Kansas Scenic Byways

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Fun Facts about Rocks, Fossils and the Landscape of Kansas

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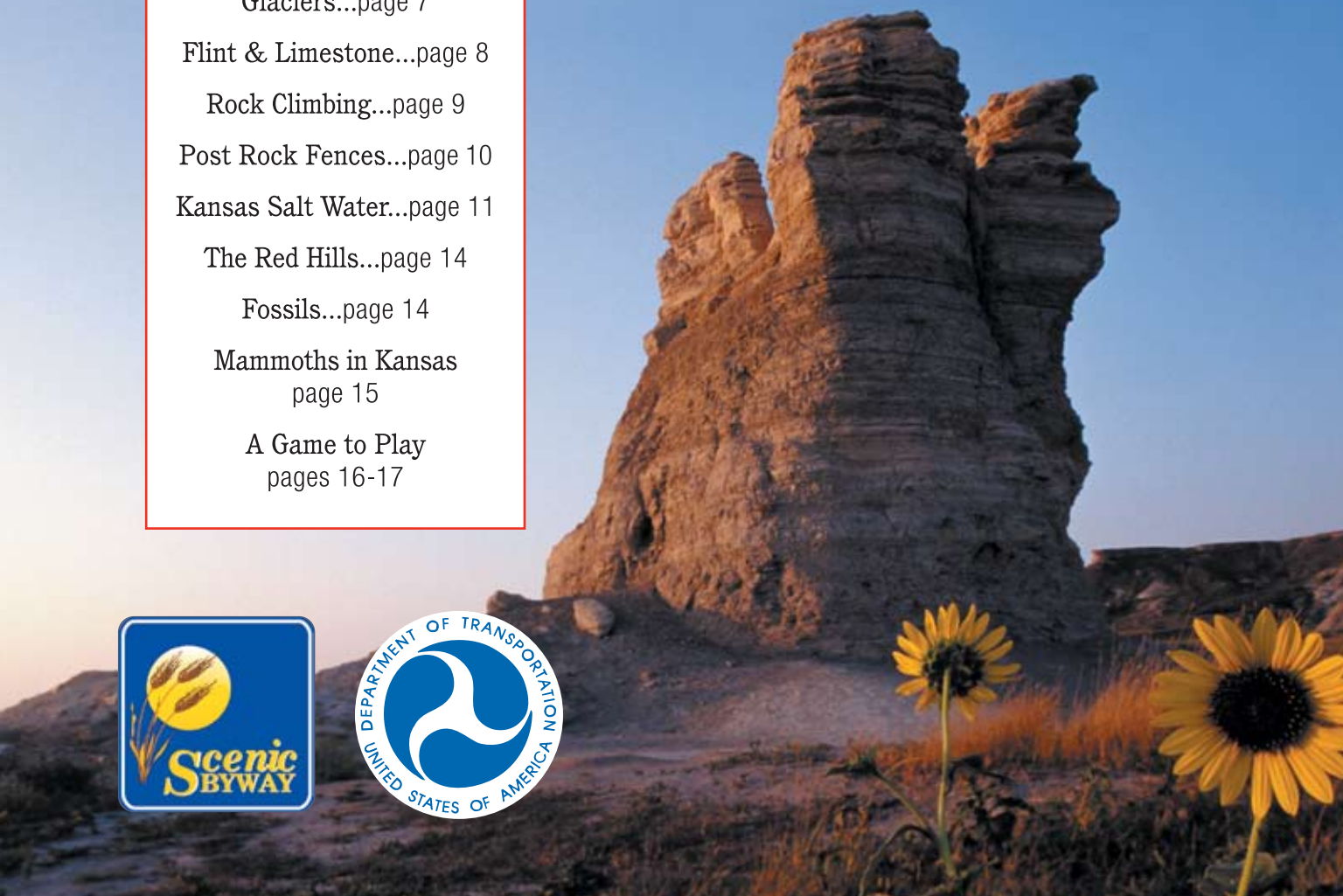


This booklet is designed to help you see the miles of Kansas scenic byways with new eyes.

Included are photos and brief descriptions of rocks, fossils and geologic features you will see along the way. It is a booklet that young and old will enjoy whether you are a visitor to the state or a life-long Kansan.

Many publications about geology are available. However, this booklet will help you look at the geology of Kansas in particular. **We hope it helps you see and appreciate the natural beauty of the state.**

Other booklets in this series are on: **farms and ranches; birds and wildlife; grasses, trees, wildflowers and shrubs; weather; architecture;** and the **roads** themselves. Each booklet has a map of the scenic byways of Kansas and a game for kids.

We hope that this little booklet will put a smile on your face as you drive around our scenic byways.

Can I see Kansas's history by looking at its rocks and fossils?

You sure can. By looking at the many layers of rocks and fossils in the state, you can map the geologic history of Kansas. They tell us that Kansas was once an area of seas and swamps where ferocious sharks and huge clams lived; that there were times of massive dust storms, volcanoes and earthquakes; that once glaciers covered part of the landscape; and that at one time huge mammoths roamed the area.

You can touch 345 million-year-old rocks in Kansas!

The oldest rocks at the surface of the earth are in the southeastern corner of Kansas and were deposited there some 345 million years ago!

In an area near Baxter Springs and Galena, on the *Frontier Military Scenic Byway,* you will see these layers where the roads have been cut and in outcroppings along stream beds. These layers are made up of limestone with beds of *chert,* also called flint. The chert is hard and has helped to keep this rock from eroding through millions of years. Reach out and touch these rocks in the Schermerhorn Cave, located in Cherokee County.

Schermerhorn Cave

Where are the *youngest* rocks?

In general, the rocks on the surface of Kansas get younger as you travel west. New layers of rock, caused by erosion from the Rocky Mountains in Colorado a few million years ago, have been deposited in the western part of Kansas covering over the older layers. Now that is young!

Does that mean that Western Kansas is higher than Eastern Kansas?

Yes. The lowest part of the state is in the southeast corner and it is 700 feet above sea level. By the time you reach the Colorado border, it is around 4,000 feet above sea level. The increase, caused by the uplift of the Rocky Mountains, is so gradual that you may not feel the change.

Whimsically dubbed Mount Sunflower, the highest point above sea level in Kansas, with an elevation of 4,039 feet, is located in Wallace County.

Can plants become rock?

Yes, they can. The eastern part of the state was once a dense swamp where plants grew. The dead plants accumulated at the bottom of the swamps and were covered by layers of sediment, forcing the plant life into the form of coal. Of course, this took place over millions of years.

What happened to the coal?

The early settlers mined the coal to burn for their own use. Eventually, coal was mined to use in fueling steam locomotives, for generating electricity and for making cement.

Coal mines were common in Bourbon, Crawford, Cherokee and Osage counties. At first, these mines were underground mines, but by the 1930s strip mining had begun.

The history of mining in Kansas can be found at the Galena Mining and Historical Museum on the *Frontier Military Scenic Byway.*

Big Brutus is a monumental reminder of the glory days of coal mining in southeastern Kansas.

Big Brutus could take a big bite out of the ground!

Huge shovels were used to clear the earth to get at the coal below the surface. Big Brutus, located in West Mineral, near the *Frontier Military Scenic Byway,* was one of these shovels. In fact, it is the **second largest electric shovel in the world** and stands 16 stories tall! It is so big it could scoop up 150 tons of soil and rock in one shovelful, cleaning the earth for smaller equipment to mine the coal. Today it is a museum and you can tour inside of it.

What has become of the strip mines?

The Kansas Department of Wildlife and Parks has purchased more than 14,000 acres of these coal mines and runs them as Mined Land Wildlife Areas. Prairie grasses, shrubs, oak and hickory woodlands, lakes, and marshes provide a rich habitat for a variety of wildlife. One such area is located off U.S. 69 just north of Pittsburg, along the *Frontier Military Byway.* There are buffalo there, too!

This is what can be done with an abandoned strip mine!

Are oil and gas found in Kansas?

Kansas is one of the country's top producers of oil and gas. Oil is formed by the compression of living organisms -- plants and animals -- over millions of years and is found in reservoir rocks that can be drilled for the oil. It can also be found in shale, which must be distilled to extract the oil. The oil wells along the byways are a reminder of the importance of oil and gas to the state's economy.

Glaciers in Kansas?

Yes, in fact, during one of the ice ages -- about 600,000 years ago -- glaciers covered the north-eastern part of the state with hundreds of feet of ice. When the glaciers melted they left behind great boulders of red quartzite and tons of other rocky debris. *These rocks were not native to Kansas,* but were picked up by the glaciers as they moved from Minnesota and South Dakota and were left here when the glaciers receded.

You will see wonderful views of rock-strewn valleys and hillsides as you drive the *Glacial Hills Scenic Byway* and the eastern portion of the *Native Stone Scenic Byway.*

Also left by the glaciers were areas of wind-borne silt called "loess" *(pronounced luss).* Along the byway near White Cloud huge bluffs of loess line the Missouri River.

Are the Flint Hills really made of flint?

Yes, these hills are made of layers of limestone, shale, and flint. The limestone is softer and weathers away, leaving a gravelly, flinty soil.

The early settlers found the ground too hard to plow, so much of it has been left native prairie -- **the largest native tallgrass prairie in the country.** You can see the strata of limestone, shale, and flint at the roadcuts on the *Flint Hills National Scenic Byway.*

What can be made of limestone?

Many things! Settlers mined the limestone found in the Flint Hills and used it to construct their homes and buildings.

Native Cottonwood limestone can be seen in the courthouse in Cottonwood Falls and the ranch house at Spring Hill Ranch on the Tallgrass Prairie National Preserve -- both on the *Flint Hills National Scenic Byway.* In addition, stacked limestone fences line the *Native Stone Scenic Byway.*

The Spring Hill Ranch house built with native Cottonwood limestone

Can you go rock climbing along the Byways?

Yes, you can. **Echo Cliffs** are 50-foot high sandstone bluffs along the Mission Creek in eastern Wabaunsee County near Dover where adventurers climb and rappel. The sandstone dates back some 300 million years. The cliffs, located along the *Native Stone Scenic Byway,* were cut into the stone by water rushing in front of the glaciers that pushed into that region during the Ice Age.

The textural beauty of the sandstone of Echo Cliffs

You might try walking along the top of the rocky cliffs at **Cedar Bluff.** The bluffs, which can be seen along the *Smoky Valley Scenic Byway,* are made of layers of limestone that are 80 million years old and provide a dramatic view of the Cedar Bluff Reservoir on the Smoky Hill River.

Cedar Bluff Reservoir

Why are there so many post rock fences in Kansas?

Early settlers, who lived on the treeless prairie, used uniform beds of limestone they found just under the surface of the ground to create posts for fencing. **The fascinating thing about this limestone** is that, shortly after it is uncovered it can be cut and gouged easily. Over time, as it is exposed to the air and weather, it hardens into sturdy fence posts.

Along the *Post Rock Scenic Byway,* stone posts dot the landscape, as do houses, bridges, churches, schools, and other structures that have been built with the post rock limestone.

Grassroots Art Center courtyard in Lucas

Can you live in Rocktown?

Not really. Rocktown is a collection of massive red sandstone formations at Wilson Lake, on the *Post Rock Scenic Byway,* that rise 15 to 20 feet above the ground and look like a city skyline. They and the mushroom-like structures along the shore are made of Dakota sandstone.

Is the country's largest marsh really in Kansas?

Yes, **Cheyenne Bottoms,** on the *Wetlands and Wildlife National Scenic Byway,* is the largest marsh in the interior of the country. It is a lowland, bounded on the north, south, and west by steep limestone, sandstone and clay bluffs -- some reaching 100 feet above the marsh bottom below. From these higher elevations, you can see the mudflats and large pools of water and see the stunning view of migrating birds stopping over. About 45 percent of the North American shorebird population stops here each spring.

Do birds like salt water?

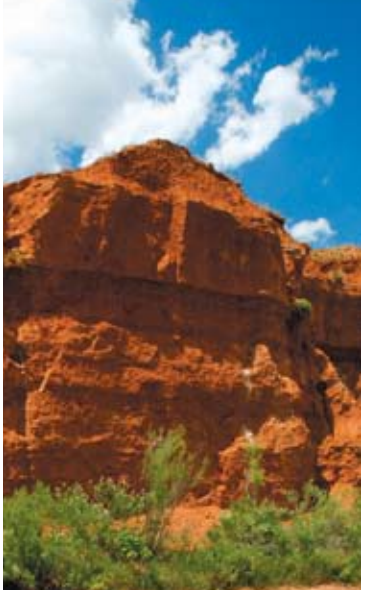
They sure do. The salt marshes at the **Quivira National Wildlife Refuge,** along the *Wetlands and Wildlife National Scenic Byway,* are a resting ground for thousands of migrating birds each year. On the surface of the Big and Little Salt Marshes is sand, under laid by the Great Bend Prairie Aquifer, a layer of watery sand and gravel. The natural salt water of the aquifer is forced to the surface, and as the water evaporates, the salt concentration increases.

How did that happen?

When you look at the formations at **Mushroom Rock State Park,** you may wonder how in the world they were created. These rocks are made of sandstone that was once along the edge of a sea that covered Kansas some 100 million years ago. Circulating ground water deposited limey cement between the grains of sand and formed "concretions," the part that forms the top of the mushrooms. The softer sandstone of the stems has been eroded faster creating the unusual mushroom shapes.

Interesting formations and sandstone rocks can also be seen at nearby Kanopolis Lake. From the towering sandstone bluffs to the caves of Horsethief Canyon, this area is a good place to see the rugged beauty of the sandstone country.

Wow! Those hills *are red!*



The Gypsum Hills, just west of Medicine rocks containing iron oxide (the same as rust) and are capped with layers of gypsum and dolomite. The uneven erosion has left beautiful buttes and mesas.

From the *Gypsum Hills Scenic Byway* look for the Twin Peaks and Flower Pot Mound. The Native Americans named these the Medicine Hills because the minerals in the rivers and creeks helped to heal their wounds.

Can those be made of chalk?

A good part of west central Kansas is made of chalk, a type of limestone. Castle Rock and Monument Rocks, both in Gove County, are fascinating monolithic chalk formations that were *created some 80 million years ago.* These and the chalk bluffs of the Smoky Hill River Valley are known worldwide for the vertebrate fossils found in them.

Monument Rocks

Where can I find fossils?

Kansas rock is full of fossils and **you can see them along every scenic byway.** You can see them best in roadcuts, in rock outcroppings and along stream banks. Look for them in the rocks along the lakes and on the bluffs throughout the state. Invertebrate fossils -- *corals, clams, and crinoids* -- are especially common in eastern Kansas.

What do fossils tell us?

Paleontologists, scientists who study fossils, can piece together a history of the state from the abundance of fossils found here.

The fossils of coral, sharks, and clams are just a few of the fossils that tell us that **Kansas was once a series of oceans.**

The fossils of ferns, cougars and huge birds tell us that forests once covered parts of the state. *You might be surprised to know that camel, rhino and mastodon fossils have all been found in Kansas.*

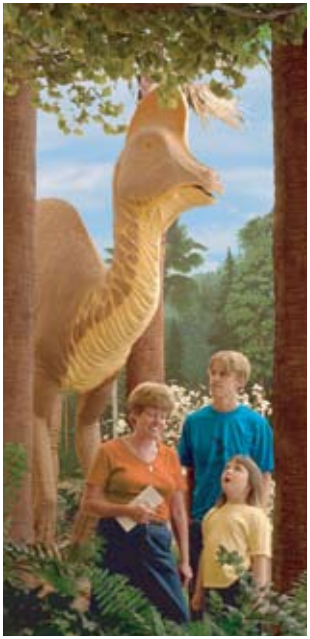
The Fick Fossil and History Museum, Oakley, is one of several places in Kansas to view fossils.

Did mammoths really roam Kansas?

You bet! Mammoths roamed the prairie eating the grasses two million years ago. Check out the mammoth bones and the incredible rows of mammoth teeth found in Barber County that are on display at the **Stockade Museum** in Medicine Lodge.

Where else can I see rocks and fossils?

The Sternberg Museum of Natural History on the campus of Fort Hays University, the University of Kansas Natural History Museum, the Richard H. Schmidt Museum of Natural History at Emporia State, and the Fick Fossil and History Museum in Oakley all have great collections and displays of rocks and fossils that document Kansas' geologic history.



The Sternberg Museum of Natural History features extensive permanent displays plus traveling and temporary exhibitions.

A GAME FOR KIDS!

Did you see it?

Place a check beside the items that you find and note the date and location.

☐ 1. Cliffs DATE _____
LOCATION _____

☐ 2. A limestone house DATE _____
LOCATION _____

☐ 3. Castle Rock DATE _____
LOCATION _____

☐ 4. Big Brutus DATE _____
LOCATION _____

☐ 5. Reclaimed mines DATE _____
LOCATION _____

☐ 6. A boulder DATE _____
LOCATION _____

☐ 7. Red hills DATE _____
LOCATION _____

☐ 8. A post rock fence DATE _____
LOCATION _____

☐ 9. A marsh DATE _____
LOCATION _____

☐ 10. A cave DATE _____
LOCATION _____

☐ 11. A fossil DATE _____
LOCATION _____

☐ 12. A piece of coal DATE _____
LOCATION _____

☐ 13. A loess bluff DATE _____
LOCATION _____

☐ 14. Flint Hills DATE _____
LOCATION _____

☐ 15. A roadcut DATE _____
LOCATION _____

☐ 16. Mushroom Rock DATE _____
LOCATION _____

☐ 17. Mammoth teeth DATE _____
LOCATION _____

☐ 18. Chert DATE _____
LOCATION _____

SCENIC BYWAYS

Etiquette

Kansas scenic byways are to be enjoyed by everyone.

Please help us preserve this beautiful land by not picking the flowers and native grasses, and by not straying onto private land. Please use care in stopping to collect rocks or fossils along any highway or byway. Of course, please do not litter.

This magnificent scenic land is home to many Kansas residents who welcome you to their communities, shops, and restaurants.

Please stay out of the way of cattle drives.
Do not climb fences or gates.
And please, help keep everyone safe by obeying posted speed limits.

This booklet is one of a series produced for your enjoyment by the Kansas Scenic Byways Program. Authors of this booklet are Debbie Divine and Michele Clark, edited by Rex Buchanan. Photographs are by Harland Schuster, Mike Blair - KDWP, Barbara Shelton, Janet Bean, Dana Gythiel - NaturalKansas.org, Linda Phipps, Bob Gress, and BWR Corporation. Booklets designed by Catalyst Creative Services, Inc. Printed by Mennonite Press. Resources include *Kansas Geology: An Introduction to Landscapes, Rocks, Minerals, and Fossils;* the GeoKansas website; the Kansas Geological Society website; and many other on-line sources. Thanks to the Kansas Scenic Byways Committee for its encouragement and assistance in completing these booklets.

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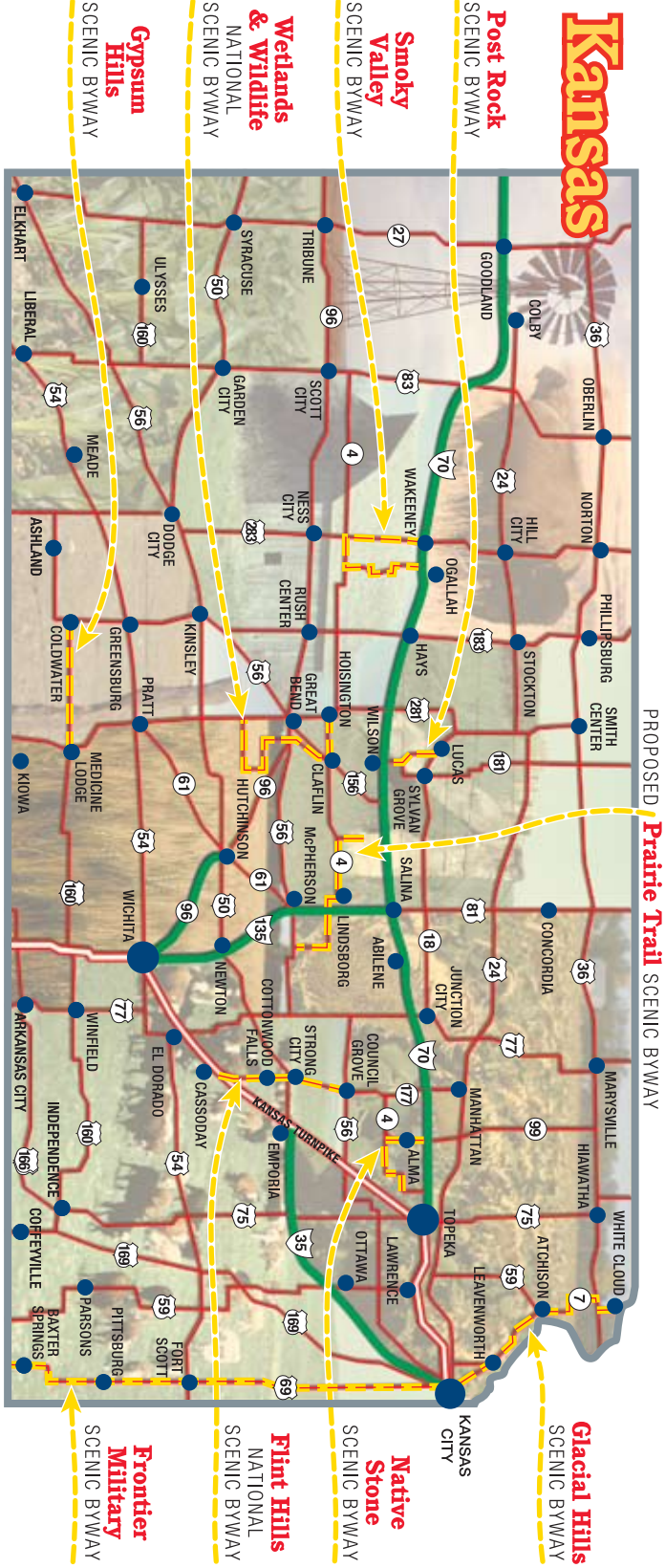
Enjoy Kansas Scenic Byways!