How Hot Springs Came To Be
Exhibits in New National Park Museum at Arkansas Resort Explain in Detail the Geological Formations Involved in Producing Famous Health-Giving Waters.

By Mary D. Hudgins
July 25-37

The Hot Springs National Park museum tells the complete history of that area. The story goes back 250,000,000 years. Pictures, charts, captions and models explain clearly the changes which have taken place in the earth's crust, making the waters of the hot springs possible.

The museum is in a large room to the right of the entrance on the first floor of the Park Service Administration building. A series of 15 cases arranged along the walls and through the middle of the room tell the story of the development of the area about the hot springs from its first emergence above the ocean bed to the present time.

The Hot Springs National Park Service staff, headed by D. S. Libby, superintendent, worked for months selecting, checking and cutting information and possible exhibits. H. W. Lee, acting park naturalist, did much of the work. Experts of the Museum Division of the National Park Service at Washington, D. C., have carefully prepared material for the cases. Albert McClure of Washington spent two weeks supervising the installation of cases and their contents. The Arkansas History Commission, through its secretary, Dallas T. Barnard, made available an elaborate display of Caddo Indian artifacts. The Hot Springs Natural History Society co-operated in every way possible. Members of pioneer families have lent and contributed valuable memorabilia of early day Hot Springs.

Of the exhibits, Superintendent Libby says: "I feel that the residents of Hot Springs and the visitors to Hot Springs National Park for years to come will consider the exhibit the most effective means of telling the story of the earth forces which caused the hot spring to exist, the aboriginal occupations and utilization of the springs for health purposes, early discovery by white men, pioneer settlement and development, early and current park administration and the intriguing interrelation of all phases of natural science responsible for the plant and animal adaptation found in the park and the vicinity of Hot Springs."

Circling the room from right to left, one is introduced to and made instantly and thoroughly acquainted with the changes in the earth's formation during many millions of years; origin and formation of mineral deposits; early life forms; the Indians and how they utilized what they found near the springs; the early evening of the white man, featuring the expedition of Hernando de lobo; the later coming of the hunter, pioneer home builders and men of science intent on physical and chemical research; the development of the park and city, individually and collectively, and above all the alternating of the hot waters under the various agencies which have dictated their control.

As one enters the room the first thing to the right is given over to a huge map. It depicts a cross-section of the earth's formation cut vertically deep into the interior of the globe. A series of printed cards at either side of the map explain changes that have taken place in region of which the park is a unit and the piling of layer upon layer of earth materials—rocks and minerals—upon it during the passage of eons of slow development.

The legend begins with an explanation of a great sedimentary basin, which, delta-like, was deposited from wash from the ancient mountains to the south, which were called Llomeria by the geologists. Gradually these beds of erosion-deposited rocks hardened into a rocklike mass. This was uplifted and folded into jagged mountains by the great interior heaving of the earth. During the latter part of the Paleocene era—the time of ancient life—there were great ridges was forced above the rest of the district. At points where the strain was greatest, faults occurred. These faults resulted frequently in great cracks appearing in the wavelike strata of rock. After the mountains had been thrown up, nature set to work to level them down again. Water lapped against the mountain peaks. Winds blew away the surface soil. Finally, the hills were worn away until the whole surface was a vast plain.

A little before or during the next period of uplifting of mountain peaks, huge beds of molten magmas were introduced into the region and forced through the faults, or cracks, from the heart of the earth. The sedimentary rock beds into which the magmas were forced in time cooled far more quickly than the newly intruded molten substances. It is thought that these intrusions, deep seated, and in the earth's crust, are responsible for the heat of the hot springs.

Case No. 2, along the museum's right walls, holds as its central attraction a "U" shaped tube. It is lighted to reveal the water flowing down one arm of the convery and up the other to an equal height, forced by the pressure of the water behind it. Thus, instantly the observer may grasp the principle by which many scientists consider the source of the water is explained, as well as the manner by which the hot springs reach the surface.

This animated exhibit is mounted on a chart showing a vertical cross section of Hot Springs National Park — a cross section which makes Hot Springs West and Sugar Loaf mountains mere inch high projections at the top of the map. The theory goes that during the period of uplift and erosion, a huge mass of porous Big Rock chart, embedded between an upper layer of Pink Creek shale and a lower border of Wombell shale was exposed to the surface. Both Pink Creek and Wombell are water resisting. Water — from rain, springs and creeks—filters down through the sponge-like consist of the Steve-like Big Rock chart. Perched above and below by the impervious layers of shale, like the "U" tube of the demonstration, the water is filtered downward and forced up to the surface again, flowing in the natural water pipe of the folded chart. Somewhere along its way it doubtless comes in contact with superheated steam rising from the deeply buried masses of hot rocks.

Cracks in the surface layer of Pink Creek shale permit the rising of the heated water to the surface. Such a process constitutes the most popular explanation of the creation and existence of the hot springs.

Other possible sources of the hot springs are, according to the museum charts, several. One takes into account the possibility of the disintegration of radioactive mineral in the rocks. Another possibility is the friction caused by sliding of rock masses over one another during the period of faulting. The "normal heat gradient of the earth's crust caused by the weight of overlying rocks and conduction from the hot core" is another theory that deserves attention. A fourth is "oxidation, reduction and other chemical reactions in the rocks." With the introduction of the four less widely accepted theories comes the possibility of "pristine" "virgin" or "juvenile" water—which has never before reached the surface of the earth as a basis for the flow of the springs.

A central case has a chart which diagram the radioactive quality of the water. The Arkansas hot springs are compared to European spas as to radio activity. The waters of Hot Springs National Park are shown to rank to good advantage in the analysis.

Baths Taken at Hot Springs Show Gain

Hot Springs, Ark., Dec. 31 (AP)—Hot Springs National Park, where the prosperity barometer is based on the number of baths you take, found 1937 a good year. Bath takers in the bathhouses supplied by the government-owned hot springs reached 657,369 through December 31, 1937, compared with 514,751 for 1936.

Attractions of the National Park Service said the 1937 figure was "an all-time high," the figures ranging from 1932 to 1933.

Every month of the past year, except the month of December, showed an increase over similar periods of the preceding year.
THE GREAT OUTDOORS

Special to the Gazette

Hot Springs, June 16—Officials of the National Park Service, Washington, have notified Superintendent Donald H. Libbey that they have selected the above picture taken from the top of the tower at Hot Springs mountain, which has been enlarged many times, to be framed and hung in the new administration building of the Park service.

The mountain to the left with the shadow is West Mountain and the one to the right in the shadow is Sugar Loaf mountain, both of which are in the Hot Springs park domain. In the valley may be seen the Medical Arts building, the tallest structure in Arkansas. In front of it is the Arlington hotel and on the right (the smaller structure) is the New Park hotel.

The picture does not pretend to show anything of the city of Hot Springs or its main thoroughfare, Central avenue, which it was selected because it contained such a fine exemplification of "the great outdoors", and reveals that Hot Springs is nestled in the lap of the beautiful Ozark mountains. Superintendent Libbey, shortly after taking charge here, was so impressed with the scenic grandeur of the picture that it, too, had one enlarged. Like the one in the National Park Service building in Washington, it is in a special frame. "It is one of the greatest views of the glory of our national parks," said Superintendent Libbey.

Calcutta

food consumed by the members of the tribe. It is easily possible that Capt. John Smith, when he quoted his slogan "Those who will not work, cannot eat!" from the code of the redman.

The exterior appearance of an earth lodge in its prime must have looked very much like a Zulu chieftain's notion of a giant beehive. As well as archaeologists can reconstruct the fort, or must have been something like this A circle was described, from 14 to 33 feet in diameter. Into it at one end the entrance was driven and drawn up to a low dome. Atop him and almost at right angles still smaller poles were laid, giving a layer of earth to form the roof. Roof poles were interlaced with still smaller poles, cane and small sticks. A layer of sedge or grass was added and on top was placed a thick coating of wet dirt. Side walls were subjected to a similar coat of stucco.

Writers sometimes mention Spanish moss as being used in the grass coat of side walls and roof. One of the few places in central Arkansas where Spanish moss grows abundantly is Cedar Glades, the center of one of the richest sources of Indian artifacts in the state.

At the center of the roof of the earth lodge a large opening was left. Here smoke from the communal fire built in the middle of the room below might escape. A single door usually served as the only other source of light and fresh air.

Six to a dozen families lived in one of these dwellings. Privacy was simply and skillfully contrived. Six or eight feet inside the outer wall a second circle of poles was driven into the ground, some six feet apart. From outer wall to inner poles the walls were stretched. When walls were hung between inner poles no Indian could ask for a more compact retreat than his six-foot-square cubicle afforded him.

Housekeeping was relatively simple. The chief squaw took charge of the grain raised by the beavers in the fields on the river banks. She presided over the distribution of the game, which was hunted and consumed in common.

Vessels for storing grain, baskets and jars for extracting salt from the earth, and the pots used in the getting and preparing of food were hand-made. Often the process was a complicated one. Clay was rolled into long, snake-like whips. These were coiled in ever widening circles, circles which might flatten out into a dish or curve upward into a narrow-mouthed jar. For the more primitive vessels, sun baking was enough. But for the more delicate, yet lasting posts, those which were elaborately decorated, a system of firing in hot ashes over a bed of glowing coals was used.

Arkansas pottery is deemed by archaeologists to be of exceptionally fine quality. Dr. John R. Swanton of the Bureau of American Ethnology, Smithsonian Institution, says: "Archaeologically, Arkansas is one of the most important states in the Mississippi valley." And Dr. R. Herrington, curator of the Southwest Museum of Los Angeles, says: "Southwest Arkansas yields early earthenware that is for quantity and for variety of form and decoration has few rivals in the territory now covered by the United States and Canada; in fact, only the Pueblo district of the Southwest and the mound region of the Middle Mississippi valley can pretend to compare with it; and of those, the art of the latter is in many ways inferior."

Along with these monuments to the art of the Pueblo and the Pueblo, we have the works of long-deceased redmen, remarkably fine specimens of Caddo pottery have been found, especially along the banks of the Ouachita and Caddo rivers. Usually they are discovered either in mounds which were burial grounds or in the remains of what once were earth lodges. It is odd, when actually so few Indians roamed the hills of Arkansas, that so many fallen lodges have been found in so many places. The answer is simple. An earth lodge was not necessarily a permanent home. Villages generally constituting a number of earth lodges and perhaps a ceremonial house were concentrated near the headwaters.
and appreciation of art may be traced in that man of "reputation" who found in soil deposited so slowly through the centuries.

While the Harrington party worked the Laurence site they heard tales of the artifacts to be found farther on near Caddo Gap. In 1915 floods washed uplift and soil from the farm of Cotton Golden and brought to light valuable pottery of an early civilization. Golden went to town and told his friends. Many of the finest examples of that unearthly may be seen today in the museum of the Hot Springs bath house in Hot Springs. The late Dr. A. U. Williams, another Indian enthusiast, acquired some of the jars sold by Golden.

When his work at Laurence was finished, Harrington moved on to Cedar Glades. Here he found deposits quite similar to those located nearer Hot Springs, but his time was short, and it was necessary to abandon his project in order to be on hand to land at one of the mounds into which Harrington dug.

Seven mounds were investigated by Harrington and his party. Four, averaging five feet high, were fallen earth lodges. Two mounds indicated possible village sites. Burials were discovered on or near the sites, and fragments of pottery were found at the edges of most of them. Remarkably fine artifacts were uncovered. But the fact remains that it was the most extensively excavated part of the Harrington discoveries. At a depth of nine feet, nine inches, he discovered a human skull. The site was then known as the "Skull Site," and now as the "Harrington Site." A large cairn of stone and earth, which he inventoried as a mound, now lies beneath the waters of Lake Catherine. A smaller cairn of stone and earth, which was uncovered by Harrington the next year, has been removed from the area.

Dr. Dellinger’s work has been thorough and his enthusiasm continues. He was the lead archeologist for the entire project. His work was neat and thorough, and he was known for his meticulous attention to detail.

The site, which had been a small but significant one, was covered by river sediments. The deposits were deep, and it was necessary to be very careful in order not to disturb the artifacts. The entire site was carefully excavated, and the artifacts were carefully recorded and cataloged.

On the ground floor of the buildings, which are located near the site, there is an exhibit of the artifacts that were found there. These artifacts include pottery, stone tools, and bones. The pottery is particularly interesting, as it is of a type that is not commonly found in the area.

The site was donated to the University of Arkansas by Mr. C. J. Harrington in 1937. Since then, it has been managed by the university and has been open to the public for educational purposes.

The site is located on the campus of the university, and is easily accessible by foot or car. It is a beautiful location, with trees and gardens surrounding the buildings. The site is also a great place to learn about prehistoric Arkansas, and is definitely worth a visit.

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Street scene on Central Avenue, Hot Springs, as Jay Gould saw it when he was guest of honor at Castle Park.

he had got along in years he broke loose and wasn’t fooling. Around and around inside the park’s little white picket fence he chased the owner. Finally they shot him. There was no other way.

His had been a spectacular career. Once a private dinner party held in honor of Jay Gould at a leading resort hotel by the high mumps of the community was delayed a full hour, and Bruin was responsible. Little did the pet bear care that the manager was late. Near the bear a man had broken down and was left lying in a pool of blood. Bruin was able to get the bear to his feet and lead him away. He then went on to do his own thing, ignoring the situation.

Bruin was a famous bear, known for his intelligence and his ability to perform tricks. He was a favorite of the public and was often featured in advertisements and on radio and television programs.

Gazette 5-29-28

Building castles in Spain usually is considered a precarious business. Building Castle Park in the village of Hot Springs, Ark., during the early 1920s, the financier was popularly considered nothing short of foolhardy. How any man could have expected to cash in on a modern amusement center, complete with dance hall, auditorium, skating rink and the beginning of a saw in a hamlet reached only by stage coach, no one living in Hot Springs at that time could say. The only incredible thing is that it did succeed, and gloriously.

Perhaps Bruin, a dancing bear, famed for his fondness for beer and noted for the wrestling contests which he usually won, had much to do with it. Bruin, however, wasn’t the sole attraction. The skating rink was a big drawing card. It was a sport enjoyed by grown men and women and children alike. Those who owned their own skates took them along, others rented them on the grounds.

Although everybody knew a salmon was part of the set-up, Castle Park remained a favorite for a long time. The views in its wide expanse gave welcome shade to parties. A local school pensive.

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there was a right turn and the journey continued for a few blocks. Brunin wasn't expecting it, but he was always glad to accommodate where beer drinking was concerned. The mayor's speech was brief, نوعי and to the point. Such a famous visitor, he felt sure, must have seen some rare sights in his time. Now he was in for a new one. "Mr. Brunin, Mr. Gould, Mr. Gould, Mr. Brunin." The mayor bowed. "Mr. Gould, I have had the honor of presenting one of Arkansas's first citizens who is eager to drink your health." Brunin's chain wasn't long, but he advanced as far as possible and gave his own version of a smile.

For a moment, Gould was a bit taken back. But as the cork was drawn and the bear began to rock farther and farther backward, clinging to the empty bottle, a slow grin spread over the visitor's face. As the level of the liquid descended in the bottle the grin widened. By the time the first bottle was finished the usually stately Gould had so far unban that he set them up for the whole crowd, and especially for Brunin.

At the dinner which followed, and which turned out to be not so much the worse for a little waiting. The Wizard of Wall Street" turned out to be the wit of the occasion. Brunin, whose bear had reminded him of the woodland bear, he had encountered while serving as a civil engineer in his youth, had been a mover of the Lewis and Clark expedition in 1828. In 1832 Congress created a reservation to prevent exploitation of the waters for private gain, but litigation ensued which was not ended until a Supreme Court decision in 1876.

Alabaster Map of State Given Hot Springs Museum.

Special to the Gazette, 5-21-33
Hot Springs, June 29—An alabaster model of Arkansas, eight feet high and 11 feet long has been installed in the National Park Museum here. It was presented by Dallan Henderson, Little Rock, secretary of the Arkansas History Commission. The model is the reproduction of a map drawn by the late Dr. John Brunner, state geologist from 1877 to 1916, and the father of the present state geologist. It shows all elevations principal highways, especially those along principal highways, and the location of all state roads.

Hot Springs National Park To Be Enlarged.

Washington, D.C., June 29—Fifty thousand acres will be added to Hot Springs National Park, when President Roosevelt, under authority of the act appropriated $1,000,000 for the enlargement of the park, signed the bill enacting the park yesterday.

"The next thing will be to get an appropriation for additional maintenance," said H. S. Lithbey, who bills himself as the "great national park" of the government's work. "The park is open to the public by donation or purchase, but it is the business of this government to keep it open to the public by donation or purchase, and it is to round out the park area."

The opinion was read, more expensive foot trail and bridle paths will be sought by the National Park Service.

ARKANSAS AND THE GROWING PARK PATRONAGE, 5-29-33
The National Park Service reports that the number of persons who have visited the national parks since last October, 1932, is an increase of 11,870 over the corresponding period last year. Last year there was a 20 per cent increase over the previous year, which itself brought a record breaking number of visitors. 9-3-31

The popularity of national and state parks is growing with every year, and Arkansas stands to gain a continually increasing tourist business in consequence. Arkansas has its own state parks, and in reces-
ARKANSAS BEAUTY SPOTS IN BLOCK PRINT

By Vivian Williams Utley

The question often is asked: "How long have the healing properties of the waters of Hot Springs, Ark., been known?"

Tradition says that their curative properties were known to the Indians long before the Spanish explorations, that they warred for them, that they were sold, and is making an agreement, whereby all tribes had access to the springs. They probably were known to De Soto, who reached the place on his Southwestern journey of 1541-42, "since the historian of the expedition relates that they came to a place where their horses drank of a lake of very hot water and somewhat brackish."

The springs were visited about 1800 by French hunters. The Lewis and Clark expedition found them in 1806, when a hunting and trapping village was already established there.

The Spaniards realized the value of the springs, and the Spanish authorities tried to detach them from the Louisiana Purchase of 1803. Visitors began coming in 1812, many of them bringing their families and camping near the springs.

Featherstonhaugh, the English traveler and geologist, visited them in 1834 and described them in the following passage: "Four well-built log cabins, in one of which was a small store, contained all the accommodations that the springs offered to travelers. We had never seen anything worse or more unpromising.

A Mr. Whittington, who purchased bear skins and other skins of wild animals of the hunters, was paying for them with the commodities he gets from Little Rock, was obliging enough to say that we could take possession of one of the cabins." He then says that Mr. Whittington located them some skins to cover with and that they feared a dismal visit in the place.

Since Mr. Featherstonhaugh was a naturalist and was sent here for geological research in America, he probably found much to report on the geological formations around Hot Springs.

In 1833, a Thompson leased the springs and built a bath house, commercializing on the hot water. Other citizens bought land at or near the springs. In time several families claimed the land on which the springs were located and litigation followed until 1876, when a decision by the United States Supreme Court designated the land on which the springs are located as a United States National Park. Hot Springs was incorporated as a town in 1876 and chartered in 1879.

Hot Springs, Ark., probably is better known at large than any American city west of New York city. A railroad was built to the city in 1874 and visitors found it easy to reach the place. Business began to grow. It is now a thriving city. The National Park is under federal supervision, including all the bath houses. The government has an Army and Navy hospital there, as well as a government bath house where needy people can be treated free.

ARKANSAS BEAUTY SPOTS IN BLOCK PRINT

By Vivian Williams Utley.

Devil's Den State Park is located in the northwest corner of the state, in the Boston mountains, 25 miles southwest of Fayetteville.

One wonders what could suggest such a name for a state park, but a description of the wonders and beauties of the region offers the answer.

It is so named because of an unusual formation of a rock ledge which parted and formed a subterranean cave several miles long and varying from two to 50 feet in width. Like all caves found in isolated places, legends and stories about its history abound. It is said that an Indian girl was once carried to the cave and killed. Someone's imagination about the infernal regions gave the cave its distinctive and possibly very appropriate name.

The dam pictured in the print is one of three on Lee's creek, a small stream in the valley, the source of which lies in small springs and streams. During the dry season pools of clear water stand on the rocky bottom of the creek, but after a rain the creek rushes through the mountain valley with a fierce force that cuts out the eroding banks which are overhung by high bluffs 800 feet high.

Many of these high bluffs are in the form of stairsteps and are extremely steep. They overlook points from which one may view the beautiful valley below. Several little waterfalls tumble over 60-foot-high bluffs, adding to the beauty of the park. Blooming trees abound, as well as the better known timber trees on the mountainsides.

Wild life has been almost killed out by hunters, but the state Park Commission hopes when the entire region of 5,500 acres is placed under the proper supervision that the park will be restocked with animals active to that section.

A CCC company has been working on the park for several years. The most important of the completed developments are the roads and paths for horseback riding and walking. When the project has been completed it will contain all necessary equipment for a recreation area. Cottages, assembly halls for all kinds of gatherings, a water system, amphitheaters, swimming and fishing facilities, camping sites with picnic tables and furnaces will be included.

The dams will make several lakes within the park. One outstanding thing that will be restored in a settler's log cabin homestead that stands in the enclosure. It will be kept intact, with house, barn and fences, adding to its rustic charm.

Arkansas may well be proud of the state and national parks that are being established within her borders, and Devil's Den State Park promises to be one of the most attractive.
BEAUTY SPOTS IN BLOCK PRINT

BY ViRiCa WrrriRIe WrrL
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"Why make the long trip to the Grand Canyon, Yellowstone Park or Yosemite in the Gods to see world-cele-

brite wonders, when you can take a short drive up to Buffalo River State Park site in Marion county, Ar-

kansas, and see enough to keep you looking and wondering for a week?" asks Tom Shiras on, Mountain Home.

He might have said the same thing about Boone county, situated between White and Buffalo rivers, deep in the Arkansas Ozarks.

One passes on the brink of a paved highway to see a glorious varicolored sunset above majestic mountains cov-

ered with stately timber, veiled in a hazy haze, with the line between the hills and the sky lost in dark blue clouds overhead.

The view staggered the imagination. It seems like a stupendous stage set up for a movie stunt. Looking down in the valley where swift flowing streams zigzag around hills and mountains, one sees white bridges which mark the place where seemingly tiny roadways cross the crystal streams. Goats and horses on wellkept farms are far down in the valleys.

Often, going along on a ridge road at an elevation of from 1,000 to 1,800 feet above sea level, the shining white highway can be seen miles ahead on the other side of the valley. At many points where rivers and creeks have eroded for ages, high, pine-covered sandstone buttes, 500 feet high, have been left by erosion. Big holes on their sides mark the opening of caves, many of them running several hundred feet back into the hill. Some of these caves have been used as Indian battlegrounds and as the walls of variations are told about the possibility that De Soto's men carved scenes on the pictures on the walls of the caves.

It was a few miles south of Harrison, in the vicinity of Pin-

nacle Rock, shown in the print, that a man who was driving across a dry creek bed was to find a peculiar rock. He took it to Harrison and left it in a store, where Mrs. Bertha Babcock

found it and bought it. It is a pure Castile clay, found in the vicinity of Pinn-

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Pinnacle Rock, near Harrison, Boone county, Arkansas

found it and bought it. It is a pure Castile clay, sculptured out of pure quartz and of excellent workmanship.

There is some historic basis for the idea that the sculptured head may be that of De Soto, as an account of De
n
Soto's journey was written by one of his men and presented to the king and court of the Indies in 1541. [VOL. 2, Ar-

kansas Historical Commission: "We started for a province 11 days off", which they called Coligny," a novel

saying that Coligny is supposed to have been situated between the sources of the St. Francis and White rivers on the plains or the hills of the White river. On the way they "crossed vast plains and high mountains." Here they set out for the province of "Tula," which is supposed to have been in the country between the Wabash and Little Missouri rivers.

The account of "The Gentleman of Elvas," published in 1557, relates that De Soto sent out scouting parties to the west to ascertain the size of Indian towns and the amount of supplies they might secure. It is entirely possible that they came down Crooked Creek and wandered there. If that is true, one of their men might have made the sculptured head to pass away the time and it would have been natural for him to make a likeness of his leader.

On April 8, 1689, Gov. Powell Clayton approved an act of the legislature creating the county of Boone out of several surrounding counties and nam-

ing it for Daniel Boone, the Kentucky frontiersman and Indian fighter.

Harrison was founded in 1869 by Capt. W. W. Pick and named for Lauren Harrison, who surveyed and platted it.

It is a thriving town between majestic mountain ranges. Lumbering and fruit raising are the principal industries.

Roadside markets sell baskets, cider, grape juice, apples, peaches and melons in season.

STATE PARKS FOR ARKANSAS 1-10-09 SAT. RAK.

The state has been put on notice that Civilian Conservation Corps assistance in state park development work may be withdrawn unless the legislature makes adequate provision for maintaining and operating the parks.

But a more immediate threat is that the parks should be adequately maintained in the interest of the public and for the benefit of Arkansans as well.

It might be said that without the work the CCC has done Arkansas would have no developed state parks.

The government has provided almost all the labor and most of the money that have gone into them since the active development program started in 1932. The appeal asked for in the state Park Commission's budget amounts to less than one-third of what the federal government has been spending annually, and is prepared to keep on spending if Arkansas does its part.

It is important as it has been and is still to receive this federal assis-
tance, Arkansas for its own sake can not afford to lose the nine state parks which last year drew 182,000 visitors, including many from other states.

"Why Hot Springs Are Always Hot

Constant Temperature of World - Famous Waters Is Studied by Scientists.

By Mary D. Huddins. GAZETTE

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Just why the waters of Hot Springs range in temperature from 112.5 to 144 degrees Fahrenheit, with an average of about 143 degrees, has been a problem to scientists for many years and for explosives of the waters. Each man has sought to solve the enigma in the light of his own experience and beliefs. Darwin forces a heretical notion. But it is only within comparatively recent years that geologic science has been made and scientific theories evolved.

There are tales of both red and white wells, which fed the spring, containing pools. One account of the Hernando DeSoto expedition tells that the party was "in some difficulty," which came unexpectedly upon lakes of very hot water. But the self-confidence of the conquistadores checked their curiosity.

They themselves drank and bathed and were pleased with the result. New literary interest in hot springs, called "Folksy of Arkansas," recounts the tales of the Kan-wa-as Indians. Because of their arrogance and sullenhoodfulness in disregard for the commandments of the Great Spirit, they were visited with a dreadful scourge of illness. The plague raged until the entire tribe was threatened with extinction. Finally their boastful arrogance became broken and they promised to deliverance. One youth, not quite so ill as his fellows, crept down the embankment to the valley below the springs, braving the flames to his fellows. But there he found what he thought to be the final answer to his malady. The cold, refreshing springs had turned to pools, steaming with heated vapors.

He died in horror, but, in desperation touched his lips to the water. Recovered, he bathed himself as well. Refreshed, he returned to his fellows and spread the glad tidings of his return with strength. Soon all the Kan-wa-as had despaired of the madness that was in the pools, were refreshed and began to recover. But the hot springs forever promised a pledge of the Great man's god of protection for his people. There is yet another tale of Indian tradition. The red man, believing in the curative properties of the water, felt that no single tribe should be sole owner of the hills about the springs. All men should equally share in the privilege of coming into the "land of the Great Spirit," in peace and quiet sanctuary. It is even said that a tribe too closely pressed by an enemy would retreat within the prescribed area and be safe from pursuit. Meanwhile truth may be in this tale in its entirety, it is an undeniable fact that red men, even those of enemy tribes, have been seen by early white men bathing together in the springs.

As late as 1832, Hiram A. Whittington wrote to a brother in Coahsah, Mass. These springs were discovered by the French whilst hunting on the Wabash, about 100 years ago. At that time, and we know not how long before, they were reported to be visited by dif-

ferent tribes of Indians for the purpose of healing their sick, and it was always considered sacred ground. Hostile tribes on meeting here (no matter how irritated they were toward one another as brothers) would pitch their tents and Djalk was buried and the pipes, em-
contours. When the pressure against bulging mountains became too great, rocks broke instead of bending. Flashes appeared. Huge masses slipped upward, others downward.

Through other thousands of years Mother Nature started the patient task of wearing down the mountains she had built. At least twice she succeeded in so obliterating the peaks she had thrown up that the area was a vast plain and erosion practically ceased. Not satisfied, she again threw up mountains, and again carefully set to work to tear them down once more. Peaks were ground away until their tops became low-lying valleys.

This is the story, roughly, of the Ouachita range extending from Little Rock into Oklahoma. In particular it is the story of the Zig-Zag mountains, one of the subranges of the Ouachita’s novaculite uplift. It explains how and why strata of rock, rock-rolling through the earth like polished flames of lightning, with occasional cracks or “faults” running vertically through them have been piled, layer upon layer for uncounted centuries.

In the immediate vicinity of Hot Springs National Park the underling rock strata include:

- Stankey shale: Mississippian
- Hot Springs sandstone: Mississippian
- Arkansas novaculite: Devonian
- Missouri mountain shale: Silurian
- Polk creek shale: Silurian
- Bigfork chert: Ordovician

Wemble shales: Ordovician.

The accompanying diagram shows the relative positions of the formations and can be used in explaining the theories evolved for the cause of the heat of the hot springs.

Now Bigfork chert of Novaculite, or whitonite, (a variety) is slightly porous. Shale is not. The surface of much of the Hot Springs area is overlaid with a layer of Stankey shale and underlaid with Polk creek shale. Much, much farther down, Wemble shale and Mississippian shale have been solidified into gigantic lumps. Between these impervious walls there is a widespread area of Bigfork chert, forming a conical conduit. Between West and Sugarloaf mountains there is an outcropping of rock which is hot thinly concealed beneath the earth’s surface. Upon it have fallen the rains of centuries.

Slowly, slowly, this water is filtered through the microscopic openings in the chert. Impeded by the impervious walls of shale, above and below it sinks down and down into the bowels of the earth. There it melts—what it is. It is believed that igneous rock (resulting from the solidification of molten magma) was introduced into the sediment in an early age. Some of these areas are now exposed. Since heat from this source must long since have dissipated away it cannot be credited with the heating of the water. But such observable formations probably are identical with the deep-lying magnetic body which supposedly "heats the springs."

Some say that as the meteoric water from the surface seeps downward it comes in direct contact with beds of radioactive minerals. Others insist that it only approaches near enough these beds to be affected by waves from it. Still others say that just as the waters (those created and held within the earth) rise to meet the downwelling, mingle with them and heat them. Still others believe that instead of hot water, the steam pours through faults in the shale, blends with and raises the temperature of water. The igneous rock, mentioned in the preceding paragraph would account for the source of heat in the last two theories.

Analyzing the water of the springs would lend credence to the final theory. Radioactivity undeniably is there. But a comparison of the amount in the different springs shows no correlation between the extent and temperature.

Some experts have held that the entire source of the hot springs is juvenile water (that which has never before reached the earth’s surface). They point to certain possible flows in the meteoric water theory. In many places the surface of the collecting basin, they insist, is lower than the point of emergence of the spring, thus destroying the "U" tube explanation of its conduction. Their opponents reply that it has never been proved that sufficient space, at a great enough height, is not present to insure collection of enough water to account for the daily flow.

Another debatable question has been: "Can it be proved that rainfall effects the volume and outrush from the springs?" This time the meteoric water theory devotes answer devoted to the question of the juvenile water theory in this way: "So far, measuring the daily flow has not been sufficiently inclusive to make a direct answer possible either way."

But on one point there is certainty. Whatever the source of heat, its constancy is pretty well established. There has been practically no change in temperature during the period in which man have recorded the thermometer’s readings. Dunbar and Hunter (1864) listed 150 degrees from the "longest spring," which unquestionably must have been the "Big Iron Spring." In 1894, G. W. Featherstonhaugh visited the spot and wrote that the waters of some of the principal springs reached a temperature of 168 degrees. David Dale Owen reported 146-158 degrees in 1869 for "Hog Spring," which still shows at the location of the "Big Iron." Hoywood in 1901 recorded 147 degrees and Hamilton in 1901 showed at 148. Allowing for discrepancies in instruments, this would point rather definitely to a record of no appreciable change in more than 100 years.

The spotlight of interest in the phenomenon of the source of heat for the hot springs has been particularly strong during the past few years. For approximately 40 years Arkansas and United States government experts have made studies and released pamphlets on the subjects. Universities have sent research workers to the springs for a similar purpose. But with the setting up of Hot Springs National Park Museum, causes were put on display with maps and legends, so plain and so easy to understand that the layman could comprehend them almost at a glance.

Henry W. Lix, acting park naturalist, assisted in the arrangements of the museum and was responsible for Cases One and Two, which graphically show the strata underlying the Hot Springs area and the probable sources of heat for the springs. A skilful planning of lighting and actual flow of water through a "U" tube offers a vivid and animated picture of what probably is occurring beneath the earth’s crust.

Much of the material for this article has been obtained from Mr. Lix and from a paper of his appearing in the National Park Service Quarterly for Region 111, April, 1968. Another source was "Mineral Water at Hot Springs," a brochure by Frederick W. Cron, lieutenant corps of engineers, Reserve, reprinted from "The Military Engineer," March, 1939.
HOT SPRINGS NATIONAL PARK IS A LAND OF THRILLING SPORTS AND RECREATION AMID SCENIC BEAUTY

Mountain climbing, tennis and golf at the Country Club which is open to visitors the year around, fishing and boating on Lakes Hamilton and Catherine, swimming and bicycling or, in short, most any sport on land or water your heart may desire is yours at Hot Springs National Park, Arkansas.

PONCE De LEON SOUGHT HOT SPRINGS AS FABLED "FOUNTAIN OF YOUTH"

By ALTA SMITH.
The city of rest, recreation and rejuvenation is the title that has been applied to Hot Springs National Park—the first and only area in America recognized by the United States government for nature's great magic spring water. This, the original, is the source of the world-renowned waters of Hot Springs, Arkansas, which have been used by man for thousands of years, and are still the basis of the park's success.

Leaves and flowers which cover the landscape are not the only signs of the park's beauty. The spring water itself is a most remarkable feature. The water is warm, clear, and delicious, and it has been used for centuries to relieve ailments of all kinds. The water contains minerals that are thought to be beneficial to health, and it has long been believed to have rejuvenating properties.

The park is open year-round, and visitors can enjoy a variety of activities, including hiking, picnicking, boating, and fishing. The park also offers a number of accommodations, including cabins, campgrounds, and lodges.

The history of the park is as fascinating as its natural beauty. The area was first settled by the Choctaw Indians, and it has been a popular destination for visitors ever since. Today, the park is managed by the National Park Service, and it is one of the most visited national parks in the United States.

Forest Service Has Provided Modern Vacation Facilities

By ROY ROSSON.

One of the largest, most diversified, and most unusual public recreation developments ever attempted in the United States is the modernized Hot Springs National Park. This project has been completed atop lofty Mount Magazine by the U. S. Forest Service.

The park is situated in the heart of the Ozark Mountains, and it is the site of the world's largest thermal springs. The park is open year-round, and visitors can enjoy a variety of activities, including hiking, picnicking, boating, and fishing. The park also offers a number of accommodations, including cabins, campgrounds, and lodges.

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