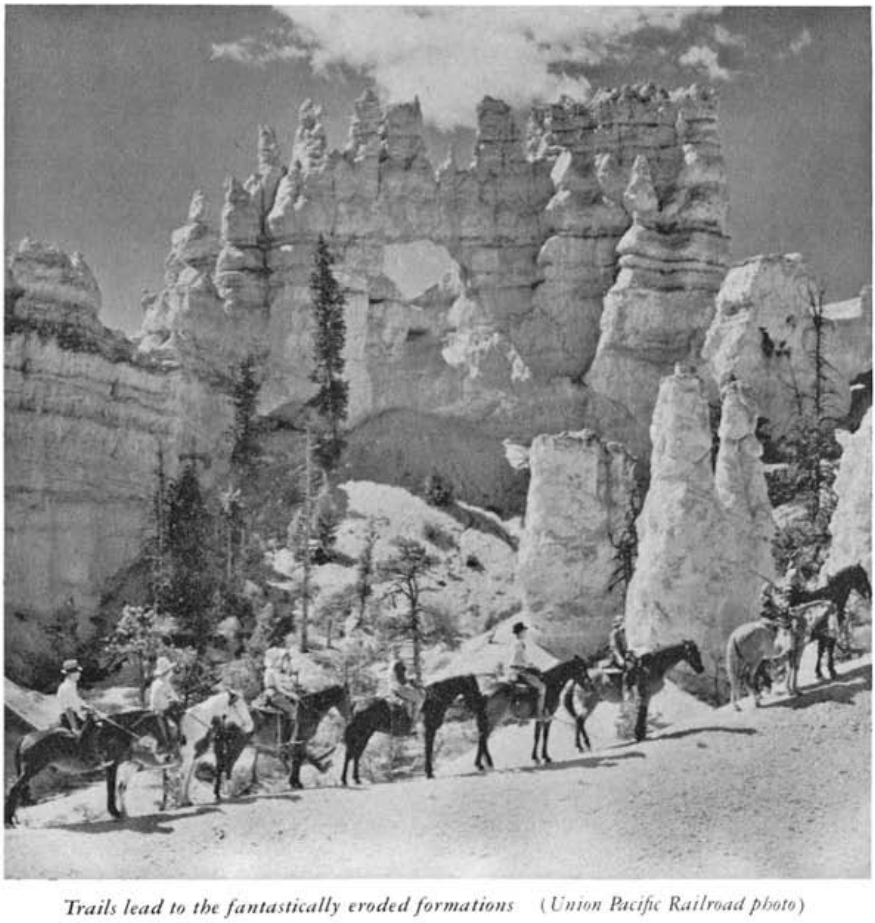
Bryce Canyon Lodge is provided with post office, telegraph, and long-distance telephone service. The post office address during the summer season when the lodge is operating is Bryce Canyon National Park, Utah.

Miscellaneous Services

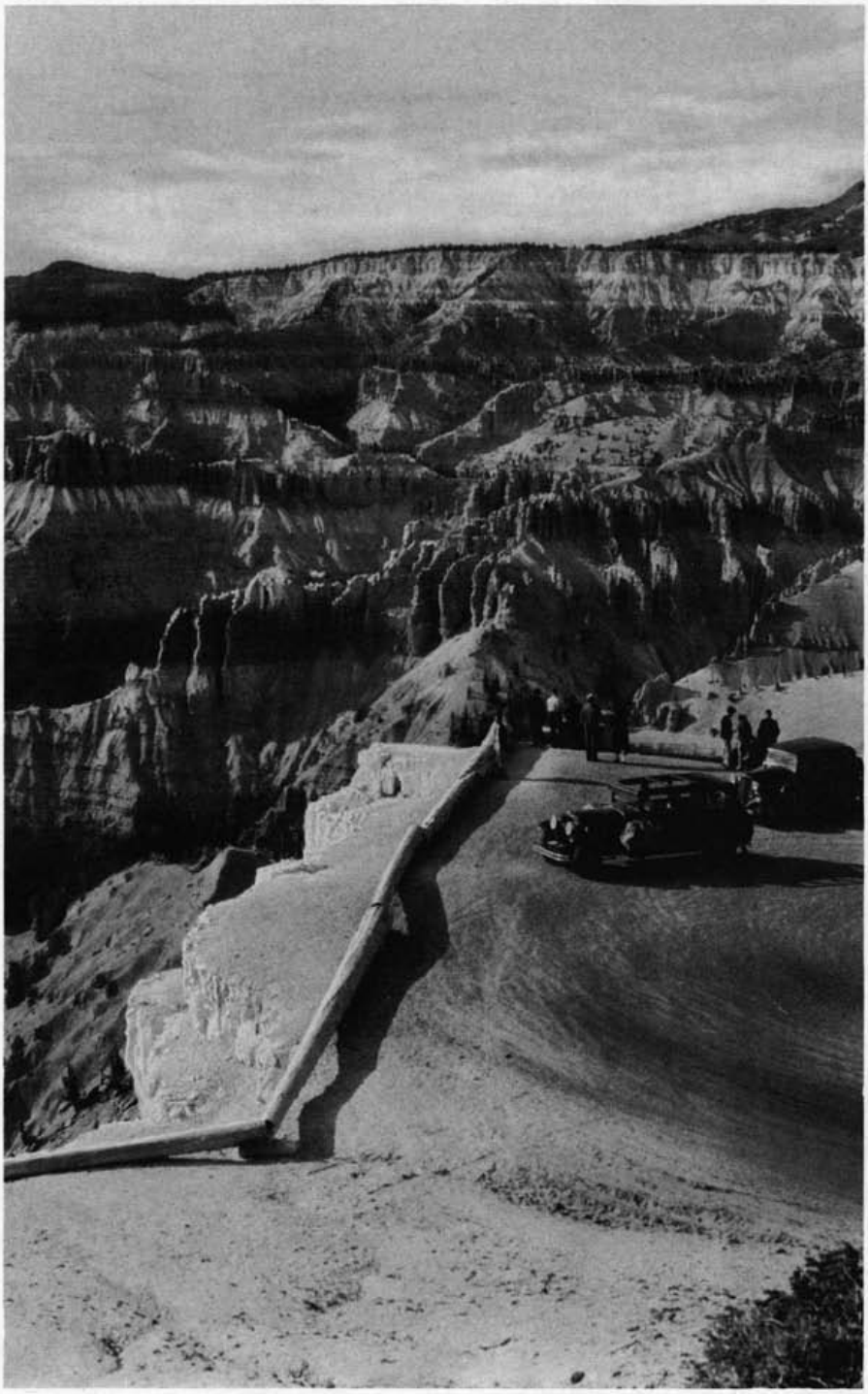
Fountain service is available in the lodge. Photographs of Bryce may be purchasesd here, and laboratories are maintained for developing and printing.

Curio stores, specializing in Indian handicraft, are operated. Curios, postcards, and other items may be obtained at the cabin camps, which also carry a complete line of foodstuffs.

Garage service, including storage, repairs, tires, batteries, gasoline, and oil, is provided by the Utah Parks Co.



Trails lead to the fantastically eroded formations (*Union Pacific Railroad photo*)



Motorists park on overlook for view of Cedar Breaks

during the regular lodge season.

A registered nurse is on duty at the lodge when it is in operation.

Cedar Breaks National Monument

Twenty miles east of Cedar City, within the Dixie National Forest, where the high plateau breaks away to the west, is a great amphitheater called Cedar Breaks, in the Pink Cliffs formation. The more spectacular part of the formation was established as a national monument by the proclamation of President Franklin D. Roosevelt on August 22, 1933, and placed under the administration of the National Park Service. The monument embraces an area of 6,052.20 acres of federally owned land.

While Cedar Breaks is cut from the same geological formation as Bryce Canyon, there is a marked difference between these two scenic areas. There are not countless numbers of outstanding temples, spires, and minarets in the Cedar Breaks bowl, but Cedar Breaks is on a more gigantic scale and has a greater variety of tints. The Pink Cliffs here have a thickness of nearly 2,000 feet, and 47 different shades of color have been distinguished.

The heavily forested rim attains an altitude of 10,700 feet. The cliffs are white or orange at the top, breaking into tints of deep rose and coral. The high elevation also affords an excellent distant view of mountains and desert.

The Utah Parks Co. has provided a comfortable lodge with an attractive dining room, lobby, and rest rooms. Sleeping accommodations are available in cabins operated in connection with the lodge at the rate of $2.25 for 1 and $3.50 for 2 persons in a standard cabin room. Meals in the dining room at Cedar Breaks Lodge are table d'hôte: Breakfast, $1; luncheon, $1; and dinner, $1.75. Groceries, campers' supplies, gasoline, and oil may be procured. Cedar Breaks Lodge is open from about June 1 to September 20.

A free public campground is maintained where water, cooking fireplaces, and fuel are furnished.

The season of accessibility varies with weather conditions, but is usually from early June to the first of November. On account of the high altitude, snows persist until late spring. During the summer season, the National Park Service maintains an information office and small museum near the parking area at Point Supreme.



Cedar Breaks

Rules and Regulations

[Briefed]

The Park Regulations are designed for the protection of the natural beauties and scenery, as well as for the comfort and convenience of visitors. The following synopsis is for convenient reference and general guidance of visitors:

Preservation of Natural Features.—The parks are established primarily for preservation of natural features. It is a violation of the law to destroy or disturb flowers, trees, animals, etc., or to write on or otherwise deface rocks and other natural features. Hunting and the use of firearms are also prohibited.

Camping.—Camp only in established campgrounds. Keep your camping area clean. BE CAREFUL WITH FIRE. Lunching and picnicking are permitted only in public auto camp. Camping limited to 30 days.

Disorderly Conduct. — Proper conduct is required of all visitors for the benefit of others who are entitled to get the fullest possible enjoyment from the park.

Pets.—If you are carrying a dog, cat, or other pet, you may take it into and through the park provided it is at all times kept tied or confined within the car. Pets are not permitted in public buildings or on trails.

Trails.—Do not attempt to make short cuts; to do so you may endanger yourself as well as others using the trails. Before attempting more difficult trails seek advice from a park ranger.

Automobile Regulations.—(a) *Permit.*—A charge of $1 for each automobile is made at Bryce Canyon and Zion National Parks. One permit is good for both parks, and is good for the remainder of the year in which issued. House trailer fee, $1.

(b) *Careful driving.*—The roads in the park are built purely for scenic purposes, not as high-speed thoroughfares. Observe speed limits and the usual rules of the road; keep to right; do not park on curves; pass cars going in the same direction only when the road ahead is clear and the vision unobstructed. The speed limit in the park is 35 miles per hour.

Penalties.—Maximum penalty for violation of park regulations is $500 and/or imprisonment for 6 months.

The park rangers are employed to help and advise visitors as well as to enforce regulations. When in doubt, ask a ranger. A complete copy of the park rules and regulations is on file in the superintendent's office.

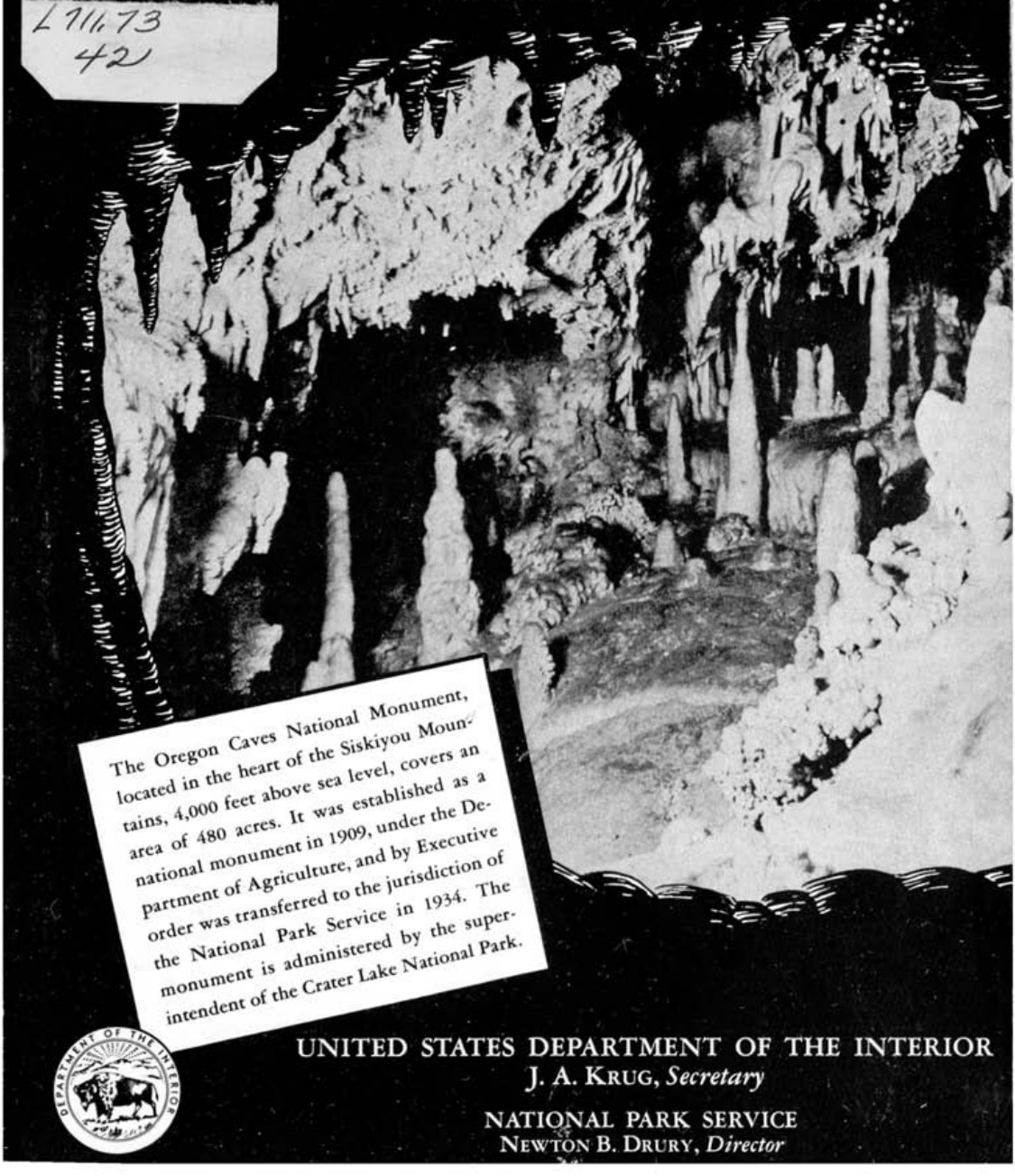
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Oregon Caves

NATIONAL MONUMENT—OREGON

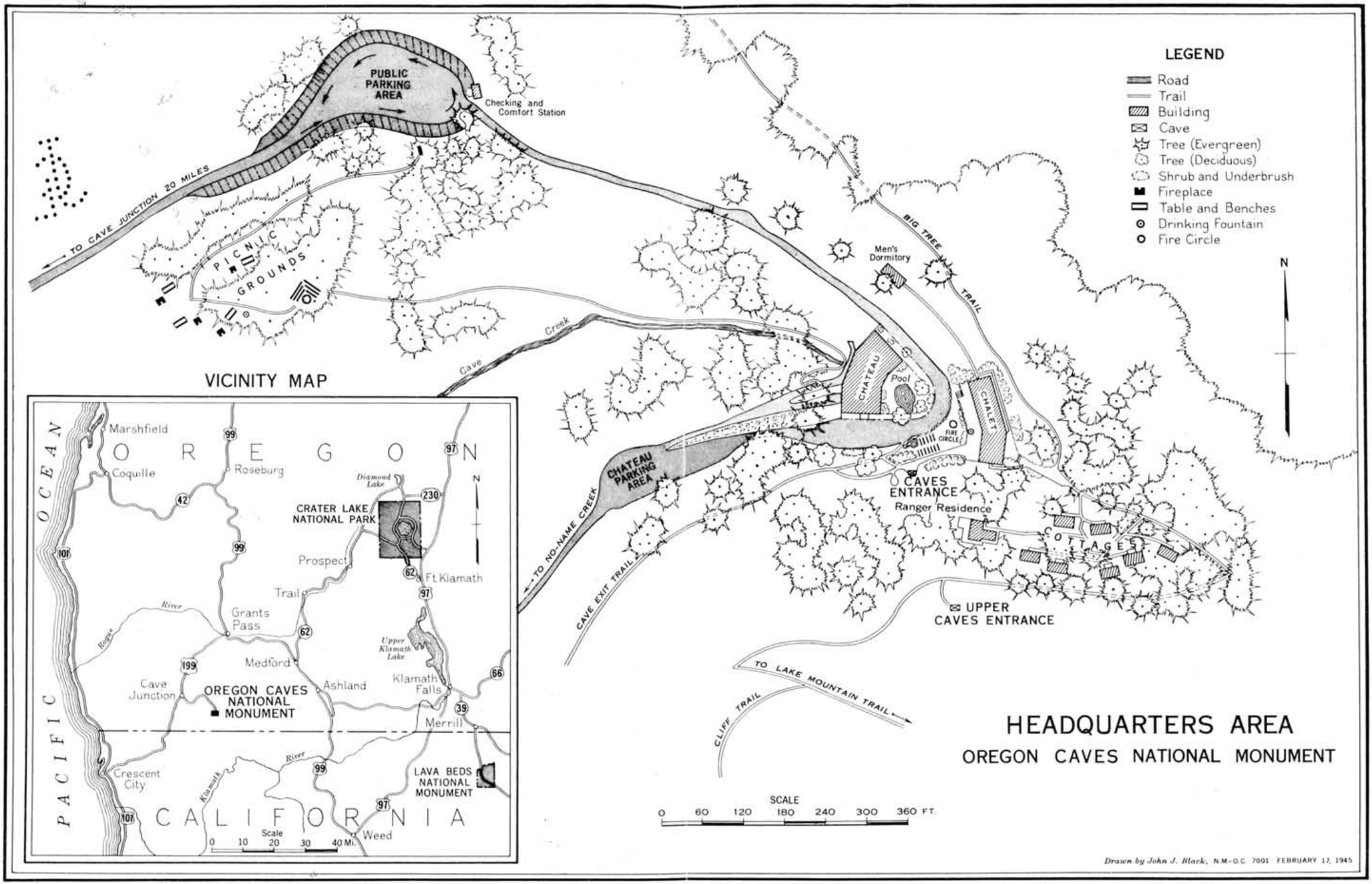
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The Oregon Caves National Monument, located in the heart of the Siskiyou Mountains, 4,000 feet above sea level, covers an area of 480 acres. It was established as a national monument in 1909, under the Department of Agriculture, and by Executive order was transferred to the jurisdiction of the National Park Service in 1934. The monument is administered by the superintendent of the Crater Lake National Park.

UNITED STATES DEPARTMENT OF THE INTERIOR
J. A. KRUG, *Secretary*

NATIONAL PARK SERVICE
NEWTON B. DRURY, *Director*



Reprint 1947

U. S. Government Printing Office: 1947 O-F-767496

HISTORY

The caves are said to have been discovered by Elijah Davidson in August 1874, while hunting. A bear, wounded by one of his shots, sought refuge in an opening in the rocks. Davidson hastily gathered a few splinters of pitch for a torch, and, with an old muzzle-loading rifle, followed the bear. It was then that he made his remarkable discovery. Soon after this the caves became an attraction for the adventurous, and portions of them were explored and opened; but to date they have not been completely penetrated. In 1877, Frank M. Nickerson, of nearby Kerby, Oreg., found four different floors or levels. He opened a number of the galleries which had been blocked by stalactites.

In 1907, two years before the area was set aside as a national monument, the caves were visited by Joaquin Miller (the Poet of the Sierra), C. B. Watson, and Jefferson Meyers. These visitors were deeply impressed with the beauties of the region, and Joaquin Miller did much to attract public attention to the area by his many references to the caves as "The Marble Halls of Oregon".

GEOLOGY

The geological story of the Oregon Caves goes back over a vast period of time to an age when an ancient ocean covered this area. In this ocean a thick deposit of lime was formed which later hardened into limestone. This limestone, during a period of mountain building, was transformed under the terrific pressure and heat generated within the earth into marble and was raised above the sea as part of a mountain range.

During the mountain uplift the marble was broken and fractured in many places. The actual openings along these fractures may have been very small, but they were sufficient to allow the passage of water through them. Rain water falling upon the surface of the ground and charged by carbonic and other acids from decaying vegetation found its way along the small fracture plains dissolving out the marble which in composition is almost pure calcium carbonate. As the fractures were enlarged by solution, they admitted more water which increased the rate of solution.

The lime dissolved in one place by the water was redeposited wherever the water was subjected to evaporation. This occurred particularly where the water dripped slowly from the ceiling of the cavern, for here each drop as it clung to the rock lost some of its water to the air, and the lime which it carried was left as a deposit on the rock. This deposit grew downward as would an icicle, forming what is known as a stalactite. Where the drops of water fell to the floor and there evaporated, a pillar known as a stalagmite was built upward by the deposit of lime. In some places the stalactite and stalagmite joined, forming a column which extends from floor to ceiling. These deposits assume in some cases odd, fantastic, or grotesque shapes and in others beautiful, inspirational forms. Here and there are exquisite miniatures of lakes or waterfalls created in stone. Fantastic names are given to some of the main features and chambers in the caverns, such as the Garden of the Gods, Paradise Lost, Neptune's Grotto, Joaquin Miller's Chapel, Ghost Chamber, and Satan's Cradle.

GENERAL INFORMATION

From Cave Junction on the famous Redwood Highway No. 199, it is only 20 miles to the caves over scenic State Highway No. 46. To go through the caves, a guide is required. Guide service throughout the year is provided by the Oregon Caves Resort, Inc., under contract with the Department of the Interior. During the summer season, this company also provides meals, lodgings, candies, ice cream, soft drinks, souvenirs, etc., and such other services and accommodations as are usually made available to the traveling public. Lodgings are provided in the modern, unique, and comfortably appointed mountain chateau, as well as in modern, comfortable sleeping cabins.

The Government maintains a picnic area nearby. No camping is permitted in the monument, but adequate campground facilities are found at the Greyback Campground along the approach highway, 8 miles from the monument.

The caves are electrically lighted and the temperature in them is about 48°.

Like all other areas under the jurisdiction of the National Park Service, special provisions are made for the safety and comfort of visitors at all times.

United States Department of the Interior
HAROLD L. ICKES, *Secretary*
National Park Service
NEWTON B. DRURY, *Director*

Facts about
GRAND CANYON

Grand Canyon National Park (Arizona)

The Grand Canyon National Park was established by act of Congress, approved February 26, 1919. It has an area of 1,009 square miles, is 56 miles long, and contains 105 miles of the Colorado River.

The Canyon

The Canyon is 217 miles long, measured by river course, width from 4 to 18 miles, all in the State of Arizona. It is 10 miles wide at Yavapai Station. The Canyon bottom below Yavapai Point is 2,500 feet above sea level, about 4,500 feet below the South Rim, and 5,700 feet below the North Rim, making an average depth of about one mile.

Six of the seven climatic belts recognized throughout the world are represented in the Grand Canyon region. They vary from that of desert Mexico at the Canyon bottom to the Arctic-Alpine type of the San Francisco Peaks.

The Canyon was formed by the river cutting down as the land moved upward with the accompanying widening of the Canyon due to the breaking down of the rock walls.

The rock layers in the Canyon walls are remnants of ancient mountains, sea bottoms, river beds, and deserts millions of years old. Fossils in the rocks of the Canyon walls show stages in the development of ancient life from primitive one-celled plants to large lizard-like animals.

The Colorado River

This is the second longest river in the United States (about 2,000 miles) and it cuts 19 major canyons along its course. At the gauging station in Grand Canyon the river averages about 300 feet in width, varies from 12 to 45 feet in depth, and flows at a speed of between 2½ and 10 miles an hour. It carries past this station an average of nearly one million tons of sand and silt every 24 hours. The river empties into the Gulf of California in Mexico.

The Boulder Dam is 260 miles down stream from the Kaibab Suspension Bridge. The water will not back up into this part of the Canyon.

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SCHEDULE OF NATURALIST SERVICES

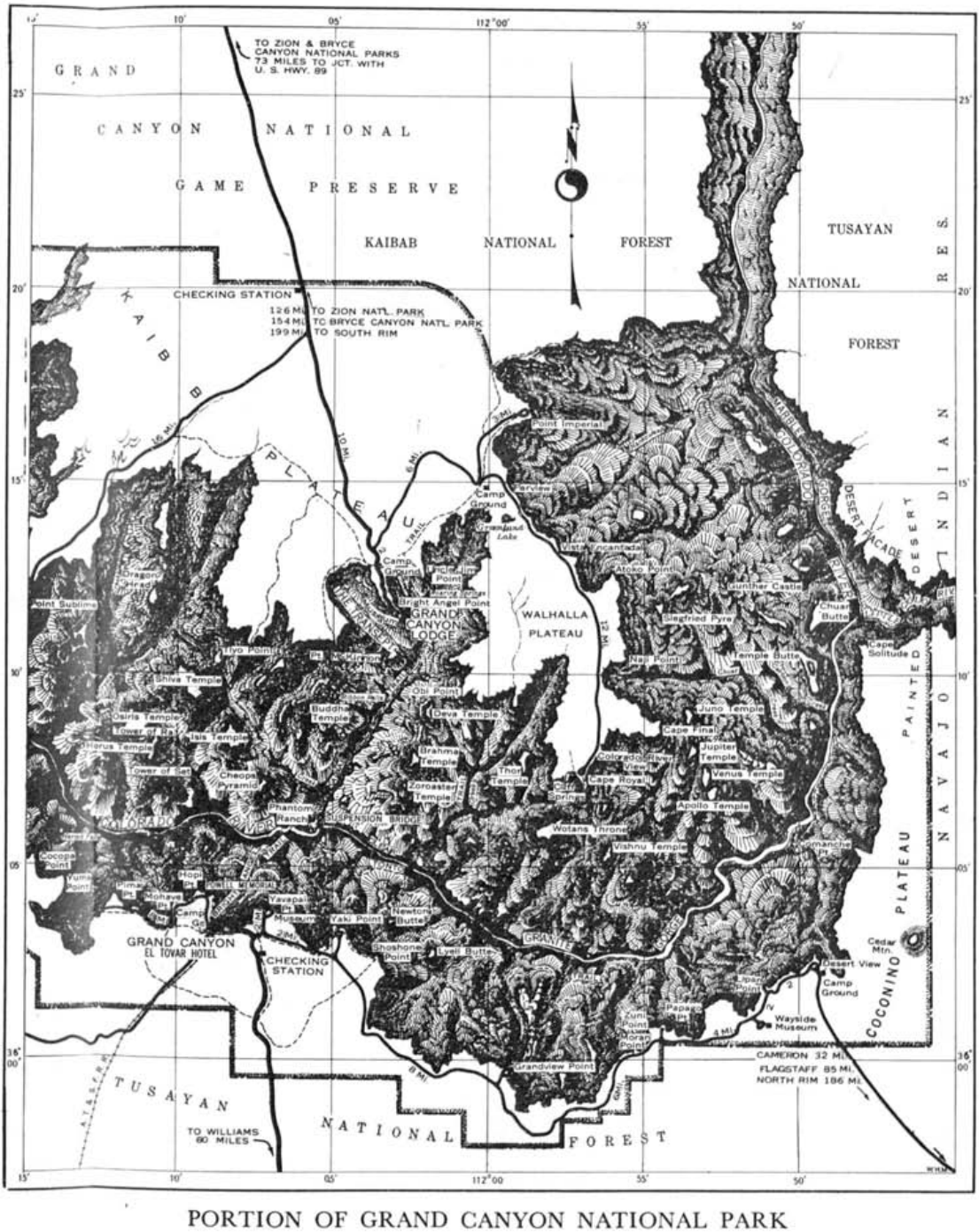
(Offered by National Park Service without charge)

I. South Rim, Grand Canyon

Yavapai Observation Station	The story of Grand Canyon told with telescopes and exhibits. Open daily throughout the year. Located on Yavapai Point. 1½ miles east of Grand Canyon Village.
Wayside Museum of Archeology	The story of early man in the Southwest and his place in earth history told with exhibits. Excavated pueblo ruin nearby. Open daily during summer season. Located 20 miles east of village on Desert View Drive.
Reference Library	Small collection of books on Grand Canyon region at park administration building. Available for use of visitors upon application to ranger on duty.
Auto Caravan (In normal times)	Conducted trip along Desert View Drive in which visitors travel in own cars. Twice daily throughout summer season. Distance 26 miles, one way. Starts 8:30 a. m., 2:30 p. m., in front of public garage.
Camp Fire Talk	Subjects include Canyon origin, its fossils, animals, Indians, etc., every evening during summer season--see daily schedule on bulletin boards. Starts at 8:30 p. m., at camp fire site in public campgrounds.

II. North Rim, Grand Canyon

Auto Caravan (In normal times)	Conducted trip along Cape Royal Drive in which visitors travel by company bus or in own cars. Daily throughout summer season. Round trip distance 52 miles. Starts 1:30 p. m., at public campgrounds in front of cafeteria.
Nature Walk	Guided walking trip to end of Bright Angel Point. Geological and biological features explained. Every morning throughout summer season. Starts at Grand Canyon Lodge at 9 a. m.
Camp Fire Talk	Subjects include origin, fossils, animals, Indians, etc., of Grand Canyon. Every evening during summer season. 8:30 p. m., at camp fire site in public campgrounds, weather permitting.


GRAND CANYON NATIONAL GAME PRESERVE
KAIBAB NATIONAL FOREST
TUSAYAN NATIONAL FOREST
NAVAJO INDIAN RES.
PAINTED DESERT
COCONINO PLATEAU
TO ZION & BRYCE CANYON NATIONAL PARKS 73 MILES TO JCT. WITH U. S. HWY. 89
CHECKING STATION
126 MI. TO ZION NATL. PARK
154 MI. TO BRYCE CANYON NATL. PARK
199 MI. TO SOUTH RIM
KAIBAB PLATEAU
WALHALLA PLATEAU
GRANDE CANYON LODGE
GRAND CANYON EL TOVAR HOTEL
CHECKING STATION
TO WILLIAMS 60 MILES
CAMERON 32 MI.
FLAGSTAFF 85 MI.
NORTH RIM 186 MI.
Point Imperial
Camp Ground
Cape Royal
Wotans Throne
Vishnu Temple
Apollo Temple
Juno Temple
Jupiter Temple
Venus Temple
Cape Final
Temple Butte
Siegfried Pyre
Chuar Butte
Cape Solitude
Desert View
Camp Ground
Wayside Museum
Cedar Mtn.
Grandview Point
Yaki Point
Shoshone Point
Hopi Point
Mohave Point
Yavapai Point
Maricopa Point
Pima Point
Powell Memorial
Museum
Bright Angel Point
Cape Royal
Point Sublime
Lyo Point
Shiva Temple
Osiris Temple
Isis Temple
Horus Temple
Cheops Pyramid
Buddha Temple
Deva Temple
Brahma Temple
Thor Temple
Zoroaster Temple
Phantom Ranch
SUSPENSION BRIDGE
Cocopa Point
Yuma Point
Newtons Butte
Lyell Butte
Papago Point
Powell Point
Colorado River
Bright Angel Trail
Kaibab Trail
Tonto Trail
Grandview Trail
Hermit Trail
Hance Trail
Tanner Trail
Escalante Route
Navajo Trail
Point Hopi
Point Maricopa
Point Yuma
Point Pima
Point Mohave
Point Yavapai
Point Powell
Point Papago
Point Grandview
Point Imperial
Point Sublime
Point Hopi
Point Yuma
Point Pima
Point Mohave
Point Yavapai
Point Maricopa

Wildlife in Grand Canyon

Animal life in the Canyon includes about 180 species of birds, 60 species of mammals, 25 reptiles, and 5 amphibians. During the growing season both rims and canyon slopes are covered with a great variety of wild flowers.

Ancient Indians in Grand Canyon

About 500 ruins of ancient Indian pueblos have been found on the Canyon rims. Cliff dwellings made by these Indians are found along the lower walls of the Canyon in many places. Especially noteworthy are those along Clear Creek.

Indians of Today in Grand Canyon

There are four Indian tribes living in the Grand Canyon region today. The Navajo, a pastoral people, numbering about 48,000, live in the largest Indian reservation in the United States, just east of Grand Canyon. The Hopi, a pueblo farming people, numbering 2,500, live on three mesas north of the Painted Desert. The Havasupai, an agricultural people, numbering about 200, live within the park boundaries in Havasu Canyon, west of the Grand Canyon Village. The Paiutes are found to the north.

AVAILABLE LITERATURE ON NATURAL HISTORY OF GRAND CANYON

(The publications listed below may be purchased through the Grand Canyon Natural History Association at any of the park museums or information offices.)

GENERAL

Grand Canyon Country. By Tillotson, M. R., and Taylor, F. J.... $1.00

BIOLOGY

Mammals of the Grand Canyon Region. By Bailey, Vernon..... .25

Trees of Grand Canyon National Park. By Dodge, N. N..... .50

Check list of Grand Canyon Birds. By Grater, Russell..... .25

HISTORY AND INDIANS

History and Exploration. By Dellenbaugh, F. S., and others..... .15

Prehistoric Man in the Southwest. By Getty, Harry..... .25

GEOLOGY

Guide to Yavapai Station views and exhibits. By Grand Canyon Committee, National Academy of Sciences, and Carnegie Institution.. .10

Ancient Landscapes of the Grand Canyon region. By McKee, Edwin D..... .50

ROAD AND TRAIL GUIDES

Kaibab Trail, South Rim to river.. No Charge

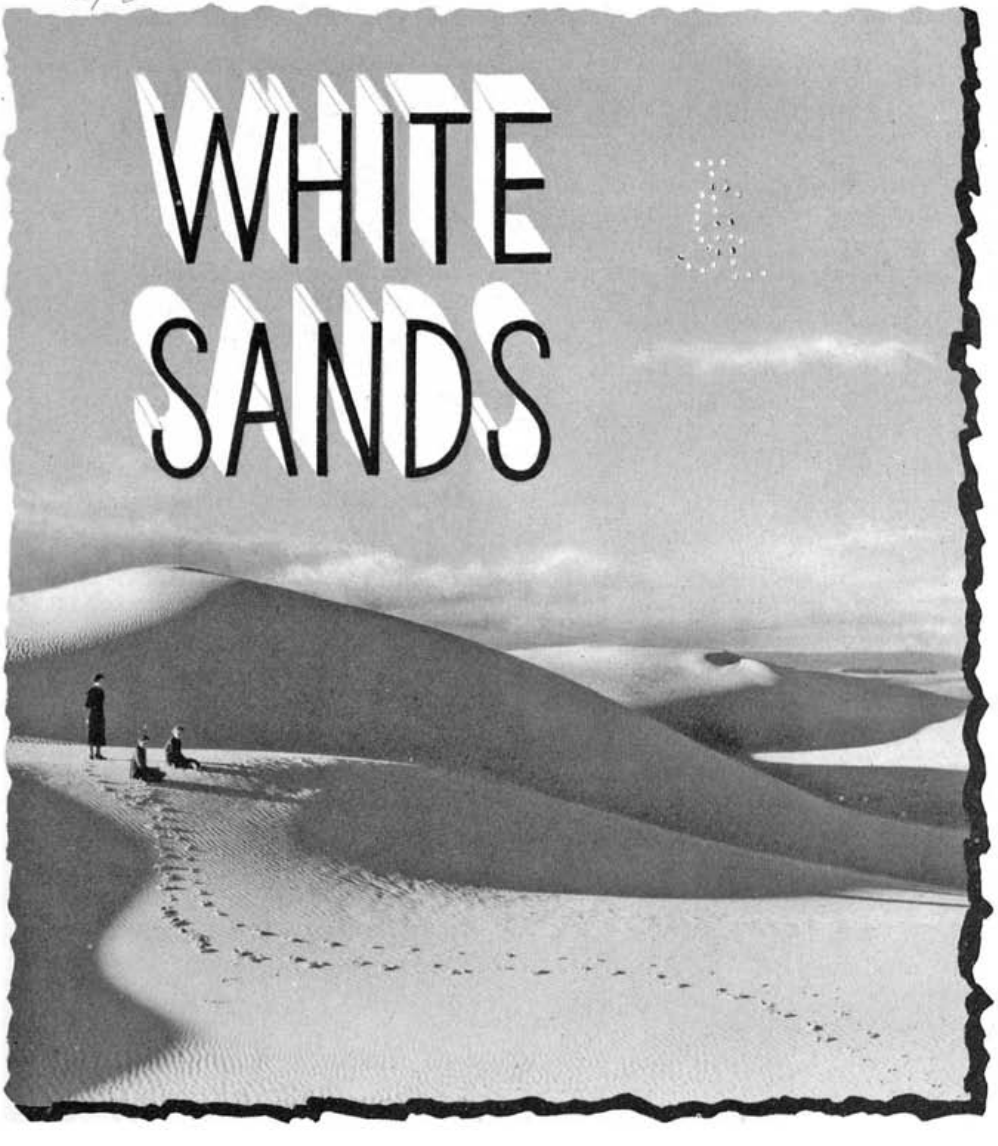
Desert View Drive, South Rim..... No Charge

Hermit Rim Drive, South Rim.... No Charge

U. S. GOVERNMENT PRINTING OFFICE O—1944

42

WHITE SANDS



NATIONAL MONUMENT

NEW MEXICO

WHITE SANDS
NATIONAL MONUMENT

United States Department of the Interior, J. A. Krug, *Secretary*
National Park Service, Newton B. Drury, *Director*

One of the world's strangest and most spectacular deserts, with huge gypsum dunes of purest white, some of them more than 50 feet high

A portion of the largest of rare gypsum deserts, the White Sands in Tularosa Basin, N. Mex., is included in White Sands National Monument. Its snow-white glistening "sands," deposits of wind-blown gypsum, drift into huge dunes. Sparsely covered with a variety of plant growth at its fringes, much of this wide sea of dunes is almost bare of vegetation. A few species of plants, exhibiting remarkable adaptability to their peculiar surroundings, have been able to resist burial under the ever-shifting dunes, and several types of animals demonstrate protective coloration in the pale, bleached appearance which renders them unnoticeable in their strange environment.

"Here is a unique bit of America. The loveliness of its white and green, the cleanliness of its vast expanse, and its appeal to the lover of the unexplored mark it as an area which attracts those discerning travelers who would see Nature's masterpieces."

Sand dunes of pure gypsum encroaching upon the flats.



White Sands National Monument is one of the areas of the National Park System owned by the people of the United States and administered for them by the National Park Service of the Department of the Interior. In these areas the scenery and objects of historic, prehistoric, and scientific interest are carefully preserved and displayed for public enjoyment.

Sands Result of Ancient Earth Movements

Stretching north and south between two mountain ranges, the Tularosa Basin slopes gently from all directions, forming a great natural basin with Lake Lucero, at the southwestern extremity of the White Sands, constituting its focal point.

Geologists say that, perhaps millions of years ago, this basin was formed by the settling of a huge block of a high plateau. This condition is indicated by the occurrence of thick beds of gypsum beneath the floor of the basin. Remnants of the same beds are found high above the valley floor, in the parts of the plateau that did not settle and which are now the mountain ranges flanking the valley. Gypsum is the mineral from which plaster-of-Paris is made. Its massive translucent form is called alabaster. Percolating waters from rains and melting snows carry tons of gypsum in solution from the mountains into Lake Lucero each winter, while underground waters dissolve gypsum from the beds beneath the valley floor. For months each year, cloudless skies and warm winds evaporate the water.

Lake Lucero shrinks to a crystal-encrusted marsh, and the gypsum-impregnated underground waters are drawn to the surface where they deposit their burden, forming extensive alkali flats. The ever active southwest wind picks up the particles of gypsum left by the evaporating water and whirls them away to join the accumulations of centuries—the dunes of snow-white sand. Thus the dunes are ever growing, ever moving, ever changing.



Yucca plant in bloom.

Plants and Animals Adapted to Strange Conditions

Because of the almost constant wind and the consequent gradual movement of the dunes, such plants as are able to establish themselves in the open spaces between the dunes eventually become covered.

Of the many species of plants found in the area, only a few are able to survive the irresistible march of the sand. Through a rapid elongation of their stems, the crowns ride the crest of the rising dune. Plants with stems more than 40 feet long have been found. As the dune, continuing onward, gradually recedes in height, occasional plants are left behind elevated on pillars of hardened gypsum bound by the adventitious roots.

Animals, as well as plants, have become altered in the long process of accommodation to the unique surroundings. Such small creatures as lizards and mice would be, if of normal coloration, so conspicuous against their white background that they would be picked off easily by their enemies. Through many centuries, only the lighter colored individuals have survived, and in this manner pale forms have evolved. The white pocket mice of the sands are of especial interest to scientists because, in the nearby red hills, pocket mice of reddish pelage are found, while in the beds of black lava, a few miles north, the pocket mice have dark, almost black fur.

Region Rich in Indian, Spanish, and Early American Lore

Near the sand dunes, camp sites of prehistoric Indians, identified by arrowpoints and other artifacts, have been found.

Remains of an ancient two-wheeled wooden cart, probably an early Spanish carreta, were laid bare by the shifting of a dune.

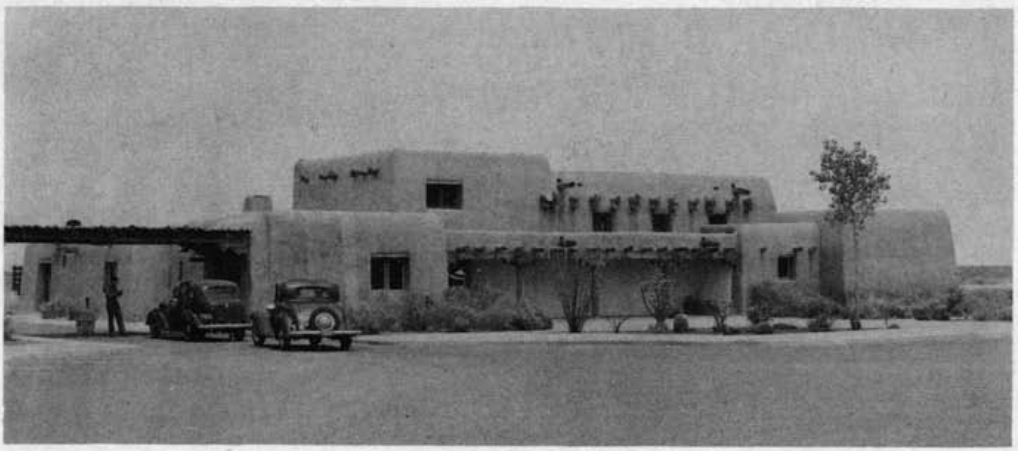
Fights between renegade Apache Indians and United States Army troops occurred in Dog Canyon, about 20 miles east of the monument.

Several historical novels have been written about early-day events in the Tularosa Basin. Eugene Manlove Rhodes, author of many popular westerns, based his stories on his experiences in this part of New Mexico.

The Monument Museum

The fascinating tale of the White Sands and how they originated is told through the use of photographs, paintings, and models in the small museum in the monument headquarters building.

Monument headquarters and museum.



Location and Facilities

Located in south-central New Mexico, the monument is on United States Highway No. 70, 15 miles from Alamogordo and 54 miles from Las Cruces. It is a little less than 100 miles from El Paso, Tex. Although neither meals nor accommodations are available at the monument, excellent facilities may be found in both Las Cruces and Alamogordo.

A concession at headquarters provides cold drinks, candies, souvenirs, and supplies at popular prices.

A picnic ground, with tables and fire grills, is provided for persons wishing to bring lunches.

Administration

White Sands National Monument, comprising 140,247 acres of Federally owned lands, was established by Presidential proclamation in January 1933.

A permit fee of 50 cents for each automobile, motorcycle, and house trailer is collected at the monument entrance. This permit remains good throughout the entire calendar year in which it is purchased.

All plants and animals in the monument are protected and must not be disturbed or harmed. Help to keep the sands clean by using the fireplaces and refuse containers. VEHICLES ARE RESTRICTED TO ROADS AND PARKING AREAS. DO NOT DRIVE ON THE SAND DUNES—IT IS DANGEROUS.

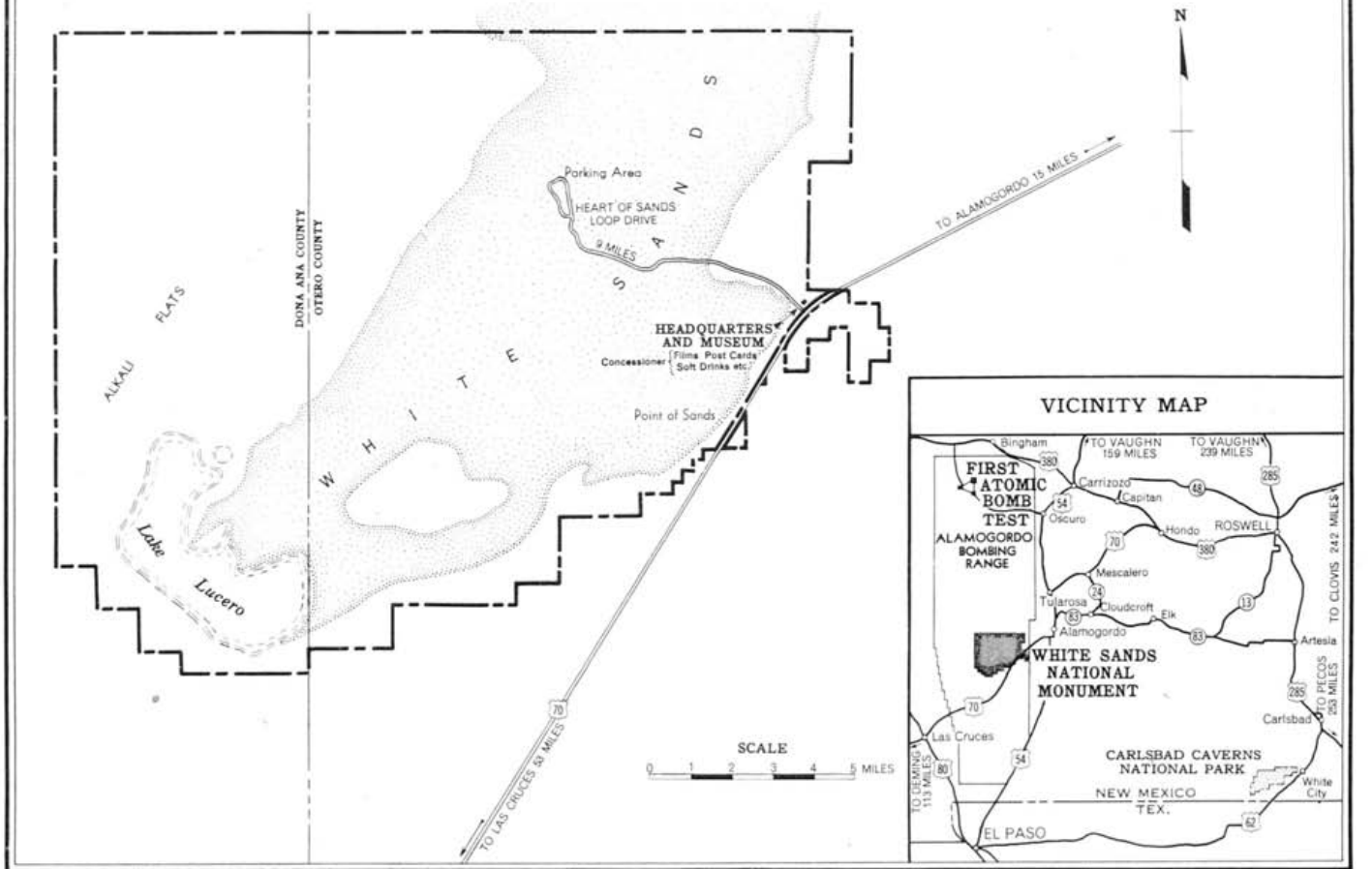
Inquiries and communications regarding the monument should be addressed to the Custodian, White Sands National Monument, Alamogordo, N. Mex.

An Indian exhibit in the museum.



WHITE SANDS NATIONAL MONUMENT

NEW MEXICO

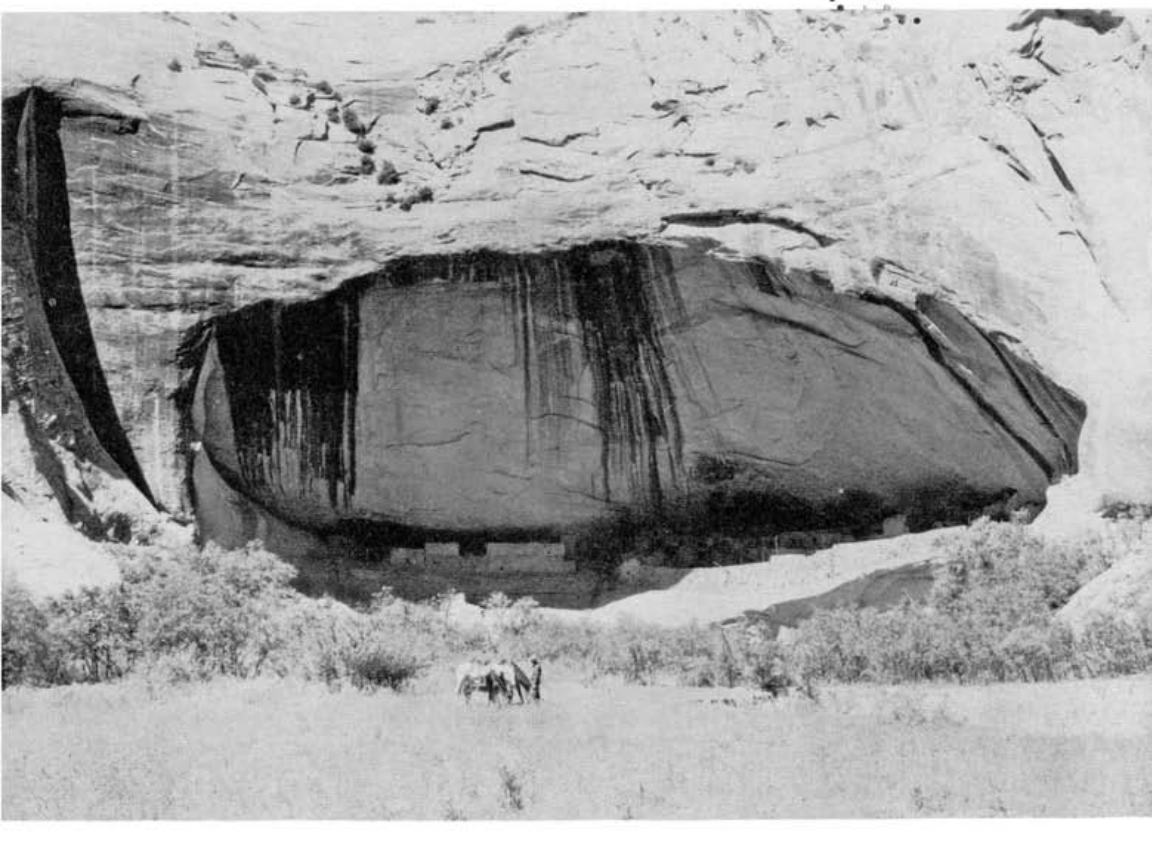


Drawn by H. L. Golder NM-W.S. 7007 February 1947

Revised 1947.

U. S. Government Printing Office 1947 O-F-743010

NAVAJO



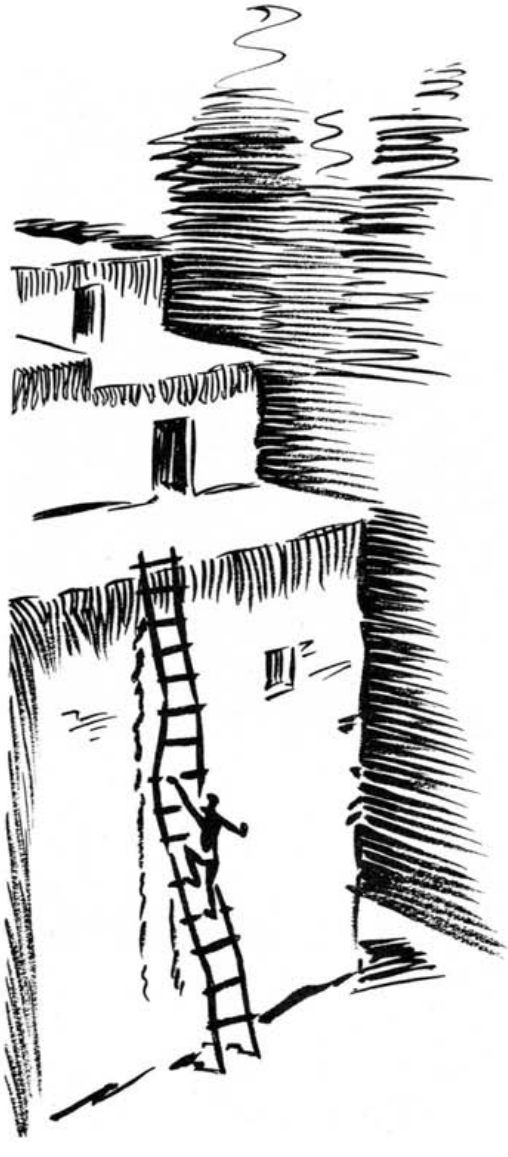
National Monument

ARIZONA

NAVAJO *National Monument*

United States Department of the Interior, J. A. Krug, *Secretary*
National Park Service, Newton B. Drury, *Director*

Prehistoric cave villages abandoned by drought-stricken Indian farmers before 1300 A. D.

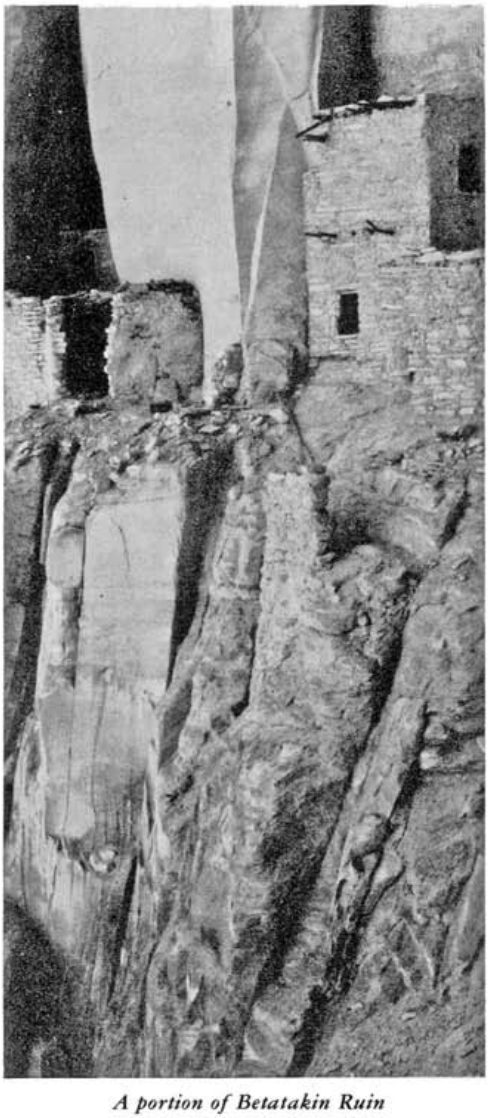


Navajo National Monument has three of the largest and most intricate of known cliff dwellings, together representing a local or tribal subpattern of the prehistoric Pueblo culture in its greatest period, the thirteenth century.

Perched high in their matchless settings, the dwellings of this superb triad are among the finest of their class. Almost perfectly preserved by their caves and the dry atmosphere, they appear as if they had been abandoned only yesterday.

The monument is completely surrounded by the Navajo Indian Reservation and lies on the edge of a "roadless area" nearly 100 miles from paved highways. The National Park Service has established monument headquarters in Betatakin, the most accessible ruin. Visitors to outlying areas may obtain information and guidance by calling first at the Headquarters Area.

Betatakin is the only ruin in the monument which has been excavated and restored. It is in a great cave which is 450 feet long with a maximum depth of 150 feet. The cave was carved by stream meander and wind erosion, in the side of a soft, red, sandstone cliff which forms the sheer and vertical 500-foot north wall of a picturesque and beautiful canyon. The cave roof projects far out over the village, which originally contained more than 130



A portion of Betatakin Ruin

ground-floor rooms and occupied every foot of available building space. Sand storms had piled among the central rooms an accumulation in which oaks 4 inches in diameter and varied shrubbery had taken root.

In the canyon fronting Betatakin are tall, slender quaking aspen, alder, and birch; pines deck the talus slopes; cedar and piñon cap the bordering cliffs.

Betatakin

Betatakin is a well preserved apartment house, 700 years old (as determined by the tree-ring dating method, the village was occupied between the years 1242 A. D. and approximately 1300 A. D.). The Navajo name "Betatakin" means "Hillside House."

Betatakin once had almost 150 rooms, of which more than 50 were residential, 6 ceremonial (kivas), 13 open courts or patios, about 30 storage, and 2 grinding rooms. The last mentioned are among the many rooms which are still well preserved. The manos and metates on which the ancient people ground their corn meal may be seen by those who enter the canyon, or through binoculars from the opposite rim.

Because of the rugged character of the country and the necessarily arduous trip to the cliff house, the National Park Service has provided a trail to the opposite rim, where a splendid view of the cave and ruin may be had.

Betatakin was discovered in 1909 by John Wetherill and Byron Cummings, and was excavated and stabilized in 1917 by Neil M. Judd, of the Smithsonian Institution.

The pottery found in Betatakin and the other Tsegi cliff ruins is of exceptional quality, very artistically painted, including both black-on-white ware and varieties of polychrome redware.

Keet Seel

Keet Seel is the largest cliff ruin in Arizona and one of the last to be abandoned in the Tsegi Canyon region. It may be reached by horse or on foot from Betata-

kin by an 11-mile trail, which is primitive and crosses the canyon stream many times, making the trip on foot a difficult one. Horses may be obtained from the nearby Navajos through the custodian of the monument. One full day is required for the round trip.

Keet Seel was partially excavated and stabilized in 1934, and today it still gives the impression that it might have been abandoned only a few years ago. Actually, almost 700 years have passed since the Anasazi last lived in this cliff city. Keet Seel was discovered in 1893 by Richard Wetherill.

Inscription House

Inscription House lies almost 20 miles in an airline west of Betatakin, the Headquarters Area. This fine ruin, the smallest of the three (with approximately 75 rooms) was so named because of an inscription found scratched into the plastered wall of one of the rooms. Weather-beaten, little remains of the original inscription. It is generally believed to be of Spanish origin, and to date from the 1660's, but the exact wording has been variously reported. John Wetherill, from his second trip to Inscription House in 1909, remembers the inscription thus:

C H O S

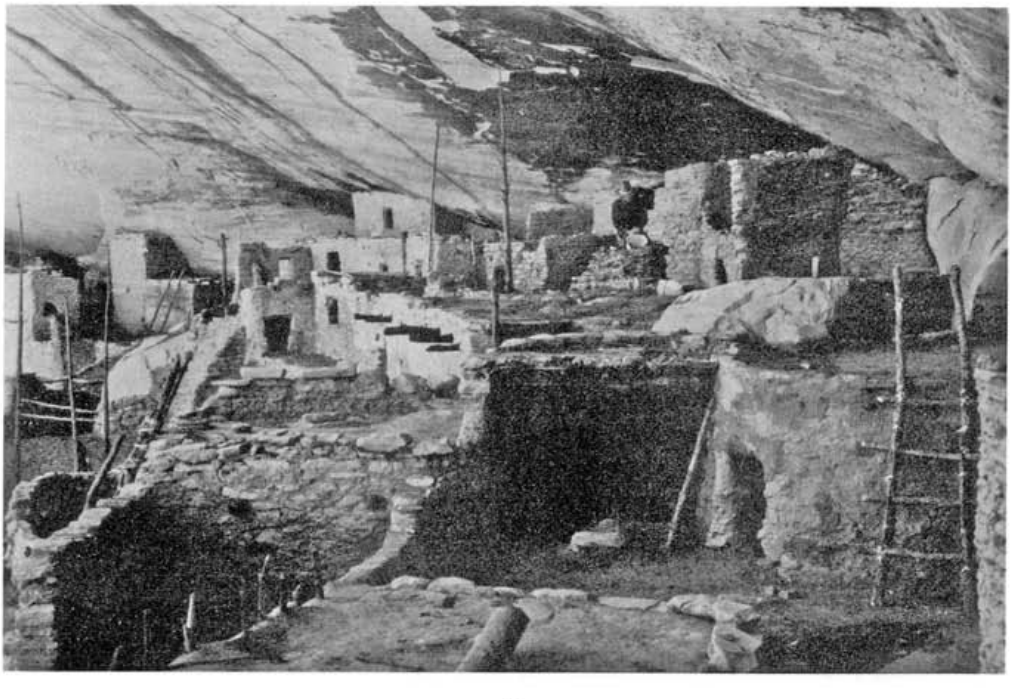
1661 A d n

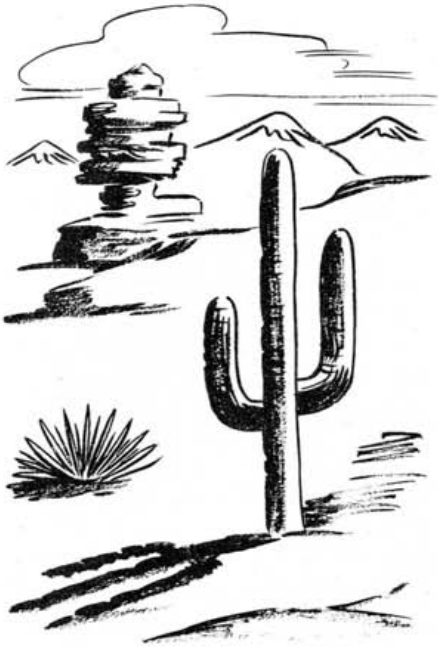
with more letters which were illegible.

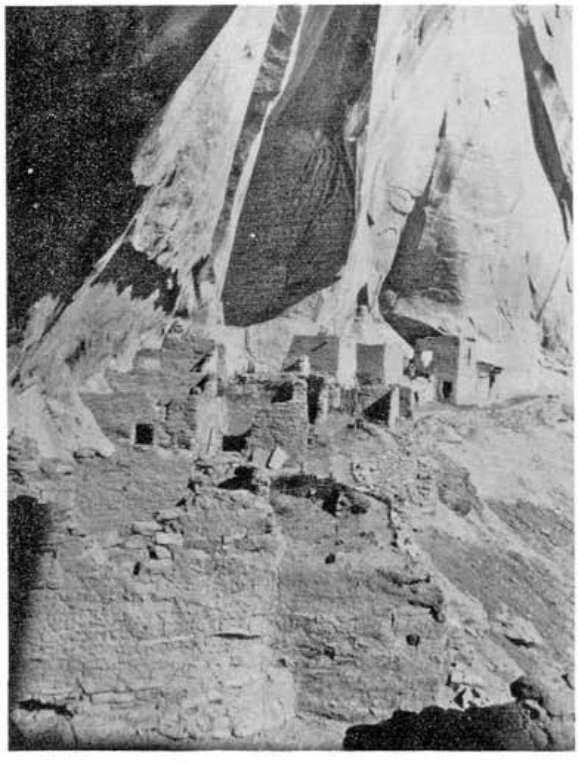
Administration

Navajo National Monument is a part of the National Park System and is administered by the National Park Service, United States Department of the Interior.

Interior of Keet Seel Ruin







Inscription House Ruin

For further information write the Custodian, Navajo National Monument, Tonalea, Ariz.

Other cliff dwellings in the National Park System include those in Canyon de Chelly, Walnut Canyon, Montezuma Castle, and Tonto National Monuments in Arizona; Mesa Verde National Park in Colorado; and Bandelier and Gila Cliff Dwellings National Monuments in New Mexico.

Accommodations

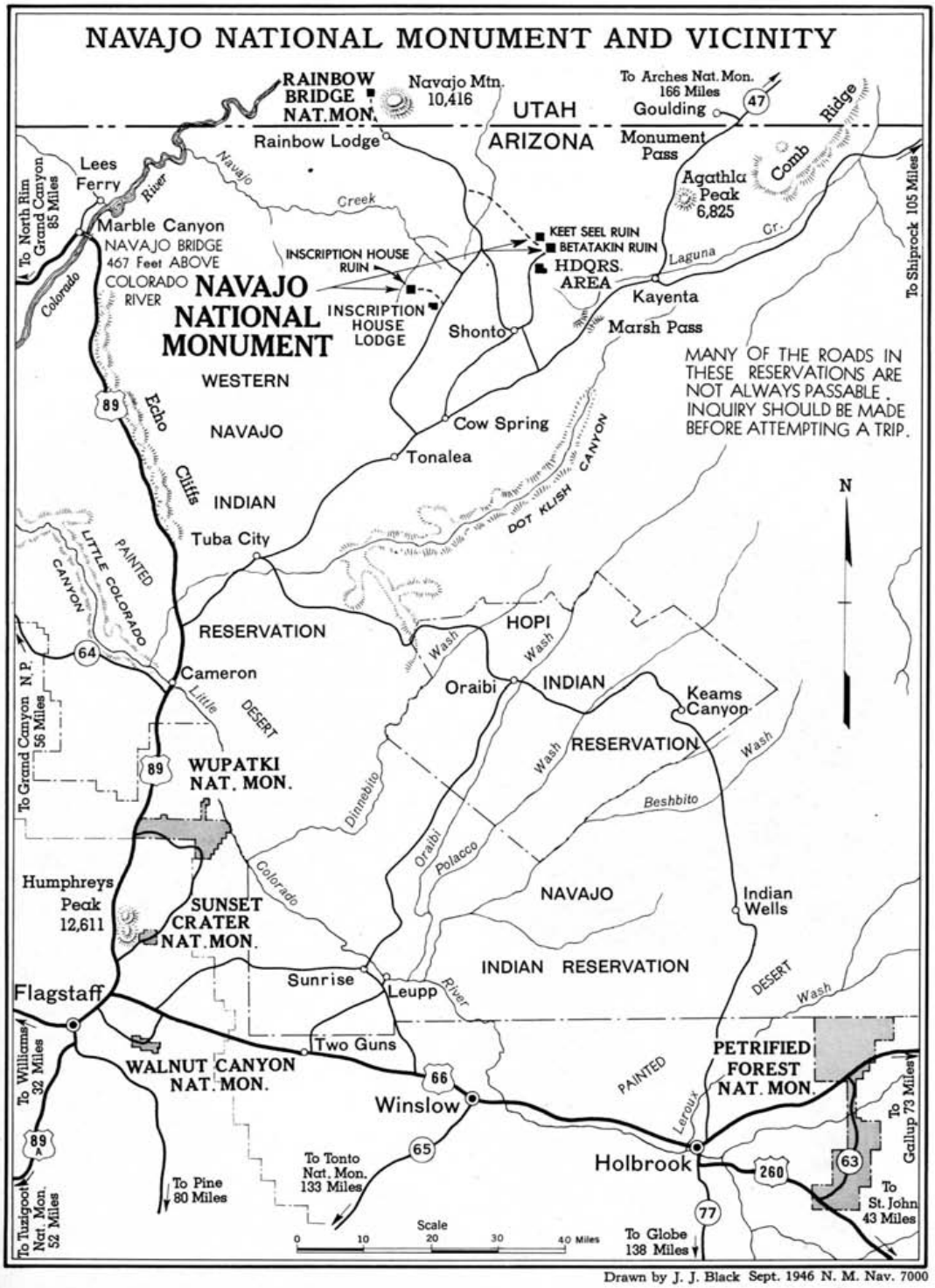
Picnic benches and designated campgrounds are available in the monument. Trading posts and guest ranches in Kayenta, Tonalea, Goulding, Shonto, Tuba City, and Rainbow Lodge offer modern accommodations.

Service to the Public

Because of the need of protecting the ruins, and the difficult unmarked trails by which they are reached, no one will be allowed to enter any ruin unless accompanied by a guide.

Betatakin may be viewed from the binocular station on Betatakin Point at any time, with or without a guide.

Trips to Betatakin should start at 9 a. m. or 1 p. m.; to Keet Seel at 8 a. m. Further information regarding these trips may be secured from the custodian.



Drawn by J. J. Black Sept. 1946 N. M. Nav. 7000

Revised 1947.

U. S. Government Printing Office: 1947 O-F-738855

Winter Encampments

of the

Revolution

NATIONAL
PARK SERVICE
POPULAR STUDY
SERIES

HISTORY No. 1



For sale by Superintendent of Documents, Government Printing Office, Washington
Price 10 cents

NATIONAL PARK SERVICE
POPULAR STUDY SERIES

History No. 1

Winter Encampments *of the* Revolution

A Soldier's Christmas at Morristown in 1799

1941

UNITED STATES DEPARTMENT OF
THE INTERIOR, HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE, NEWTON B. DRURY, *Director*



Reconstruction of Continental Army hospital hut built in the winter of 1779 in what now is Morristown National Historical Park, N. J. Fires on the earthen floor provided the only heat. Smoke escaped through the wooden vents in the roof.

Winter Encampments of the American Revolution[1]

By Elbert Cox

When Mr. Cox wrote the article which follows he was Superintendent of Morristown National Historical Park, N. J. He was transferred later to the Superintendency of Colonial National Historical Park, Va.

THE long periods of winter encampments have received little consideration in narrative histories of the American Revolution. Emphasis has been given to accounts of maneuvers and battles, with attention to the success or failure of the army and its officers in this phase of operations. Of the long months of forced inactivity in general military operations, only a sketchy story of the personal privations and sufferings of the soldiers has been written.

A thorough examination of contemporary accounts gives to the winter encampment a much greater significance in the complete history of the Revolution. In fact, the task of keeping the Continental Army together during a winter encampment may not have been less difficult than leading them through a summer campaign. Certainly an army has to live through the winter before it can fight in the summer. It may be suggestive of the point to cite a modern situation—the feeling of relief that a clear day brings to Civilian Conservation Corps commanding officers after inclement weather has held the boys idle for a week.

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[1] Reprinted from *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. I, No. 2, August 1938, pp. 3–7.

In two separate winters Washington brought the major portion of his army to Morristown, N. J., for cantonment. The first time, in 1777, sheer exhaustion after his surprising successes at Trenton and Morristown forced a halt to his activities. The second time, in 1779–1780, Morristown offered peculiar advantages in location which Washington was quick to see. Safe from attack because of the natural barrier furnished by the Watchung Mountains, he still could watch the British Army in New York. The chains of mountains stretching to the north toward West Point and south to Philadelphia also gave assurance that supplies of food, clothing, and military equipment were reasonably secure from attack and that lines of communication to the north and south could be kept open.

The severity of the winters and the hardships of the men at Morristown are fully recorded. Of the extreme cold in 1779 Washington wrote from Morristown on March 18: "The oldest people now living in this country do not remember so hard a winter as the one we are now emerging from." The scarcity of supplies became so acute as to threaten all efforts to keep the army together. The men were led, out of their own distress, to forage for themselves. In consideration of these depredations, Washington wrote to the magistrates of New Jersey that "For a fortnight past the troops, both officers and men, have been almost perishing for want. They have been alternately without bread or meat the whole time."

An account by one of the soldiers after his arrival in camp in 1779 is no less enlightening:

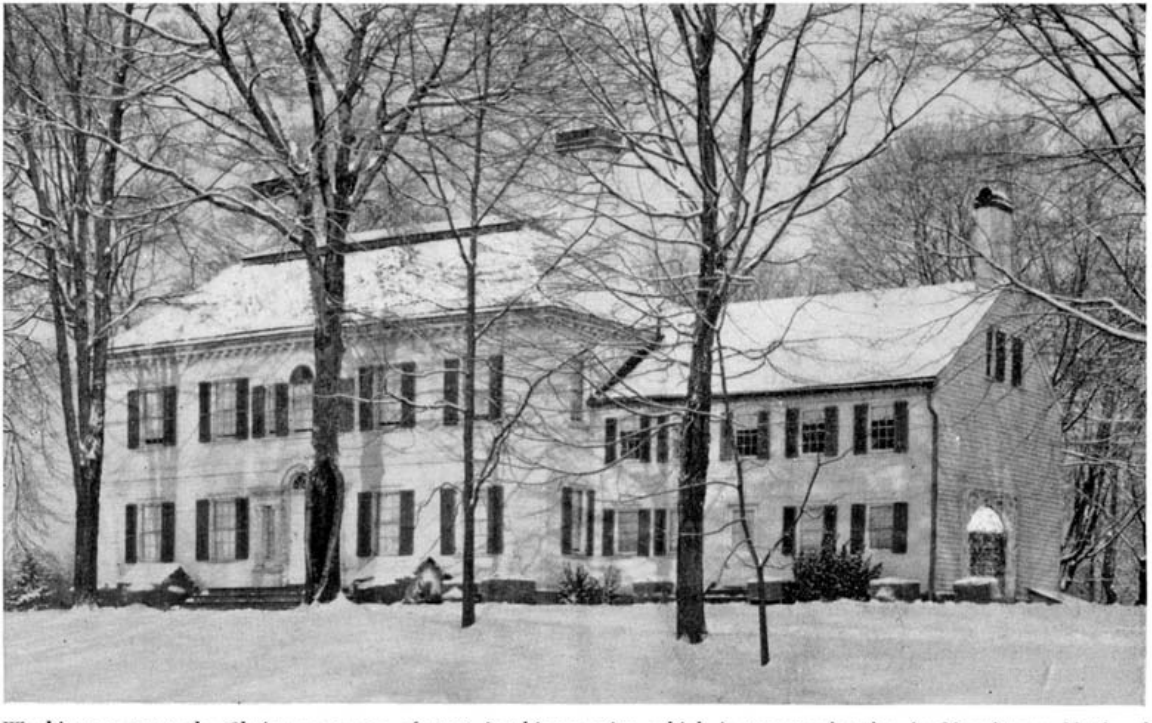
> It was cold and snowy, we had to march all day through the snow and at night take up our lodgings in some wood, where, after shovelling away the snow, we used to pitch three or four tents facing each other, and then join in making a fire in the centre. Sometimes we could procure an armful of buckwheat straw to lie upon, which was deemed a luxury. Provisions, as usual, took up but a small part of our time, though much of our thoughts.

A log hut was a luxury after a few weeks of living under those conditions. Though serious, and keenly appreciated by Washington, the privations of the men were only one of many problems. There was ever the need for recruiting, outfitting, and drilling new enlistments to take the place of those whose terms were up or who left of their own accord. Washington's appraisal of this problem is given in his letter of January 22, 1777, to the President of Congress.

> We have a very little time to do a very great work in, the arranging, providing for, and disciplining a hundred and odd Battalions, is not to be accomplished in a day; nor is it to be done at all with any degree of propriety, when we have once entered upon the active part of the campaign; these duties must be branched out, or they will be neglected and the Public Injured. [There was extreme need for men] for if our new Army are not ready to take the Field early in the Spring, we shall loose all the advantages, which I may say, we have providentially gained this winter.

The business of running an army was no small undertaking even for the few thousand men that Washington had. The recruiting of additional regiments must be accompanied by the appointment of new officers, and the Continental Congress proved often to be more whimsical than wise in its actions. Washington wrote letter after letter patiently explaining why one candidate should not be advanced over another. Deserved recognition for his experienced officers gave him much concern as witness his letter of March 6, 1777, to Richard Henry Lee, inquiring into the cause for the nonpromotion of Benedict Arnold.

He recommended a "plan . . . for the arrangement and future Regulation of the General Hospital" and finally won its approval by the Continental Congress. Smallpox became so prevalent during the winter of 1777 that inoculation was a necessity. Attention had to be given also to the problem of suitable clothing, arms, and ammunition for the troops. After much pleading by the Commander in Chief, the Continental Congress resolved to establish "Magazines, Labora-



Washington spent the Christmas season of 1779 in this mansion which is preserved today in Morristown National Historical Park.

tories and Foundries" in the State of Pennsylvania and in New England.

With all these details to manage, Washington still kept keen watch upon the British to anticipate their projected movements in the coming summer (he had guessed the general plan of their campaign for the summer of 1777 as early as February of that year). He lost no opportunity to harass and annoy them upon all occasions by removing out of their reach "all the horses, waggons and fat cattle" as the best mode "of distressing the Enemy and rendering their Situation still more disagreeable." Of similar intent was the plan to have Lord Stirling attack Staten Island by crossing on the ice from the Jersey shore.

He complained that more time to "the military parts of my duty" was not possible because of "the infinity of perplexing business," and the "multiplicity of letters and papers I have to read and consider . . ." These ranged from an order respecting the "Colour of Horses"—the white or gray ones were too conspicuous for reconnoitering—to letters of petitions for appointments, pensions, or pay.

Yet not every hour of the day was given to stern duty. Numerous balls were held at which the officers and their wives or sweethearts were in attendance. Washington and his Lady were frequently among the participants. A lighter side of the General's nature is revealed by Mrs. Martha Daingerfield Bland, wife of Colonel Theoderick Bland of Virginia, in a letter to his sister-in-law, Frances Bland Randolph, describing her visit in Morristown.

> We visit them twice or three times a week by particular invitation—Ev'ry day frequently from Inclination. he is generally busy in the forenoon—but from dinner till night he is free for all company. His worthy Lady seems to be in perfect felicity while she is by the side of her Old Man as she calls him. We often make partys on Horse Back the Gen[l] his lady; Miss Livingstone, & his aid de Camps . . . at which time General Washington throws off the Hero and takes on the chatty agreeable com-

panion—he can be downright impudent sometimes—such impudence, Fanny, as you and I like . . .

It is to be assumed that diversions could be found also by the men in the line. In reality their personal letters suggest that human nature, even of the soldier, has not changed from that day to this. Two examples, one to illustrate the "seamy" side, and another the comic, may be taken as typical. First, there is the case of the one who had been impressed into duty as regimental clothier. He described his predicament in a letter to his brother:

If you was just now to step into my Hutt . . . You'll find me sitting on a chest, in the Centre of six or eight taylors, with my Book, Pen & Ink on one side and the Buttons & thread on the other—the Taylor you'll find some a Cutting out others sewing, outside of the taylors you will see maybie half Dozen men naked as Lazarus, begging for cloathing, on the floor you'll find it about knee deep with snips of cloth & Dirt. If you stay any time you'll hear every Minute knock-knock at the door & I calling walk in, others going out, which makes a Continual Bussle—Presently I begin to Swear . . .

But to prove the eternal buoyancy of the human soul consider this soldier's account of how he spent his time:

During these operation, we were encamped at a place called the Short-hills. While lying here, I came near taking another final discharge from the army in consequence of my indiscretion and levity. I was one day upon a camp guard; we kept our guard in the fields, and to defend us from the night dew, we laid down under some trees which stood upon the brink of a very deep gully; the sides and tops of the banks of this gully were covered with walnut or hickory saplings, three, four, or five inches diameter at their butts, and many of them were fifty or sixty feet in height. In the morning before the guard was relieved, some of the men (and I among the rest, to be sure, I was never far away when such kind of business was going forward) took it into our heads to divert ourselves by climbing these trees as high as they would bear us, and then swinging off our feet, the weight would bring us by a gentle flight to the ground, when the tree would resume its former position. After exercising ourselves some time at this diversion, I thought I would have one capital swing; accordingly, I climbed one of the tallest trees that stood directly on the verge of the gully, and swung off over the gully; when the tree had bent

to about an horizontal position it snapped off as short as a pipestem; I suppose I was nearly or quite forty feet from the ground, from which distance I came feet foremost to the ground at quick time; the ground was soft, being loamy and entirely free from stones, so that it did me but little hurt, but I held the part of the tree I had broken off firmly in my grasp, and when I struck the ground with my feet, I brought it with all the force of my weight and its own directly upon the top of my unthinking skull, which knocked me as stiff as a ringbolt. It was several minutes before I recovered recollection enough to know or remember what I had been about, but I weathered the point, although it gave me a severe headache for several days afterwards, as a memento to keep upon the ground, and not to attempt to act the part of a flying squirrel.

The story of the winter encampment in the Revolution is the theme for the development of Morristown National Historical Park, a unit of the system of national parks, monuments, and historic sites which are preserved and maintained for the American people by the National Park Service of the United States Department of the Interior. The three separate areas which comprise the park contain historic objects and remains connected with each encampment. The preservation and restoration of historic buildings, the construction of sample log huts, and the use of modern museum methods are combined to supplement existing information and to stimulate the imagination of the visitor. Washington's Headquarters, reconstructed Fort Nonsense, and the many features in Jockey Hollow form a link with the past by which he can obtain a better understanding and appreciation for the story of the American Revolution.

A Soldier's Christmas at Morristown in 1779[1]

By Russell Baker, Junior Historical Technician, Morristown National Historical Park, N. J.

"HALF rations again! By Christmas we'll be on no rations at all!"

—And when we came to Morristown they told us the people were all in sympathy with the cause; very few Tories among them, and that this was a land of plenty.

"Yes, plenty of cold and snow Sam, if this cold continues there won't be one of us left to live in these damned log huts. Why did General Washington pick such a place for our winter encampment?"

—Washington knows what he's doing, Henry. We're safe from attack here at Morristown. The British can never get over the mountains east of here. I, for one, am willing to go any place Washington says; I'm willing to suffer along with the rest, but I've stood all any human being can stand. We've been for weeks on half rations; half-naked and not enough blankets to go around, and the coldest winter of the century. If we could only get more grog, that would keep out the cold.

"I haven't had a drink of grog for days. The only way we can keep warm is in building these huts. When do you think we'll be in our hut, Sam? This tent is as good as nothing at all."

---

[1] Reprinted from *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. III, No. 6, December 1939, pp. 3–7.



The luckier Revolutionary soldiers were living in huts like the one reconstructed above, but many of their comrades still were in tents when Christmas came to Morristown in 1779.

—About 3 days more. Perhaps we can make it by Christmas, then we'll celebrate in our new log mansion. But Captain Ashmead won't be in his hut by Christmas. He says he'll see all the privates under cover first.

"I heard that General Greene is attempting to get most of the officers in private homes, but is meeting with great opposition. No one wants an officer in their home, I guess, because they're afraid the British will attack most any day and burn their place down. If the British do get through, we certainly can't offer much resistance."

—Sam, some of the other boys ate a good meal last night—even had a chicken. What do you say we do the same tonight? Down this road, not very far, lives a farmer by the name of Wick. His yard is full of chickens and his barn is overflowing with grain—more than he and his family can ever use.

"Wick's farm![1] That's where General St. Clair is staying. If he ever caught us there we'd be up for court-martial in the morning."

—I'd take a good lashing for a square meal. Anyway we deserve something to eat for Christmas, and we may not get caught.

"But haven't you heard General Washington's orders. No more of this pillaging, he says, and calls us a band of robbers rather than disciplined troops."

—That's easy for the General to say, but does he understand what we are going through out here?

"They say he is going to visit camp tomorrow. Let's wait. Perhaps he'll bring us some news—news that the French fleet is going to arrive, or that we can borrow some of the 5,000 barrels of flour collected for the French to use when they come. Then at least our bellies will be full on Christmas."

★ ★ ★

This imaginary conversation between two Continental soldiers encamped in Jockey Hollow, near Morristown, N. J.,

was probably typical of hundreds of others which took place during the memorable Christmas season of 1779. Both from a military and a political standpoint, the winter was an extremely critical period. Soldiers were compelled to live on half and sometimes quarter rations, which made it impossible for Washington to prevent pillaging and marauding. An attempt on his part to prevent ruthless stealing of supplies from the farmers in the vicinity caused a complete famine in camp, making it necessary to order regular foraging and marauding expeditions which went from house to house and took everything not absolutely essential to the inhabitants.[2]

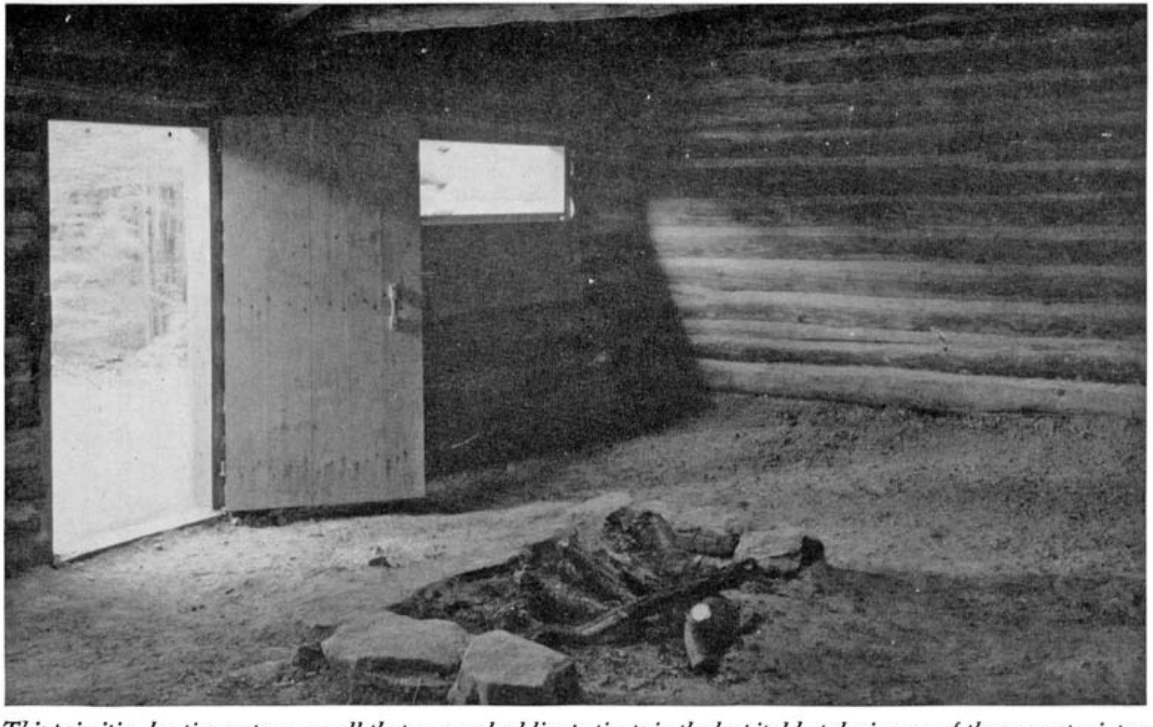
Christmas of 1779 found the ragged, half-starved men of the Continental Army busily engaged in building crude log huts, which were to be their homes until the opening of the next year's campaign. Just before Christmas there began the extreme cold which was to characterize the winter of 1779–80, the worst of the century. Some of the men were under cover by Christmas, but others still were in the open two weeks later when a sudden blizzard brought a 5-foot snow blanket to most of New Jersey, and froze the Hudson and other rivers solid.

Most of the officers were even worse off than the ordinary privates, yet had to wait until all the men were under cover before beginning construction of their own quarters. Quartermaster General Greene attempted to obtain quarters for the officers in private homes, but found that the people offered determined resistance to the idea. Greene appealed to the civil magistrates for help, but their sympathies were with the populace. Exhausted in his patience in providing what he deemed absolute necessities for the officers, he finally appealed to Washington. Washington then threatened to obtain accommodations for his officers by the exercise of martial law, if necessary, but he never carried out his threat.

The following letter, written by Brigadier General Samuel



Reconstructed officers' hut at Morristown.



This primitive heating system was all that warmed soldier patients in the hospital hut during one of the severest winters of the century. The interior is one of the Morristown reconstructions.

H. Parsons, Connecticut Line, to General Greene, illustrates the difficulties encountered in housing even general officers:

> Dear Sir: I beg you to order me a large markee and a stove as the last resort I have to cover me; I cannot stay in this Trophet a day longer nor can I find a House without going four miles from camp into which I can put my Head. The Room I now have is not more than Eight feet square for six of us; and the family worse than the Devil; and the Justices threatening you and me if I continue to occupy this Hutt.
>
> I beg you not to fail to send me the Markee and Stove to Day; or send me somebody to drive away the Evil Spirits who inhabit this House.
>
> Your Obedt Servt
> Samuel H. Parsons

What did the Continental soldier eat for his Christmas dinner? While we have no record of any special food's being rationed for the day, the following general order illustrates the kind of food he must have had—perhaps only a half or even a quarter of the prescribed ration:

> A pnd. of hard or soft bread & 19 Pound of Indn. Meal or a pound of flower, a pound of Beef or 14 oz. Pork to be daily Ration untill further orders.[3]

Some of the officers, at least, were able to escape the hard times prevalent about the camp on Christmas Day. A letter written by Lieutenant Erkuries Beatty, of Hand's Brigade, illustrates a celebration in splendid style:

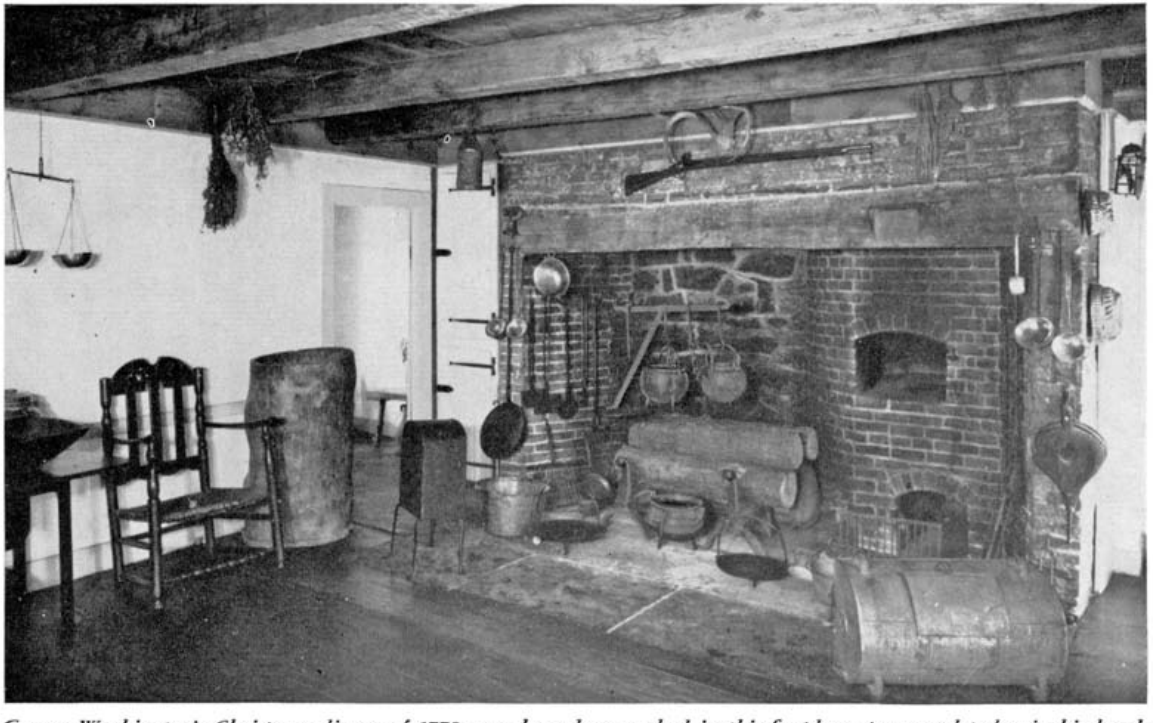
> Camp near Morristown
> Christmas Day
> Dec.r 25th [17] 79.
>
> . . . I am just done dinner about half Drunk, all dined together upon good roast & boiled, but in a Cold Tent, however grog enough will keep out cold . . . tomorrow we all dine at or with the Colonel, which will be another excellent dinner and I think you may call that fine living, but oh! I am afraid it won't last many Days—we hutt about four miles from Morristown . . . in about one week we will be in our hutt & a fine lay out it is . . .[4]

Even the Commander in Chief, living at the Ford Mansion in Morristown throughout this Christmas season of 1779,

could not have been very comfortable. The official family was much crowded even though most of the spacious mansion was placed at its disposal. As late as January 22, 1780, Washington wrote:

> . . . I have been at my prest. quarters since the 1st day of Decr. and have not a Kitchen to cook a Dinner in, altho' the Logs have been put together some considerable time by my own Guard; nor is there a place at this moment in which a servant can lodge with the smallest degree of comfort. Eighteen belonging to my family and all Mrs. Fords, are crowded together in her Kitchen and scarce one of them able to speak for the colds they have caught . . .[5]

Besides the dearth of personal comforts, this Christmas was one of the most disheartening of the entire 8 years of the war. Up until November, high hopes had been held that the powerful French fleet under Count D'Estaing, which was operating in the West Indies, could arrive on the coast in time to cooperate with the Continental Army in a siege of New York City. But D'Estaing failed to grasp the opportunity and chose instead to assist General Lincoln in an unsuccessful attack on Savannah, Ga. Thus, at Christmas time, Washington found it necessary to weaken his own force to give assistance to the defeated Lincoln. Besides this, Washington and his staff became alarmed at the indications of a possible attack by Sir Henry Clinton, the British commander at New York. Clinton had called in all his outlying detachments and had the entire army concentrated on Manhattan Island. Preparations were being made to embark a large fleet, which, Washington thought, may have been a feint for an attack on Morristown. Not to be caught unawares in such a situation, Washington gave orders to place all the troops in a position to defend themselves. A system of alarm signals was organized, each brigade being directed to its proper place in the line of battle, and Duportail, chief of the engineers, and General Greene were instructed to prepare a plan for a defense of the position. Such an attack, however, never occurred.



George Washington's Christmas dinner of 1779 may have been cooked in this fireplace, preserved today in his headquarters mansion at Morristown.



Farmer Henry Wick, whose home (above) was the object of hungry soldiers' pilferings, provided quarters for General St. Clair.

Four days before Christmas, Washington wrote to Governor Livingston of New Jersey concerning his apprehensions in regard to the plans of the British. He wrote that Clinton could not be ignorant of the small number of men left in the Continental Army, the distress of the military magazines, and the want of forage. "The loss of our huts at this inclement season," he pointed out, "would be a most serious calamity. This loss would be accompanied by that of a great part of our baggage, and a number of our men by desertions."[6]

The general orders on Christmas Day, 1779, make no mention of the festiveness of the occasion, only the prosaic grind of military routine. One order dated December 24, 1779, calls for a court martial on December 25 at 10 o'clock in the morning, for a trial of the noncommissioned officers and privates who were in confinement.[7] Another announced that a small supply of shirts had arrived and would be delivered.[8] Still another, dated December 25, is a reprimand for the "shameful waste of forrage" in camp.[9]

But what must have added most to this disheartening Christmas season, at least to Washington, was the court martial of Benedict Arnold, who was tried for permitting a Tory vessel to enter the port of Philadelphia without acquainting other officials of the fact, and other charges. The trial was held in the old Dickerson Tavern in Morristown and the occasion made it one of the most important gatherings ever held in America up to that time. Arnold was summoned December 19[10], and further sessions were held at the same place at 11 o'clock on the mornings of December 24, 25, and 26[11]. Even on Christmas Day the trial continued! As evidence in his favor Arnold placed before the court complimentary letters from the Commander in Chief which bore out the fact that he was one of the bravest generals of the army. A sad Christmas, the first of many which Benedict

Arnold was to have! Sadder still it must have been to Washington who had put implicit faith in Arnold.

So, it may be wondered, could there have been a Christmas at Morristown in 1779? These "times that tried men's souls," as Thomas Paine wrote, were never more in evidence than during that season.

Today, 160 years later, when the ageless Christmas message is said and sung again to the sound of bells and the twinkle of candles, when the firelight burns brightly on twentieth century hearths, Americans still may keep green the story of Morristown's Christmas in 1779. For that story, in the great realities of the present, well may remind us of an ancient sacrifice whereby we now are afforded, as Scrooge's nephew said, "a good time, a kind forgiving, charitable, pleasant, time."

Notes

[1] The Wick House, as well as Washington's Headquarters (the Ford House) mentioned elsewhere in this article, are now units of Morristown National Historical Park.

[2] Letter from the Chevalier de la Luzerne, the French Minister, to his government, *New Materials for the History of the American Revolution* (John Durand, Henry Holt and Company, New York, 1889), pp. 217–218.

[3] General Orders, January 18, 1780, *Morristown Orderly Book*, Morristown National Historical Park manuscript collection.

[4] Written to his brother, Dr. Reading Beatty, "Letters of Four Beatty Brothers of the Continental Army, 1774–1794," *The Pennsylvania Magazine of History and Biography*, Vol. XLIV (1920), pp. 193–263, Historical Society of Pennsylvania.

[5] John C. Fitzpatrick, *Writings of Washington* (United States Government Printing Office, Washington, May 1937), Vol. 17, p. 432.

[6] *Ibid.*, 292.

[7] *Ibid.*, 309.

[8] *Ibid.*, 310.

[9] *Ibid.*, 320.

[10] *Ibid.*, 286.

[11] *Ibid.*, 302, 312.

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1941

UNITED STATES DEPARTMENT OF
THE INTERIOR, HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE, NEWTON B. DRURY, *Director*

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Illustrations by Tyler B. Kiener.



HISTORICAL units of the national park system include fields of battle, birthplaces of famous men, memorials of superlative contributions to human progress, and physical mementoes of many another episode that illuminates the career of a nation. Whether they recite stories of war or of peace, of a single individual's impress upon the centuries' record, or of the collective achievement of America as an astonishing crucible of the world's races, they usually embody a central historical theme. Such fundamental narratives are familiar enough, for they are phasic chapters of national history and form the principal outline of the expanding chronicle of man's endeavors west of the Atlantic Ocean.

Increasingly diverting today, therefore, are the growing footnotes which project revealing spotlights on the skeletal story. Humble second-thoughts, they clothe the stark silhouettes of the bony frame and provide the meatier upholstery of

romance for the gaunt ribwork of common fact. Paradoxically, the lower-page fine print day by day is making more entertainingly readable the capital letters of the text.

An ancient rifle may speak more eloquently than wordy tomes of George Washington at Fort Necessity; a primitive kitchen sometimes may excel the historian in recounting the struggles of frontier life; or an old wharf may evoke, far better than a multidegreed researcher, the glories of Yankee ships that defied Britannia's seas. All these are but modest annotations of a greater work, but they afford refreshing pauses which encourage the reader to keep his book open.

Such a footnote to America's history is to be found in the museum of Vicksburg National Military Park, Miss., where a rectangular scrap of paper symbolizes, with a sparkle of ironical humor, one of the many grim battles which journalism has survived on this continent in its climb from the lowly station of a tolerated evil to the happier position of a public necessity. It is a copy of *The* (Vicksburg) *Daily Citizen*, issued July 4, 1863, at the end of the 47-day siege of the famous river port during the War between the States. It relates, by suggestion, a far more significant story than is told literally in its meager columns. It was printed first by a beleaguered Confederate editor and then, with pointed emendations, by Union victors. The back of the single sheet is not printed at all in the usual sense—because it is befigured wallpaper.

The occurrence is a trifling but instructive episode of the vicissitudinous development of paper, that all-powerful instrument for the diffusion of knowledge, which had its traditional origins nearly twenty centuries ago in the inventions of Ts'ai Lun, an ingenious Chinese who lived in what now is war-torn Hunan Province.[1] Paper has been made from an almost incredible variety of substances ranging alphabetically from asbestos, cabbage and dandelion roots, through potatoes,



thistles and wasps' nests. In such contempt was it held in the twelfth century, as opposed to parchment (from sheep and goats) and vellum (from calves), that documents written upon it were held to be without legal authority.[2]

Wood pulp paper, the staff of life of the voracious press of today, did not reach the experimental stage until 1800, and the mass production sulphite process was not devised until 1874.[3] There have been many periods of paper scarcity, and consequently of price fluctuations which often took their roots in frank and homey soil. The growing ascendency of linen over woolen underwear in France during the fifteenth century provided cheaper rags for paper makers and nurtured the timid growth of printing.[4] The resulting premium placed on the casual remnants of one's more personal garments must have been transplanted in America by early colonists, for John Holme, who wrote in 1696 *A True Relation of the Flourish-*

ing State of Pennsylvania (said to be the first metrical composition of that Quaker region), admonished his fellow citizens:

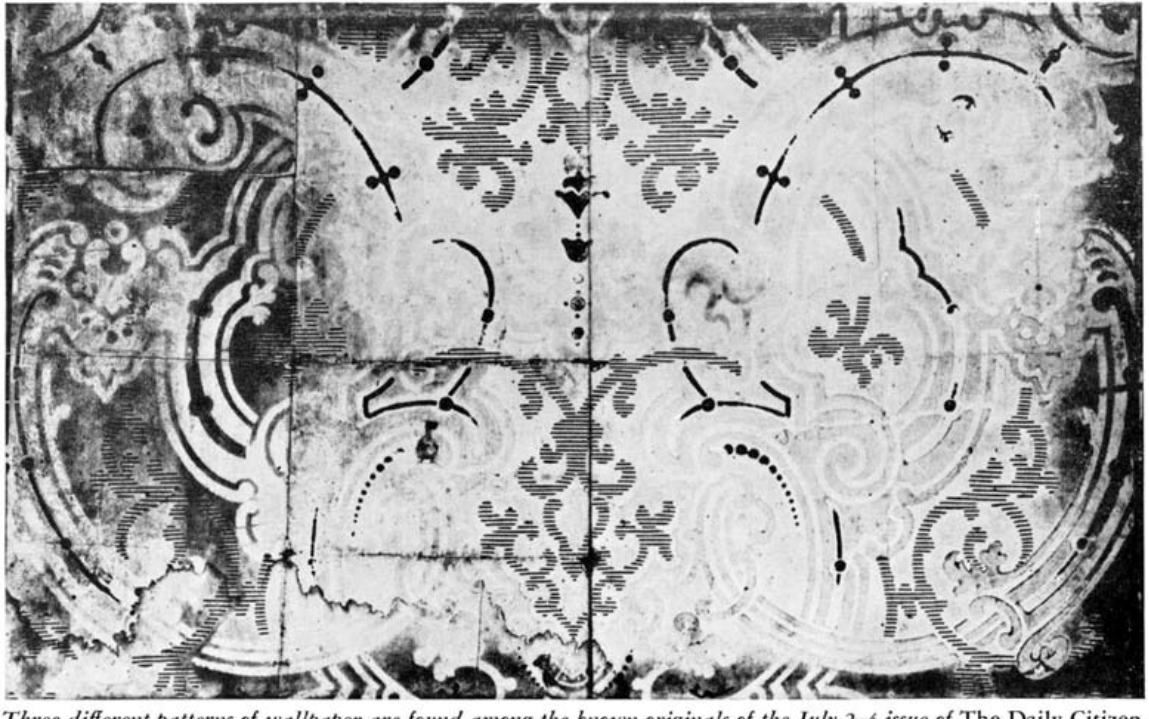
> Kind friend, when thy old shift is rent
> Let it to th' paper mill be sent.[5]

More earnest still was the poetic entreaty of an up-State New York paper maker of the eighteenth century, who published a notice to fair householders of his day:

> Sweet ladies pray be not offended,
> Nor mind the jest of sneering wags;
> No harm, believe us, is intended,
> When humbly, we request your rags.[6]

Scarcity of paper was not uncommon in later Colonial days and particularly during the Revolutionary War when importations ceased and several of the 40-odd American mills halted production.[7] Even near the end of the century, so hard beset with printing woes was John Scull, founder of *The Pittsburgh Gazette* (1786), that he had to procure from the fort commandant the material upon which to publish his journal: ". . . twenty-seven quires of cartridge paper,"[8] a notable instance which conceivably may be the substantiating exception to the rule that the pen is more potent than the sidearm. The first mill "beyond" the Alleghenies was not established until 1793, and the West suffered shortages throughout the period of its early expansion.

Confronted by this somewhat forbidding historical background in which the role of paper was often conspicuous by its dearth, the South was warned in 1860 by *The New Orleans Bulletin* that it should temper its opinions on secession until it became independent of Northern ink, type, presses, and paper.[9] In 1852 the United States was importing rags from 32 countries, and its consumption of paper already had equalled that of England and France combined.[10] Yet, by 1860, with 555 paper-making plants in the country, only 24 were operating in the South.



Three different patterns of wallpaper are found among the known originals of the July 2–4 issue of The Daily Citizen. *The one shown above is the back of one of the sheets preserved in the Library of Congress.*



The admonition of *The Bulletin* probably was soon forgotten, but fulfillment of its implied prophecy was not long delayed. The outbreak of war, with the resulting cessation of paper shipments from the North, was reflected quickly in a shortage of printing stock. As early as September 1, 1861, *The Charleston Courier*, a leading mouthpiece of the Confederacy, was compelled to reduce the size of its pages. Progressive shrinkages followed periodically throughout the lengthening years of the struggle until, by February 1865, that journal appeared as a four-columned sheet of 10 by 15 inches.

Some newspapers collected their own rags, some raised subscription prices as high as $120 a year, some rejected orders for any period exceeding 60 days, and some led a peripatetic existence, publishing here today and there tomorrow (even in railroad freight cars), as they fled approaching invaders and sought new sources of printing supplies. Many suspended publication altogether.



Among those which managed to survive the famine of paper and other misfortunes of war, several were forced to resort to heroic measures. Long established organs appeared on wrapping paper, tissue paper, writing paper, ledger paper, and, in final extremities, on odds and ends of wallpaper of many hues and patterns. Dainty bedroom designs featuring the interwoven tendrils of vague and unbotanical plants often vied, in the same edition of a journal containing the affrighting news of battle, with the more formal geometric whimsies of the living room and library.

At least 13 newspapers, all of them published in Louisiana and Mississippi, are known definitely to have been printed on wallpaper. Of these, 31 different issues have been found in the larger repositories of the country by Clarence S. Brigham, director of the American Antiquarian Society, who believes that many others may have appeared, only to be discarded as of trifling value because readers were interested in the stirring

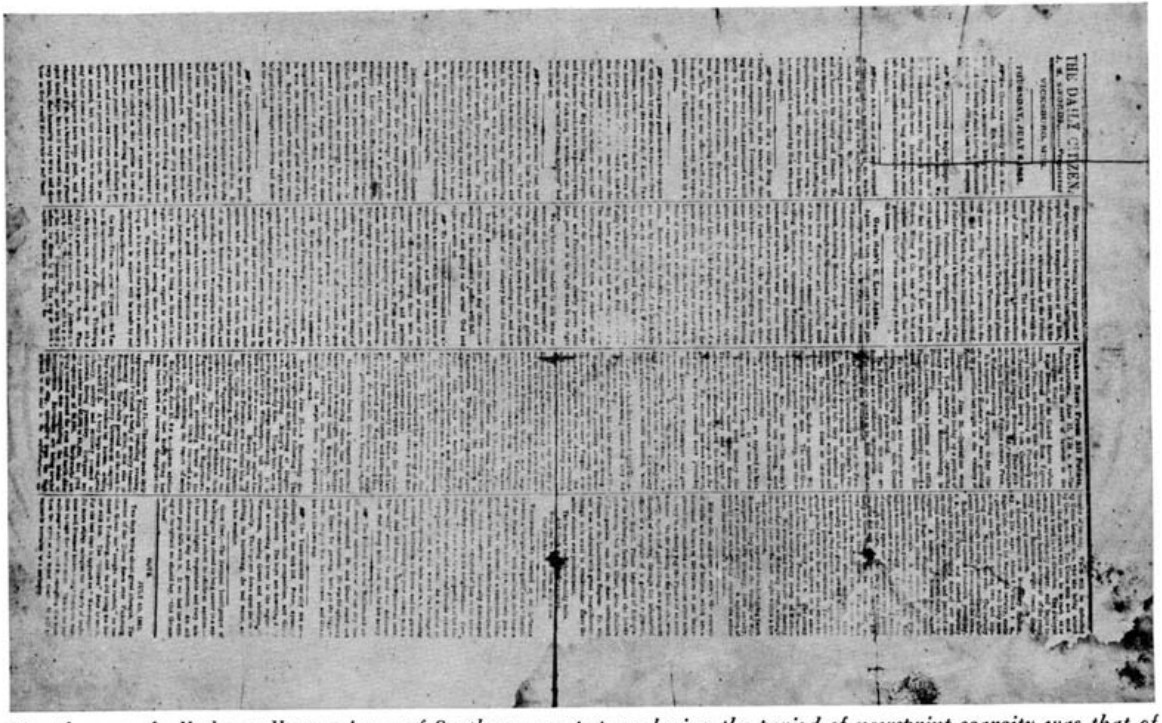
news of victory or defeat rather than in the stop-gap fashion by which it was disseminated.[11] Institutionally catalogued specimens include Louisiana organs edited in both English and French, such as *Le Courrier des Opelousas;* the *Unconditional S. Grant*, an army sheet published in 1863 by Federal troops stationed at New Iberia, and *The* (Alexandria) *Southern Sentinel.* The harassed sponsor of the latter journal, in his issue of March 21, 1863, lamented editorially:

> Even the apology for paper which we are forced to use to print one page on, and which we will change for the better as soon as possible, costs four or five times as much as a full sheet of four pages would have done two years since. . . .

Most interesting of all the wallpaper press, however, is Vicksburg's *Daily Citizen*, edited by J. M. Swords in an easy-going town seated comfortably on the river bluffs where, for 47 days, Confederate forces made a last stand for control of the lower Mississippi. In the prewar days of 1860 *The Citizen* was a four-page newspaper of full dimensions. Even by June 13, 1863, after 26 days of a siege whose encircling fetters General Grant drew ever tighter, Editor Swords' daily account of the progress of war appeared on genuine newsprint. But the thin fingers of scarcity already had begun to pinch. *The Citizen* that day was a single sheet, two columns wide. Yet, however modest the format of the journal, it must have enjoyed a demand sufficiently brisk to inspire street-corner profiteering. That became evident 5 days later when the hard-pressed Swords explained to his readers:

> The price of our paper at the office is twenty-five cents. Newsboys who charge fifty cents on the streets are not authorized by us to sell at that price; and those who object to the extortion should call at the office and get their papers at first cost. We cannot control the trade nor the prices of newsboys and can only sell our papers to them at the same prices that we get from those who call at the office.

Swords must have read the handwriting on the wallpaper, because that issue, June 18, 1863, is one of the six numbers of *The Citizen* now known to exist which were published on that



Most famous of all the wallpaper issues of Southern newspapers during the period of newsprint scarcity was that of The *{Vicksburg, Mississippi}* Daily Citizen *for July 2 and 4, 1863. Published on the first date by a Confederate editor, the same paper was reissued by Federal soldier-printers two days later when the besieged city fell. The "note" inserted by the victors at the bottom of the fourth column provides a good-natured rebuttal for the last paragraph of column two.*



Now the property of a parochial school, the building shown above was the city headquarters of Gen. John C. Pemberton, Confederate commander, during the 47-day siege of Vicksburg. It was occupied by Federal forces on the same day that printers of General Grant's army reissued The Daily Citizen.

Printers may not be ubiquitous, but certainly they are present in every army. Some of those under Grant soon found the offices of *The Citizen*, with its type still standing in the lone "form" of the issue of July 2. Two observations are supported readily by the evidence: (*a*) The contents of the paper were read carefully, and (*b*) there were some easy-humored typographical warriors among the conquerors of Vicksburg. By recourse to the abandoned type cases the newcomers composed a 14-line rebuttal. Its unanswerable repartee appended a good-natured postscript to one of the most arresting journalistic episodes of the American Civil War:

NOTE

July 4th, 1863.

Two days bring about great changes. The banner of the Union floats over Vicksburg. Gen. Grant has "caught the rabbit;" he has dined in Vicksburg, and he did bring his dinner with him. The "Citizen" lives to see it. For the last time it appears on "Wall-paper." No more will it eulogize the luxury of mule-meat and fricasseed kitten—urge Southern warriors to such diet never-more. This is the last wall-paper edition, and is, excepting this note, from the types as we found them. It will be valuable hereafter as a curiosity.

Using precious scraps of Swords' wallpaper remnants, the visitors printed an undetermined number of copies of a "July 2–4" edition, one of the most novel "replates" ever run through a press. Three designs of paper are found among the known originals, but more than 30 reprints have appeared since 1863. Henry S. Parsons, Chief of the Periodical Division of the Library of Congress, has made a searching study of them[12] in order to establish nine unerring typographical tests for distinguishing the genuine from the various souvenir copies. Exuberant collectors, he explains,[13] still send "discoveries" to him for examination, only to learn that they are somewhat unfaithful imitations.

Supplementing typographical clues are those provided by the design of the paper itself. That of the original in the

Library of Congress is described with studied precision by Mr. Parsons:

"A large brocade pattern in faded red-purple over a scroll design in faded rose on a cream background."

Altogether, the historical record appears to uphold the forecast made July 4, 1863, by the waggish Federals who predicted that *The Citizen* "will be valuable hereafter as a curiosity." It is even more valuable, however, as a revealing footnote to an interesting page of America's national record, for it substantiates the validity of the warning sounded in 1860 by *The New Orleans Bulletin* that ink and paper, as well as guns and swords, are indispensable items in the *matériel* of war.

Notes

[1] André Blum, *On the Origin of Paper* (Harry Miller Lydenberg, trans., R. R. Bowker Company, New York, 1934), 17.

[2] *Ibid.*, 23.

[3] H. A. Maddox, *Paper, Its History, Sources and Manufacture* (Sir Isaac Pitman and Sons, London, n. d.), 64.

[4] Blum, *op. cit.*, 35.

[5] Dard Hunter, *Papermaking through Eighteen Centuries* (William Edwin Rudge, New York, 1930), 36. This author explains (p. 232) how a fifteenth century mosquito is preserved in a sheet of his collection of paper.

[6] Mary E. Wheelock, *Paper, Its History and Development* (American Library Association, Chicago, 1928), 7.

[7] James Melvin Lee, *History of American Journalism* (Houghton Mifflin and Company, Boston and New York, 1917), 69, 97.

[8] George Henry Payne, *History of Journalism in the United States* (D. Appleton and Company, New York, 1920), 203.

[9] Lee, *op. cit.*, 305.

[10] Wheelock, *op. cit.*, 8.

[11] "Wall-paper Newspapers of the Civil War," *Bibliographical Essays, A Tribute to Wilberforce Eames* (Harvard University Press, Cambridge, Mass., 1924), 203–209.

[12] "Wall-Paper Editions of the Vicksburg 'Daily Citizen,'" *Antiques*, Vol. XXV, No. 3, March 1934, 97–98.

[13] Personal interview, November 9, 1939.

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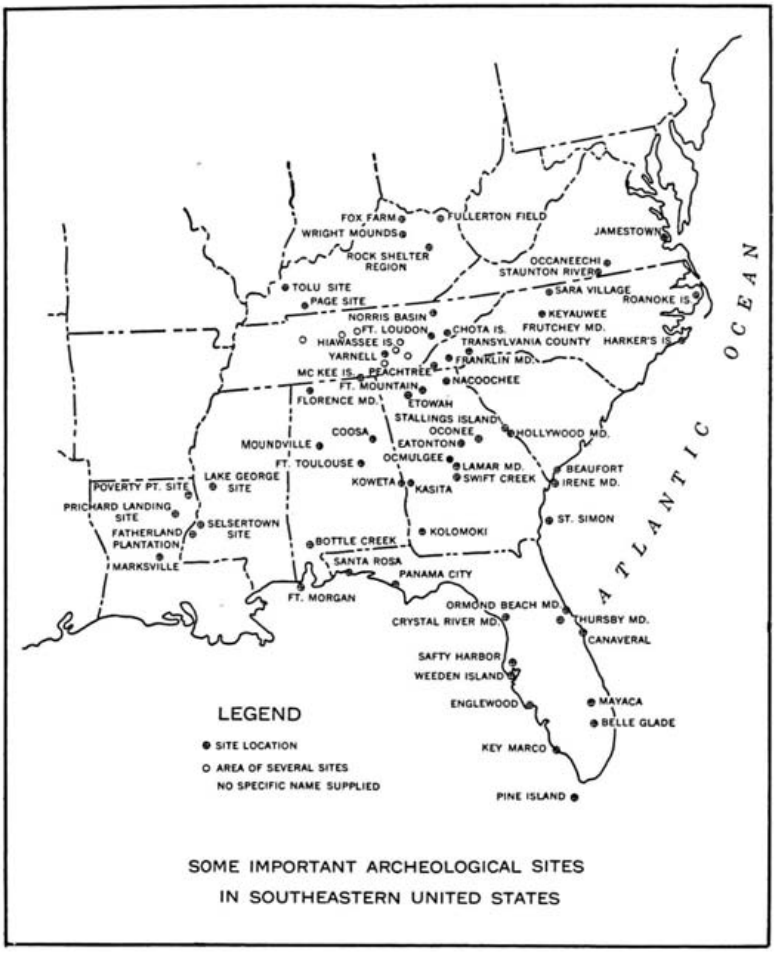
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UNITED STATES DEPARTMENT OF
THE INTERIOR, HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE, NEWTON B. DRURY, *Director*

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SOME IMPORTANT ARCHEOLOGICAL SITES
IN SOUTHEASTERN UNITED STATES

The Coordination of Southeastern Archeological Studies*

By A. R. Kelly, Chief, Archeologic Sites Division, Branch of Historic Sites, National Park Service.

DURING the last few years, archeological exploration in the eastern United States, particularly in the southeast portion, has flourished under sponsorship of numerous local and State scientific organizations in cooperation with the Smithsonian Institution. In several instances, involving both National and State park developments, the National Park Service has served as sponsor.

At Ocmulgee National Monument, Macon, Ga., there has been developed the first national monument east of the Mississippi River which is predicated primarily or solely on American prehistory. Interest created by archeological exploration and restoration projects at Ocmulgee has led to the demand from many parts of the Southeast that a museum be established which would serve as a center of prehistoric research and survey for the whole region. Tentative plans were drawn for a museum and initial work on a small unit of the structure was started under the Emergency Relief Act. [A modern administration-museum building which will cost approximately $280,000 is in progress.—ED.]

* From *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. I, No. 1, July 1938, pp. 9–12.

At Mound State Monument, Moundville, Ala., another smaller park museum is in process of erection. [An excellent structure has been completed.—ED.] A State-wide archeological survey was initiated to catalog the prehistoric resources of Alabama. Similarly, the University of Georgia and the Georgia Department of Natural Resources have combined to sponsor a State-wide archeological survey.

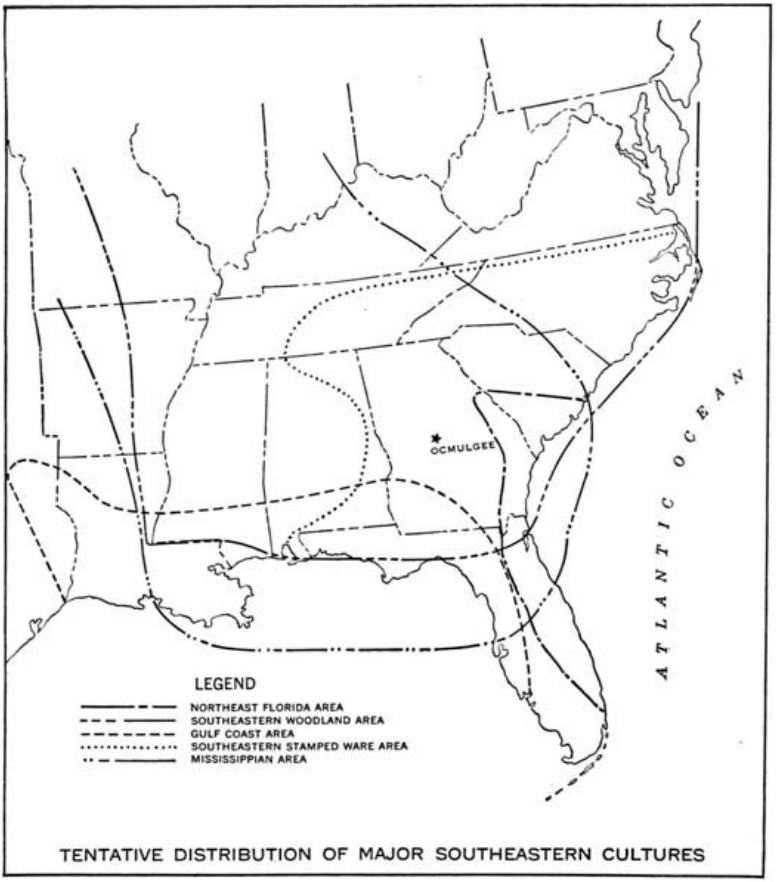
In Tennessee, the University of Tennessee has carried out extensive archeological investigations in an effort to salvage valuable sites and information from destruction as a result of the impounding of waters under the Tennessee Valley Authority program.

The largest scale archeological operations under emergency relief auspices have been those directed by Prof. W. S. Webb, Chairman, Department of Anthropology, University of Kentucky. Work is still going on in connection with an extended TVA program to salvage many valuable sites which will soon be under water.

At Louisiana State University, James A. Ford, Research Associate in Archeology, a former assistant in directing archeological explorations at Ocmulgee and later a collaborator in the restoration of the Macon ceremonial earth lodge, is continuing an archeological survey, begun several years ago, which resulted then in extensive surface collection of study sherds from many village sites in Louisiana and Mississippi.

All these institutions in the southeastern United States sent representatives to the Ceramic Repository at the University of Michigan, Ann Arbor, Mich., to discuss the problem of obtaining uniform terminology and essential agreement in classification of pottery, regarded as the best criteria available to the archeologist in working out problems of cultural relations.

As a result of the Ann Arbor meeting, it was decided to establish a uniform pottery nomenclature involving a trinominal classification referring to pottery types perceived to be distinctive and



TENTATIVE DISTRIBUTION OF MAJOR SOUTHEASTERN CULTURES

NOTE.—The five prehistoric cultural distributions can be indicated only approximately because their periods of development in the Southeast took place over a span of 700 to 1,000 years. The clue to these cultures consists of distinctive pottery types found on the sites assigned to the different horizons of prehistory. *Areas as suggested by Dr. A. R. Kelly and compiled by Gordon R. Willey.*

widely distributed in the Southeast. This trinominal system of classifying Indian pottery promises to have wide usage as pottery types agreed upon in discussion are to be recognized as standard among the group of specialized workers in the southeastern area. The method of standardization allows for a maximum interchange between the respective field workers with results coordinated in annual or semiannual conferences.

All archeological field workers in the region will have opportunity to see and become acquainted with the new pottery types, as proponents of the types will send representative examples to each of seven centers where archeological survey is going on. After a period of discussion, criticism, and correspondence on the pottery types, the members in joint conference will decide upon the selection of approved types. Full descriptions, with pen drawings of these types, will then appear in mimeographed form, put out under the editorship of Mr. Ford at Louisiana State University. Copies will be supplied to the cooperating field workers in archeology. The same institutions have expressed, individually, a desire to see the coordination of pottery studies carried further in a uniform systematization of methods of archeological survey in the Southeast.

These preliminary agreements between cooperating institutions in the southeastern United States will facilitate the program of surveying historical and archeological sites under the sponsorship of the National Park Service. It is recognized that the administrative difficulties of undertaking a Nation-wide survey of historical and archeological sites would be extremely complex and unwieldy. For this reason, a regional breakdown in supervision is contemplated, with the Southeast serving as a testing ground for initial efforts to realize objectives in survey. The following institutions, either now engaged in archeological survey or planning surveys in the near future, have expressed an interest in the plan: Louisiana State University, and the Universities of Alabama, Tennessee, Kentucky, and Georgia.

Ocmulgee National Monument has become a center of archeological survey activity. Throughout the Southeast, other collaborating institutions, as named, have expressed individual concurrence and support for the projected plan to establish at Ocmulgee an archeological museum of regional character, which will serve the area in much the same manner that the Laboratory of Anthropology at Santa Fe, N. Mex., acts as a research center to unify survey and research activities in archeology in the Southwest.

Recent additions to our knowledge of southeastern prehistory, coming from extensive explorations undertaken in several parts of the region, strongly suggest a number of distinctive localized cultural manifestations, whose character must be perceived at present on the basis of specialized pottery traits. These cultural subdivisions of the Southeast have some geographic distinction, and seem to be separate hearths or centers which nourished distinctive cultural developments, and that, as centers of diffusion, they influenced widely and at different times the prehistoric settlements in central Georgia on the Ocmulgee. Specifically, it appears that the Ocmulgee site was influenced from afar by several of these centers, and that the central Georgia area was peripheral to such influences.

The following cultural subareas might be defined tentatively as showing appreciable localized or specialized cultural developments in the southeastern archeological area regarded as a whole:

(1) The lower and middle Mississippi;

(2) The Piedmont or Southern Appalachian section, comprising north Georgia, with extension into the mountainous sections of neighboring States;

(3) The South Atlantic littoral, which includes the coastal plains and confluent major drainage in the Carolinas, and the Savannah Basin with a long Atlantic coastal sweep south into Florida;

(4) The Florida Gulf Coast, which extends west into Alabama;

(5) The fall-line region of central Georgia, with Macon on the Ocmulgee as a central point whose cultural position might be connoted by geographical reference as the southeastern marginal subarea.

The strategic position of the last-named cultural subarea, the central Georgia fall-line, finds Macon and Ocmulgee National Monument situated in the precise spot where cultural influences were being received from the greatest number of developing cultural centers. This makes Ocmulgee an ideal museum location for the Southeast, and also makes it an advantageous center from which to initiate a southeastern archeological survey.

It may not be generally recognized how much responsibility is invested in the National Park Service to conduct such a survey of archeologic and historic sites. The Historic Sites Act of 1935 specifically embodies the national policy as applied to the preservation of historic sites, and fixes the duty of surveying historic and archeologic sites directly upon the Secretary of the Interior, through the National Park Service. The duty and functions of the Service in section 2 of this act definitely impose the obligation to undertake a survey and to carry out research investigation needed to evaluate the various sites.

In pursuance of the conditions created by the Historic Sites Act of 1935, an interbureau agreement defining objectives and working relationships has been reached between the Branch of Historic Sites of the National Park Service and the Smithsonian Institution regarding survey planning and the coordination of Government activities in conducting archeological investigation.

Ocmulgee's Trading Post Riddle*

By A. R. Kelly, Chief, Archeologic Sites Division, Branch of Historic Sites, and Louis Friedlander, former student technician in history

IN 1936 archeological work under direction of Dr. Kelly on the middle plateau section of Ocmulgee fields, near Macon, Ga., revealed unmistakable evidence of what in all probability was a trading post established among the Creek Indians during the closing years of the seventeenth century by English traders working out of Charleston, S. C. The discovery came as a surprise because there were no known historical records concerning a trading post or a fort at this location for the early colonial period. An interesting archeological-historical problem thus presented itself.

In an attempt to establish by historical documentation the existence of a trading post of the Ocmulgee to agree with the evidence uncovered by the archeologist, a student technician, Louis Friedlander, of Columbia University, was assigned in 1938 to the task of examining the colonial records and archives at Columbia, S. C. It was believed that there, if anywhere, would be found documents bearing on the problem. He spent several weeks without finding a single direct reference to a trading post on the Ocmulgee near the present city of Macon. Sixteen volumes of the *Calendar of State Papers* for the period 1690–1715 were examined, but they yielded no specific information. It

* From *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. II, No. 1, January 1939, pp. 3–11. The collations are by Roy Edgar Appleman, Regional Supervisor of Historic Sites.

has not been possible to make anything approaching a complete examination of all the early South Carolina records because they have never been indexed and arranged in such form that they may be readily used. Considerable material was found, however, to substantiate strongly the inference that a trading post might have been established at Ocmulgee. For the present, there remains unsolved a fascinating problem of historical research, one which must receive further attention if we are to develop and interpret adequately for the public the potential contributions which this site has to offer in knowledge of the prehistory and history of the Southeast.

Dr. Verner W. Crane, Professor of History at the University of Michigan, an outstanding authority on the southeastern Indian frontier, in a letter dated September 30, 1938, comments on the lack of precise information in the early Indian books and colonial records regarding trading establishments. He states that he has found "Descriptions of trading posts in the South are practically nonexistent," and offers the suggestion that this is so, "probably for the reason that the references to them are made not by travelers writing for the general public, but by traders and agents in reports to persons who need no descriptions." He has suggested the Ocmulgee post may have been associated with the enterprises of a trader named John Bee who, according to Dr. Crane's own research, "maintained a trading factory on the Upper Ocmulgee for some years after the desertion of the Lower Creeks and in 1725 took out licenses for a 'parcel of traders' to the Choctaw."

The following *résumé* of the archeological findings at the site of the supposed trading post are taken from "A Preliminary Report on Archeological Explorations at Macon, Ga.," by Dr. Kelly, *Bulletin 119,* Bureau of American Ethnology, (Anthropological Papers, No. 1), Smithsonian Institution, Washington, 1938.

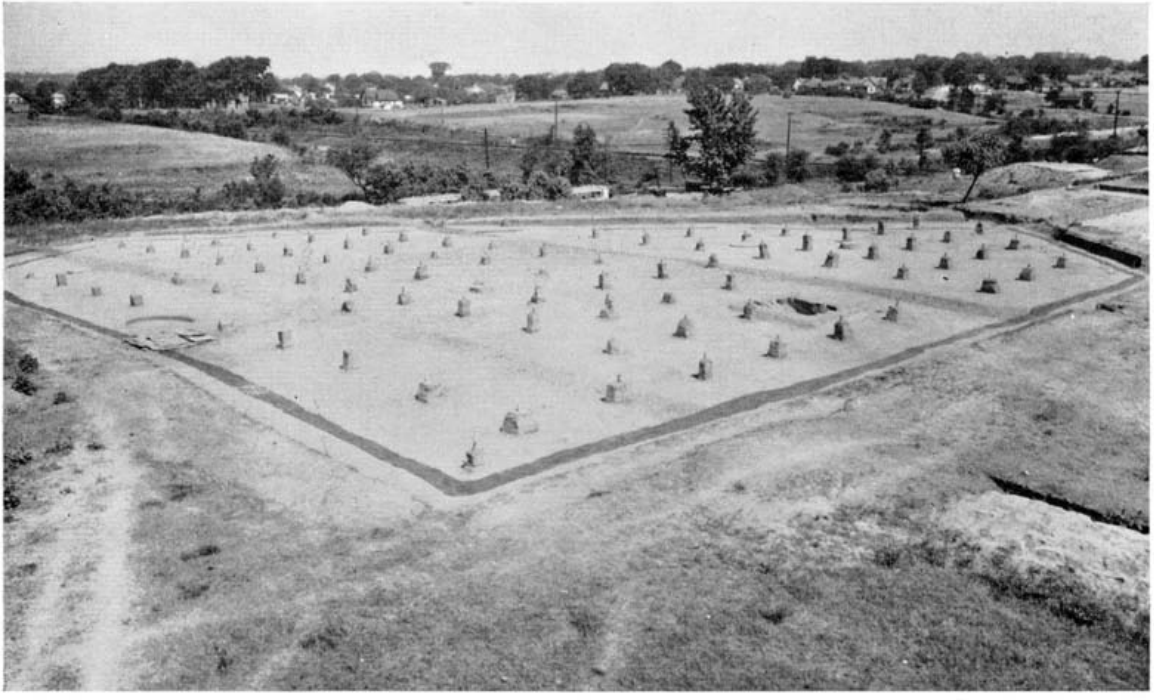
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A FIVE-SIDED enclosure was worked out in its entirety. There was a broad base side, 140 feet long, facing the river toward the northwest. Two shorter sides or legs set at right angles to the base extended southeast 40 feet. The two remaining sides converged to form a triangle or gabled point directed southeast. The two sides forming the apex of the five-sided enclosure were 100 feet in length. The footing ditch, for such it was now perceived to be, had two breaks in its continuity in the base or front. One of these was 12 feet wide, the other 5 feet wide; they were apparently gates opening into the stockade from the river approach.

There were no remaining indications of decayed wood found except for the darker discolorations or black organic mold with thin discontinuous water-laid sand laminated between the darker soil areas. Vertical profiles through the footing ditch indicated horizontally laid logs probably pegged together. Early difficulties in planning the area to discover post molds were thus explained.

Inside the enclosure were rectangular areas of dark soil suggesting the decay of numerous logs. These were considered to be indications of what had once been cabins or storerooms.

Both in and around the enclosure were found burials of Indians of all ages and sexes, associated with European trade artifacts and objects of Indian manufacture, including pottery. A number of burial tracts not previously observed were encountered. The prevailing custom of primary flexed burials was noted, corresponding in this respect to burials at Lamar and other sites. However, the presence of artificial frontal deformation in a number of burials implied that this custom was much more prevalent in historic than in prehistoric times. Also several burials, again associated with European objects, were definitely cremated. The calcined bones had been heaped together and buried with guns, knives, axes, beads, iron ornaments, and other items.



The pentagonal base outline of the old structure at Ocmulgee National Monument is shown by the dark band of soil visible near the periphery of the cleaned area. The small square blocks of earth are control sections left around each stake of the grid system during excavation.

In addition to the burials in and around the enclosure there were numerous indications of house sites in the form of broad oval wall continuities traced out from post-hole alignments. The tendency for large domestic pits to be located in the center of these simple timber houses was noted in several instances and generous quantities of pottery, animal bones, flint scrap, and artifacts, scattered European objects, including some glassware and crockery, were taken from the fill. The houses were small, usually not exceeding 15 feet in diameter, and were sometimes smaller.

The implied construction consisted of light sapling wall timbers probably bent and tied to form the roof, with brush or reeds covering the whole. Sod might have been used also but this was not evidenced in the debris.

In addition to the house sites there were uncovered numerous refuse pits not definitely associated with post-hole indications of house floors. Midden materials found *in situ* on the occupation level on which the houses were troweled out added to the data of exploration around the enclosures.

Another interesting feature was the profiled indication of a beaten trail terminating in front of the entrance to the trading post site. In profile the trail appeared as a ditch-like excavation 6 to 8 feet wide varying from 14 to 24 inches in depth. A bluish mucky clay fill in the bottom of the trail impression implied gradual deposition of clay sediments in stagnant water. The upper fill consisted mostly of water-laid or wind-blown sand.

The same trail indications had been followed at 50-foot intervals all the way across the plateau from a point at the extreme northeast rim margin beyond the outer dugout series north of Mound D to a point converging on the entrance of the trading post. The total extent of the trail thus surveyed was approximately three-quarters of a mile. Beyond the entrance to the enclosure the trail was picked up again in profile and carried southeast toward the river, dropping down from the plateau

below the lower west slopes of Mound B. Beyond that point present explorations have not been attempted to trace the trail to its intersection with the river. In all likelihood river erosion has destroyed any vestiges in the plain below the plateau.

Another structural feature of importance was brought out in final exploration around the footing ditch. This was a moat-like ditch, separated by an average distance of 20 feet from the footing ditch, which indicated the line of the trading post stockade. The borrow ditch ran parallel to the footing ditch around four of the sides. It did not extend in front of the broadest or base side. The width averaged 10 feet with gently sloping sides; the depth varied from 2½ to 3 feet. The fill showed a bluish mucky clay in the bottom with water-laid sands and loams in the top fill. Midden accumulations, refuse pits which had been cut through in the process of making the moat-like ditch, burials made in the floor after the excavations were made, all served to substantiate the view that the ditch was obviously related to the structure of the five-sided enclosure.

The quantity of European trade materials found in midden, house site accumulations, and definitely associated with burials, indicated a rather numerous population of historic Indians living around a trading post which seemed at a later date to have been partly fortified. The interpretation of the moat-like ditch is still in doubt, although five-sided wall enclosures with moat-like ditches surrounding the walls were a frequent construction in the seventeenth and eighteenth century colonial fortifications of the Southeast. The cataloged European materials exhibited a large number of finds which were weapons of war. In addition to the guns, knives, swords, and pistols found with burials, there were scores of gun flints, molded lead bullets, brass buckles, buttons, and other objects suggestive of military equipment. In contrast with these materials were many trade objects, such as beads, clay pipes, coiled iron wristlets, and copper and brass sheets sometimes rolled into small funnels or into cylinders. Several burials of

children and women with beads and other trade trinkets were cataloged from the area.

The field data previously summarized seem fairly conclusive to the effect that general exploratory trench explorations had come upon the site of a large and thriving trading post. The military character of many of the European finds seemed on first impressions to be too evident to suggest an ordinary establishment set up primarily for trade. The presence of 50 burials representing individuals of various ages and sexes denoted the existence of a stable population and probably a fairly sizable community, as these interments had been uncovered in only so much area as was represented in general trench exploration.

Pronounce It Oak-mull-ghee

ESTABLISHMENT in 1936 of a national monument embracing the rich archeological treasures of Ocmulgee Fields, an ancient Indian town situated at the edge of the present city of Macon, about 4 miles from the geographic center of Georgia, has brought that aboriginal name with increasing frequency to American lips. Many variants in pronunciation sprang up as the word spread farther and farther from the region of its origin.

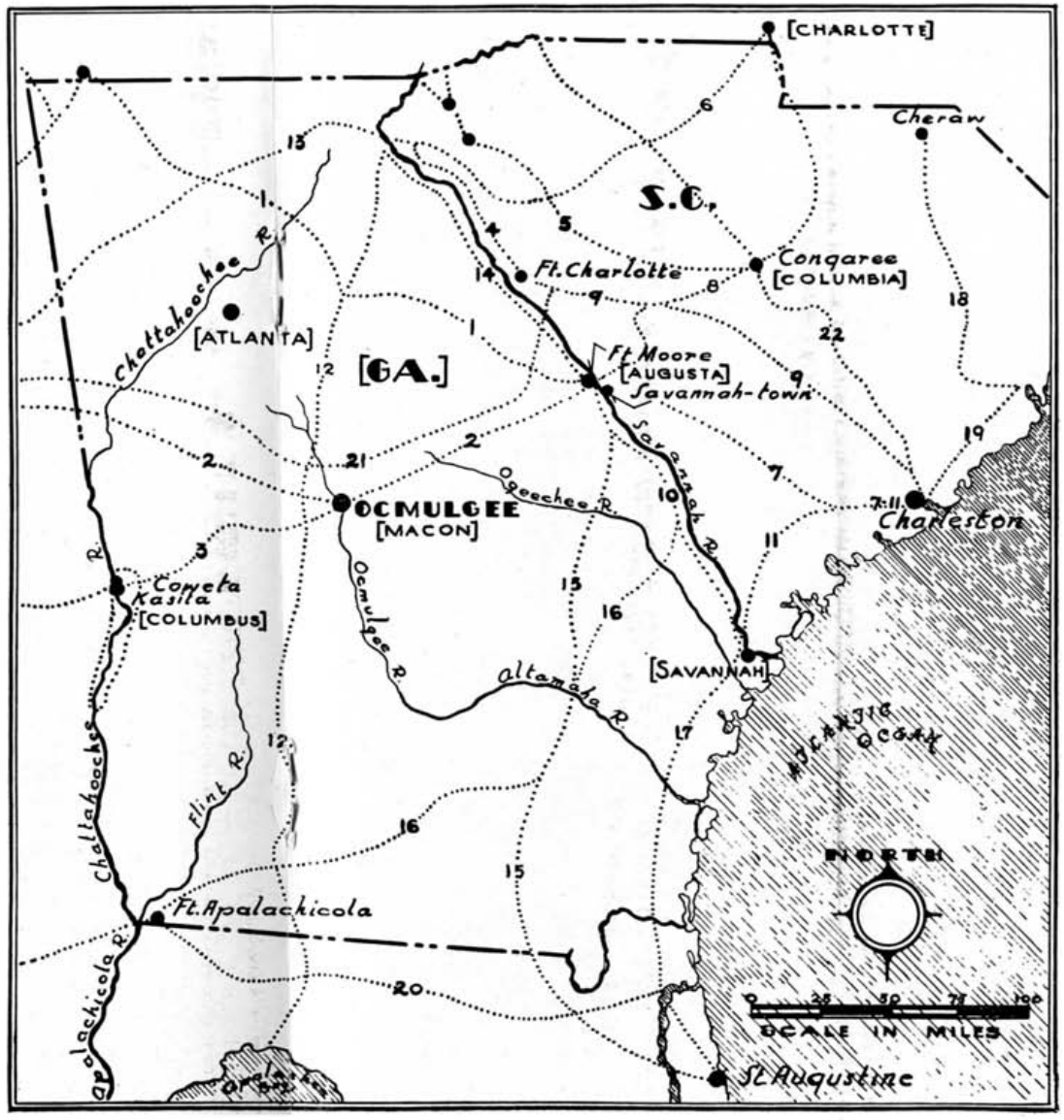
Ocmulgee, meaning *boiling water,* is from the Hitchiti tongue, a dialect spoken among the Lower Creeks. It is pronounced as though spelled *oak-mull-ghee* (the g hard) with stress on the second syllable. That pronunciation is preferred by the Bureau of American Ethnology. It prevails today throughout the Ocmulgee River valley of middle Georgia.

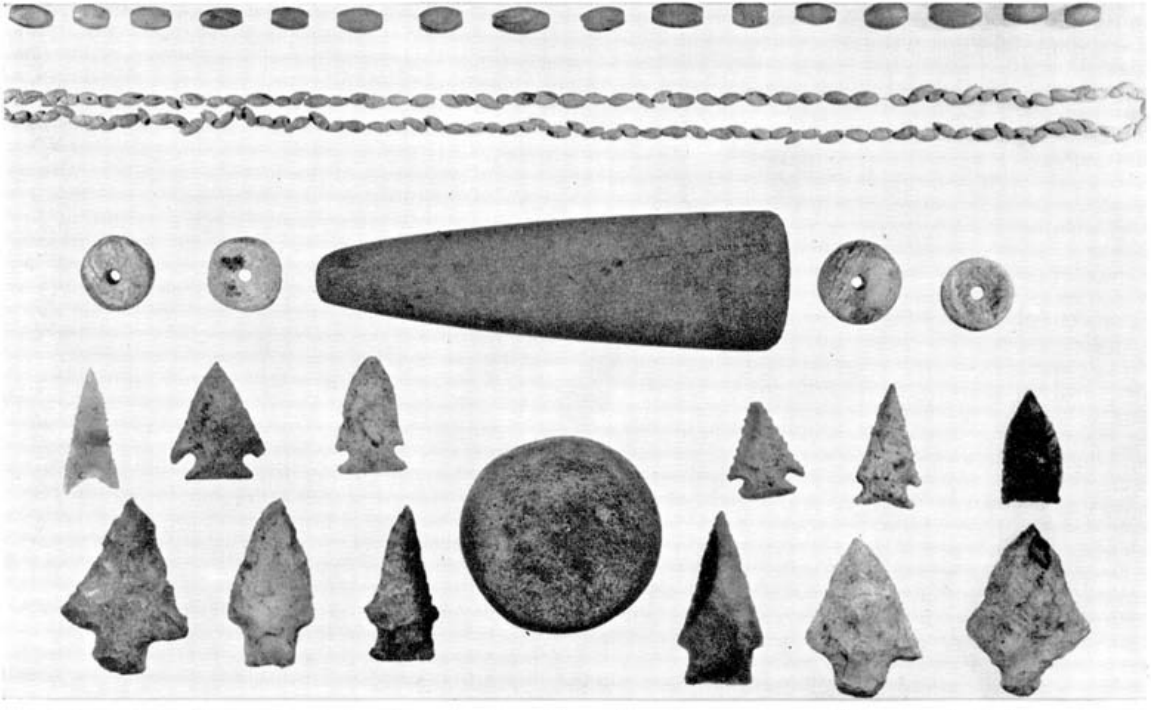
According to Creek tradition Ocmulgee was the site of the first permanent Creek settlement after migration of the tribe from the West.

TRAIL SYSTEM OF GEORGIA AND SOUTH CAROLINA—IN EARLY COLONIAL DAYS

(Adapted from a map published in the *42d Annual Report*, Bureau of American Ethnology, op. p. 748.)

1. Cisca-St. Augustine Trail.
2. Lower Creek Trading Path.
3. Augusta, Macon, Montgomery, and Mobile Trail.
4. Old Path from Fort Charlotte to the Cherokee Country.
5. Old Cherokee Trading Path.
6. Lower Cherokee Traders' Path before 1775.
7. Trail from Fort Moore (Augusta) to Charleston.
8. Occaneechi Path.
9. Charleston-Fort Charlotte Trail.
10. Augusta-Savannah Trail.
11. Charleston-Savannah Trail.
12. Tugaloo-Apalachee Bay Trail.
13. Old Indian Path between Tugaloo and Coosa.
14. Trail from Augusta to the Cherokee via Fort Charlotte.
15. Augusta-St. Augustine Trail.
16. Old Trading Path from the Savannah to Pensacola.
17. Savannah-Jacksonville Trail.
18. Trail from Winyah Bay to the Cheraws.
19. Charleston-Winyah Bay Trail.
20. Trail from Jacksonville to mouth of the Flint River.
21. Middle Creek Trading Path.
22. Old South Carolina Road to the North.





Many thousands of arrowheads, beads, and other objects have been uncovered by archeological excavations at Ocmulgee National Monument.

THE following extracts from Mr. Friedlander's historical research report (typewritten manuscript, September 1938) on the Ocmulgee trading post problem indicate the general field of English and Spanish trade relationships with the southeastern Indians and the general character of Colonial rivalry involved in early white contact with the aboriginal occupants of what is now southeastern United States. Considering the historical circumstances of period and environment, the establishment and operation of a trading post at Ocmulgee would appear to be convincingly logical.

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THROUGHOUT the Colonial period, the Indian trade was the chief instrument of Carolinian expansion. Its importance can readily be seen in the activities of Indian traders in attempting to win the friendship of the Lower Creeks away from their previous Spanish alliance to an English one. The urge of a highly profitable commerce led the English traders farther into the wilderness in this region than they were wont to venture in the north. By 1700 "they were in contact and in keen rivalry not only with the Spanish of Florida, but also with the French in the region of the Gulf and the lower Mississippi." [1]

The first Englishman to make contacts with the Creeks was Henry Woodward. Probably in 1670 and certainly in 1685, Woodward journeyed to the villages of the Creeks on the Chattahoochee. This was the region of their early home before their migration in 1690. It is safe to say that Woodward must have passed through Ocmulgee Fields on his journey westward—this being the shortest route to the Creek villages. But definite proof of this is lacking.[2] We are certain though that "both at Coweta, the 'war town,' and Kashita, the 'peace town,' the English with their trading goods were cordially welcomed." [3]

The final victory of English diplomacy resulted in the move-

ment of the Lower Creeks, about 1690, from their old home on the Chattahoochee to the region on the Upper Ocmulgee, the primary reason for this being that they would be closer to the source of the English trade and in a direct line with Charleston over the Lower Trading Path which connected with their settlement via Savanna Town (near present-day Augusta).[4] It was the lure of cheap English goods that decided the contest between English and Spanish traders. Dr. Crane observes:

> From the western river the Lower Creeks now migrated eastward to the upper waters of the Altamaha. Most of their new towns were placed along the Upper Ocmulgee River, known to the English as Ochese Creek. There for the next quarter-century was maintained the great center of the southern Indian trade. Goods for this trade were sent by packhorse, periago, or Indian burdeners, to the inland intrepot at Savanna Town, on the left bank of the Savanna at the falls. An early map shows also "the Old fort" on the right bank, near the site of Augusta. An outpost apparently, of the Carolina traders, this was probably the first English establishment upon the soil of Georgia. From Savanna Town . . . most goods were transported southwestward, by two trails which branched near the Ogeche River. One, the Upper Path, led to Coweta Town; the other, the Lower Path, to the settlements of the Ocmulgee and Hitchiti nearer the forks of the Altamaha. All Georgia, under Creek sway, was an English sphere of influence.[5]

Thus the importance of trade on the Upper Ocmulgee is clearly established. We should naturally expect to find numerous references to the establishment of a trading post at Ocmulgee Fields to substantiate the archeological evidence of one found by Dr. Kelly in 1936. But the lack of material on this particular point is surprising.

Until 1715 the English controlled the trade of the Lower Creeks. Governor Nathaniel Johnson showed a keen realization of the importance of their trade when he declared in an official report that the Cherokee were "a numerous people but very Lasey," and their trade inconsiderable in comparison with the flourishing

southern and western trade of the Creeks who were described as "Great Hunters and Warriors and consume great quantity of English Goods." [6]

Not only was the Ochese Creek country important in itself for trade, but likewise "it soon became a base for the further extension of trade . . . From the Ocmulgee were sent out many of those slave-taking expeditions against Florida, and, later, against Louisiana, which provided on outlet for the warlike energies of the Indians, enriched the traders, and served to weaken the defenses of the rival Colonial establishment in the South."[7]

In 1708 the first commission to control the Indian trade was established in Charleston. The *Journal* of the Commissioners for the Indian Trade is an invaluable record and from it can be obtained the names of the traders with the Lower Creek Indians. The agents of the Commissioners and very often the traders themselves were required to make reports on conditions and the extent of trade among the Indians. These reports are not contained in the *Journals* and if they could be found they would almost certainly provide a wealth of material on the post at Ocmulgee. The *Journals* themselves are bare of material immediately relevant to a trading post at Ocmulgee Fields. The most important traders with the Lower Creeks, as indicated by the *Journals,* were John Chester, John Weaver, Richard Gower, William Britt, and Samuel Everleigh. All references to their names in the *Journals* have been followed but nowhere is an Ocmulgee post mentioned. Samuel Everleigh is especially important because it was he who supplied the traders with merchandise for the Creek trade.[8]

During Queen Anne's War (1702–1713) the region surrounding Ocmulgee became extremely important because it served as a frontier line between the Spanish and English spheres of influence. The anxiety of the colony in regard to the friendship of the Creeks is shown by a letter of Governor James Moore in 1702 in which he writes:

> That you think of Some way to Confirm ye Cussatoes who live on Ocha-Sa Creek & ye Svannos in the place they now live in, and to our ffriendship they being the only People by whom Wee expect Advice of an Inland Invasion.[9]

In 1702 Queen Anne's War was precipitated in America by Anthony Dodsworth, often referred to as "Captain Antonio." It was he who led a force of 500 Creeks from Coweta to the Flint River to defeat the advancing force of Spaniards and their allies the Apalachees. Dodsworth is an elusive figure in the history of the period and conclusive evidence is lacking to the effect that he was ever at Ocmulgee. Nor can we be certain what part he played in Moore's expedition in 1703, although we know that it was he who urged the Commons House of the necessity of sending out the expedition. It was at the Creek villages on the Ocmulgee, the site now included in Ocmulgee National Monument and within which the archeological evidence of what is thought to have been a trading post has been found, that James Moore in 1703 fitted out his expedition in company with 50 Carolinians and concentrated 1,000 Indian allies on the meadows beside the post, armed them and proceeded south where he defeated a large force of Spaniards and Apalachee Indians.[10]

The *Journals of the Commons House of Assembly* record:

> Coll. Ja. Moore be commissionated to Raise a Party of men to go to ye Assistance of ye Cowetaws, And other our ffriendly Indjans, And to Attacque ye Appellaches and allso to Concurr with this House in Sending a Present to ye sd Indjans our ffriends And present the Same To this House To-Morrow Morning.[11]

The only letter we possess of James Moore at this time is a report to the Governor on his victory over the Spaniards and their allies, but it does not contain any information on Ocmulgee itself.[12] Certainly Moore must have written back to the Governor from Ocmulgee or kept notes himself on the beginnings of the expedition.

Moore was a visionary Governor and he developed a conception of the destinies of England in this quarter of America far in advance of his time. Under his governorship South Carolina trade was actively fostered and, indeed, it was hard to distinguish between the leaders in trade and the leaders in government. He saw the necessity of destroying Spanish influence among the Southern tribes and his records are, therefore, especially important.

Sir Robert Quary, King's Commissioner of Customs stationed at this time in the South, has a good description of the consequences of Moore's expedition of 1703 and gives an enthusiastic estimate of the importance of his campaign in a report back to England.[13] But this report also lacks definite information on Ocmulgee.

Research is aided by the fact that we can pin down the probability of establishing the post to within a definite number of years, that is, from about 1690 to 1715. The Creeks migrated to the Ocmulgee about 1690 and emigrated back to their old grounds on the Chattahoochee in 1715 after the Yamassee Wars.[14] Governor Johnson's report to the Board of Trade in 1719 is interesting insofar as he records the beginning of the latter war. It says:

> By the within Account of the Number of Indians Subject to the Government of South Carolina in the year 1715 Yo Lord ps will finde upwards of Eight and twenty thousand Souls of which there was Nine Thousand Men, which traded for above 1,000 lbs sterling Yearly in Cloth Guns Powder Bullets and Iron Ware and made return in Black Skins Doe Skins, Furs and other Peltry, and there was one or other near 200 English Indian Traders employed as Factors by Ye merchants of Carolina Amongst them; But in ye Said Year 1715 most of them rose in Rebellion and Murdered ye Said Traders & Severall of the Planters and their Family' that lay most exposed to them.[15]

While the information now known to us does not permit any definite or conclusive statement based on historical records regard-

ing the question posed by the archeological discoveries at Ocmulgee, the weight of indirect evidence strongly supports the hypothesis that a trading post was established there among the Creeks by the Carolinian traders.

Notes

[1] Verner W. Crane, *The Southern Frontier* (1928), p. 22.

[2] *Ibid.*, pp. 17, 35.

[3] H. E. Bolton and Mary Ross, *The Debatable Land,* University of California Press (1925), pp. 48 ff.

[4] Verner W. Crane, *op. cit.*, p. 34.

[5] "The Origins of Georgia," *The Georgia Historical Quarterly,* Vol. 14 (1930), pp. 92–110.

[6] *Records of the British Public Record Office Relating to South Carolina,* Vol. 5, p. 207.

[7] Verner W. Crane, *op. cit.*, p. 36.

[8] *Journals of the Commons House of Assembly,* 1792, p. 133.

[9] *Journals of the Commons House of Assembly,* 1702, Edited by A. S. Salley, p. 6.

[10] Verner W. Crane, *op. cit.*, p. 79.

[11] P. 103.

[12] This letter is reprinted in Carrol's *Historical Collections of South Carolina,* Vol. 2, pp. 574–576.

[13] Contained in the *Documents Relating to the Colonial History of New York,* Vol. 4, p. 1088.

[14] *Records of the British Public Record Office Relating to South Carolina,* January 12, 1719–1720, p. 235.

[15] This migration is established clearly in Bolton & Ross, *Spanish Resistance to the Carolina Traders,* GHQ, Vol. 9, p. 115.

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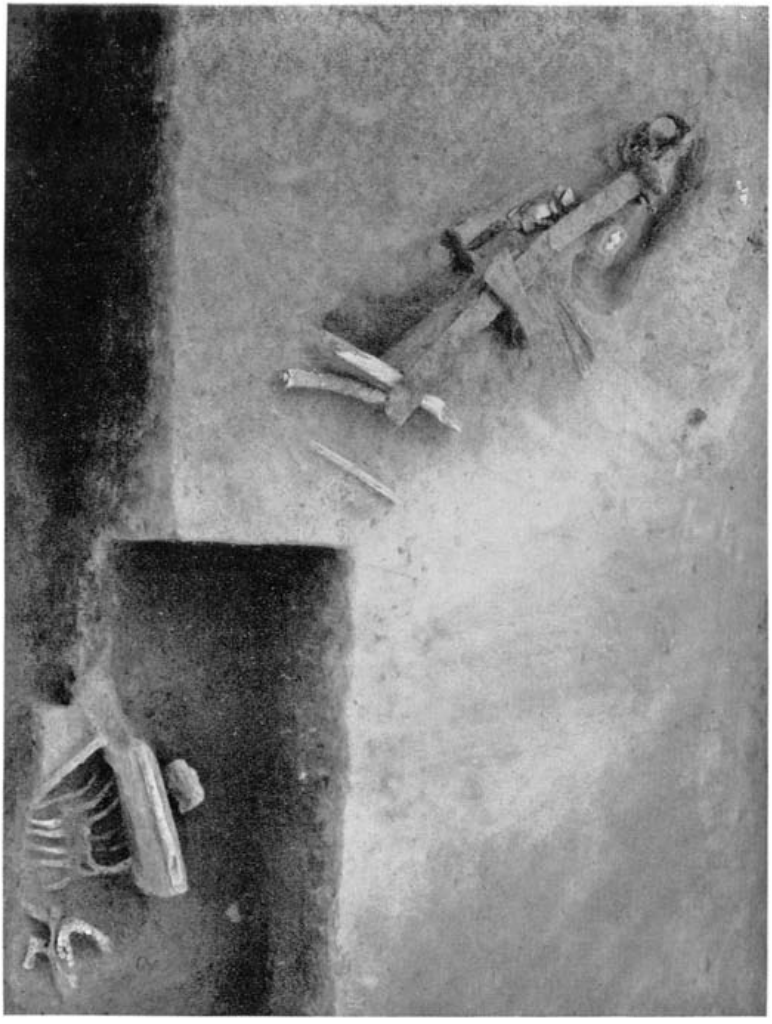
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All that remained of an ancient burial at Ocmulgee. Note rusty saber, ax, and other European trade material.

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Using metal profile gage in reconstructing an excavated pot in the archeological laboratory at Ocmulgee National Monument.

Indoor Archeology*

By Charles H. Fairbanks, Junior Archeologist, Ocmulgee National Monument, Macon, Georgia.

IN THE popular imagination the archeologist is a mysterious fellow who delves in the ground and periodically emerges with exciting news of some striking discovery—a rare object, bones of strange people long since buried, remains of ancient towns and villages, or other material evidence of the existence of man in past ages. He is a sort of glorified ditch digger who, spade in hand, pushes back the boundaries of our knowledge of human life before the dawn of history or adds concrete information to support the written record of the historic past.

In reality the archeologist is a scientist whose work requires the use of many and varied techniques. When he drops his spade and trowel and climbs out of his excavation his work is but half done. Armed with voluminous field maps, sketches, and notes, he moves his excavated materials indoors. There, in his specially equipped laboratory, he painstakingly analyzes his finds and compares them with discoveries made at other sites. Then he prepares the detailed reports which announce to other archeologists and to the world at large the real nature and significance of his findings.

The Ocmulgee laboratory was established for the purpose of cataloging and studying the large collections of pottery and

* From *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. III, No. 3, September 1939, pp. 9–13.

other objects excavated since 1933 at Ocmulgee National Monument, Macon, Ga., and a number of nearby sites. This extensive excavation program resulted in about 30,000 storage boxes of potsherds (fragments of Indian vessels), flint tools, bone and shell ornaments, and numerous other objects of Indian manufacture.

The laboratory was established early in 1938. It took over the staff of the earlier field laboratory which had been operating during excavation. Temporary quarters for storage and office space were obtained in the Macon Municipal Auditorium. The staff consisted of 35 clerical workers supplied by WPA, ERA, and CCC, under the direction of two supervisors.

The first problem was to catalog adequately all the material and to index the voluminous field notes and observations written by the excavation staff. During excavation the archeologist separates the material into groups according to the evidence revealed in digging. Thus a single field number may be assigned to a single object or to a collection of similar objects from the same location, soil level, house floor, burial, and the like. In the case of whole pottery vessels, stone tools, and similar materials each object is given a separate number. Small potsherds, broken tools, scraps of animal bone, and related objects are lumped together so that all of the materials from one place may be handled at the same time. This segregation depends upon the judgment and knowledge of the archeologist. Notes are taken for each separate piece on the surroundings, soil condition, associated objects, depth, or other items of significance. The notes, together with a running account of the excavation, are returned to the laboratory where they are typed, indexed, and preserved for future reference.

The purpose of cataloging is to make each collection readily available for analysis together with the notes describing its discovery. In the laboratory a number is first assigned to each object or collection. This consists of a serial number and an abbreviation identifying the site by county. This is written on the object

in India ink, or, in the case of beads and other small objects, on an attached tag. The number also appears in the upper left corner of the catalog card as shown in the accompanying illustration. The catalog card also contains (at the left side) references to various notes, profiles, maps, or photographs of the material. On the right side of the card are recorded the site name, field number, horizontal location, depth, and associations, together with a description of the material. The location in the storage spaces is given at the bottom. The cards are typed in triplicate and filed by master catalog number, site (geographical unit), and by material (bone, stone, shell, or pottery). When the catalog cards are completed and filed it is possible to learn all the information available by consulting the file under any one of the three headings.

More than a million objects have been cataloged in this manner. These fall into some 35,000 collections representing either single objects or boxes of sherds, flint, or bone fragments. This large number of objects is temporarily stored in approximately 10,000 boxes, 10 exhibit tables, and 35 feet of shelves for whole vessels. The great majority of this mass of material came from the Macon plateau and the Lamar tract, the two areas of Ocmulgee National Monument.

The second phase of work in the laboratory is the preservation and restoration of excavated material. All human bones from burials, as well as bone tools, such as awls, punches, and needles, are strengthened by saturation with a solution of synthetic resin in acetone. Shell beads and ornaments must be cleaned carefully before they are strengthened with the same solution. Wood and charcoal specimens are preserved by soaking in a mixture of paraffin and gasoline which makes them more easily handled by the dendro-chronologist. These wood specimens are vitally important because it is hoped that exact dates for the various occupations can be determined from a study of the climatic changes as recorded by the growth rings. Copper ornaments from the



Identification serial numbers are written in India ink on pottery fragments when excavated objects are cataloged.

historic Creek occupation are cleaned with chemicals to prevent further corrosion, and reveal something of the original appearance. These copper bells, buckles, bracelets, and other ornaments, when cleaned of the green patina, reveal an attractive yellow color that readily explains why copper was such a favorite article of trade among the Indians. Many glass beads from the Creek village and shell beads from the earlier settlements must be strung—a considerable task when it is considered that more than 26,000 minute shell beads were found with a single burial.

Finally, the pottery vessels which have been crushed by burial in the earth or broken by the Indians must be restored to their original form. The first step is to fit and glue together all the pieces recovered. In many cases it is then simply a matter of filling in with plaster of paris a few small missing fragments. Often, however, only a third or a half of the vessel is found. In this situation it is necessary to construct a mold of clay by the use of the pottery wheel to support the sherds while the lost section is replaced. This is done only in cases where similar vessels are at hand in sufficiently intact condition to indicate clearly the shape of the missing parts. The reconstruction of badly broken vessels from as many as 200 pieces is often an extremely delicate task compared to which the most difficult jigsaw puzzle is child's play. The work of the restoration unit provides material for museum exhibits and enables the archeologist to get a better picture of the objects as the Indians actually used them.

The third function of the laboratory is to analyze the materials with a view toward making technical reports. Analysis depends upon the habit of human beings to make things in "style." Thus the various Indian settlements on the Ocmulgee had different styles of pottery, tools, and ornaments. Within a single group these styles changed with time or the influence of other groups. The archeologist calls these styles "types" and by careful study identifies the various types, their changes, and relationships to other types.



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Location 3.2' N. stake 1426, 1.9' W. stake 1426; in Pit # 2, Burial #46.

Object or Collection Halstead Plain water-bottle, 10.5 cm. high, 15.9 cm. diameter. Color: Chocolate. Hardness: 2.5

Probable Cultural Allocation - If Known

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Steve Woody, a life-long resident of the Great Smoky Mountains, was 86 years old when this photograph was made while he described a bear hunt. A Civilian Conservation Corps youth is operating the controls of a machine which recorded Mr. Woody's speech as a part of a linguistic survey in Great Smoky Mountains National Park, North Carolina-Tennessee.

Mountain Speech In the Great Smokies[1]

By Joseph S. Hall, Former Technical Collaborator

THE writer made a linguistic survey of the Great Smoky Mountains National Park and its environs during the summer of 1937 as a student technician of the National Park Service. The subjects of the study were primarily those native inhabitants who, for one reason or another, have been allowed to remain within the bounds of the park. In most cases the residents were elderly couples who expect to stay in their old homes for the rest of their lives and to whom yearly leases are granted by the Service. Other subjects were selected from areas immediately adjacent, especially those near sections of the park which have been abandoned completely by the original population. In many cases, speakers and informants who previously lived in what is now the park were interviewed. Altogether, a representative linguistic picture of the entire Smokies region was obtained.

Owing to the mountaineer's sensitivity and his apprehension of criticism, it was not found feasible to tell a subject that linguistic information was being collected. It was therefore necessary to gather data by indirect methods. Careful observation was made of the speech of hillsmen in their conversation together and in the writer's meetings with them on the road, in stores, and the like. The bulk of the information, however, was received during interviews in their homes. In such contacts it was necessary to tell the speakers that the Service was interested in gathering up old

[1] From *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. III, Nos. 4–5, October–November 1939, pp. 3–8.

stories, accounts of the settlement of creeks and coves, tales of bear-hunts, liquor-making, and similar materials.

In the large majority of cases it was possible to divert the subject with questions and get him or her to talking naturally. At such times linguistic notes were taken freely, although the reason for them ostensibly was to record the story or tale told by the speaker. The results of this method were successful and four field notebooks were filled with data pertaining to pronunciation, morphology, syntax, and vocabulary. All of the important vowel and consonant sounds and their variations were transcribed, and a word-list of some three or four hundred items was compiled.

Besides the linguistic data, there was a considerable residue of byproduct material, such as folk tales and folk history, and this has been assembled separately. In view of the complex nature of Great Smokies speech sounds, however, it was felt that the effectiveness of the phonetics study would be increased immeasurably by phonographic records of natural speech. Such records would make possible not only a more accurate description of the Great Smokies dialect, but also the preservation of specimens of local speech for future times. It, therefore, was thought to be urgently desirable to return to the area with a phonographic recorder before publishing the data collected. Since the entire linguistic study will be published as a doctoral dissertation, great regard necessarily is paid to accuracy and thoroughness.

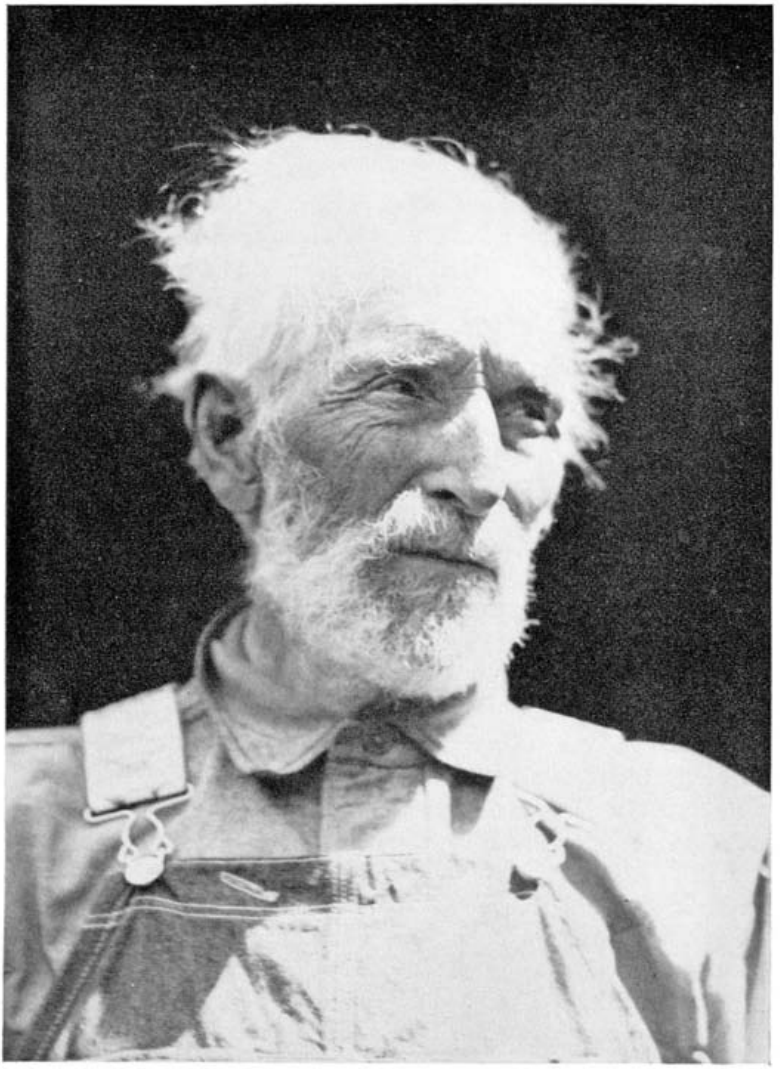
A resumption of the study was made possible June 1939 by a fellowship awarded to the writer by Columbia University. The National Park Service endorsed continuance of the project by naming him technical collaborator and offering generous cooperation in every way. The Service provided a recorder, discs, a pickup truck for transportation of equipment, and office space in which to do the writing. Besides that recorder (use of which is limited to CCC camps and neighboring towns where alternating electric current is available, or where direct current may be converted to alternating current), the investigator equipped himself

with a second one operating from a 6-volt, 200 ampere-hour battery. The latter machine has seen 2 years of service in Africa but, after thorough reconditioning, it continues to make good records. It may be taken up rough roads to remote mountain homes where it is set up on the pickup truck or on the porches of dwellings. The first machine cuts acetate discs, the second aluminum. It will be interesting to know which type of record is the more durable. Authorities feel at present that acetate provides more accurate reproduction, but that aluminum is more lasting.

Two methods are employed to elicit speech material for recording. One is to ask the speaker to read the story of *Arthur the Rat*. This little tale may be used for ready reference when one desires to know how a particular speaker pronounces a given word. Use of the story also is helpful when comparisons of the speech of two or more parts of the country are made. The other and principal method is to have a subject tell a story or event from his life experience. It is thought that a more natural utterance is evoked in this way. The results are surprisingly good, and cases of microphone fright have been far less frequent than anticipated.

Men relate enthusiastically the stories of bear hunts in which they have participated and at times forget themselves so completely as to become dramatic. Women generally are more reluctant to talk into the microphone but, with a little urging, tell of old times, memorable experiences, and bygone methods of weaving and cooking. One elderly woman of the Oconaluftee River area declined the microphone, however, and informed the investigators: "I don't fancy no sich as that and I won't jine up with ye!" Two men in a remote section near the park thought they were about to broadcast over the radio when the recorder was placed before them.

Many of the records should be historically valuable some day for the contemporary culture which they preserve. The chief disadvantage lies in the fact that it is necessary to transcribe all the



Aden Carver was a vigorous 93-year-old example of mountain man when he related for the recorder a story of his escape from a panther. A resident of the national park area, he was a consultant in the reconstruction of an early mountain mill.

material on the record for reference. Moreover, a subject may continue his account for two or three record surfaces without pronouncing all the sounds required for a good phonetic transcription of his speech. On the other hand, what is lost in this respect is more than compensated by the natural idiom which he employs and the consequent opportunity for the investigator to discover linguistic archaisms and colorful expressions.

All the speech material on the records will be transcribed eventually in the alphabet of the International Phonetic Association with modifications for American English as advised by the editors of *American Speech* and the *Linguistic Atlas of the United States and Canada.*

Because it was found possible in the previous survey to combine the collection of data on both speech and folklore, the writer continues to look for folklore material. Recordings of a number of old English ballads and traditional American pieces have been made. Among the former are *Barbara Allen, Pretty Polly, William Hall, Jack the Sailor, The Butcher's Boy,* and *Pretty Sara;* among the latter are *Come All You Texas Rangers* and *Cindy.* The musical field will not be covered thoroughly, of course, but at least there will be specimens recorded while it still is possible to preserve them. Two recordings made at an outdoor square dance at Bryson City, N. C., are notable for their dance calls and the reflection of the crowd's enthusiasm.

Careful observation is taken of local plant and animal names, of old remedies for ailments, and of customs, superstitions, and the like. Most of this material never will be captured by the phonographic disc; but in some cases it may be possible to induce a woman to tell her favorite home remedies or her superstitious beliefs into the microphone. Stories of events which, as a result of exaggeration and imaginative embellishment, have passed into the folklore stage, should be obtained easily.

It is contemplated that duplicates of all the outstanding records will be made, one set to go to Columbia University and the other

to the National Park Service. Because campfire entertainment constitutes a feature of the Service program, it is conceivable that the best records of speech and music may be used ultimately for the diversion and enlightenment of park visitors. Such records would combine well with motion pictures portraying the scenery and culture of the Great Smokies. This use of the discs, however, would require pressings of the commercial type, for a number of copies of the same recording would be needed and the originals should be saved.

One question which it is hoped the phonographic survey may aid in solving is whether mountain speech represents a survival of Elizabethan English, as some romantic writers have claimed. One cannot deny that fourteenth, fifteenth, and sixteenth century forms persist in the Great Smokies. *Ax* for *ask* occurs in Chaucer and in the Wycliffe, Tindale, and Coverdale Bibles. *Fotch* for *fetch* is found in the fourteenth century *Cursor Mundi* and in the fifteenth century *Townely Mysteries.* The expression, *to spend one's opinion,* heard in the sentence, "I'd rather not spend my opinion," was used by Shakespeare in *Othello. Use* for *to dwell* or *to inhabit,* which appears in one of the phonograph records in the sentence, "We located a big bear and found where he was a-usin'," was employed by Beaumont and Fletcher. Spenser and the people of the Great Smokies agree in the pronunciation *swinge* for *singe.*

★ ★

American Shibboleths of Today

Jephthah, it is related in the Book of Judges (XII), employed the Hebrew word *shibboleth* as a test at the passage of the River Jordan to distinguish the Ephraimites, who were unable to pronounce the combination *sh*, from the men of Gilead.

With similar if more complex aims, students of American linguistics have adopted generally the somewhat tragic chronicle of *Arthur the Rat,* a hero whose habitual indecision cut short his rodent's career. The little story serves as a kind of phonetic yardstick for measuring the accents of northerner, southerner, easterner, or westerner, because it contains all the important sounds of the English language. The tale of Arthur, with its many shibboleths, follows:

Once there was a young rat named Arthur who never could make up his mind. Whenever his friends asked him if he would like to go out with them, he would only answer, "I don't know;" he wouldn't say yes or no either. He would always shirk making a choice. His Aunt Helen said to him, "Now look here! No one is going to care for you if you carry on like this. You have no more mind than a blade of grass."

One rainy day the rats heard a great noise in the loft. The pine rafters were all rotten, so that the barn was rather unsafe. At last the joists gave way and fell to the ground. The walls shook, and all the rats' hair stood on end with fear and horror. "This won't do," said the captain; "I'll send out scouts to search for a new home."

Within 5 hours the 10 scouts came back and said, "We found a stone house where there is room for us all. There is a kindly horse named Nelly, a cow, a calf, and a garden with an elm tree."

The rats crawled out of their little houses and stood on the floor in a long line. Just then the old rat saw Arthur. "Stop," he ordered coarsely. "You are coming of course."

"I'm not certain," said Arthur, undaunted. "The roof may not come down yet."

"Well," said the old rat, "we can't wait for you to join us. Right about face! March!"

Arthur stood and watched them hurry away. "I think I'll go tomorrow," he said calmly to himself, "but then again I don't know; it's so nice and snug here." That night there was a big crash. In the foggy morning some men with some boys and girls rode up and looked at the barn. One of them moved a board and saw a rat quite dead, half in and half out of his hole.



Mrs. Wiley Oakley weaving at a loom in the Great Smoky Mountains.



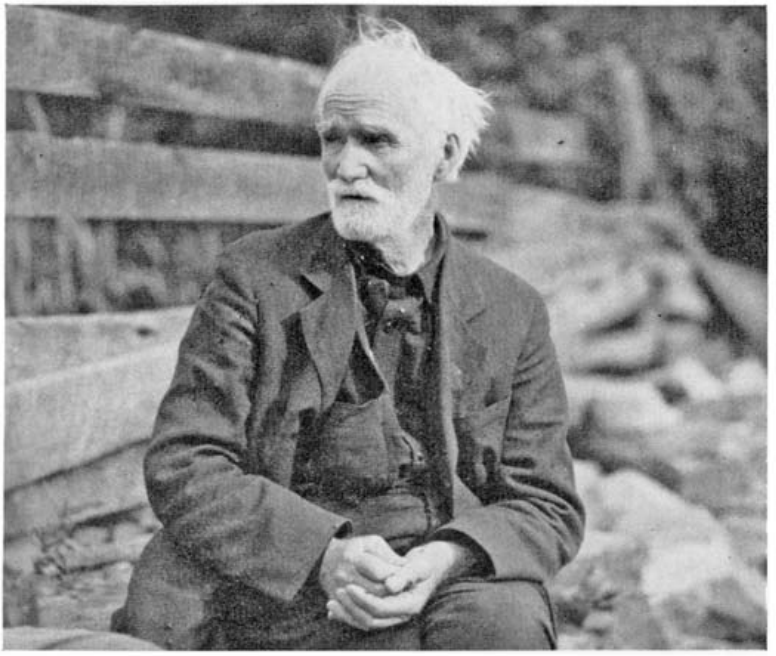
"Uncle" Dan Meyers, of Cades Cove in Great Smoky Mountains National Park, shown with his beehives fashioned from tree trunks.

Yet most of the Elizabethan forms which survive in the Southern Appalachians continued in standard use into the seventeenth, eighteenth and (sometimes) the nineteenth centuries. *Afeared* occurs more than 30 times in Shakespeare, but it was also the prevailing form throughout the seventeenth century and thus cannot be said to be exclusively Elizabethan. *Ballet* for *ballad* was the common sixteenth century pronunciation (although Shakespeare was *ballad*), but it flourished also in the seventeenth century, being used by Pepys among others. Examples of *not to care to* for *not to mind,* as in a sentence spoken by an Emerts Cove man, "She don't care to talk," meaning, "She doesn't mind talking," are found in both the sixteenth and seventeenth centuries. (It is interesting to note in the *English Dialect Dictionary* that this sense of the phrase survives dialectally in Scotland.)

Furthermore, the historical evidence does not favor the supposition that Southern Appalachian speech is an off-shoot of Elizabethan English. The region in question was peopled largely by emigrations from England, Scotland, and northern Ireland during the eighteenth century. It may be expected, therefore, that the area should contain numerous seventeenth and eighteenth century expressions, and such is the case. The pronunciation *cowcumber* for *cucumber,* now obsolescent in the Great Smokies, was prevalent in England in the seventeenth century and in the beginning of the eighteenth. *Catched,* the past tense of catch, was current, besides caught, from the thirteenth century to the middle of the eighteenth, and was used by Shakespeare, Milton, Bunyan, and Pope. *Funk,* "a disagreeable odor," is rather definitely a seventeenth and early eighteenth century word, as an examination of the *New English Dictionary* will show. So also *chigger,* an insect which burrows beneath the skin, is a development from a Spanish loan-word *chigre,* apparently introduced into English toward the end of the seventeenth century.

Mention may be made of a quaint and picturesque use of the word *shine,* heard in the summer of 1937. An old hunter in





At the top is seen a mountain couple on the porch of a hewn log home near Gatlinburg, Tenn. At the bottom is Mack Hannah, octogenarian resident of the park, whose speech was recorded for linguistic study.

Wears Valley said: "In just a thought or two the painter [panther] come out and screamed. Hit wouldn't come up within shine of the fire." Compare Milton's "Now sits girt with taper's holy shine," and Pope's "Fair opening to some court's propitious shine." Spenser employs *sorry* in the sense of *melancholy* or *dismal,* but the Miltonic sense of *vile* or *worthless* is reflected in the statement of a resident of Cataloochee, who was chafing under the restrictions imposed by the park: "The wust, sorriest things they is, like bobcats, you caint kill!"

Examples could be extended, but these perhaps suffice to show that Great Smokies speech is not Elizabethan English transplanted to America. Yet it possesses a rugged, colorful, and imaginative character, a pleasant archaic flavor, and deserves to be recorded for the benefit of future students of American civilization.

Some Great Smokyisms

It began to come down dusky; the sun was a-settin'.

We ought to do plenty of fishing against the season closes.

It's not generated in me to steal.

Hit'll kill ye or cure ye, one.

I didn't want to be catched in the rain and no shelter.

Dad gone it, there weren't even a sprig of fire in his place!

Hit was thick of houses, thick of people up thar then.

I had a good barn until come a wind storm and blowed it down.

I would rather surround (avoid) a snake than kill it.

I let drive (shot) at him. The bear broke to run and ran yan way up the mountain.

The day before the hunt we usually go and find where the bears are usin'. There's a heap more hard work and slavish runnin' and trampin' in bear huntin' than in 'coon huntin'.



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1941

UNITED STATES DEPARTMENT OF
THE INTERIOR, HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE, NEWTON B. DRURY, *Director*



SEQUOYAH (From a pencil drawing by Samuel O. Smart based on reproductions of the original portrait).

New Echota
Birthplace of the American Indian Press*

By Hugh R. Awtrey, Associate Recreational Planner, National Park Service.

NEW Echota Marker National Memorial is one of the smallest and most obscure of the 162 areas administered by the National Park Service. Few travelers turn aside from the Dixie Highway (U. S. Route No. 41) onto the rural road that leads from the present town of Calhoun to a pastoral scene in the north Georgia hills where a modest stone chronicles briefly the rise and fall of a nation. The story seldom is told, yet merits constant and eloquent repetition; for it is the recital of an unparalleled human achievement. It is the record of a people raised in a scant decade, by its own intellectual bootstraps, from unlettered savagery to the refined estate of a government by published code—and a literature by the printed word. It is the moving but tragic history of the Cherokee Indians.

American ethnologists, political economists, social and religious historians, and students in numerous allied fields may find at this abandoned eastern capital of the Cherokees the subjects for fruitful investigation into many questions of aboriginal culture. The present discussion is intended merely to suggest some of the little-trod trails of inquiry which might lead to profitable discoveries in the realm of Indian journalism, a surprisingly prolific institution which had its origins 112 years ago at New Echota before it spread westward and gave the first periodical press to at least two of the young States beyond the Mississippi.[1]

* From *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. IV, No. 3, March 1940, pp. 24–35.

New Echota's unique page in the history of world journalism is an incidental gift of Sequoyah, that incredible genius whose career still awaits a comprehensive biography which overreaches academic quibble. Long recognized as "America's Cadmus," that untutored linguist, who spoke no word of English or any other "civilized" tongue, endowed his fellow tribesmen with a written language which offered to the eye an easy and faithful transcript of their ancient speech.

Strange to tell, Sequoyah, hero of his nation, beneficiary of the only literary pension ever granted by the United States Government, recipient of a medal from Congress, commemoratee in Statuary Hall at the National Capitol, official emissary in Washington, veteran of the War of 1812, subject of an oil portrait by a leading painter of the day, drunkard turned prohibitionist, artisan who developed silvercraft to the highest point attained by North American Indians, inspiration for the name of a famous giant tree, and, above all, inventor of a remarkably efficient system of language signs, remains today, a century after his death, something of a man of mystery.[2]

This fact becomes all the more astounding when it is considered that many inquiring visitors, including men of literary reputation, interviewed Sequoyah in his later years. Nevertheless, his paternity, the time and place of his birth, and even the details of his death are unproved questions which have tantalized numerous researchers. One of them,[3] after a cautious review of the evidence, believes that "it may be enough to say that Sequoyah was born of a Cherokee mother, somewhere in the lower Appalachian region, between the years 1755 and 1775."

Fortunately for those lay readers who are not disagreeably insistent upon microscopic substantiation of pleasantly plausible theories, most students of the Sequoyan saga concede, with varying degrees of reservation, that the gifted Indian was born about 1760 at Fort Loudon, near the original Echota in east Tennessee, the son of a white man.[4] The somewhat uninspiring etymologi-

cal thesis has been advanced that the hero's name is derived from *Sikwa,* suggesting "pig pen." [5] Another explanation, which perhaps could not withstand the dissolving acids of philological scrutiny, is that the Indian mother, forsaken by her itinerant spouse before the arrival of their child, chose the name *Sequoia,* meaning "he guessed it." [6] Happily, such discussions are but academic bypaths which stem from the high road of achievement blazed by the man himself.

Divested of split-hair carpisms, the essential story starts with Sequoyah's recognition of the superior power that written speech, "talk on paper," conferred upon the men who understood it, in contradistinction to those who could transmit their ideas only by mouth. He began in 1809 to devise a system of symbols for words and ideas which developed gradually into an elaborate, laborious, and inflexible pictography similar in basic principle to Chinese. Aware of his error, he made a new start; and there was his stroke of genius. He noted carefully every sound in the Cherokee language and designated each by an arbitrary character.[7] After a decade of experimentation, while enduring patiently the jeers of relatives and friends, he perfected a system of 85 fundamental symbols, plus one recurrent prefix, and evolved, not precisely an alphabet, but a syllabary—a phonetic transcription of the entire Cherokee vocabulary with its bewildering 9 modes, 15 tenses, and 3 numbers (singular, dual, and plural).

The prime significance of Sequoyah's invention, however, was not his own mastery of a complex lingual problem. It was the amazing facility with which others could learn the system. A considerable number of the Cherokee Indians, some of them cultured and wealthy, commanded polished English, and a few perhaps were scornful of the syllabary. The unschooled tribesmen, however, found it a linguistic open sesame which unfolded magnificent new vistas of knowledge and vicarious experience. Scoffers were quieted by a successful public demonstration of the system in 1821, and thousands of Indians were conversant with

it by the following year.[8] It was adopted officially in 1825 by the general council of the Cherokee Nation.[9]

Stirrings of powerful new intellectual interests among the Indians soon were observed by workers at Brainerd Mission, an institution near the present city of Chattanooga, which had been established in 1817 by the American Board of Commissioners for Foreign Missions.[10] *The Missionary Herald* of February 1826, reported:

> A form of alphabetical writing, invented by a Cherokee named George Guess, who does not speak English, and was never taught to read English books, is attracting great notice among the people generally. The interest in this matter has been increasing for the last 2 years; till, at length, young Cherokees travel a great distance to be instructed. . . . In 3 days they are able to commence letter writing, and return home to their native villages prepared to teach others. . . . Probably at least 20, perhaps 50, times as many would read a book printed with Guyst's character, as would read one printed with the English alphabet.[11]

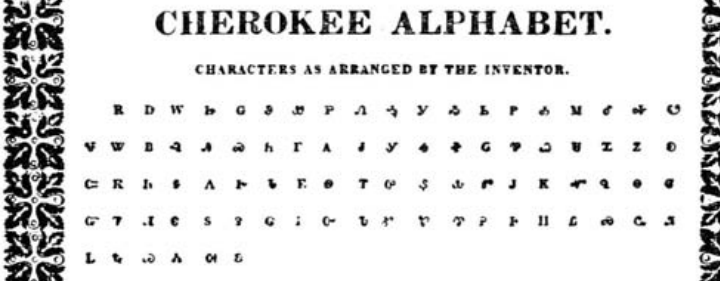
Dr. Samuel A. Worcester, a distinguished New England missionary who lived among the Cherokees for 34 years and served for a time as New Echota's postmaster, seized upon the Seyuoyan syllabary as a potent instrument for the diffusion of religious literature. He urged the immediate establishment of a press which would disseminate, by the new-found system, the message that he had sought to convey through the clumsy device of interpreted sermons and lectures. The Board of Commissioners had received an urgent plea as early as September 1825:

> The Cherokees have for some time been very desirous to have a press of their own, that a newspaper may be published in their own language. . . . Already the four Gospels are translated and fairly copied; and if types and a press were ready, they could be immediately revised and printed and read.[12]

The Missionary Herald of December 1827,[13] contains several items of superlative significance in Cherokee history. One is the eleven-line reproduction (see illustration on p. 7) of Dr. Worcester's translation of the first five verses of Genesis—the initial

CHEROKEE ALPHABET.

CHARACTERS AS ARRANGED BY THE INVENTOR.



CHARACTERS SYSTEMATICALLY ARRANGED WITH THE SOUNDS.

Ꭰ a	Ꭱ e	Ꭲ i	Ꭳ o	Ꭴ u	Ꭵ v
Ꭶ ga Ꭷ ka	Ꭸ ge	Ꭹ gi	Ꭺ go	Ꭻ gu	Ꭼ gv
Ꭽ ha	Ꭾ he	Ꭿ hi	Ꮀ ho	Ꮁ hu	Ꮂ hv
Ꮃ la	Ꮄ le	Ꮅ li	Ꮆ lo	Ꮇ lu	Ꮈ lv
Ꮉ ma	Ꮊ me	Ꮋ mi	Ꮌ mo	Ꮍ mu	
Ꮎ na Ꮏ hna Ꮐ nah	Ꮑ ne	Ꮒ ni	Ꮓ no	Ꮔ nu	Ꮕ nv
Ꮖ qua	Ꮗ que	Ꮘ qui	Ꮙ quo	Ꮚ quu	Ꮛ quv
Ꮜ s Ꮝ u Ꮞ sa	Ꮟ se	Ꮠ si	Ꮡ so	Ꮢ su	Ꮣ sv
Ꮤ da Ꮥ ta	Ꮦ de Ꮧ te	Ꮨ di Ꮩ tih	Ꮪ do	Ꮫ du	Ꮬ dv
Ꮭ dla Ꮮ tla	Ꮯ tle	Ꮰ tli	Ꮱ tlo	Ꮲ tlu	Ꮳ tlv
Ꮴ tsa	Ꮵ tse	Ꮶ tsi	Ꮷ tso	Ꮸ tsu	Ꮹ tsv
Ꮺ wa	Ꮻ we	Ꮼ wi	Ꮽ wo	Ꮾ wu	Ꮿ wv
Ᏸ ya	Ᏹ ye	Ᏺ yi	Ᏻ yo	Ᏼ yu	Ᏽ yv

SOUNDS REPRESENTED BY VOWELS.

a as *a* in *father*, or short as *a* in *viral*.
e as *a* in *hate*, or short as *e* in *met*,
i as *i* in *pique*, or short as *i* in *pit*,
o as *aw* in *law*, or short as *o* in *not*,
u as *oo* in *fool*, or short as u in *pull*,
v as *u* in *but* nasalized.

CONSONANT SOUNDS.

g nearly as in English, but approaching to k. d nearly as in English, but approaching to t. h, k, l, m, n, q, s, t, w, y, as in English.

Syllables beginning with g, except s, have sometimes the power of k; Ꭺ, Ꮪ, Ꮹ, are sometimes sounded to, tu, tv; and syllables written with tl, except Ꮮ, sometimes vary to dl.

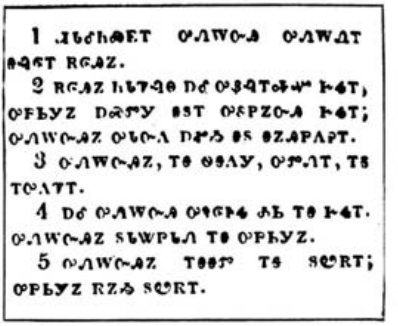
use, in printed form, of Sequoyah's phonetic symbols. Another is the announcement that a font of Cherokee type had been cast in Boston and "an iron press of improved construction" purchased. Reflecting the missionary group's interest in the venture, the note continues:

> A Prospectus has also been issued for a newspaper, entitled the *Cherokee Phoenix,* to be printed partly in Cherokee and partly in English. . . . All this had been done by order of the Cherokee Government, and at their expense. . . .[14]
>
> Among the Cherokees, then, we are to see the first printing press ever owned and employed by any nation of the Aborigines of this Continent, the first effort at writing and printing in characters of their own; the first newspaper, and the first book printed among themselves; the first editor; and, the first well-organized system for securing a general diffusion of knowledge among the people. Among the Cherokees, also, we see established the first regularly elective government, with the legislative, judicial, and elective branches distinct; with the safeguards of a written Constitution and a trial by jury. . . .

The Cherokee press and type were shipped by water from Boston in November 1827. They arrived at Augusta, Ga., via Savannah, and finally reached New Echota in January 1828, after an overland trip by wagon. Isaac H. Harris and John F. Wheeler, two printers who had waited at the Cherokee capital since December 23, 1827, greeted the equipment with professional enthusiasm. Wheeler, who went to Arkansas in 1834 and became a pioneer typographer in the new country of the West, designed the first Cherokee type case, probably while at New Echota, but never received a patent for it.[15] He later recalled the arrival of the printing materials in north Georgia:

> The Press, a small royal size, was like none I ever saw before or since. It was cast iron, with spiral springs to hold up the plates, at that time a new invention. We had to use balls of deerskin stuffed with wool for inking, as it was before the invention of the composition roller. . . . John Candy, a native half-breed . . . could speak the Cherokee language, and was of great help to me in giving me the words where they were not plainly written.[16]

The absence of newsprint caused a delay in the publication of Volume I, No. 1, of *Tsalagi-twi-le-hi-sani-hi,* the *Cherokee Phoenix.* A supply finally was obtained from Tennessee and, on February 21, 1828, there appeared the inaugural issue of the father of America's aboriginal newspapers. It was a journal of four five-columned pages measuring 21 by 14 inches. The vignette included a representation of the fabulous phoenix, the Egyptian bird which lived for 500 years, was consumed by a cleansing fire, and arose from its own ashes in all its youthful freshness. That first issue announced that the weekly *Phoenix* could be procured for $2.50 a year paid in advance, or $3.50 paid at the end of the year. Rates were reduced to $2 and $2.50 for non-English readers. Altogether, the paper justified the 1827 prospectus, already mentioned, which had said that it would contain:


1 ᎯᏴᏣᏏᎵᎢ ᎤᏁᎳᏅᎯ ᎤᏁᎳᎢ ᏰᎵᎢ ᎡᎶᎯᏃ.
2 ᎡᎶᎯᏃ ᏂᏓᎿᏉ ᏗᎧ ᎤᏚᎿᎢᏍᏔᏅ ᏥᎨᎢ, ᎤᏲᏨᎩ ᎠᏍᎪᎵ ᏪᏚ ᎤᏲᎩᏃᎮᎭ ᏥᎨᎢ; ᎤᏁᎳᏅᎯᏃ ᎤᏓᏅᏁ ᎠᎴᏍ ᏪᏚ ᏥᏃᎯᏴᎯᏍᎢ.
3 ᎤᏁᎳᏅᎯᏃ, ᎢᎦ ᏱᏚᎯᎩ, ᎤᏍᏁᎢ, ᎢᎦ ᎢᎾᏁᎢ.
4 ᏗᎧ ᎤᏁᎳᏅᎯ ᎤᏬᏢᏎ ᎣᏏ ᎢᎦ ᏥᎨᎢ. ᎤᏁᎳᏅᎯᏃ ᏚᏓᎳᏫᏓ ᎢᎦ ᎤᏲᏨᎩ.
5 ᎤᏁᎳᏅᎯᏃ ᎢᏪᏍᏛ ᎢᎦ ᏚᎾᏒᎢ; ᎤᏲᏨᎩ ᎡᏃᏍ ᏚᎾᏒᎢ.

When the first five verses of the Book of Genesis appeared in this translated form in *The Missionary Herald* of December 1827, it marked the first composition printed in the Sequoyan syllabary.

> (1) The laws and published documents of the Nation.
> (2) Accounts of the manners and customs of the Cherokees, and their progress in education, religion, and the arts of civilized life, with such notices of other Indian tribes as our limited means of information will allow.
> (3) The principal interesting news of the day.
> (4) Miscellaneous articles, calculated to promote literature, civilization, and religion among the Cherokees.[17]

Here an admirable and tragic character appears on the journalistic stage of the American Indians. He is Elias Boudinott, known also as Kub-le-ga-nah (and other spellings), meaning "The

Buck," a brilliant young part-breed who had been singled out at Brainerd Mission and sent to a higher church school at Cornwall, Conn. Among his scholarly achievements at an early age was the distinction of having calculated a solar eclipse, "very neatly projected and the results stated in the usual form."[18] Boudinott, whose signature bore two "t's," although he had adopted the name of Elias Boudinot, Governor of New Jersey and President of the American Bible Society,[19] created something of a social ferment when he married Harriet Ruggles Gold [20] at Cornwall in 1822 and departed with his white bride for the wilderness of New Echota. Because of his superior mental powers and his excellent training, he was chosen clerk of the Cherokee National Council. With the issuance of the *Phoenix* he became America's first Indian editor.

Aware of the extraordinary handicaps imposed upon him by a pioneer publishing venture born in the wilds of Cherokee Georgia, young Boudinott was diplomatic but purposeful as he wrote his first editorial. The newspaper was not undertaken for profit, he explained, but would depend largely on the liberality of his supporters. He continued:

> We would now commit our feeble efforts to the good will and indulgence of the public . . . hoping for that happy period when all the Indian tribes of America shall arise, Phoenix-like, from the ashes, and when the terms "Indian depredation," "war-whoop," "scalping-knife," and the like, shall become obsolete, and forever be buried "deep underground."

Considering the objectives which it was created to serve and the unusual circumstances of time and place in which it was produced, the *Cherokee Phoenix* was a good newspaper. While it functioned, on the one hand, as the official organ of a nation, it also did duty, on the other, as something of a "local weekly." That second office was subordinated entirely to the first, however, and the struggling little paper maintained a journalistic standard whose catholic tone and editorial technique merit the respectful attention of present-day students of the press.

The earliest issues contained many reprints (in English) of

informational odds and ends from other newspapers. Some of them, such as those relating to the complexities of European politics, probably quickened few pulses among Cherokee readers; but the contents improved as editor and printers became better oriented and crystallized their "interest" formula. The paper was strongly educational, mainly, perhaps, because young Boudinott wished earnestly to convey to his more benighted tribesmen some of the knowledge that white men have gathered from the corners of the earth. There were carefully chosen articles on better farming and a series on natural history. Descriptions of Calcutta rubbed columnar elbows with excerpts from *Robinson Crusoe,* Washington Irving's *Traits of Indian Character,* and translations of *The Parable of the Prodigal Son.* An official duty was performed by the serial reproduction (in Cherokee and English) of the Cherokee Constitution and Laws, but there also were political announcements of district candidates for National Council seats, a poetry corner, lost and found column, and notices (printed bilingually) from husbands who foreswore responsibility for their wives' debts.

Resulting probably from the indirect sponsorship of missionary workers and from the fact that Editor Boudinott had been educated among them, the *Phoenix* had about it a distinct aura of proscriptive morality. There were frequent exhortations against the evils of intemperance, and generous reprints describing the tragic fate of those unfortunates who fell victims to the insidious beguilements of the bowl. Nicotine, as well as alcohol, was clad in the wanton garments of iniquity, for the issue of July 2, 1828, reported under the heading, "Warning to Snuff-Takers," the arresting case of an Englishwoman who, upon taking an overgenerous pinch, forthwith had sneezed her neck out of joint and died. An autopsy revealed "four and one-half pounds of snuff in the place where her brains should be."

Most significant of all the contents of the *Phoenix,* however, were its political editorials. They inveighed against the abuses,

ᏣᎳ ᎫᏩᏍᎪ.

CHEROKEE PHŒNIX.

VOL. I. NEW ECHOTA, WEDNESDAY JUNE 18, 1828. NO. 17.

EDITED BY ELIAS BOUDINOTT
PRINTED WEEKLY BY

ISAAC H. HARRIS,

FOR THE CHEROKEE NATION.

At $2 50 if paid in advance, $3 in six months, or $3 50 if paid at the end of the year.

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☞All letters addressed to the Editor, post paid, will receive due attention.

ᎩᎳ ᏣᎳᎩᏙᎯ ᎠᏰ ᏂᏍᎬᏍᏆᏗ. ᎤᏬᏰᏂᎯ ᎢᎬᏱ ᏄᏍᏛ ᏧᏂᎵᏏᎯ ᏒᎯᏱᏗ. ᏴᏫᎬ ᏂᏥᏁᎵᎹ ᏦᎢᏁ ᎠᏎ ᏫᏚᏓᏅ ᏣᏓᏅ, ᎢᏣᏃ ᎢᎬᏩᏍᏛ ᎠᏍᏓᏯᎯᏱᏗ. ᏥᏈ ᏤᏍᏗ ᎢᏳᏩᏁ ᎢᏰ ᎠᏍᏓᏯᎯᏱᏗ, ᏂᎦ ᏚᏫᏚᏓᏅ ᏒᎯᏱᏗ. ᎠᏍᏓᏯᎯᏱᏗ ᎢᏰ ᎩᏯ ᏴᎯᏱᏗ, ᏫᏄᎢ ᎠᏎ ᏫᏚᏓᏅ ᏒᎯᏱᏗ. ᏫᏯᏉ ᏫᏩᏂᏁᎵᎹ, ᏫᏥᏍᏛ ᎠᏍᏓᏯᎯᏱᏗ. ᏫᏯᏉ ᏫᏩᏂᏁᎵᎹ, ᏫᏥᏍᏛ ᎠᏍᏓᏯᎯᏱᏗ. ᏣᏓᏅ ᏂᏥᏁᎵᎹ, ᏫᏥᏍᏛ ᎠᏍᏓᏯᎯᏱᏗ. ᏣᏓᏅ ᏂᏥᏁᎵᎹ, ᏫᏥᏍᏛ ᎠᏍᏓᏯᎯᏱᏗ. ᏣᏓᏅ ᏂᏥᏁᎵᎹ, ᏫᏥᏍᏛ ᎠᏍᏓᏯᎯᏱᏗ.

AGENTS FOR THE CHEROKEE PHŒNIX.

The following persons are authorized to receive subscriptions and payments for the Cherokee Phœnix.

HENRY HILL, Esq. Treasurer of the A. C. F. M. Boston, Mass.

GEORGE M. TRACY, Agent of the A. B. F. M. New York.

Rev. A. D. EDDY, Canandaigua, N. Y.

Male negroes 7 } Total 24
Female negroes 17 }

Whole population 1,383

There are in this District, eight white men married to Cherokee women, and one Cherokee man married to a white woman.

There are in this District, 211 spinning wheels, one grist mill, one blacksmith shop, 308 ploughs, fifty-three looms, 323 sheep, 2,419 swine, 1,506 black cattle, 554 horses.

CHICKAMAUGA DISTRICT.

Males under 18 years of age	484	
Males from 18 to 59 years of age	396	
Males over 59 years of age	43	
Total number of males	—	923
Females under 15 years of age	293	
Females from 15 to 40 years	374	
Females over 40 years of age	131	
Total number of females	—	803
Total of males and females		1723
Male negroes 90 } Total		187
Female negroes 97 }		
Whole population		1,913

There are in this District, fifteen white men married to Cherokee women, and four Cherokee men married to whitewomen.

There are in this District four Schools and seventy-two scholars of both sexes, a grist-mill, two saw-mills, one cotton gin, 121 looms, 368 spinning wheels—eighteen wagons, 354 ploughs, 1,175 horses, 2,505 black cattle, 8,900 swine, 111 goats, eleven blacksmith shops, five ferries, four stores, and 397 sheep.

HICKORY LOG DISTRICT.

Males under 18 years of age	287	
Males from 18 to 59 years of age	360	
Males over 59 years of age	48	
Total number of males	—	739
Females under 15 years of age	345	

of both sexes, seven blacksmith shops, one turnpike, five ferries, six public roads, one threshing machine, one store, ninety-three goats, 243 sheep, 6,080 swine, 1,730 cattle, 845 horses, 372 ploughs, seventy looms, 327 spinning wheels, twenty-nine wagons, three saw-mills, six grist mills, two cotton gins.

CHATTOOGA DISTRICT.

Males under 18 years of age	420	
Males from 18 to 59 years of age	400	
Males over 59 years of age	30	
Total number of males	—	850
Females under 15 years of age	339	
Females from 15 to 40 years	365	
Females over 40 years of age	95	
Total number of females	—	799
Total of males and females		1,649
Male negroes, 122 } Total		292
Female negroes, 170 }		
Total Population		1,941

There are in this District, eighteen white men married to Cherokee women, and three Cherokee men married to white women.

There are in this District, 6 schools in which are ninety two scholars of both sexes; and 1,318 horses, 7,018 cattle, 4,654 swine, 335 sheep, fifteen goats, 124 looms, 307 wheels, 446 ploughs, eleven blacksmith shops, five grist mills, two cotton gins, one saw-mill, and two stores.

HIGH TOWER DISTRICT.

Males under 18 years of age	347	
Males from 18 to 59 years of age	325	
Males over 59 years of age	26	
Total number of males	—	698
Females under 15 years of age	300	
Females from 15 to 40 years	306	
Females over 40 years of age	71	
Total number of females	—	677
Total of males and females		1,375
Male negroes 43 } Total		79
Female negroes 36 }		
Total Population		1,454

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some imaginary, others only too real, which the Cherokees suffered from white settlers and adventurers, and there were attacks but half restrained upon the Georgia government. More informative than carefully organized argumentation is the indignant note of February 19, 1831:

> Let our patrons bear in mind that we are in the woods, and as it is said by many, in a savage country, where printers are not plenty, and therefore they must not expect to receive the *Phoenix* regularly for awhile, but we will do the best we can. . . . This week, we present to our readers but half a sheet. The reason is, one of our printers has left us; and we expect another, who is a white man, to quit us soon, either to be dragged to the Georgia Penitentiary for a term of not less than four years, or for his personal safety to leave the Nation, to let us shift for ourselves as well as we can. Thus is the liberty of the press guaranteed. . . .

It may have been similar utterances, but more probably it was the moral zealotry of the editor, which had led the National Council on November 19, 1828, to instruct him to withhold "scurrilous communications which have a tendency to excite and irritate personal controversies, also he shall not support or cherish . . . anything on religious matters, that will savour sectarianism." [21]

Meanwhile, the fame of the *Phoenix* had spread afar. Mr. Duponceau, president of the American Philosophical Society, sent a copy of the first issue "to a learned society in France as a great curiosity!" [22] William de Humboldt, a German philologist, wrote a commendatory letter to the editor,[23] and *The London Times* exchanged on even terms with the Indian journal. The Georgia Government recognized it as an official organ and often sought to have notices inserted in it.

It must have become early apparent to Boudinott, however, that his publisher's duties were to be fraught with woes. In the issue of April 24, 1828, there was an announcement that, because of difficulties encountered in replenishing the supply of paper, no *Phoenix* would appear the next week. On June 18 he considered it desirable to inform his readers that the post office had promised better delivery service, and added ruefully:

> . . . Another complaint has reached us, and that is, our papers are not done up in a substantial manner. There we acknowledge the complaint is reasonable, but the fault is not designed, but altogether from necessity. Our readers probably know that we live in a wilderness, and of course cannot obtain paper without considerable expense. As soon as may be, we intend to supply ourselves with good wrapping paper.

Boudinott lamented in the issue of July 30, 1828, that the wealthiest and most influential tribesmen were not subscribers of the *Phoenix*. He announced his resignation on December 3, pleading ill health, but must have mended, or was dissuaded, for the next number to be found in the collection of the Library of Congress (February 4, 1829, Vol. I, No. 47),[24] contains an explanation from the same editor that the *Phoenix* was placed in the mails in routine fashion on the preceding week and no reason could be established to indicate why no one ever received it.

A month later, March 4, 1829 (Vol. I, No. 51), he directed attention, with some pride, to the forthcoming final number of the first volume of the newspaper. He then cited the lack of an assistant wherefore "it is impossible to devote a large portion of the paper to the Cherokee language, as the whole must be original." To reassure those readers who might construe his linguistic preference as an evidence of disloyalty, he asserted:

> . . . The paper is sacred to the cause of the Indians, and the editor will feel himself especially bound, as far as his time, talents, and information will permit, to render it as instructive and entertaining as possible to his brethren, and endeavor to enlist the friendly feelings and sympathies of his subscribers abroad, in favor of the aborigines.

A tragicomic misfortune overtook that issue. An editorial notice of the following week (March 11, 1829, Vol. I, No. 52) described the calamity. Mail from the small post office at New Echota was transported to that at Spring Place by a post rider. With bundles of the *Phoenix* slung across his saddle, the messenger fell from his horse while crossing Holly Creek and dropped his load in the water. The papers remained submerged for 7 hours

before they were recovered and taken to Spring Place. The postmaster notified Boudinott that all the papers were damaged and the addresses rendered barely legible. "In short," he wrote to the editor, "the whole mail is in a miserable situation." He proposed, however, to attempt to dry the papers as well as he could and to make the distribution as usual.

After Boudinott, because of illness, had omitted his editorial comments from the issue of April 1, 1829 (Vol. II, No. 3), he explained apologetically in the next *Phoenix:* "The Editor of this paper regrets that, owing to indisposition, he is not able to render his present number as interesting as he would wish." The issue of April 22 was skipped entirely for want of printer's ink, the editor announced in the following number (April 29, 1829, Vol. II, No. 7). He published at the same time the news that Wheeler, one of his printers, had married Nancy Watie at New Echota on April 23. The paper then suspended entirely until May 27 (Vol. II, No. 8), when it was explained that the shipment of ink had been delayed. The reader is left to wonder whether a bridal trip of the Wheelers might have been partly responsible for the hiatus of three consecutive issues.

The illness of "a hand" reduced the *Phoenix* of September 22, 1829 (Vol. II, No. 22) to two pages and, for the first time since its establishment, there was no Cherokee type in its columns. A study of the newspaper file reveals a diminishing quantity of material printed in the Sequoyan syllabary, an indication perhaps, that the poor health of Boudinott, who still was only about 26 years old, did not permit him to devote his entire time to editorial duties. Another explanation may be found in the fact that Boudinott and Dr. Worcester were busily engaged in preparing religious materials for publication on the *Phoenix* press. Portions of the Bible were translated from Greek into Cherokee, numerous tracts were issued, and an Indian hymn book, first printed in 1829 at New Echota, ran through new editions long after both co-authors had died.[25] Worcester began a Cherokee



New Echota Memorial erected in 1931.

geography, and a dictionary and grammar were in progress when he left Georgia for the West. One investigator estimated that the press produced 733,800 pages in Cherokee within 5 years after adoption of the syllabary.[26]

Boudinott's bad health was noted again in the *Phoenix* of February 12, 1831 (Vol. III, No. 37), and issuance of the paper became increasingly irregular thereafter. Wheeler's name had disappeared by April 9, 1831 (Vol. III, No. 44) from its accustomed position in the masthead and John Candy's took that place. Finally, on August 1, 1832, Boudinott laid down the editorial banner which he had borne so well through four and a half years of wilderness journalism. It was taken up by Elijah Hicks, a fellow tribesman who later became a leader in the Indian Territory and in 1839 and 1843 was a member of official missions in Washington.[27]

A precise determination of subsequent events awaits a thorough sifting of the records by a patient student. Activities of the *Phoenix* were linked inextricably to the long and complex three-sided controversy which raged between Washington, the Georgia Government, and the Cherokees concerning the removal of the Indians to the West. The New Echota newspaper, a strong voice for Cherokee independence, was marked as early as 1831 as a factor with which Georgia would have to contend, and it soon was assailed because it was a potent weapon against white encroachment. Dr. Worcester was imprisoned that year, won a decision from the United States Supreme Court in 1832, and was released at last in 1833.

Meanwhile, the *Phoenix* appeared more and more irregularly. It is conceded generally that the last issue was published May 31, 1834, and that the press and types were seized by Georgia authorities in October 1835. That was after Boudinott, still a resident of New Echota, had placed his signature sincerely but unadvisedly to a "treaty" providing for removal west of the Mississippi. He represented the views of only a small minority of the Nation and

his act cost him his life 4 years later in the West—a grim assassination with knives and hatchets.

The Cherokee National Council resolved in 1836 to remove its press from Georgia and set it up across the border at Red Clay, Tenn. When a wagon was sent to transport it from New Echota, possession was refused. Chief John Ross and other leaders complained to the Secretary of War that the equipment was being "used by the agents of the United States in publishing slanderous communications against the constituted authorities of the Cherokee Nation."

The tragic climax came in 1838. A few thousand Cherokees were taken West as prisoners on boats, but the majority, some 13,000, was sent in 13 overland parties on the journey of 3 to 5 months down the harrowing "Trail of Tears" to the West which, only by bitter irony, could be called "that happy land beyond the setting sun." About 4,000 died *en route.*

What became of the pioneer Indian printing press and its novel Sequoyan type? The National Park Service, or any public agency or private organization, could make a noteworthy contribution to the history of Indian journalism if, circumstances permitting, it might devote the required study to a determination of the fate of the mechanical apparatus which gave to an extraordinary people the printed pages that lifted thousands of common tribesmen from the illiteracy of the forest to the lettered realm of higher citizenship.

Dr. Grant Foreman, a leading historian of the Cherokee removal, writes: "In spite of my research and the examination of every scrap of evidence I could get my hands on, what happened to the *Cherokee Phoenix* press is still a mystery to me." [28] John P. Brown, a Chattanooga investigator cited above (*Old Frontiers*), is "of the opinion that the Georgia Guard demolished the printing press, as that would be the natural thing for them to do with the feeling then raging . . ." [29] Dr. Worcester took a press to the West with him and issued the first pages printed in what now

is Oklahoma, but the claim that it was the same machinery used at New Echota appears to be open to serious doubt. Dr. Foreman is "persuaded that Dr. Worcester obtained a new press which he brought out with him and set up at Union Mission in 1835."

A font of Cherokee type, 4 type cases, and 140 matrices were received by the United States National Museum in 1911 by transfer from the Office of Indian Affairs, but those materials were transmitted in 1915 to the Cherokee Orphan Training School, at Park Hill, Okla. (now the Sequoyah Orphan Training School, of Tahlequah, Okla.).[30] Although it had been believed by some students that the type was a part of the font used at New Echota, the archivist of the Oklahoma Historical Society reveals[31] the existence of official records which show that the metal had belonged to the *Cherokee Advocate,* established at Tahlequah in 1844 as the western successor of the *Phoenix* and published there as the official national organ until the disintegration of the tribal government in 1906.

E. D. Hicks, a grandson of Elijah Hicks (mentioned above as the second editor of the *Phoenix*), who has lived in Tahlequah since birth, discloses that the press and some of the other equipment of the defunct *Advocate* were sold to J. S. Holden, "Who tried to run a paper in Fort Gibson (Oklahoma), but he died and what became of the old outfit I do not know."[32] It appears improbable, in any case, that either the *Advocate* type, or that now to be found in a mixed case of English and Cherokee type stored in an attic of the school at Tahlequah,[33] ever served in producing the New Echota *Phoenix.*

Nevertheless, even though the historic physical equipment of publication be lost forever, there still must remain at New Echota Marker National Memorial the material for an exceptional volume of stories yet untold concerning the *Phoenix* and its monumental work. Those stories well may deserve public recital.

[1] Oklahoma and Idaho. John Clyde Oswald, *A History of Printing: Its Development Through Five Hundred Years* (D. Appleton & Co., New York and London, 1928), 232, 234.

[2] This formidable assortment of known facts and diverting legend is reviewed by John B. Davis," The Life and Works of Sequoyah," *Chronicles of Oklahoma,* Vol. VIII, No. 2, June 1930; Rodney Sydes Ellsworth, *The Giant Sequoia: An Account of the History and Characteristics of the Big Trees of California,* J. D. Berger, Oakland, Calif., 1924; Grant Foreman, *Sequoyah,* University of Oklahoma Press, Norman, Okla., 1938; George E. Foster, *Se-Quo-Yah, the American Cadmus and Modern Moses,* Office of the Indian Rights Assn., Philadelphia, 1885; Albert V. Goodpasture, "The Paternity of Sequoyah, the Inventor of the Cherokee Alphabet," *Chronicles of Oklahoma,* Vol. I, No. 2, October 1921; Samuel C. Williams, "The Father of Sequoyah: Nathaniel Gist," *Chronicles of Oklahoma,* Vol. XV, No. 1, March 1937.

[3] Davis, *op. cit.,* 155.

[4] One school of Sequoyan genealogists favors George Guess, a German peddler from Savannah. Another rejects him with scholarly vehemence and cites Col. Nathaniel Gist, friend of Daniel Boone, Orthographical variants include Guess, Guest, Gist, Guist, and Guyst. Government records concerning Sequoyah contain the forms Guess and Gist.

[5] Davis, *op. cit.,* 156.

[6] Herbert Earl Wilson, *The Lore and Lure of Sequoia, the Sequoia Gigantea, Its History and Description* (Wolfer Printing Co., Los Angeles, 1928), 90.

[7] Most of the signs are letters of our own alphabet employed normally, reversed, or upside down. Some investigators suggest that Sequoyah adapted them from an English spelling book (which he could not read), others that he followed the print in a newspaper picked up on the roadside.

[8] Foreman, *op. cit.,* 11.

[9] Davis, *op. cit.,* 166.

[10] George E. Foster, *Literature of the Cherokees, Also Bibliography and the Story of Their Genesis* (Phoenix Publishing House, Muskogee, Indian Territory, 1889), 23, 24. Cited hereafter as Foster, *Literature.*

[11] *The Missionary Herald* (Crocker and Brewster, Boston), Vol. XXII, No. 1, 47.

[12] Foreman, *op. cit.,* 7.

[13] Vol. XXIII, No. 12, 382.

[14] The Council, meeting at New Echota, October 15, 1825, had authorized the expenditure of $1,500 for a press and two type fonts. Three days later it directed that an editor be chosen at an annual salary of $300. On

November 2 it approved construction of a printing house "24 by 20 feet, one story high, shingle roof, with one fire place, one door at the end of house, one floor, and a window in each side of the house, 2 lights deep, and 10 feet long." On November 4 it appointed Isaac H. Harris "principal printer" of the Cherokee Nation at a salary of $400 a year. *Cf.* Foster, *Literature,* 38, 41–42.

[15] Carolyn Thomas Foreman, Oklahoma Imprints, 1835–1907: *A History of Printing in Oklahoma Before Statehood* (University of Oklahoma Press, Norman, Okla., 1936), 10.

[16] John P. Brown, *Old Frontiers: The Story of the Cherokee Indians from Earliest Times to the Date of Their Removal to the West,* 1838 (Southern Publishers, Inc., Kingsport, Tenn., 1938), 482.

[17] Robert Sparks Walker, *Torchlights to the Cherokees: The Brainerd Mission* (Macmillan Co., New York, 1931), 232.

[18] Grant Foreman, *The Five Civilized Tribes* (University of Oklahoma Press, Norman, Okla., 1934), 355.

[19] Foster, *Literature,* 55.

[20] Buried at New Echota. She bore six children. Boudinott later married Delight Sargent, a white missionary of Brainerd, who accompanied him to Indian Territory. *Cf.* Walker, *op. cit.,* 155–156.

[21] Foster, *Literature,* 51.

[22] *Cherokee Phoenix,* Vol. I, No. 22, July 30, 1828, p. 2.

[23] *Cherokee Phoenix,* Vol. II, No. 2, June 24, 1829, p. 2.

[24] There are 96 issues in the file: 28 of 1828; 33 of 1829; 15 of 1830; 18 of 1831, and 2 of 1832. Some 250 issues are available in the library of the American Antiquarian Society but, humiliating as it may be, the most nearly complete collection of originals is not to be found in the United States, but in the British Museum.

[25] A missionary wrote in 1861: ". . . they were singing a hymn in the Cherokee language. Never before did music appear half so sweet to me. The language is music itself. The air is a sweet one, and the deep feeling of devotion with which it was sung rendered it truly refreshing." Cephas Washburn, *Reminiscences of the Indians* (Presbyterian Committee of Publication, Richmond, Va., 1869), 42.

[26] Foster, *Literature,* 53.

[27] E. D. Hicks, of Tahlequah, Okla., a 76-year-old grandson of the late Elijah Hicks, who himself is a great-grandfather, revealed to the author, after original publication of this article, that the second editor of the *Phoenix* was born June 20, 1796, the son of Charles R. Hicks, second chief of the Cherokee Nation. He became clerk of the Council in 1822 and president of the national committee (the Senate) in 1827. He was a

captain of one of the Cherokee emigrant detachments transplanted west of the Mississippi River, signed the Constitution of 1839, and settled on the California Trail at the site of the present Claremore, Okla. He became clerk of the Cherokee Senate in 1845. He died August 6, 1856, and was buried at his home, now the cemetery of Claremore.

[28] Personal communication, February 17, 1940.

[29] Personal communication, March 4, 1940.

[30] Personal communication from the U. S. National Museum, February 29, 1940.

[31] Mrs. Rella Looney, personal communication of March 8, 1940, with transcripts of items 2017, 2018, and 2019 in *Cherokee-Newspapers*, Archives of the Society.

[32] Personal communication, March 19, 1940.

[33] Personal communication of March 16, 1940, from Superintendent Jack Brown, Sequoyah Orphan Training School.

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Filled section of the moat at Fort Marion National Monument, St. Augnstine, Fla. The hot shot furnace is seen in the left middleground. (From a drawing by Samuel O. Smart.)

Hot Shot Furnaces[1]

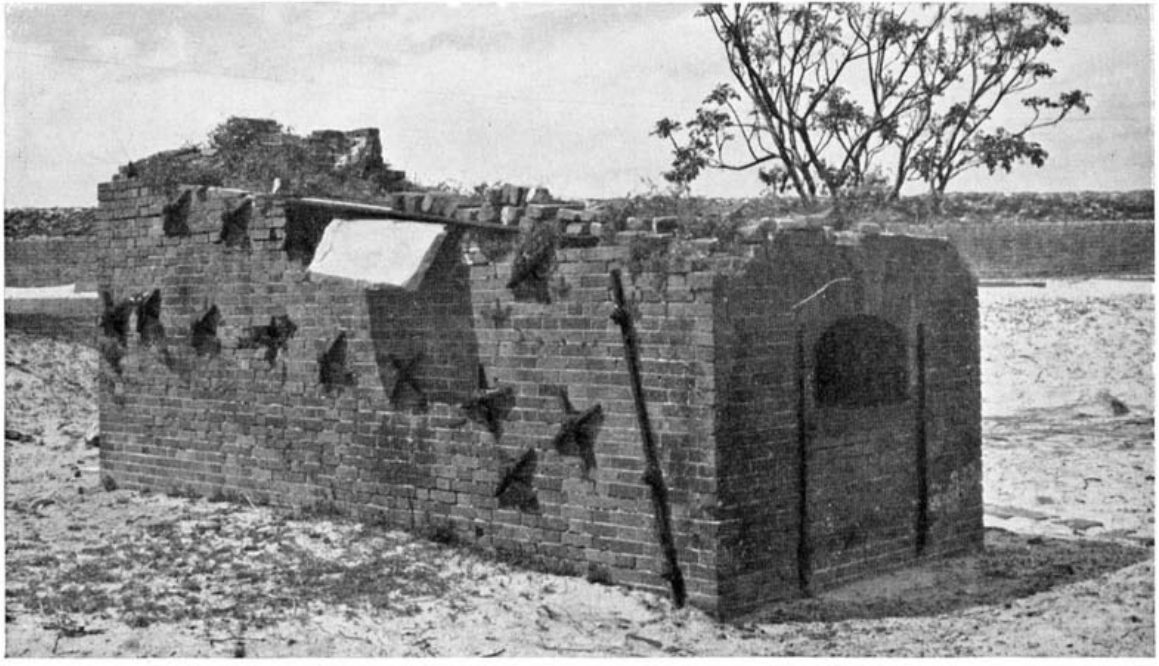
By Herbert E. Kahler, Chief, Historic Sites Division, Branch of Historic Sites, and F. Hilton Crowe, Assistant Historical Technician.

NEXT to the dungeon, no other feature at Fort Marion National Monument elicits so many questions as does the hot shot furnace. Visitors are interested in knowing when this old structure was built, and why and how it was used.

Hot shot antedates gunpowder itself. In 54 B. C., the Britons launched heated clay balls into the tents of the invading Romans with great effectiveness. With the advent of gunpowder there was considerable hesitancy in using hot shot because of the great difficulty in controlling the time of the explosion, but experimentation finally developed a clay that separated the hot ball from the powder. In 1579, the King of Poland successfully carried on a siege by employing hot cannon balls in his guns. The use of heated shot became increasingly important in coast defense, especially in the destruction of wooden vessels. During the siege of Gibraltar in 1782 a part of Spain's fleet was set on fire and destroyed by hot shot.

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[1] From *The Regional Review*, National Park Service, Region One, Richmond, Va. Vol. II, No. 2, February 1939, pp. 11–13.



Old hot shot furnace at Fort Morgan, Mobile Point, Ala. The historic fort, a part of the chain of coastal defenses devised in the early nineteenth century by Simon Bernard, has been made accessible to the public through a cooperative program carried out by the National Park Service, the Civilian Conservation Corps, and the Alabama Department of Conservation

The heating of cannon balls first was accomplished on open grates, a slow, wasteful, and dangerous method. A great advance then was made with the development of the hot shot furnace which, in 1794, was used successfully at the mouth of the Rhône River.

The furnace was brought to this country in the early part of the nineteenth century. One of France's outstanding military engineers, Simon Bernard, brigadier general under Napoleon Bonaparte, was employed by the United States to make a survey for coastal fortifications in the Southeast and his recommendations, which included the latest advances in coast-line defenses, were presented to Congress in 1817 and adopted. At Fort Pike and Fort Macomb, in Mississippi; Fort Morgan, in Alabama; and Fort Jefferson and Fort Marion, in Florida, the hot shot furnaces are still in evidence. At Fort Pulaski National Monument, near Savannah, Ga., only the foundation of the furnace remains.

The War Department in 1825 declared Fort Marion useless for defense purposes, but in 1835, after the second Seminole Indian War started, it recognized that the fort still possessed certain military values. It built a water battery, installed a hot shot furnace, and proposed the construction of shallow-draft galleys for additional defense. The Seminoles apparently were expected to attack from the sea.

The hot shot furnaces varied somewhat in size, the largest one being at Fort Jefferson National Monument [on the Florida Keys in the Gulf of Mexico, 70 miles due west of Key West]. If shot were placed in a cold furnace, 1 hour and 15 minutes were required to bring them to a red heat. Once the furnace was hot a 24-pounder shot could be brought to a cherry red color in 25 minutes, the 32- and 42-pounders requiring a few minutes longer. An unusual circumstance was that the balls expanded under the heat but did not return to their normal size after cooling.

Once the balls were cherry red or white hot, they were taken from the furnace with iron forks, scraped carefully with a rasp to remove scale, and carried in ladles to the cannon. The ladles were formed of an iron ring, the interior of which was beveled to fit the ball, with two wooden-handled arms inserted. Other implements were needed at the furnace. There were pokers for stirring the fire, tongs with circular jaws for taking up shot, rasps for scraping, an iron rake for removing cinders from the ash pit, a tub for cooling heated tools, a bucket, and a rammer with head covered by a circular plate of sheet iron of larger diameter than the ball to remove clay from the bore of the cannon when clay wads were used. Many of the implements were furnished in twos so that one set could cool in the tub while the others were in service. When the battery was in action it took three men to serve the furnace and handle the tools.

In preparation for loading the projectile, the gunners elevated the cannon muzzle; next they rammed home the cartridge or powder bag. After the powder was seated, a dry hay wad was rammed against it, then a wet hay or clay wad. The powder bag was pricked open and primed through the vent and a wet sponge passed through the gun. Finally, the hot shot was rolled in, packed with another wet hay or clay wad, a match was applied to the touchhole, and the projectile was launched.

★ ★

Laboratories of Our History

The policy of preserving our growing heritage of nationally significant historic sites, buildings, and objects for the inspirational and educational benefit of the American people of today *and of tomorrow,* has been enunciated and reaffirmed by Congress as a prime obligation of our individual citizenship and of our collective nationhood. Instructive examples of this policy of historical conservation are afforded by the National Park Service of the United States Department of the Interior in its protection of five famous coastal fortifications which bear intimate association with vital stages of our national development.

Fort Marion (Castillo de San Marcos) and Fort Matanzas, at St. Augustine, Fla., proclaimed in 1924 as national monuments, are venerable coquina-built strongholds which once were symbolic New World outposts of Spain's Golden Age. Still well preserved, they are the oldest existing fortresses built by white men in the United States. Fort McHenry, a national monument and memorial shrine on the waterfront of Baltimore, Md., withstood a fierce British attack during the War of 1812 and inspired Francis Scott Key's *Star Spangled Banner.* Fort Pulaski, at the mouth of the Savannah River, in Georgia, and Fort Jefferson, situated on an island west of Key West, Fla., are protected survivals of the chain of impressive brick fortifications constructed on the Atlantic and Gulf coasts in the nineteenth century to guard against invasion by sea.

All these proud citadels of the past, although outmoded and abandoned as defensive works, nevertheless provide illuminating pages of America's military record. It is across their drawbridges and along their ramparts, rather than in the yellowing pages of paper books, that yesterday's soldier walks with us most vividly today and recounts the human story of his daily tasks, his nightly vigils, his professional duties, and his private feelings.



Hot shot oven, Fort Marion National Monument

The cartridges (the powder charge minus the ball) for hot shot were little different from those used for ordinary projectiles, being made of cannon cartridge paper or parchment well pasted to prevent the powder's sifting out. Sometimes two bags were used, one within the other. When clay wads were employed they were cylindrical in form, about one caliber long, and well moistened. Wet hay wads were preferable, however, and these were soaked in water for about 15 minutes, then allowed to drip.

When wet hay was used, steam often issued from the touch-hole or vent as soon as the ball was rammed home. This was the effect of the heat of the ball upon the water contained in the wad and no danger resulted from it. It is said that the ball could cool in the gun without firing the charge, but shots usually were fired as quickly as possible to prevent the steam from dampening and injuring the powder.

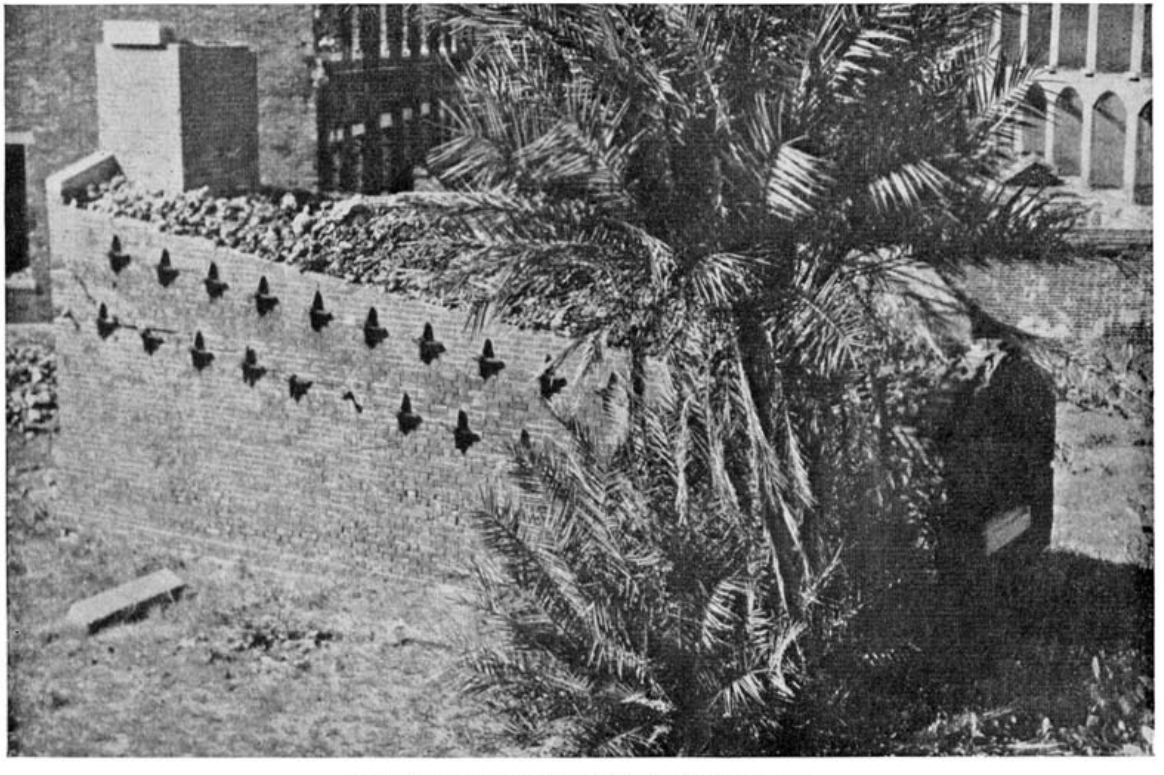
The statement sometimes is made that the cannon ball cooled in its passage through the air toward its objective. In reality the contrary is true, for the temperature of the shot was increased by friction with the air. According to the *Ordnance Manual* of 1861, a red-hot shot retained sufficient heat to set fire to wood after having struck the water several times.

Penetration of cold and hot shot into wood was found to be equal under the same circumstances. Charges for hot shot were reduced, however, to one-quarter or one-sixth the weight of the shot in order that the ball might remain in the wood and not penetrate it entirely or embed itself too deeply. It was discovered that fire was communicated more rapidly and certainly when the ball did not penetrate more than 10 or 12 inches, because at a greater depth communication with external air was not sufficient for combustion.

With the invention of the iron-clad *Monitor* and *Merrimac* during the War between the States, the days of wooden

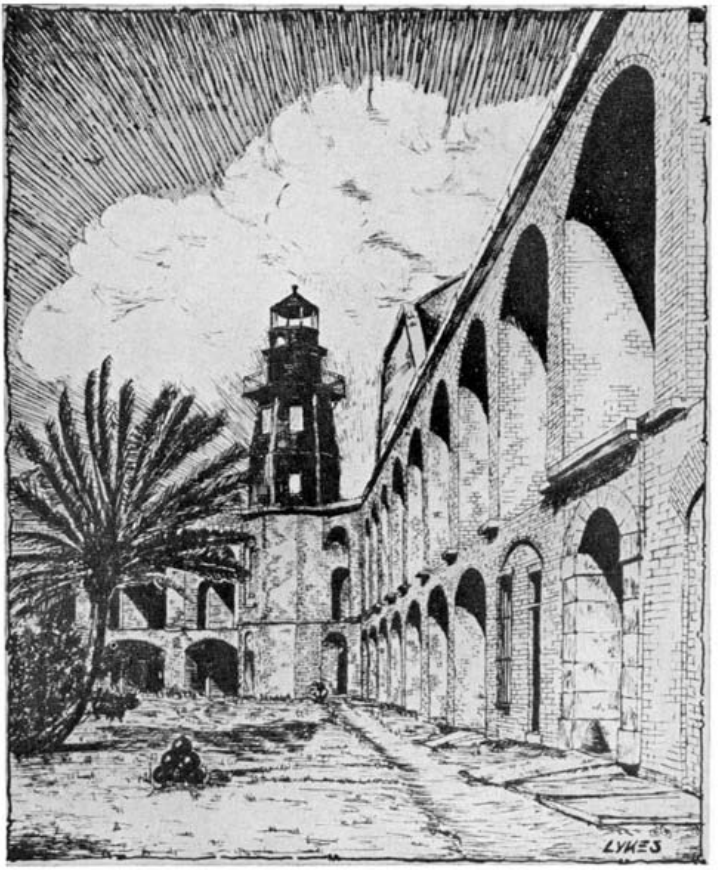


A section of the moat, Fort Marion National Monument



Shot oven at Fort Jefferson National Monument

battleships were numbered and the hot shot oven quickly became obsolete. It is cold and defensively useless today, but it constitutes nevertheless an interesting and suggestive historical object which, like the catapult, the long bow, and the claymore, illustrates the continuous evolution of military arms and equipment.



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Perry at Put in Bay

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Perry at Put in Bay

Echoes of the War of 1812

UNITED STATES DEPARTMENT OF
THE INTERIOR HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE, NEWTON B. DRURY, *Director*



Aerial view of the peace memorial and environs

Perry at Put in Bay[1]

Echoes of the War of 1812

By Dr. Charles W. Porter, Chief, Planning and Interpretative Section, Branch of Historic Sites, National Park Service

FROM 1793 until 1815, England was locked in a desperate struggle with Revolutionary and Napoleonic France. Involved in what was considered by all good Englishmen as a life and death matter, the British were not inclined to be squeamish about their methods of combating the French. This resulted in an infringement of American rights on the high seas. American sailors, being hard to distinguish from English seamen, were impressed into the British Navy. American ships were stopped and confiscated with their cargoes.

The French, mindful of the old Franco-American Treaty of Alliance and resentful because the United States now refused them aid, likewise interfered with American shipping. Quasi-war between France and the United States ensued from 1798 to 1800 and though peace was preserved outwardly, American commerce continued to suffer from both French and British outrages as England issued "Orders-in-Council" designed to blockade France, and as Napoleon responded with "Decrees" intended to prevent neutral shipping from carrying aid to England. By 1812, the situation was not unlike that in 1917 when Britain with her navy and Germany with her submarines had American commerce between the hammer and the anvil. According to estimates of President Madison, between November 1807 and July 1812, the British seized 389 vessels and the French 558.

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[1] From *The Regional Review* (National Park Service, Region One, Richmond, Va.), Vol. 1, No. 4, October 1938, pp. 2–8.

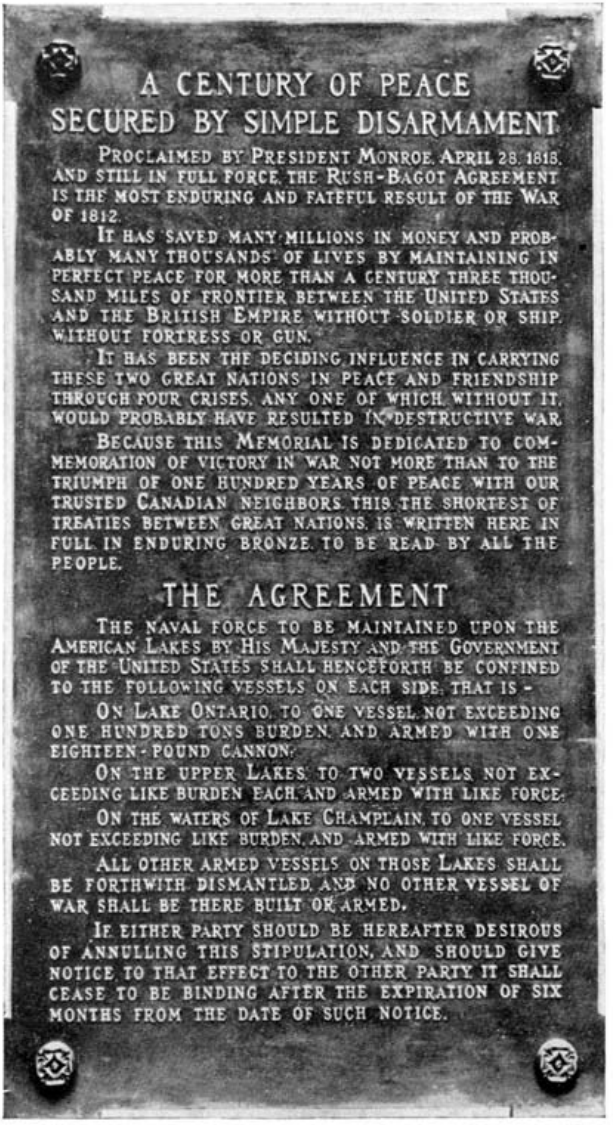
Sentimental ties with France dating from the American Revolution, the land hunger of the American "War-Hawks," who envisioned an easy but profitable conquest of Canada, the diplomatic trickery of Napoleon, and the fact that France despoiled only American property while England infringed personal rights (impressment), as well as property rights, eventually in 1812 caused the United States to declare war against England. Popularly considered, it was a war for "Sailors' Rights and a Free Sea." The American act declaring war was adopted on June 18, 1812. By an ironical turn of fate, Castlereagh had announced in the House of Commons on June 16 that the Orders-in-Council would be suspended immediately, and the suspending Order-in-Council was agreed to next day, though not actually issued until June 23. In other words, if cablegrams had then been possible, the war might have been averted, because the obnoxious Orders-in-Council were the ostensible cause of the conflict.

Most of us are familiar with the names of the American naval officers who distinguished themselves in the War of 1812—Isaac Hull, Stephen Decatur, David Porter, Oliver Hazard Perry, and James Lawrence who, dying in defeat, coined the slogan, "Don't give up the ship. Blow her up." Although the details of the naval battles may escape us, one remembers with pride the outstanding encounters in which the American ships were victorious on the high seas, such as in the fights between the *Constitution* and the *Guerriere*, the *Wasp* and the *Frolic*, and the *United States* and the *Macedonian*. The glory won by individual captains in a succession of separate duels without strategic significance should not blind us, however, to the fact that by the end of 1814 the English fleet had successfully blockaded every American port from Maine to Georgia. The American sloops and frigates were then bottled up in port and could escape only at great risk by evading the English ships at night under cover of severe

weather conditions. American overseas commerce and even the coasting trade were reduced to a state of "deplorable stagnation."

On land, the American military operations left much to be desired. At the end of the first year of war, Wellington remarked that the American campaign against Canada was "beneath criticism." Military unpreparedness and negligence reaped their just reward in August 1814, when the British moved on Washington. Five miles northeast of the capital, the American militia retreated in such a panic that the event was humorously referred to as the "Bladensburg Races." Shortly afterwards, Washington was captured and partly burned by the British in retaliation for American destruction of public property at Newark and Toronto. The most important pitched battle was the Battle of New Orleans, fought 2 weeks after the British and American commissioners had signed a treaty of peace at Ghent, December 24, 1814. It already has been said that if modern systems of communication had existed, war might not have been declared by the United States. Similarly, if news of the Treaty of Ghent had been known, the greatest land battle of the war probably would not have been fought. Doubtless the most far reaching of all of the events on land were concerned with the Indians rather than the British. These were the defeat and death of the Indian chief Tecumseh in the battle of the Thames, October 5, 1813, and Jackson's decisive victory over the Creeks in the battle of Horseshoe Bend, November 9, 1813.

In English history, the War of 1812 with the United States is such a minor incident in the larger story of the British effort to crush Napoleon that the war in America is hardly mentioned in most English history books. The chief results, so far as the United States were concerned, were a diminution of the Indian menace and consequently a more rapid settle-

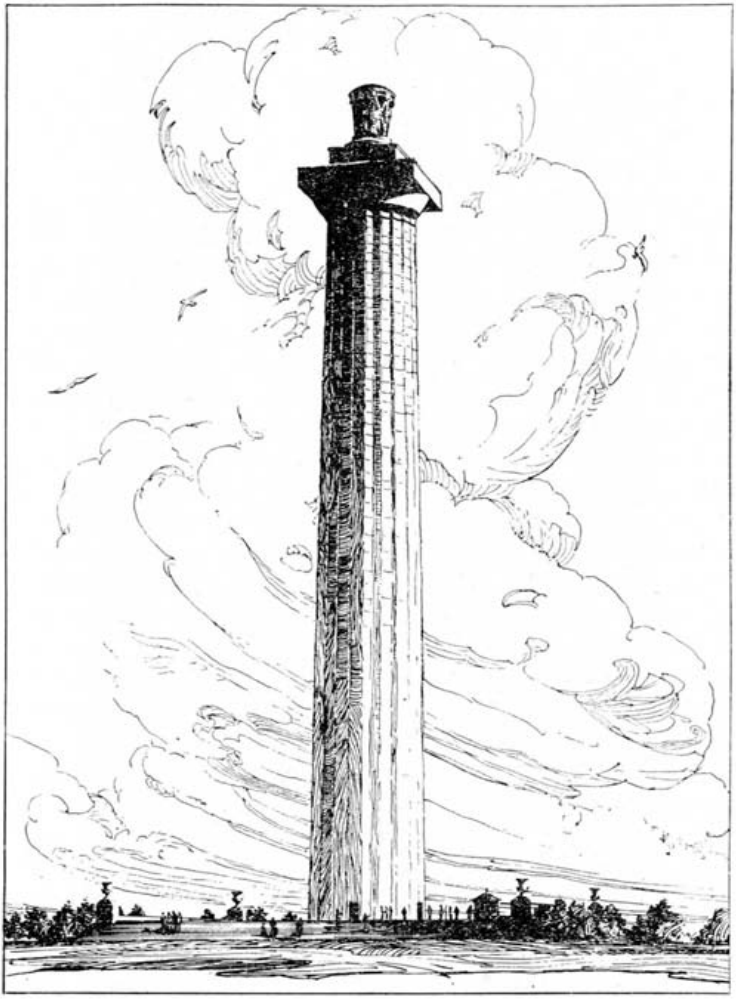


Bronze tablet on memorial shaft at Put in Bay

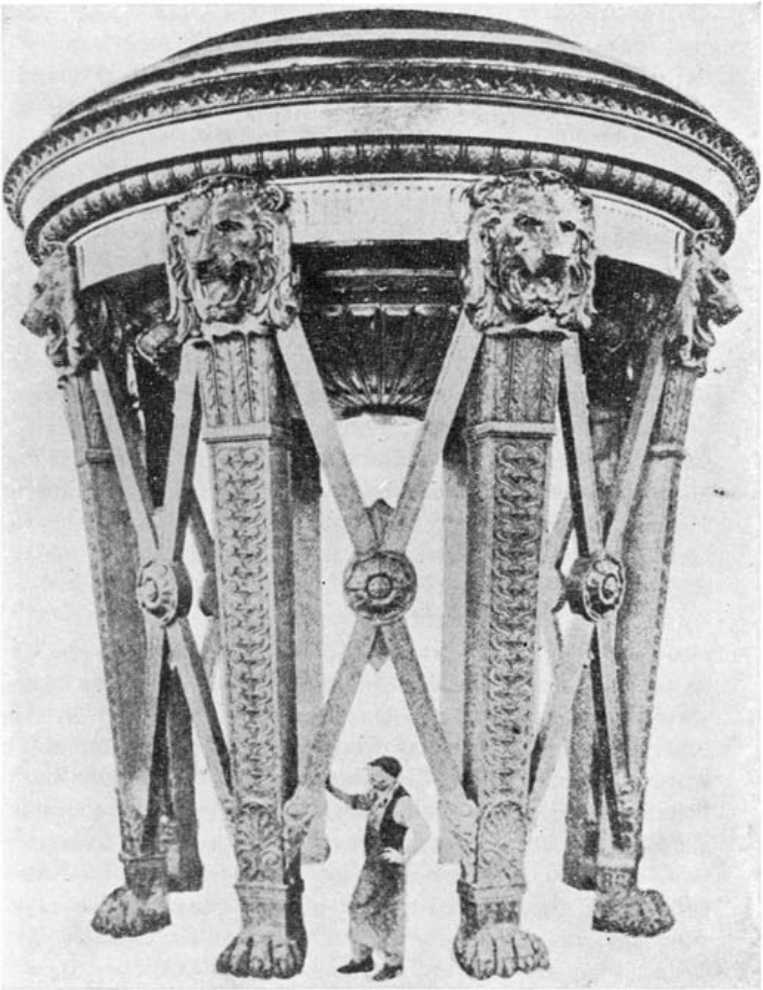
ment of the West, the development of a new nationalism and a more vigorous national spirit, and finally the achievement of a certain degree of economic independence on the part of the United States as a result of the war and blockade which led to the development of the infant industries of New England.

It often has been said by the more cynical historians and diplomats that a treaty of peace may be defined as "the foundation for the next war." The Treaty of Ghent, December 24, 1814, was a doubly remarkable document. Concerning the more important issues over which the war had been fought, the treaty had absolutely nothing to say; yet it was regarded at the time, and has been ever since, as one of the most popular peace treaties ever made. The war as a whole had not gone well for the United States and an honorable cessation of hostilities was a welcome relief, especially in consideration of the fact that Napoleon had just been exiled to Elba and it looked as though Britain would be free to send Wellington and his veterans to America. In these circumstances the people in the United States felt not unlike a college student body and football team that had fought hard all afternoon to stave off defeat and had at last been rewarded with a tie score. Then Napoleon came back from Elba, embroiled Europe in war again, and Britain thanked her lucky stars that Wellington and his veterans had not been sent to the Western Hemisphere.

Shortly after the peace of Ghent, Great Britain and the United States perpetuated the prevailing spirit of good will and respect by coming to three agreements which consolidated the amity of the two nations. A commercial convention of 1815 provided for reciprocal trade between the United States and the British Isles and between the United States and the British East Indian possessions, though trade with the British West Indies still was denied. An agreement of



Commemorative shaft at Perry's Victory and International Peace Memorial National Monument, Put in Bay, Ohio. From a drawing by George N. Wallace



This 11-ton bronze urn, 23 feet high, is equipped with powerful electric lights which project a vertical beam

1816 provided for the disarmament of the Great Lakes, and the Convention of 1818 made regulations for American participation in the Labrador fisheries, ran the Canadian boundary from the Lake of the Woods along the 49° latitude to the Rocky Mountains, and provided that the Oregon country should be held in joint occupation for 10 years. By treaty in 1846, the boundary along the forty-ninth parallel was extended to the Pacific. The end of the War of 1812 thus began a period of peace and friendship which has existed for more than 120 years, although the Canadian-American border is, for more than half of its distance, only a line on a map. It is therefore quite fitting that this remarkable record of international concord should be signalized by a peace memorial on one of the Great Lakes, close to the imaginary line separating the United States and Canada. The lakes separate and at the same time unite the two peoples, and their unfortified and disarmed condition is an everpresent reminder of Canadian-American success in the maintenance of peace without warlike preparations.

It remains to be explained how a "Victory Memorial" also can be a "Peace Memorial." At first, one might be led to think that celebration of the success of American arms would excite ill-feeling in the hearts of our friends on the other side of the Canadian-American border. It is a noteworthy fact, however, that though Americans might burn British property and the British destroy American goods in the War of 1812, the conflict gave rise not so much to bitterness as to a wholesome mutual respect on the part of the two peoples for the fighting ability of each other on the seas. After the battle between the *Chesapeake* and the *Shannon*, the British gave the gallant Lawrence and his dead compatriots all the honors and homage that one side could give to the other. The battle flag of the *Chesapeake* has an honored niche in the Royal United Service Institution museum in

London. Similar places of honor have been given to captured British flags now kept in the United States Naval Academy at Annapolis. Capt. Samuel Blyth of the British brig-of-war *Boxer* and Capt. William Burrows of the American brig-of-war *Enterprise*, killed in battle with each other, September 5, 1813, are buried side by side in similar tombs at Portland, Maine. Similarly, three United States and three British naval officers, killed in the Battle of Lake Erie, are buried beside each other under a slab in the base of the peace memorial at Put in Bay.

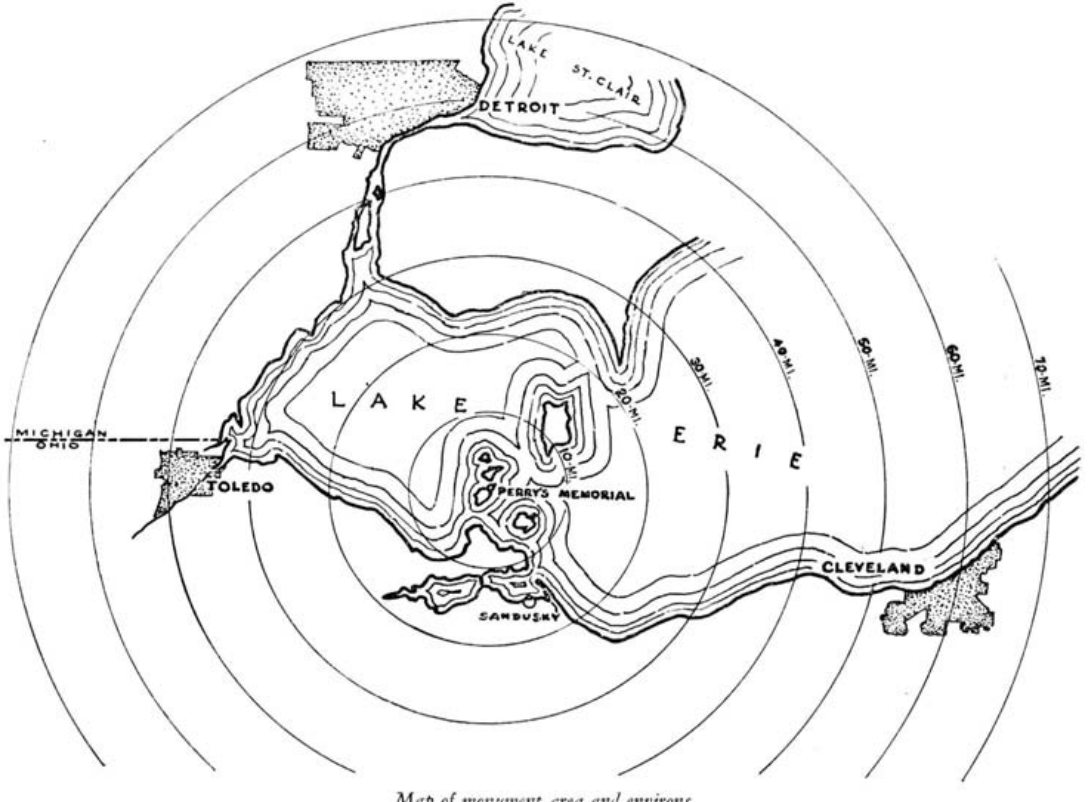
The story of the Battle of Lake Erie and of Perry's victory is a stirring one. The enemy fleet blockading Perry at Erie was led by Comdr. Robert H. Barclay. The latter relaxed his blockade for a moment and during August 2–4, 1813, Perry crossed Erie bar and took to the lake. He returned to Erie on August 10 and was reinforced by Master Comdt. Jesse D. Elliott with 102 men. On August 12, the fleet sailed up the lake without being opposed by Barclay who had retired to a station on the Detroit River. Perry then made Put in Bay his headquarters in order that he might watch Barclay and yet be convenient to Gen. W. H. Harrison, commander-in-chief of the western U. S. Army with headquarters at Seneca-town.

On September 9, Barclay sailed out to confront him, and the two fleets met the next day about sunrise. Perry had nine small vessels, the largest of which were the sister brigs, *Lawrence* and *Niagara*, of 480 tons burden each. The British commander's fleet consisted of the *Detroit*, the *Queen Charlotte*, and four other small vessels. In point of armament Perry had a decided superiority; but the number of effective men was about the same. As Perry planned the battle, his flagship *Lawrence* was to fight the *Detroit*, flagship of the enemy; the *Niagara*, under Commandant Jesse D. Elliott, was to fight the *Queen Charlotte* and the smaller United States vessels

were to contest with the smaller British ships. At 10 a. m., Perry raised the battle flag of the *Lawrence* upon which had been inscribed Captain Lawrence's memorable words, "Don't give up the ship." In the battle which began at 11:45 and lasted until 3 p. m., the *Lawrence* bore the brunt of the fight, Perry having thrown caution to the winds and engaged the enemy at close quarters. The *Niagara*, which should have supported him, hung back, either on account of a lack of wind to fill her sails or because Elliott preferred to take advantage of his two long-range guns which enabled him to pound the enemy at a safe distance. Toward the end of the furious struggle, Perry found the *Lawrence* unfit for further action and transferred to the *Niagara* which had at length come up. In another 15 minutes the fight was over. Barclay surrendered his entire fleet, having lost 41 killed and 94 wounded. Perry, the only American naval officer ever to capture a British fleet, lost 27 killed and had 96 wounded. More than two-thirds of the American casualties were on the *Lawrence*.

Perry had lived up to his middle name. He had staked all on a sudden, close-in offensive and had won a decisive victory. The United States forces gained control of Lake Erie and retained it to the close of the war. This enabled Harrison to cross the lake and invade Canada. Perry's famous message, "We have met the enemy and they are ours," was addressed to General Harrison. Control of the lake enabled the United States diplomats to make good their claim to the Northwest in the peace negotiations at Ghent.

The Perry Victory and International Peace Memorial at Put in Bay, Ohio, consists of 14.25 acres attractively located on the northerly side of South Bass Island, one of a group of islands extending southward across Lake Erie from Point Pelee. The monument was constructed under the direction of the Perry's Victory Centennial Commission, between



Map of monument area and environs

October 1912, and June 1915, at a cost of approximately $1,000,000, of which the United States contributed $250,000. It is of pink Milford granite and consists of a gigantic Doric column 300 feet high, the cap of which serves as an observation platform and resting place for a small penthouse surmounted by a bronze reflector 20 feet wide and 23 feet high and weighing 11 tons. The total height of the monument is 352 feet. The reflector is fitted with powerful electric lights that throw a beam straight upward. There is a plaza of 154 feet by 159 feet at the base of the monument and a lower plaza, 75 feet wide and 183 feet long. The column is, of course, hollow and is fitted with both stairs and elevator. Entrance to the column and to the rotunda of the memorial is gained by four doors marking the diameters of the column and facing the cardinal points of the compass. There are 467 steps in the stairway, which represent quite an exhausting climb, but the elevator ascends in 1 minute. The observation platform, or parapet, is designed to accommodate 300 people at one time. The scene from this point is one of great beauty and on a clear day it affords a view of the spot, 6 miles due west, on which Perry won his great victory, September 10, 1813.

The reservation of 14.25 acres and the memorial were ceded to the United States by act of the Ohio Legislature in 1913 and accepted by act of Congress approved March 3, 1919. Act of Congress, June 2, 1936 (Public, 631, 74th Cong.), provided for the creation of the Perry's Victory and International Peace Memorial National Monument by Presidential proclamation. The act and proclamation provide for the administration, protection, and development of the national monument by the National Park Service and for a board of advisers referred to as the Perry's Victory and International Peace Memorial Commission.

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