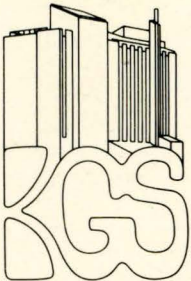


COFFEY COUNTY FIELD TRIP

Rex Buchanan
Chris Maples
Jim McCauley

Kansas Geological Survey
Open-file Report 91-16
June, 1991



KANSAS GEOLOGICAL SURVEY
1930 CONSTANT AVE., CAMPUS WEST
UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66046-2598

COFFEY COUNTY FIELD TRIP

5 June 1991

Mileage

(cumulative mileage)

- 0.0 (0.0) Leave Survey parking lot, headed south.
- 0.3 (0.3) Intersection with Iowa Street, U.S. Highway 59. Turn south.
- 1.3 (1.6) Intersection of 31st and Iowa.
- 0.4 (2.0) On the east is Sonny Hill Motors. Please note that, contrary to their otherwise impeccably honest television advertisements, Sonny Hill Motors is not precisely "just across" from the baitshop, but instead is southeast of the baitshop.
- 0.8 (2.8) Wakarusa River.
- 1.7 (4.5) Shank Hill.
- 2.2 (6.7) Toronto Limestone Member overlain by the Plattsmouth Limestone Member of the Oread Limestone. These rocks were deposited during the Pennsylvanian Period of geologic history, about 300 million years ago. Most of the limestones and shales we will see today are Pennsylvanian in age, deposited at the bottom of or along the margin of a shallow sea that covered eastern Kansas at the time. At times this sea was teeming with varieties of invertebrate organisms, which form the fossils that we will see at several stops. Many of the rocks we will see in Coffey County today are from the same formations as those around Lawrence. These Pennsylvanian formations are exposed at the surface in a northeast-southwest trend across eastern Kansas, and the route we follow is mostly in rocks of the Lawrence Formation, Oread Limestone, and Lecompton Limestone (Figure 1).
- 0.3 (7.0) Pleasant Grove. Guenther's salvage yard to the east.
- 1.6 (8.6) Intersection with the country road that runs east to Vinland. This is also on the drainage divide between the Kansas River basin to the north and the Marais des Cygnes basin to the south. The Kansas River drains the north half of Kansas, part of northeast Colorado, and much of Nebraska south of the Platte River. We are less than 10 miles south of the river at this point; thus the drainage pattern of the Kansas River is very asymmetrical. Runoff south of here eventually flows into the Lake of the Ozarks before reaching the Missouri River near Jefferson City, Missouri.

3.5 (12.1) Intersection of U.S. highways 59 and 56. The Ireland Sandstone, the remains of sand deposited in a Pennsylvanian river channel, crops out just to the west and along Tauy Creek, where it forms a landmark called Hole in the Rock. U.S. 56 runs from Kansas City, diagonally across the state to Elkhart in southwestern Kansas. Through much of the state it follows the general route of the Santa Fe trail. About eight miles east of here, ruts from the trail are easily visible in the tallgrass prairie of Ivan Boyd Memorial Prairie Preserve.

3.1 (15.2) Douglas County/Franklin County line.

6.9 (22.1) Railroad crossing.

0.4 (22.5) Overpass above railroads and city limits of Ottawa, boyhood home of Gary Hartpence.

0.9 (23.4) Exotic Tatoos, open Monday through Thursday from noon to nine p.m. and Fridays and Saturdays from 12 to 12, is visible on the east side of the road.

0.1 (23.5) Intersection with Kansas Highway 68. Turn south.

0.3 (23.8) Marais des Cygnes River. This river, whose name means "marsh of swans," is called the Osage River in Missouri.

1.2 (25.0) Two-way stop. Proceed south on county road.

2.6 (27.6) Intersection with Interstate 35 and U.S. Highway 50. Turn west.

0.3 (27.9) For the next two miles the highway passes through the Sand Hills, hills capped by the Tonganoxie Sandstone. Like the Ireland Sandstone, the Tonganoxie was deposited in a Pennsylvanian river channel and extends from Leavenworth County to Greenwood County.

2.9 (30.8) Mud Creek.

1.1 (31.9) A mile to the northwest are the Chippewa Hills, capped by Oread Limestone. The hills are named after the Chippewa Indians, who lived on a small reservation in this area in the 1800s. In 1859 the Chippewas were united with the Munsie Indians in this area. The Munsie Indian cemetery, established in 1857, lies in the hills north of the highway.

1.3 (33.2) The Lawrence Formation. Shales in the Lawrence Formation are the source of numerous fern fossils, such as those in the display case at the Survey's entrance.

0.3 (33.5) County road south to Homewood.

0.6 (34.1) Mud Creek.

1.1 (35.2) Rest area.

1.7 (36.9) Southeast of the highway is the small town of Ransomville, site of a coal mine that operated during the 1890s and took coal from the Williamsburg coal bed, a seam of coal in the Lawrence Formation.

0.7 (37.6) Plattsmouth Limestone Member of the Oread Limestone, named after a small town in Cass County, Nebraska.

0.7 (38.3) Plattsmouth Limestone Member. The thickest member of the Oread Limestone, the Plattsmouth is 15 to 30 feet thick. It is a light bluish-gray, wavy-bedded limestone.

0.4 (38.7) Coal Creek, named after exposures of the Williamsburg coal bed, the source of coal mined in Osage, Coffey, and Franklin counties in the late 1800s. The Williamsburg is not mined today because it is only 2 to 15 inches thick and is covered by the Toronto Limestone Member.

1.1 (39.8) Plattsmouth Limestone Member exposed on the south side of the road. Kansas Highway 273 goes south 0.5 miles to Williamsburg, site of Guy and Mae's Tavern, well-known rib joint.

0.4 (40.2) A small strip mine is north of the highway.

0.4 (40.6) Shale in the Lawrence Formation exposed north of the highway. About 2.5 miles south of here was the town of Silkville, an experimental utopian colony established by Frenchman Ernest Valetton de Boissiere in 1869. The colonists established a silk factory, but later gave up the enterprise as unprofitable.

0.4 (41.0) East Branch of Tequa Creek.

0.2 (41.2) Toronto Limestone Member. This massive limestone weathers deep brown and is named after a small town in southwestern Woodson County, Kansas.

0.5 (41.7) Plattsmouth Limestone Member.

- 0.3 (42.0) Franklin County/Osage County line.
- 0.2 (42.2) Plattsmouth Limestone Member on both sides of the highway.
- 0.5 (42.7) South Branch Tequa Creek and an exposure of shale in the Lawrence Formation.
- 0.4 (43.1) Plattsmouth Limestone Member south of the road.
- 2.7 (45.8) Kereford Limestone Member, the youngest member in the Oread Limestone. The Kereford is named for a quarry at the south edge of Atchison, Kansas.
- 0.6 (46.4) The Plattsmouth Limestone Member is exposed in a quarry north of the highway.
- 0.4 (46.8) Rock Creek.
- 0.2 (47.0) Plattsmouth Limestone Member.
- 0.4 (47.4) Exit and go south on Kansas Highway 31, which runs to the town of Waverly.
- 0.8 (48.2) The rocks along the road are in the Kereford; these thin, uniformly bedded rocks are known informally as the "Waverly flags."
- 0.6 (48.8) Osage County/Coffey County line. Turn east. The Rain Cloud Ranch is north of the road. Coffey County is named after Asbury M. Coffey, a colonel in the Confederate army. Coffeyville, in Montgomery County, was probably named after James A. Coffey.
- 0.2 (50.0) Here the road runs over the top of the Waverly flags.
- 0.3 (50.3) The contact between the Heumader Shale Member, below, and the Kereford Limestone Member, above.
- 0.2 (50.5) Low-water crossing over Rock Creek. The bluff to the west is in the Plattsmouth Limestone Member.
- 0.2 (50.7) Locust and Osage Orange trees form the hedge row on the south side of the road.
- 0.4 (51.1) Turn south. Here the road runs over the top of the Kereford Limestone Member.
- 0.1 (51.2) Rock Creek Cemetery is on the west side of the road.

0.7 (51.9) **STOP 1.** Exposures of Plattsmouth Limestone Member in quarry. This same unit is present in Lawrence and near the top of the Clinton Lake spillway. The upper part of the Plattsmouth here is a series of thin (<3") limestone and shale beds. The large amount of shale makes this part of the Plattsmouth unsuitable for road gravel, therefore it is stripped off and piled up to one side. However, this type of unit (alternating shale and limestone) is terrific for fossil collecting and this is an excellent locality for crinoid stems, bryozoans, brachiopods, and other fossils. Fossils here are generally small, but exceedingly numerous. Look closely in the piles of limestone/shale on the north side of the quarry. Please do not go near the highwall.

Proceed south on gravel road.

0.2 (52.1) The Plattsmouth forms of the bed of this tributary of Rock Creek.

1.1 (53.2) Turn west on county road, old U.S. Highway 50. About three miles northeast of here is the community of Agricola, formerly called Hardpan. According to John Rydjord's *Kansas Place-Names*, the current name may refer to either "a Roman general, a German mineralogist, an artist, a composer, or simply to agriculture."

0.1 (53.3) Exposure of Kereford Limestone Member.

0.9 (54.2) Turn south on Kansas Highway 31/Pearson Street.

0.3 (54.5) Rock Creek. City limits of Waverly, population 671.

0.4 (54.9) Waverly High School is west of the road, the Waverly Library is east of the road.

0.3 (55.2) Turn west on First Street.

0.6 (55.8) West city limits of Waverly.

0.5 (56.3) Asphalt ends. Continue west.

0.9 (57.2) Big E Homegrown Tomatoes greenhouse on the north side of the road.

STOP 2. This locality currently is under study by Ron West (Kansas State University) and Chris Maples, so we ask that you please not collect here. Trace fossils and spectacular sedimentary structures are in the Stull Shale Member of the Kanwaka Shale. Trace fossils are the tracks,

trails, and burrows of any previously existing organism. At this locality, the trace fossils mostly are burrows of clams, worms, and starfish. The sedimentary structures include ripple marks, flat-topped ripple marks, and wrinkle marks, all of which indicate that these rocks were deposited on a tidal flat.

Walk east along the creek for about 200 yards. Here, the sandstone is thicker and you can see many ripple marks in cross section. At the top of this sandstone are the tracks of Pennsylvanian centipedes that were about 3' long and 1' wide. In the cut bank to the north are numerous fossil shells of the clams *Orthomyalina* and *Septimyalina*, along with other fossils.

Proceed south.

0.6 (57.8) Turn west. The community of Halls Summit is south of here.

0.2 (60.0) Ozawkie Limestone Member, the lowermost member of the Deer Creek Limestone.

1.9 (61.9) Long Creek.

1.0 (62.9) Intersection with U.S. Highway 75. Turn north.

1.2 (64.1) Ervine Creek Limestone Member of the Deer Creek Limestone on both sides of the road. The ridge to the west sits on the Topeka Limestone. The Ervine Creek is named after a creek in Cass County, Nebraska.

0.8 (64.9) Intersection with old Highway 50.

1.5 (66.4) Beto Junction. This location is based on acronym formed by four nearby towns: Burlington, Emporia, Topeka, and Ottawa. The original Beto Junction was southeast of here at the junction of old highways 50 and 75. From Beto Junction, return to northbound U.S. 75.

0.2 (66.6) Take Interstate 35 headed west.

1.0 (67.6) Ervine Creek Limestone Member caps the road cut on both sides of the highway.

0.2 (67.8) Frog Creek.

2.0 (69.8) Calhoun Shale, named for Calhoun Bluffs, about 3 miles northeast of Topeka.

0.9 (70.7) Last Chance oil field. Discovered in 1977, this is the only oil field in Osage County.

- 0.5 (71.2) The quarry south of the highway is in the Topeka Limestone.
- 2.5 (73.7) Lebo exit. For many years, the barn north of the interstate carried the slogan "Lebo's Youth Welcomes You." Since Lebo's population is 966, one would assume that Lebo had more than one youth, which may be why the barn has since been repainted.
- 0.3 (74.0) South of the highway, behind Dream Homes, Inc., is an old strip pit in the Nodaway coal bed.
- 1.5 (75.5) South of the highway is the spillway in the Lebo City Lake. The Nodaway coal is exposed below the spillway. The Nodaway is part of the Aarde Shale Member of the Howard Limestone and was an important coal resource in Osage, Coffey, and Lyon counties.
- 2.1 (77.6) The hill to the north is Bebb Hill, capped by the Bern Limestone. The hill's elevation is 1200 feet, about 100 feet above the surrounding countryside.
- 1.3 (78.9) Arkansas River/Missouri River drainage divide. Drainage to the south and west of this location enters the Neosho River and eventually the Arkansas. Runoff to the north enters the Marais des Cygnes River, which drains into the Missouri near Jefferson City, Missouri.
- 0.1 (79.0) Coffey County/Lyon County line. The hill to the north is in the Reading Limestone Member of the Emporia Limestone. These are the youngest rocks exposed in Coffey County. In most parts of Kansas, the rocks are younger as you move from east to west across the state, primarily because the older rocks dip toward the west and are covered by layers of increasingly younger rocks westward. Rocks here in Coffey County fit that same general pattern.
- 0.6 (79.6) Plum Creek.
- 1.2 (80.8) Take Kansas Highway 130 exit to Hartford.
- 0.3 (81.1) Turn south on K-130.
- 2.8 (83.9) Railroad crossing. The town of Neosho Rapids is to the west.
- 2.3 (86.2) The exposure to the north is in the Church Limestone Member of the Howard Limestone.
- 2.0 (88.2) Turn east on gravel road. Go past the "Bridge Closed" sign.

4.3 (92.5) Turn south.

1.0 (93.5) Turn east.

0.5 (94.0) Turn south. About 10 miles southeast of here is the community of Ottumwa, named after the Iowa town that was the hometown of the character Radar O'Reilly in the TV series M*A*S*H.

0.3 (94.3) Gravel pit west of the road.

0.2 (94.5) Enter the Flint Hills National Wildlife Refuge. Turn east.

0.1 (94.6) Low-water crossing over a tributary of Troublesome Creek.

0.4 (95.0) Curve to the south.

0.2 (95.2) Turn west into area of gravel pits.

0.1 (95.3) **STOP 3.** Neogene chert gravels. This is one of the better exposures of chert gravel in the Coffey County/Woodson County area. The source of the chert is thought to be the Flint Hills, west of here. The chert was deposited during the Neogene Period (approximately 2-25 million years ago). Getting an exact age on deposition of these chert gravels is very difficult because of a lack of paleontological evidence. Notice here (and as we leave) how high above the present-day Neosho River valley we are standing. Notice also the scour marks on the underlying Topeka Limestone at the floor of this gravel pit. These scour marks are from the chert gravel being dragged across the top of the Topeka here.

Return to the entrance of the National Wildlife Refuge.

0.9 (96.2) Turn south.

0.1 (96.3) Enter the floodplain of the Neosho River. The bluffs on the north side of the floodplain are formed by the Topeka Limestone.

0.9 (97.2) Turn west.

1.3 (98.5) The Neosho River. The Neosho has its head waters in gravel-bottomed streams of the Flint Hills of Morris County. The river cuts southeast and exits Kansas in Cherokee County. The river is crossed here by a Marsh Arch bridge. Here the road leaves the Flint Hills National Wildlife Refuge.

0.2 (98.7) Levee at the edge of the town of Hartford, population 551.

0.3 (99.0) To the south is the Hartford Public Library, built in 1861. Today it is a senior citizens' center.

0.1 (99.1) The streets here in the interior of Hartford are designed to form the letter H. Plum Street, the east-west street we're on, forms the crossbar in the letter, while Commercial and Mechanic streets form the long sides.

0.1 (99.2) Turn south on Kansas Highway 130.

3.4 (102.6) The road to the west runs to the small town of Olpe, site of the Olpe Chicken House restaurant and hometown of Del Brinkman, KU's vice chancellor for Academic Affairs.

0.3 (102.9) Fourmile Creek.

0.8 (103.7) J.H. Shears' Sons Quarry is to the west, in the Topeka Limestone.

0.6 (104.3) The road here straddles the Lyon County/Coffey County line.

1.8 (106.1) The hills here are supported by the Bachelor Creek Limestone Member of the Howard Limestone.

0.9 (107.0) The Bachelor Creek Limestone Member is exposed on the east side of the road.

0.4 (107.4) The road here is atop the Howard Limestone, named for the town of Howard in Elk County, Kansas.

0.4 (107.8) Turn east on the road to Burlington.

2.3 (110.1) Otter Creek. South of here is an abandoned quarry in the Topeka Limestone.

0.5 (110.6) Topeka Limestone in the roadcut. An active quarry in the Topeka is south of the road.

0.1 (110.7) Otter Creek.

1.1 (111.8) This road runs south to Gridley, hometown of Survey secretary Debbie Douglass. As opposed to most Kansas towns, in which the streets are oriented east-west and north-south, the streets of Gridley are oriented northeast/southeast, lined up with the Atchison, Topeka, and Santa Fe railroad that runs through town.

1.0 (112.8) The road to the north goes to Jacob's Creek and the Strawn boat ramp on the upper part of John Redmond Reservoir.

0.8 (113.6) Otter Creek.

0.3 (113.9) Ervine Creek Limestone Member of the Deer Creek Limestone.

0.9 (114.8) Ervine Creek Limestone Member.

0.4 (115.2) Baker Cemetery south of the road.

0.6 (115.8) The road to the north goes to the dam at John Redmond Reservoir. The lake is visible to the north.

0.5 (116.3) Wolf Creek Nuclear Generating Station is visible to the northeast.

2.5 (118.8) Stop sign and 16th and Kennebeck. Continue east on Kennebec.

0.3 (119.1) Rock Creek and Burlington, the seat of Coffey County. According to McCoy and Hults in *1001 Kansas Place Names*, "The Burlington Town Company was organized in Lawrence, Kansas, in February 1857, under the leadership of O.E. Learned, former resident of Burlington, Vermont." With 2901 residents, Burlington is by far the largest town in the county, which had a population of 9370 in 1980. As we drive through the center of town, keep in mind that before John Redmond Dam was constructed, the Neosho River and Rock Creek flooded the town at least twice. One of the more devastating floods in the area resulted in water up to the first-floor awnings along Neosho Street.

0.3 (119.4) Rock Creek.

0.4 (119.8) Stop sign. Go south on Fourth Street, U.S. Highway 75.

0.3 (120.1) Detour east on Third, noting UNEEDA Biscuit sign painted on the building to the south. They used to be 5¢. Proceed south on Third Street.

0.2 (120.3) Rock Creek. Note the old mill on the south bank, east of the street.

0.5 (120.8) Return to U.S. 75.

0.1 (120.9) Turn south.

- 1.0 (121.9) A plant that manufactures concrete and fiberglass bases for light poles is west of the road.
- 1.9 (123.8) The hills are covered by gravels, similar to those seen at the last stop.
- 2.9 (126.7) The Jesus is Lord church and satellite dish.
- 0.4 (127.1) North Big Creek.
- 0.1 (127.2) Kansas Highway 57 leads west to Gridley.
- 0.1 (127.3) The Toronto Limestone Member overlain by a sandstone in the Snyderville Shale Member.
- 0.3 (127.6) Oil field.
- 1.0 (128.6) Arnold's Greenhouse is north of the road.
- 0.6 (129.2) Parmely Poultry farm, on the edge of the Neosho River floodplain, is north of the road. An oil field is east of the farm.
- 1.3 (130.5) Marsh Arch bridge over Big Creek, which enters the Neosho River about a mile southeast of here.
- 0.7 (131.2) Neosho River. The Westphalia Limestone Member of the Stranger Formation is at the base of the bridge abutment on the south side of the road.
- 0.3 (131.5) Oil field.
- 0.2 (131.7) Turn north on gravel road.
- 1.0 (132.7) Turn west.
- 0.7 (133.4) **STOP 4.** Haskell Limestone Member of the Lawrence Formation at the base of the Neosho River. This locality has several points of interest.

The Pennsylvanian Period is divided to five stages in North America; from oldest to youngest these are Morrowan, Atokan, Desmoinesian, Missourian, and Virgilian. We have been looking at Virgilian rocks today. R.C. Moore named the Virgilian for exposures along the Verdigris River in Kansas from Madison in Greenwood County to Altoona in Wilson County. The approximate midpoint of this stretch is the town of Virgil in Greenwood County, from which Virgilian takes its name. Using conodont

biostratigraphy, Phil Heckel (University of Iowa) recently proposed moving the base of the Virgilian to the base of this limestone.

The Haskell here shows its typical development of 1-2 feet thick, dense, dark, hard limestone. The fractures seen across the top of the Haskell here are called joints (if the rock were offset, they would be called faults). These joint sets show a predominant southwest—northeast trend. This is one of the dominant joint trends in many different units in this part of Kansas.

Probably because of the water and freezing/thawing during the winter, the Haskell here also breaks here into relatively thin plates. Water works its way into cracks, freezes, expands, and widens the cracks, which then fill with water, freeze, and widen even more. This process is also responsible for potholes in roads. The thin plates from the Haskell are swept along by the Neosho River during times when the river is high, and leaned against one another, much like dominoes after they have been knocked over. This is known as "imbrication." Geologists use imbrication of clasts (if present) in ancient rock deposits to interpret flow direction of the water that deposited various units.

Below the limestone is a very fossiliferous calcareous shale/sandstone interval that contains abundant myalinid clams (like those seen at Stop 2) and other fossils, many of which are coated with fossil algae. This myalinid clam interval extends almost without interruption from Nebraska to Oklahoma. A biotic interval characterized by one or a few organisms, such as this myalinid interval, is called an "epibole." Epiboles can be very helpful in tracing units and keeping track of which limestone is which from locality to locality.

Return to K-57.

1.7 (135.1) LeRoy cemetery.

0.3 (135.4) City limits of LeRoy, population 701. This town was originally called Bloomington, but the name was later changed to LeRoy after a town in McLean County, Illinois. The bank here is operated by Bill Freeman, former football coach at Lawrence High School.

0.2 (135.6) Luther's Smokehouse. After a refreshing repast and a dose of Luther's understated humor, go east to the yellow light on main street.

0.2 (135.8) Turn north.

0.4 (136.2) LeRoy High School.

0.6 (136.8) Go east on Judkins Street.

0.3 (137.1) Turn north.

- 6.6 (143.7) The railroad spur leads northwest to Wolf Creek.
- 0.5 (144.2) Stop sign. Turn west.
- 0.4 (144.6) Railroad.
- 0.1 (144.7) Long Creek.
- 1.5 (146.2) Curve south around Wolf Creek Reservoir.
- 0.4 (146.6) Logan Cemetery.
- 0.7 (147.3) Curve west.
- 1.0 (148.3) Toronto Limestone Member of the Oread Limestone overlies shale in the Lawrence Formation.
- 0.2 (148.5) Wolf Creek, the stream that the power plant is named after. This is the same stream that is dammed to form Wolf Creek Reservoir, the cooling lake for the power plant. The dam is visible to the north.
- 0.6 (149.1) Toronto Limestone Member.
- 0.1 (149.2) Mathias Lake is south of the road.
- 0.1 (149.3) Curve north.
- 0.2 (149.5) A center pivot irrigation system is south of the road.
- 0.6 (150.1) Curve west.
- 0.6 (150.7) Neosho River.
- 0.1 (150.8) Burlington city limits. The Country Critter industrial complex, where a variety of amazingly lifelike hand-held puppets are made for distribution to countless county and state fairs, is on the south side of the street. Follow the detour back to U.S. 75 and proceed north.
- 0.6 (151.4) The Burlington High School football stadium forms the rather imposing-looking structure to the southwest.
- 0.7 (152.1) Neosho River.
- 0.8 (152.9) Clay Creek Limestone Member of the Kanwaka Shale, named after Clay Creek in Atchison County.

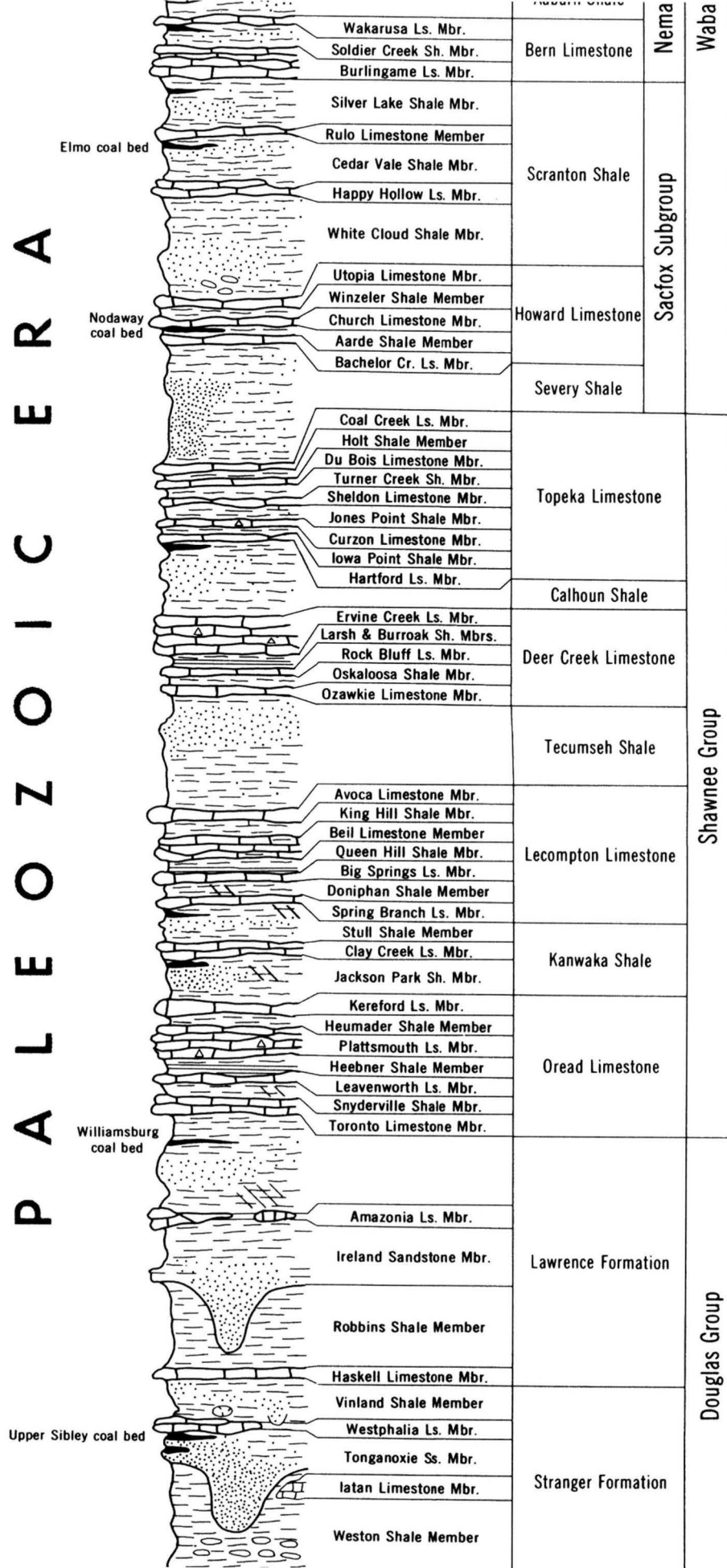
1.0 (153.9) The quarry to the east, in the Clay Creek Limestone Member, provided some of the rip rap for the dam at John Redmond Reservoir.

0.8 (154.7) New Strawn. The original site of Strawn was inundated by John Redmond Reservoir in the early 1960s, so the town was moved to this location. Its named after Enos Strawn, one of the town's founders. John Redmond was a local newspaper editor who generally is regarded as one of the first newspaper men to study under the guidance of William Allen White in Emporia, Kansas. The reservoir bears his name because of his efforts to bring flood control to the Neosho River valley.

0.9 (155.6) Turn east on county road to Sharpe.

1.0 (156.6) Turn south into the Dwight D. Eisenhower Nuclear Training Center. From here, return to U.S. 75, then to I-35, and back to Lawrence. Some people have the mistaken notion that Dwight Eisenhower was born in Kansas. Although he grew up in Abilene, Eisenhower was actually born in Denison, Texas, in October, 1890. Ike was one of seven boys born to the Eisenhower family, but was the only one born in Texas. The family moved to Abilene the spring after Ike was born. From here, return to U.S. 75, proceed north to I-35, and return to Lawrence.

P A L E O Z O I C E R A

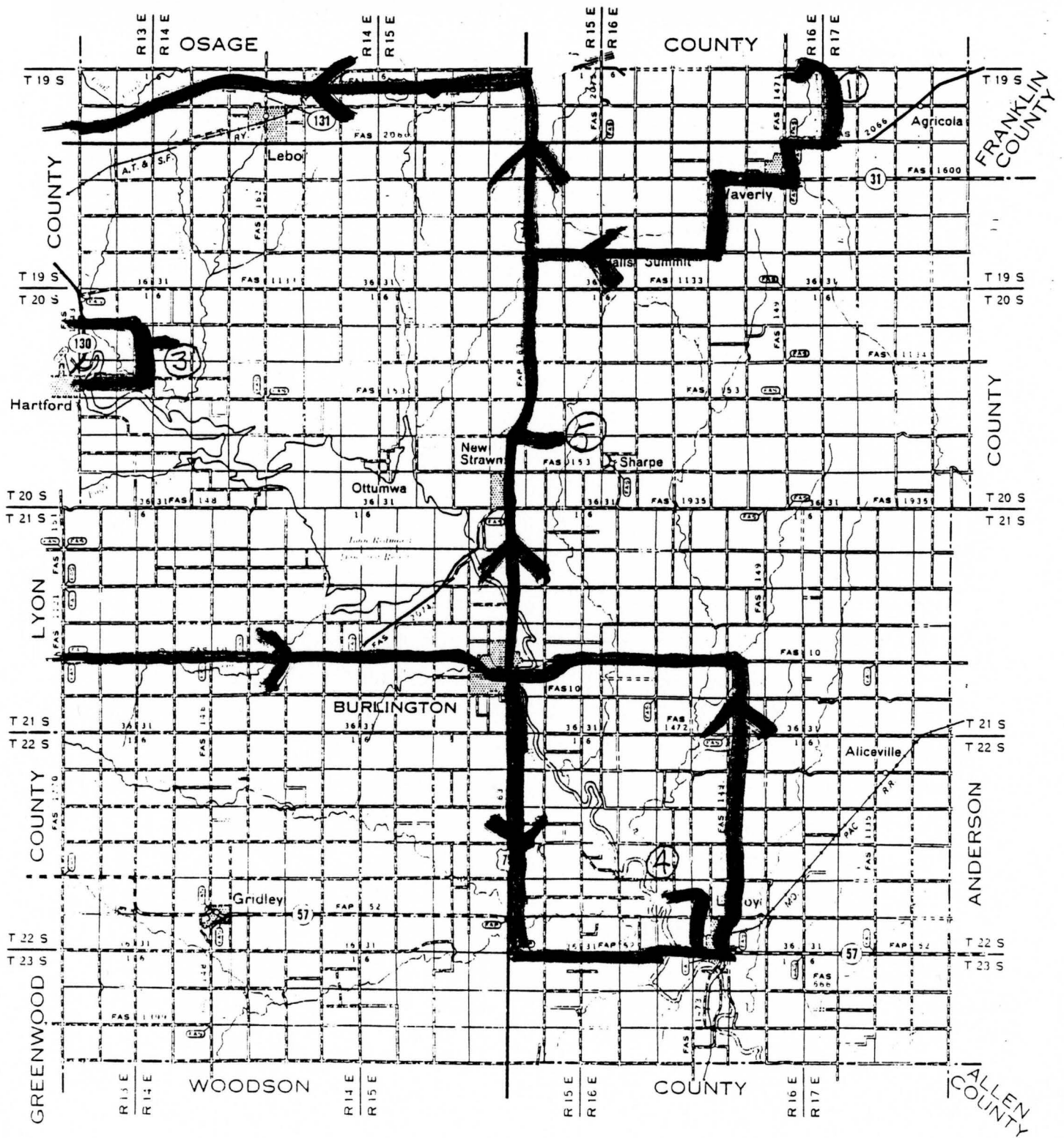


VIRGILIAN STAGE

UPPER PENNSYLVANIAN SERIES

PENNSYLVANIAN SYSTEM

Figure 1



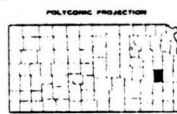
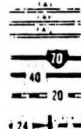
LEGEND

ROADS AND ROADWAY FEATURES

- PRIMITIVE ROAD
- UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL SURFACED ROAD
- GRAVEL OR STONE ROAD - NOT GRADED OR DRAINED
- GRAVEL OR STONE ROAD - GRADED AND DRAINED
- GRAVEL OR STONE ROAD WITH STABILIZED SURFACE
- BITUMINOUS ROAD - LOW TYPE PAVED ROAD
- DIVIDED HIGHWAY
- HIGHWAY WITH FULL CONTROL OF ACCESS AND INTERCHANGES

ROAD SYSTEM DESIGNATION

- FEDERAL AID INTERSTATE HIGHWAY SYSTEM
- FEDERAL AID PRIMARY HIGHWAY SYSTEM
- FEDERAL AID SECONDARY HIGHWAY SYSTEM
- INTERSTATE NUMBERED HIGHWAY
- STATE NUMBERED HIGHWAY
- STATE HIGHWAY SYSTEM OR STATE NUMBERED HIGHWAY
- UNOFFICIALLY DESIGNATED SYSTEM OR MARKED ROUTE



**GENERAL HIGHWAY MAP
COFFEY COUNTY
KANSAS**

PREPARED BY THE
STATE HIGHWAY COMMISSION OF KANSAS
DEPARTMENT OF PLANNING AND DEVELOPMENT
IN COOPERATION WITH THE
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

