



OKLAHOMA GEOLOGICAL SURVEY Guide Book XI

**Beavers Bend  
State Park**

1963

# OKLAHOMA GEOLOGICAL SURVEY

CARL C. BRANSON, *Director*

## GUIDE BOOK XI

### Guide to Beavers Bend State Park

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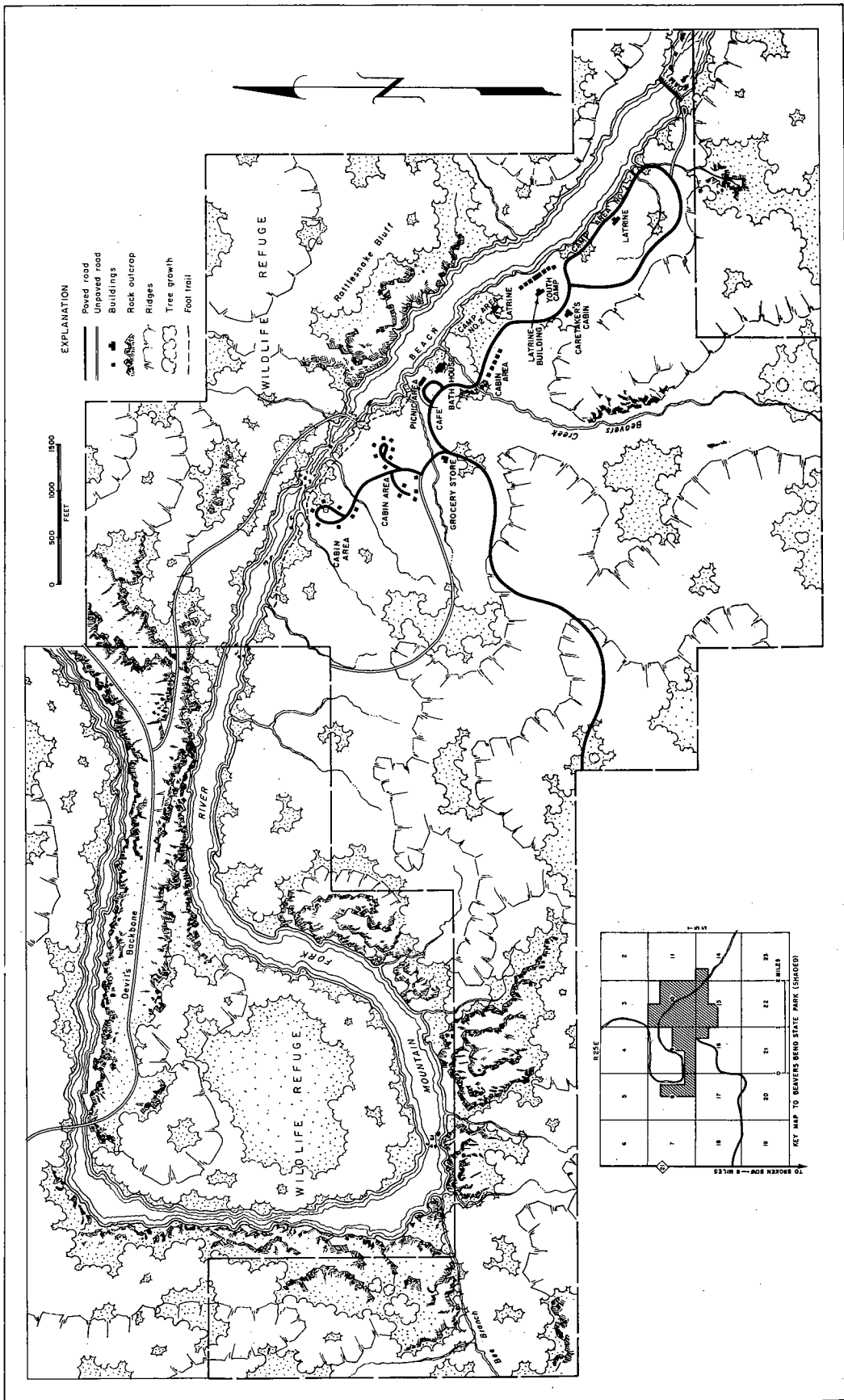


Figure 1. Map of Beavers Bend State Park.

## GUIDE TO BEAVERS BEND STATE PARK

### INTRODUCTION

This guidebook was prepared to acquaint the reader with the history, geology, botany, zoology, and recreational facilities of Beavers Bend State Park and vicinity.

The park is in the southeast corner of Oklahoma in the south-central Ouachita Mountains, the mountains that consist of a series of narrow wooded ridges extending about 220 miles westward from Little Rock, Arkansas, to Atoka, Oklahoma. The park is about 10½ road miles north of Broken Bow, Oklahoma, on State Highway 21A. It was named for Mr. Beavers, a settler whose land adjoined a sharp bend in Mountain Fork River, called Beavers Bend. The bend itself is just north of the 1,300 acres that make up the park area. The wooded hills locally rise as high as 400 feet above Mountain Fork River, providing beautiful scenery for those who explore the park area along the river.

The principal facilities of the park are in a comparatively level, grass-covered valley beside a narrow lake formed by the backwaters of a small dam across Mountain Fork River in the southeastern corner of the park. Facilities for picnicking, camping, boating, fishing, and swimming are available in the park, as is also a children's playground. In the park the Oklahoma State Planning and Resources Board operates a restaurant, 19 modern cabins, and a group camp area with sleeping and eating accommodations for 200. Access to all but the more mountainous parts of the park is provided by paved road. Elsewhere, unpaved roads throughout the park area have the happy characteristic of only locally becoming soft and impassable because of rain.

Anyone desiring more information about the park and its facilities may write to the park superintendent, Beavers Bend State Park, Broken Bow, Oklahoma.

## GEOLOGY OF BEAVERS BEND STATE PARK

WILLIAM D. PITT AND CHARLES B. SPRADLIN

Geology in its broadest definition is the study of the earth. It includes many divisions of study: rocks and their mineral constituents; the record of past life found in rock strata; the comparison of rocks of similar age throughout the world; and other similar divisions.

### PIONEER WORK OF C. W. HONESS

The park area and vicinity were first studied geologically by Charles W. Honess, who completed his geological survey of this general area in 1923, at which time his report, *Geology of the southern Ouachita Mountains*, was published as Bulletin 32 of the Oklahoma Geological Survey. In this study Honess mapped about 1,000 square miles by walking in that area all the half-section lines that ran in a north to south direction, making geological notes and collecting rock specimens as

he traversed the area. His mapped area included that of Beavers Bend Park. Charles B. Spradlin, accompanied by his father, remapped the park area and vicinity in greater detail during 1958, finding thereby that Honess' pioneer work was essentially correct.

### QUARTZ VEINS

Quartz, a hard (scratches knife blade), normally milk-colored mineral in the park area, is common in all the rocks of the park area. Tabular masses parallel the layers of rock strata or fill natural cracks in the rocks. Elsewhere rounded or elliptical masses of quartz seem to permeate large areas of sedimentary rock. Locally it completely covers the ground in the form of thickly strewn chunks, some of which are a foot or more in diameter.

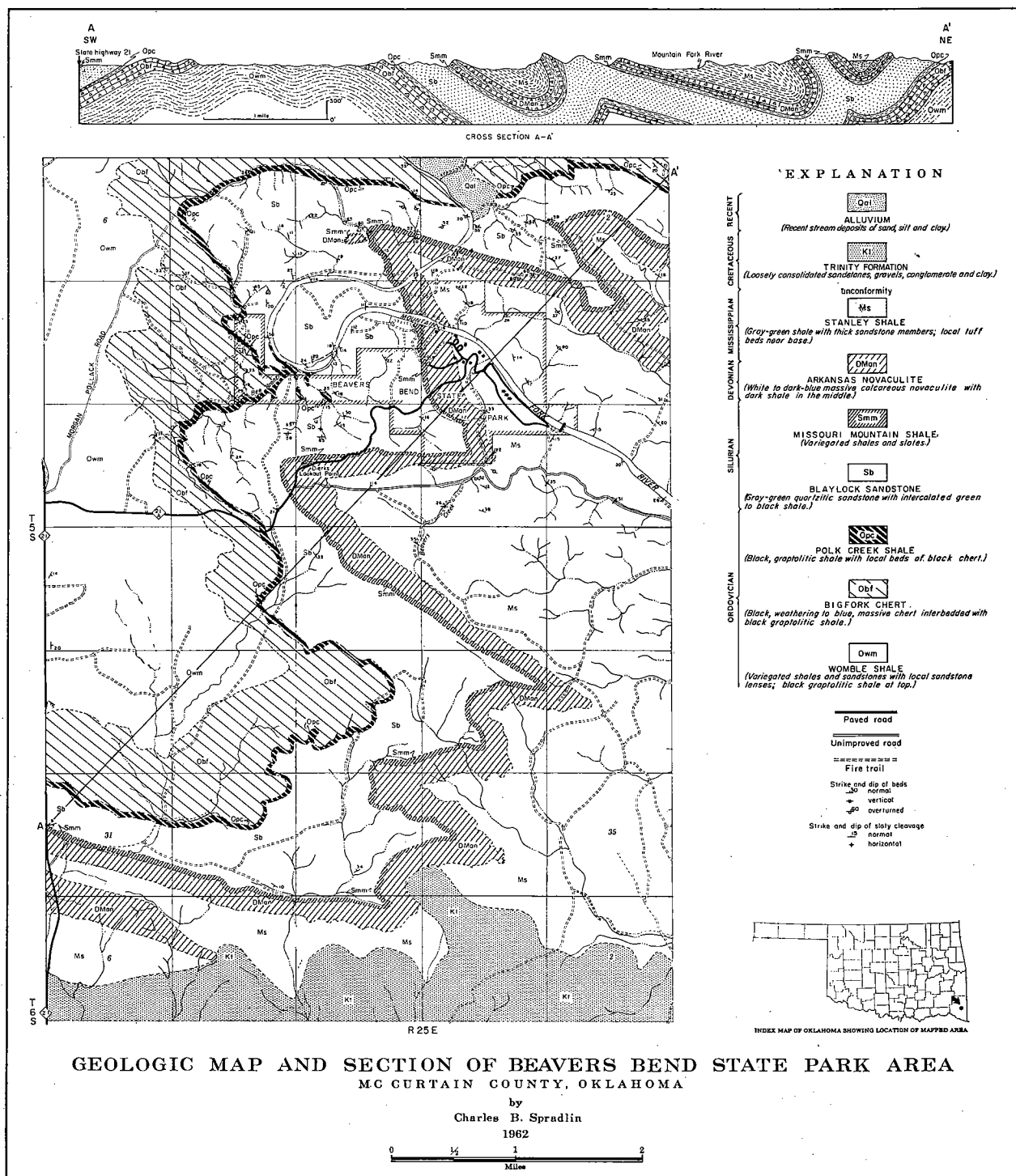


Figure 2A.

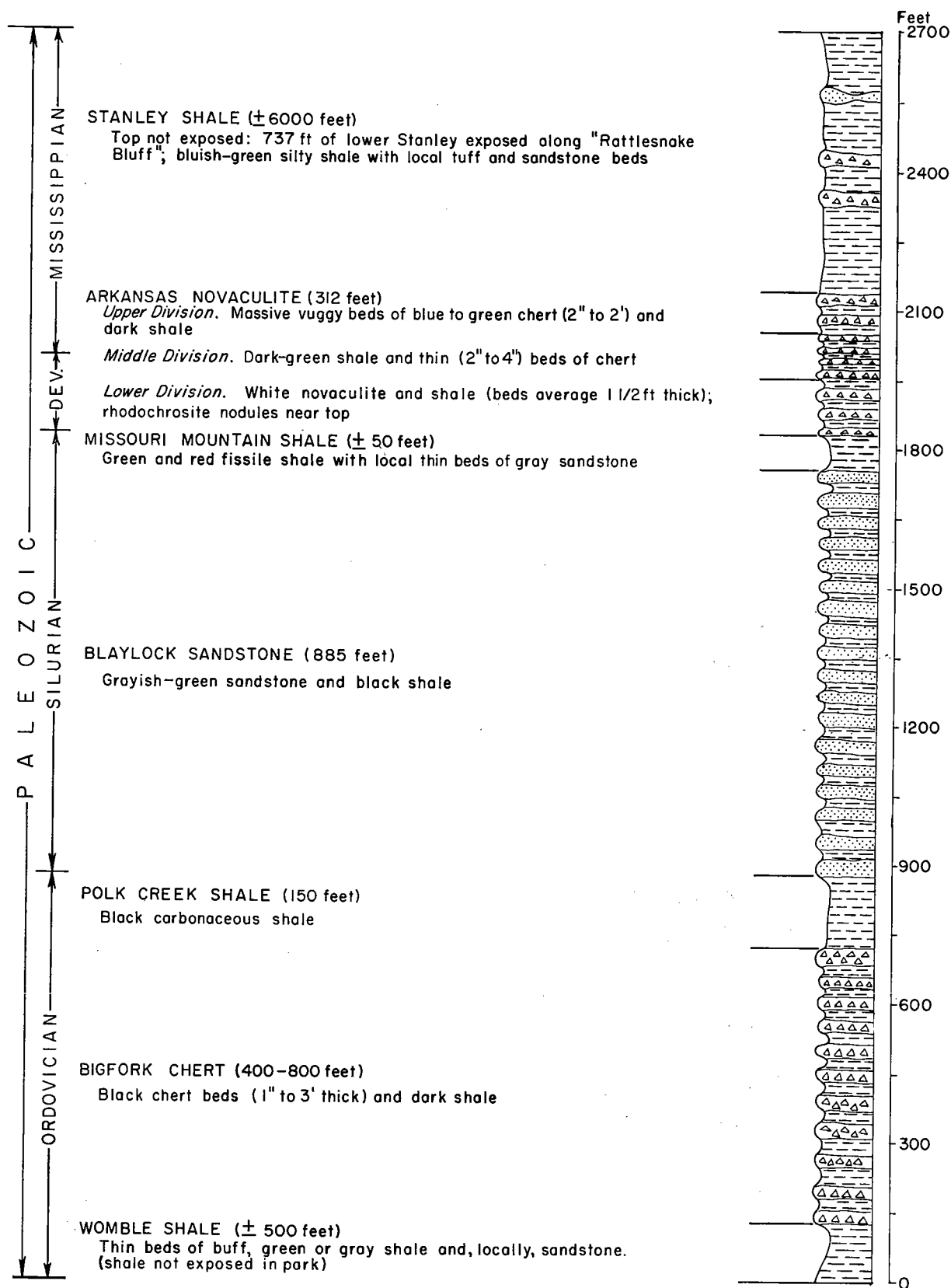


Figure 2B. Columnar Section of rocks in Beavers Bend State Park area.

## STRUCTURE AND SCENERY

"Structure" here means the way that the originally horizontal beds were deformed into some position other than horizontal. Essentially the rocks of the park area were tilted or inclined gently eastward or southeastward. This tilted structure, called a homocline, was also warped into a series of upfolds called anticlines and adjoining downfolds called synclines; but even in the anticlinal and synclinal areas the regional easterly tilt of the rock layers is present. This structure has had a profound effect upon the location of the ridges and valleys of the park area. The hard ridge-forming layers of rock that tilt eastward have a general north-south trend, as do the softer valley-forming layers on either side of the ridges. Where the hard rock layers are inclined or dip very steeply eastward, the east slope of the ridge is



*Figure 3. Massive tuff bed of lower part of the Stanley Shale Formation at Rattlesnake Bluff, Beavers Bend State Park.*

as steep as the west slope; this ridge is called a hogback ridge. Where the rock layers on the ridges are only slightly inclined eastward, the east slope is much gentler than the west slope; this ridge is termed a cuesta.

## TIME AND ROCK DIVISIONS

The largest time subdivisions of the world are known as eras. These time divisions are terminated by periods of most rapid change of life forms, or by periods of mountain making, as shown by the record found in the rocks here and elsewhere. Abundance of life forms on earth did not begin until about half a billion years ago with the beginning of the Paleozoic (old-life) Era. This era was followed by the Mesozoic (middle-life) Era, which in turn was followed by the Cenozoic (recent-life) Era. The Cenozoic Era lasted about 60 million years, during the last one million years of which man was probably on earth. The Cenozoic Era was the shortest of these three eras, for the Mesozoic Era was three times as long, or 180 million years in length of time, and the Paleozoic Era was five times as long as the Cenozoic Era, or 300 million years in length of time. The earth is at least eight times as old as these eras put together; that is, the earth itself is estimated to be from 4 to 10 billions of years old. The vast time era before the Paleozoic Era is generally referred to as Precambrian time.

Most of the rocks and sediments in the park area were deposited in seas during the Paleozoic Era, making most of them well over 250 million years old. The subdivisions of an era are called periods; seven periods of time make up the Paleozoic Era. The reader will not be able to see these subdivisions by examining the rock layers in the park; he will, however, be able to see the natural rock or lithologic subdivisions called formations. A formation is a mappable unit, a sequence of rock layers that can be traced from one area to another as a distinctive and recognizable rock unit. A geologist can trace a formation because it has a distinctive topographic expression. Some formations come to the surface along hilltops, others along valley bottoms, and still others along hill-sides. Traceable units in this area generally can be classified as ridge-makers or as valley-makers. If a given sequence of rock layers normally forms a

ridge or hill because it is more resistant to the decaying forces of nature than the rock sequences or units above or below it, we say it is a ridge-making formation; the less resistant rock sequences or units are therefore logically called valley-making formations.

#### RIDGE-MAKING FORMATIONS

**Bigfork Chert.** The name of this rock unit is derived from the hard chert beds that make up about half of its total thickness of 400 to 800 feet (See roadlog and map for locations of formation). Most of the rest of the formation consists of a softer, platy rock called shale. The chert layers seldom jut out in ledges except along Mountain Fork River. Instead, the chert typically covers the steep slope in brick-size fragments. Normally this formation weathers out along high, narrow, and short ridges that in airplane view resemble the convolutions of calves' brains. The black shales of this unit locally contain many fossils called graptolites; these fossils, visible on the bedding surfaces of the shale, resemble pencil markings, some of which are shaped like saw blades.



Figure 4. *Blaylock Sandstone exposed beside State Highway 21A just inside Beavers Bend State Park, NE¼ sec. 16, T. 5 S., R. 25 E.*

**Blaylock Sandstone.** This formation consists of about 885 feet of thin (1 to 4 inches thick) gray-to green-colored beds of sandstone and illitic shale. Typical outcrops are seen along the roadside at the first turn just inside the park entrance on State Highway 21A (See road log). The formation forms elongate, even-topped hills where it is ex-

posed at the surface. A thick mat of grass, more often than timber, is typical of the slopes where this formation intersects the ground surface or crops out. A curious and inexplicable concentric marking occurs locally on the thin-sandstone surfaces of the middle part of the Blaylock. The marking consists of a series of furrows or small ridges that parallel adjacent furrows or ridges; each ridge or furrow eventually joins to form a complete loop, never crossing the adjacent furrow in doing so. Transverse ridges or furrows that extend partly across the linear ridges or furrows resemble footprints, possibly of a millipede-like creature.

**Arkansas Novaculite.** This is easily the most distinctive formation in the Ouachita Mountains. The formation, like the Bigfork Chert, consists mostly of beds of dark chert and shale. The chert in this formation, however, is multicolored, locally being white, green, red, gray, blue, black, or yellow. Beds of chert or novaculite are up to 7 feet thick, although 2- to 12-inch beds are more common. The formation in the park area totals 312 feet in one section measured by Spradlin. The uppermost part of the formation abounds in cavities from a fraction of an inch to two feet in diameter. Where the cavities are interconnected, they become the home of myriads of rats. This cavity-filled bed may be studied behind cabin 10 in Beavers Bend State Park, where, incidentally, rats are not common.

#### VALLEY-MAKING FORMATIONS

The shales on both sides of the ridge-making formations are narrow-valley formers except for two shale units: the Womble Shale, the rock unit that underlies the Bigfork Chert, and the Stanley Shale, the shale that overlies the Arkansas Novaculite. These thick shale units are described below.

**Womble Shale.** The Womble Shale, about 1,000 feet thick, if combined with the here indistinguishable Mazarn Shale beneath, does not crop out in Beavers Bend Park; but it does so extensively west of the park area (See road log). Its outcrop band, more than a mile wide, is characterized by low hills, most of which are covered with fragments of white quartz. The quartz outcrop itself seems to cause most of the hills in this outcrop

belt. Actual exposures of this unit are few; roadside outcrops, however, are found along a one-mile stretch of road south of the junction of State Highways 21 and 21A. At these outcrops the shale unit consists of thin beds of green- to buff-colored siltstone and shale.

*Stanley Shale.* This formation, predominantly shale, contains local beds of sandstone and tuff in its 6,000 feet or more of total thickness. The main recreation (valley) area of Beavers Bend State Park rests on Stanley Shale. Here the Stanley consists of bluish-green, slabby shales interbedded with thin beds of sandstone and tuff. The tuff beds consist mostly of an accumulation of fine particles that were blown out, fiery hot, from volcanoes about 300 million years ago. A rock specimen of tuff contains grains of sand, sharp-edged pieces of a soft white mineral (kaolin), shale, glass, and other materials that together give the specimen a fragmental appearance. These fragment-filled beds make up the several tuff beds that are seen so prominently along Rattlesnake Bluff, the cliff that overlooks the swimming pool in the park area. A 90-foot-thick bed of tuff caps Rattlesnake Bluff, with thinner beds of tuff exposed beneath. A total of 737 feet of lower Stanley



Figure 5. Tabular black Stanley shales beside south bank of Mountain Fork River behind cabin 10 in Beavers Bend State Park.

was measured at Rattlesnake Bluff. The tuff beds and especially the sandstone beds in the Stanley cause high ridges in some areas, but normally the Stanley Shale crops out in a valley, between the

ridge-making Arkansas Novaculite below and the thick beds of the Jackfork Sandstone Formation above.



Figure 6. Stanley shales in Beavers Creek near the bathhouse in Beavers Bend State Park.

Scenic Road Log (with emphasis on geology), from Broken Bow, Oklahoma, to recreational center, Beavers Bend State Park.

#### Mileage

- 0.0 At junction of State Highways 3, 7, 21 and U.S. Highway 70, turn north on State Highway 21 toward Beavers Bend State Park.
- 0.15 Large frame building to right is Charles Wesley Hotel; excellent family style meals served here.
- 1.5 Entrance to State of Oklahoma Board of Agriculture, Forestry Division. This division cooperates with the Dierks Lumber Company in putting out forest fires north of here.
- 1.9 Orange- and buff-colored beds of gravel and sand, inclined slightly toward south, were laid down in seas that covered all of Oklahoma more than 70 million years ago. Geologists call these beds the Holly Creek Formation, deposited during the Cretaceous Period (upper part of the Mesozoic Era).
- 2.4 Yanubbee Creek Bridge.
- 3.0 Bridge.
- 3.4 Deep road cut at top of hill in very hard formation called Arkansas Novaculite; this rock is quarried for whetstone in Hot Springs, Arkansas. It causes the highest ridges in the Beavers Bend State Park and adjoining area.
- 4.2 Black compact rock on the east side of road (right side in going north) is the rock formation called the Bigfork Chert. It also forms many prominent ridges in this general area.

If one splits this dense rock, he can find saw-blade shaped remains of former marine animals called graptolites.

- 5.1 Junction of State Highway 21 and Old Clebit Road. The oldest rock found in the Ouachita Mountains is found 5.6 miles west along Old Clebit Road, where the road crosses Lukfata Creek by means of a cement-slab ford. These old beds consist of thin beds of dark limestone and flaky shale belonging to the Lukfata Sandstone Formation of lower Paleozoic age. Other landmarks along this road include:

At 1.7 miles (from junction of State Highway 21 and Old Clebit Road), notice clear water flowing over Womble Shale beneath bridge.

At 2 miles, see pine trees on south planted by Dierks Lumber Company, which owns about 95 percent of the land in this general area.

At 2.5 miles, at this right-angle turn and for several hundred yards west, travel on the Crystal Mountain Sandstone; notice the sandstone and milky quartz boulders.

- 5.1 Junction of State Highway 21 and Old Clebit Road; continue northward on State Highway 21. For next mile one can see outcrops of the Womble Shale, the rock unit that underlies the Bigfork Chert.

- 6.3 Junction of State Highway 21 (which continues northward) and State Highway 21A, which leads eastward to Beavers Bend State Park. By driving northward from this point 10.5 miles, one will come to the junction of the road to the Carter Mountain lookout tower and State Highway 21, at the top of a hill. One can enjoy a beautiful view of the southern Ouachita Mountains from the top of the tower, or even from its base. If you climb the tower, please remember that no more than six people are allowed on the tower at the same time. Other landmarks along this road include:

At 4.5 miles (northward from junction of State Highways 21 and 21A). Government springs to the right (east) of highway. The government land surveyors in the 1890's camped beside this spring while making the original surveys in the area. In roadcut just ahead, notice extreme degree of folding (folds that are "lying on their sides" are recumbent folds) of thin shale and limestone beds of the Mazarn-Womble Shale Formations; also notice

the quartz veins that intruded the folded beds.

At 7.2 miles, junction of Hairpin Bend trail and Cedar Creek trail with highway; just north of this point are deep roadcuts in the Arkansas Novaculite; notice the extreme degree of folding, broken locally by faults (cracks in rock along which rocks on both sides have been moved).

- 6.3 Junction of State Highways 21 and 21A; continue eastward on State Highway 21A. Sharp hill ahead is "held up" by Bigfork Chert Formation; notice the rectangular blocks of chert along the steep slopes in passing through the gap in the ridge.
- 8.2 Sharp turn to left; notice that the layers of Blaylock Sandstone, exposed along the roadside from this point northward, are inclined in the direction you are traveling (northward); you are on the south flank of a downfold of rock strata; the rock layers are folded into the form of an immense "bath tub," called a syncline.
- 8.8 At the center of the syncline, rocks beneath car are the Arkansas Novaculite; bottom of the fold is tilted slightly eastward (or to the right of a car traveling northward). Notice valley to right, which is caused by the tilting of this downfold toward the east. The valley bottom consists of the Stanley Shale, the valley-forming unit overlying the Arkansas Novaculite.
- 9.4 On the north side of the downfold, in the Blaylock Sandstone Formation (again); notice the large fold lying on its side on roadcut to right of road.
- 9.2 Entrance to Beavers Bend State Park (no guns or dogs allowed).
- 9.8 Notice layers of Blaylock Sandstone changing from horizontal to vertical in their alignment. This phenomenon is caused by tight folding and breaking of rock strata with folding.
- 9.9 Rock collectors, stop the car. Notice the varicolored thick bed of Arkansas Novaculite. Polished specimens are attractive gem stones.
- 10.4 Recreational center of park area. Slabby rock in roadcuts nearby belongs to the Stanley Shale Formation, as do the rocks in Rattlesnake Bluff opposite the swimming hole. Most of the cliff-forming beds of this bluff are tuff beds, consisting mainly of fragments blown from volcanoes roughly 300 million years ago.

## PREHISTORY OF BEAVERS BEND STATE PARK

ROBERT E. BELL

Although there have been no specific archaeological excavations conducted within the confines of Beavers Bend Park, the valleys of Mountain Fork River, Glover Creek, and other streams in McCurtain County have long been inhabited by the American Indian. Surface evidence, in the form of flint chips, fire-cracked stones, broken animal bones, burnt clay, or artifacts, such as arrowpoints, knives, or scrapers are to be found along the stream banks marking the former existence of camping spots or village sites. From our meager surface collections and from excavations along Glover Creek, we know that the region was fairly well populated in prehistoric times and that, centuries before any white man viewed McCurtain County, some early peoples achieved a way of life which merits our respect.

The oldest materials that we have on record from the region are flint spear or dart points from the Paleo-Indians or Big Game Hunters, who inhabited the Great Plains country several thousand years ago. These were a nomadic and migratory people, mainly hunters who followed and preyed upon the great herds of bison throughout the plains country. They are identified by distinctive stone projectile points; and some of these, such as the Scottsbluff and Meserve points, have been collected from the McCurtain County area. Apparently these early Big Game Hunters passed through this region, or included it within their hunting domain, as early as 5000 B.C.

For the next 5000 or 6000 years, the region was intermittently occupied by other or related groups who were more dependent upon a forest economy of hunting and gathering. These peoples are more closely related to early inhabitants of eastern United States, where we recognize them as the Archaic peoples. Although still dependent upon hunting, especially deer and forest animals, they were learning better to exploit their environment by gathering various wild plant products, such as nuts, seeds, berries, and roots. Too, shell-

fish or mussels from the streams added variety to their diet. Sites from this time suggest that, although still represented by small groups, the way of life was not so migratory and that favorite localities could be occupied over longer periods of time or were revisited more frequently. The total cultural inventory became more complex by the addition of new tools, utensils, weapons, and ornaments. One can note a greater exploitation of the local natural resources, as well as the beginnings of trade and exchange with surrounding regions.

Out of this Archaic tradition, stimulated by influences either from the Mississippi Valley or possibly from Mexico, by A.D. 800 or 1000 the McCurtain County area developed a sedentary food-producing population. These Indians were farmers, raising corn and probably various types of beans and squash. The villages were located in the stream valleys, where easily tillable agricultural lands were readily available for their crops. Although the villages were small, they were numerous and tended to cluster around a religious center, which served as a focal point for their ceremonial life. Refuse from their households indicates that hunting was still important, but the reliability of garden produce made life easier and less uncertain.

The houses of these people varied in style and were quite adequate. Some were square or rectangular, often thirty or thirty-five feet across, with walls built of wooden upright posts caulked solid with a mixture of grass and clay. Others were round, circular structures, thirty or more feet in diameter, and were built like the beehive-shaped grass houses of the Caddo or Wichita in historic times. The interiors featured fire hearths, sleeping platforms, and storage areas for food surplus. Household equipment included pottery vessels and containers of wood, basketry, or skins, various implements associated with food preparation, tools for the manufacture of clothing, various

weapons, and articles for cultivation of the fields. Personal adornment was not overlooked, and we find beads of shell, pendants and ornaments, hair pins, earrings, and various pigments which apparently were cosmetics. Probably it is in the pottery, however, that we can see the best expression of their artistic ability. They produced a wide variety of forms, variously shaped bowls, jars, and bottles, not only in brown colors but also in a bright red. Many of these were decorated with graceful incised or engraved designs, which enhance the beauty of the vessel; and prized specimens were sometimes buried with the dead.

Each village usually maintained its own burial area and contributed to the support of a nearby

ceremonial center. Such centers are marked by large earthen mounds which served as a foundation for the erection of a special structure—the local temple or ceremonial meeting place. Here the supernatural world was dealt with, but we can only guess as to the nature of such activities.

Although these people dominated the McCurtain County region for a century or more, we are unable to identify any specific tribe or individual. Apparently they had abandoned the region by the time early white explorers entered the area; in all probability, however, they were the ancestors of the Caddoan speaking groups to be found along the Red River in historic times.

## THE CHOCTAW COUNTRY

A. M. GIBSON

On the eastern fringe of the Cross-Timbers, sandwiched between the Canadian River and the Red River is the Choctaw Country. There nature ran riot. Tumbled land forms distorted the orderly prairie plains and from the geological scramble the Kiamichi range, the Jack Fork, Winding Stair, and pine-clad Sans Bois humped above the Choctaw flats. Sparkling waters tumbled from highland springs, fused into tributaries and in lowlands formed the Mountain Fork, the Kiamichi, and the Blue. These rivers cut deep and their banks were laced with oak, walnut, maple, and hickory forests, which blended with pine and cedar stands on the summits.

Bison, deer, bears, fur-bearing animals, turkeys, and wild horses abounded on its prairies and in the forest glades. Rich beaver harvests on the Mountain Fork, and muskrat, coon, and bobcat in the Kiamichi Valley made the Choctaw Country a trapper's paradise.

In the Choctaw language there are two words: *Atukko*, meaning haven and *Yakni Ach-nukma* for good land. These were the most common terms used to describe this domain in earlier times. Small wonder the Choctaws were so en-

thusiastic over this country, willingly exchanging their swamp-ridden Mississippi home for *Yakni Ach-nukma*.

Despite its pristine beauty and boundless resources, the Choctaw Country had been a home for other peoples before the Choctaw migrations. Recent mound excavations in the Spiro area have yielded evidence of pre-Columbian occupation, which includes pearls, beads, engraved conch shells, copper axes and drills, ceremonial maces, pipe bowls, images in stone, spears, and fragments of cloth (Bell and Baerreis, 1951).

Caddoan tribes occupied the Red River Valley during the seventeenth and eighteenth centuries, and erected substantial villages in the lower Choctaw Country. Quapaw bands are known to have migrated up the Arkansas Valley as far west as old Fort Coffey. In the eighteenth and nineteenth centuries the Osage considered the Choctaw Country as the southern fringe of their hunting lands.

About 1800 a band of Shawnees from the Old Northwest moved to a site near present Idabel on Red River and established Shawneetown, a thriving agricultural settlement consisting of cabins,

log-fenced fields, and herds of livestock. The Shawnees were joined in 1817 by white settlers from Arkansas.

So numerous did these whites become in the southeastern corner of the Choctaw Country that in 1820 the Arkansas Territorial Legislature or-

ganized Miller County, and the bustling community of Miller Court House, which boasted a United States post office, became the county seat. Additional Arkansas settlements in present McCurtain and Choctaw Counties, notably at Clear Creek and Pecan Point, radiated from Miller

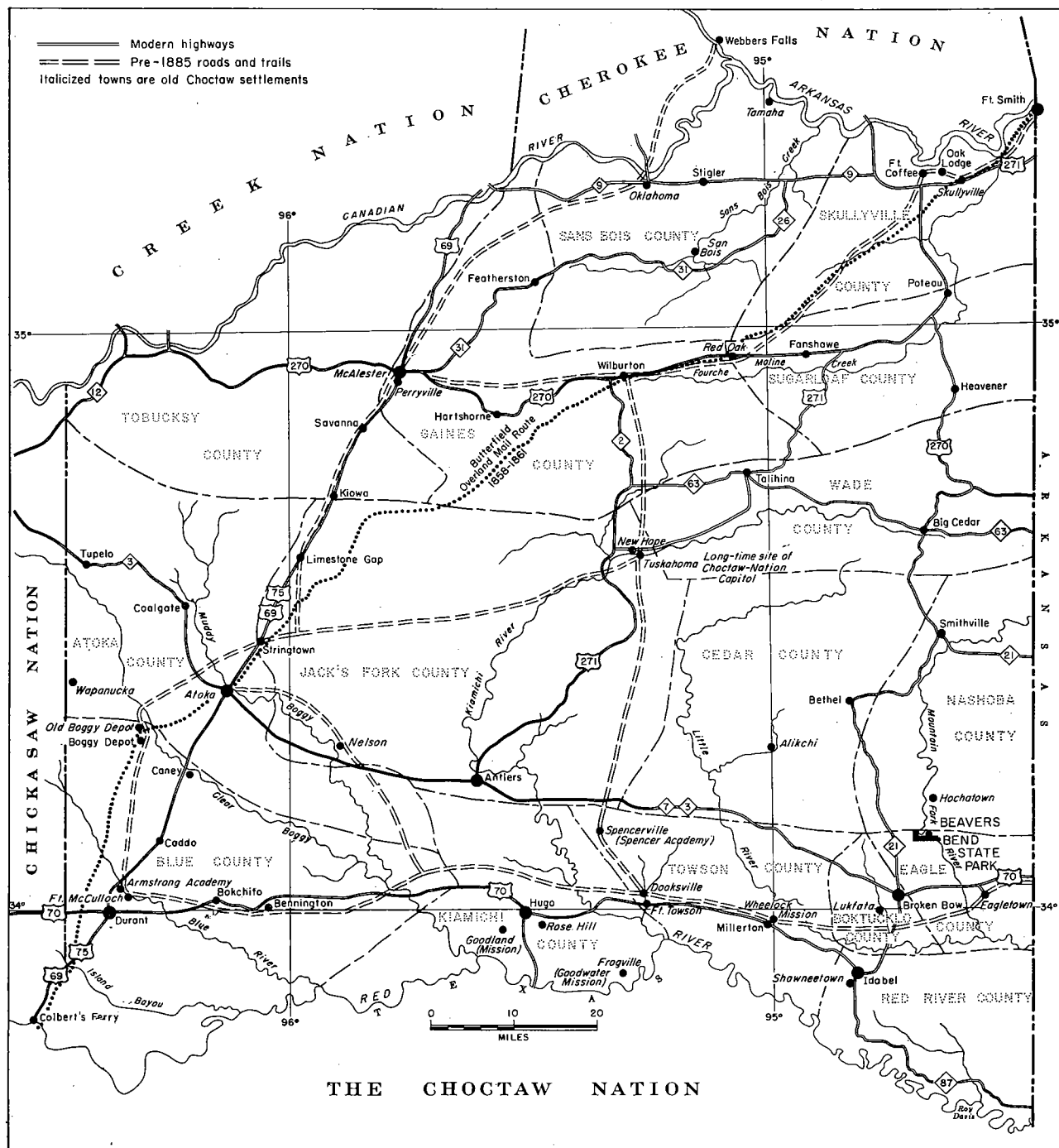


Figure 7.

Court House. Settlers cleared farmsteads, erected cabins and barns, and collected their surplus grain for shipment on the creeks and rivers via keelboats, pirogues, and bullboats to the Red River landings. From there, flatboats carried their produce to Natchitoches or New Orleans.

The *Arkansas Gazette* regularly advertised the opportunities for successful farming in Miller County (*The Daily Oklahoman*, April 23, 1939). The biggest threat to an extension of the line of Arkansas settlement in the Choctaw County was frequent forays by the plains tribes west of the Cross-Timbers. Throughout the early 1820's, Comanches and Kiowas raided up to the Kiamichi settlements of Miller County, killing settlers at work in their fields, driving off their livestock, and carrying women and children into captivity.

The Osages, too, resented this intrusion into their historic hunting lands and made ominous threats. In 1823, Mad Buffalo, son of Clermont, led a large party of mounted Osages to the mouth of the Kiamichi and drove off cattle and horses of Miller County settlers. On his return, Mad Buffalo massacred a party of American and French trappers on the Blue. Miller County citizens demanded protection; and in May, 1824, Fort Towson was constructed on the bluffs of Gates Creek as a buffer against Comanche, Kiowa, Kickapoo, Pawnee, and Osage raids (*The Daily Oklahoman*, March 13, 1927.)

Miller County residents also faced Indian boundary problems. The Treaty of Dancing Rabbit Creek, negotiated between the United States and the Choctaws had granted to the Choctaws the Miller County area. Protests from Arkansas Territory resulted in an act of Congress in 1824, providing for the western boundary of Arkansas to run due north from the mouth of the Kiamichi (*United States Statutes at Large*, vol. 4, p. 40).

This victory was brief since the Choctaws, who were preparing to surrender their Mississippi lands to the United States and journey to their new home in the West, countered with stronger protests; and the boundary was moved east to a line to run from the Red to a point one-hundred paces east of Fort Smith (Kappler, 1904). In spite of the cession of this territory to the Choctaws, a large number of original settlers in old Miller County remained and coalesced into the Choctaw

communities established between 1825 and 1835.\*

The Choctaws, to whom the country between the Canadian and the Red and west of Arkansas had been assigned, were of Muskogean linguistic stock. Early in the history of American discovery and exploration they caught the notice of Spanish, French, and British adventurers because of their remarkable economic development, tribal valor and integrity, and their intriguing folklore. De Soto's gulf expedition in 1540 found the Choctaws occupying the fortified town of Maubila (Mobile) and ranging across present Alabama and Mississippi. The Choctaws managed to stay free of Spanish involvement.

French designs in the gulf region during the seventeenth and early eighteenth centuries disrupted the relations between the Choctaws and their brothers, the Chickasaws, and provoked a series of internecine wars that drastically reduced the French-allied Chickasaws. Hostility for the French made the Choctaws allies of the British until the American War of Independence, during which the Choctaws furnished several warrior battalions for the Continental armies. Thereafter, Choctaw veterans received Revolutionary War pensions from a grateful United States.

Choctaw amity with the United States persisted through the War of 1812. When Tecumseh visited the gulf tribes in 1811, seeking their affiliation with his Indian Confederacy for the purpose of waging a massive war on the United States, the Choctaws refused. Continuing its loyalty to the United States, the Choctaw tribe furnished several battalions for service against Great Britain in the War of 1812.

Before the impact of Western culture made heavy inroads on Choctaw folklore and customs, this tribe had a most intriguing set of practices. The Choctaws lived in villages and farmed adjacent lands. These lands were held in common, ownership being in the tribe and not in individual title. The Choctaws were regarded as the best agriculturalists of the Five Civilized Tribes. Their Mississippi and Alabama cornfields yielded bountiful harvests, which were traded to neighboring

\*The new line was run in 1826, and is inaccurate; it veers west two or three miles where it joins the Red River. By the Choctaw agreement of 1825, Fort Smith remained in the Indian Territory until 1905 when an act of Congress allowed Arkansas to annex the Fort Smith area.

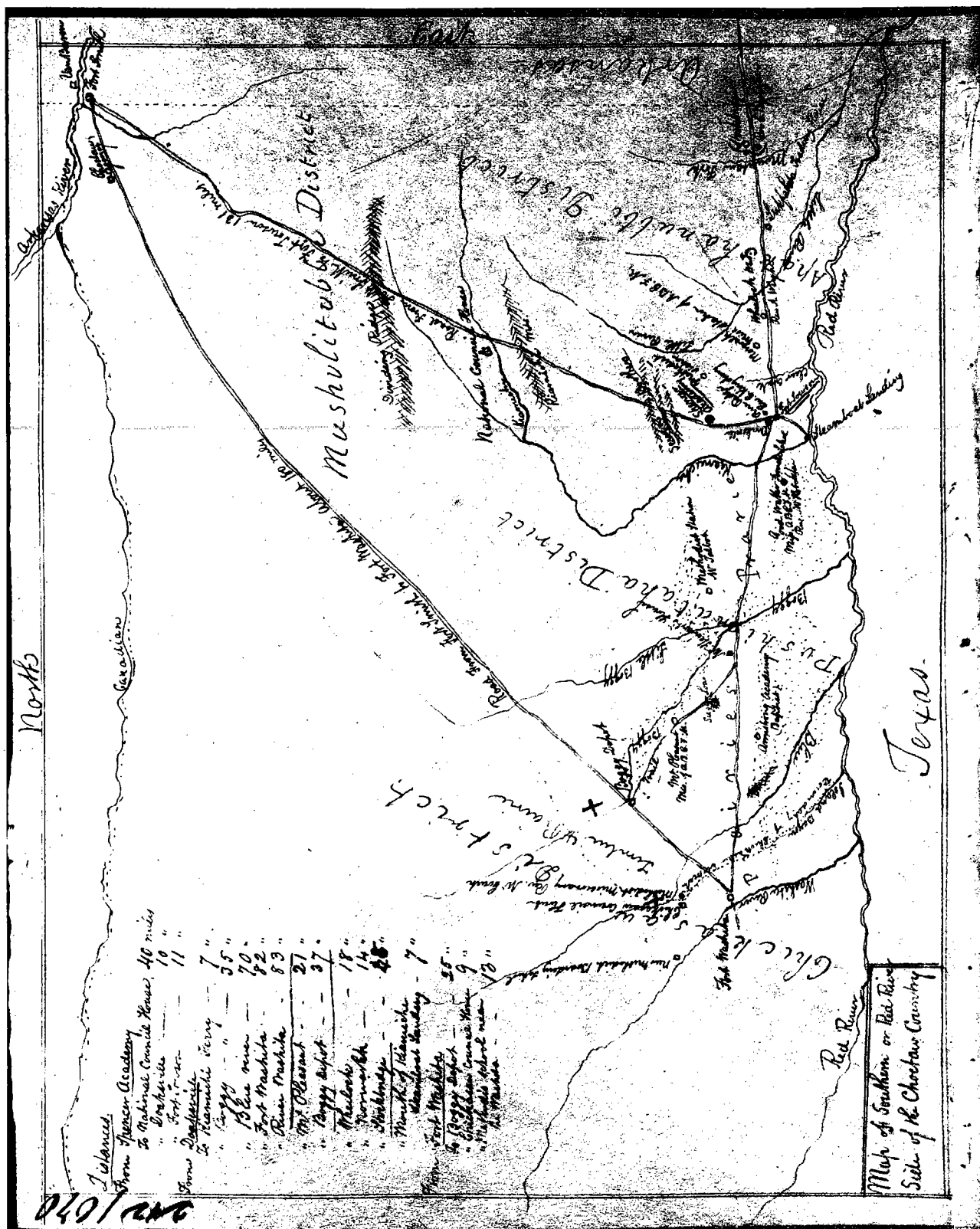


Figure 8. *The Choctaw Country, 1840 (From Presbyterian Historical Society, Choctaw File, Philadelphia).*

tribes. In addition, Choctaw farmers produced melons, pumpkins, sunflower seed, wild fruits, nuts, and berries.

European posts and settlements furnished

markets for resourceful Choctaws who brought in bear oil, honey, hogs, and furs (Wright, 1951, p. 103). The Choctaws were skillful hunters and fishermen, too, and although firearms made their

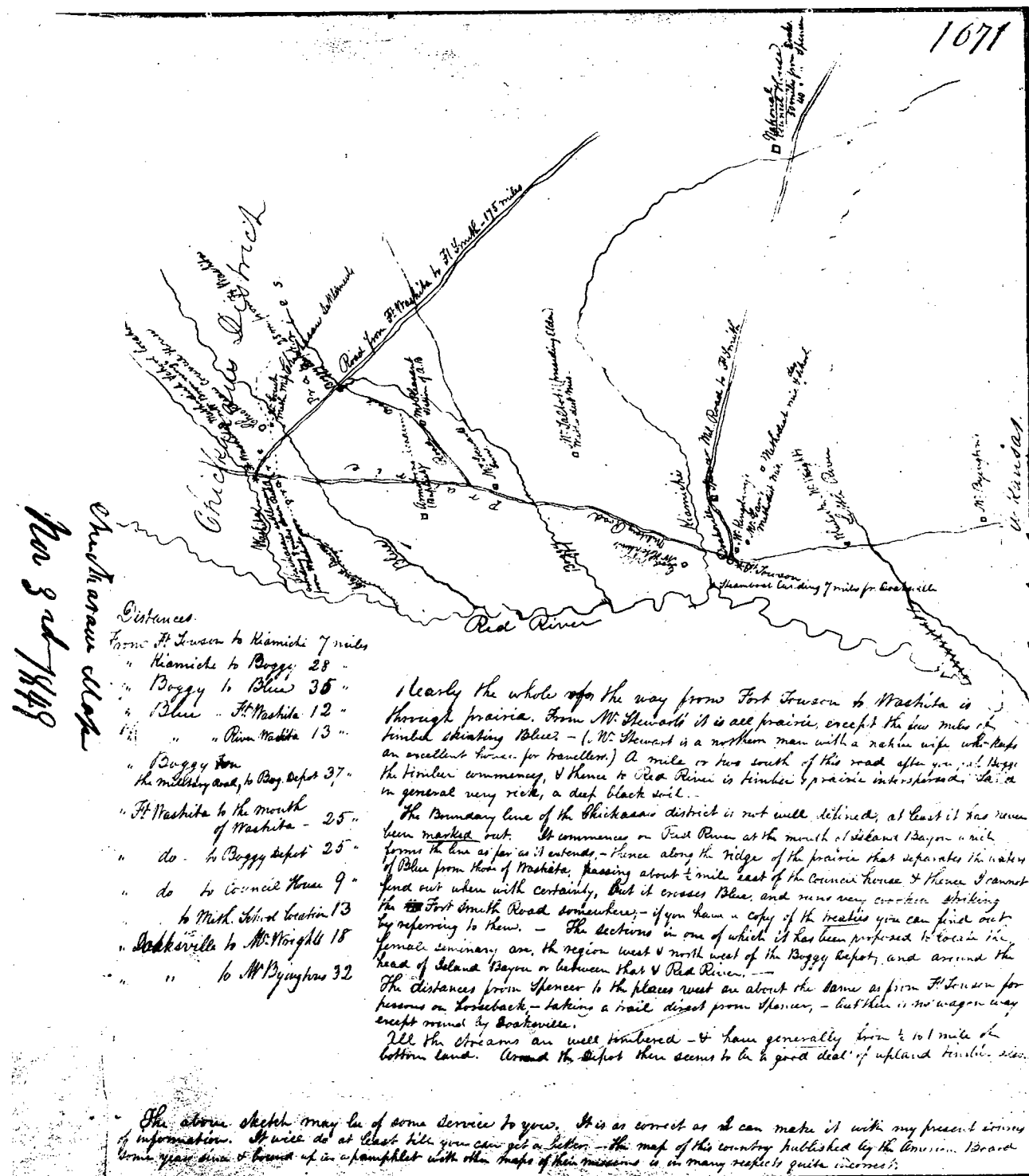


Figure 9. The Choctaw Country, 1849 (From Presbyterian Historical Society, Choctaw File, Philadelphia).

hunts more successful, even in the days of the bow and arrow Choctaws won renown as marksmen. For small game, the Choctaws used blowguns made of reeds and using small darts. Choctaw fishermen speared fish in the clear streams, captured them in nets woven from vines, and drugged those hiding in deep holes with crushed buckeye and winterberries.

Besides a stable economic life, the Choctaws had a rich folklore. The most basic feature concerned the story of Choctaw origin and depicted a deity who descended into the midst of a muddy plain and erected a high hill. This he named Nanih-waya, which means "productive mountain." When the Choctaw creator had finished this sacred mound, he drew from its vitals the Choctaw people.

The native Choctaw religion was an interesting compound of the Nanih-waya and other traditions; homage to certain elements, especially sun and fire; propitiation of good and evil spirits by fasting, dancing, and spells; and various superstitions concerning witches, demons, and signs. The Choctaw religious lore was preserved by medicine men, the *Alikchi*, to whom were ascribed special powers of controlling evil spirits, conjuring, and healing.

Besides this tribal clergy, Choctaw religion was carried on by individual warriors with special tokens, signs, and supernatural devices. These consisted of bone ash from ferocious beasts, "particles of red clay or colored sand, bones or feathers of brightly colored birds," all boiled together and enclosed in each warrior's sacred medicine bag. A series of tribal dances, including the green-corn dance, war dance, and scalp dance, expressed through physical movement the deep religious convictions of the Choctaw (McReynolds, 1954, p. 95).

Choctaw religion included a belief in the Great Spirit and in an afterlife. Their funeral customs, reflecting this belief, included erection of a burial platform near the dwelling of the departed one. Upon this was placed, besides the corpse, his weapons, tools, ornaments, food, and water. Fires were built around the scaffold to supply light and comfort for the departed. The warrior's remains might be on the platform for half a year

"the stench . . . so great that mourners, appearing at frequent intervals . . . sometimes fainted" (McReynolds, 1954, p. 94).

Caring for the Choctaw dead became an elaborate ritual involving several groups of specialists, including bone-pickers. These early-day undertakers, highly esteemed in the tribe, took over when the corpse had decomposed. McReynolds (1954, p. 94) wrote:

. . . these men, with no other instruments than long, sharpened fingernails, mounted the platform and picked the flesh from the bones. The skull was painted with vermilion, and the skeleton was passed down to waiting relatives, who laid it in a well-constructed coffin. The platform and decayed flesh were then burned. The coffin was placed with others in the village bone-house and the mourners gathered for a ceremonial banquet, the bone-pickers presiding as honored officials. At intervals, all the coffins were carried to the burial mound, where several communities might find space for the bones of their dead.

Besides the elaborate care given to the Choctaw dead by the bone-pickers, the tribe also had an unusual practice called the funeral cry. Christian missionaries assailed most of the Choctaw religious beliefs; and one by one these pagan practices were abandoned. The funeral cry, however, survived until recent times. Little grief was exhibited at the time of death, and the funeral sermon might not be preached for a year following death. During this interval, the widow sent invitations to relatives and friends now and then to come to the grave for a cry. This was preceded and followed by a feast and was always well attended (Debo, 1934, p. 229).

Choctaw superstitions were many and elaborate, the most gruesome one concerning the witch-test. The Choctaws believed that witches removed their vitals and hung them on a tree limb in preparation for going forth to cast spells and do mischief among the people. "If one happened to find a human heart and entrails hanging on a limb and a moment later saw a human form come and quickly try to replace them in its body the onlooker should instantly kill the strange being for it was surely a witch." (See *The Daily Oklahoman*, April 23, 1939.)

The country where the Choctaws had developed this interesting lore and had thrived economically and politically as a nation, was coveted by land-hungry planters soon after 1800. By a series of treaties, beginning in 1820 with the Treaty of Doak's Stand and ending in 1830 with the Treaty of Dancing Rabbit Creek, the Choctaws surrendered their historic home in Alabama and Mississippi. In return they received title to a vast domain west of Arkansas, extending to the one-hundredth meridian and bounded north by the Canadian and the Arkansas, and south by the Red.

The Choctaws knew this new country fairly well, for hunting parties had ventured up Red River into Oklahoma long before 1800. Pushmataha led an expedition north of the Arkansas in 1807. Near the mouth of the Verdigris, he met and defeated Joseph Boggy's French Canadians and Osage allies. Encouraged by the favorable reports that Pushmataha and other leaders brought back, small parties of Choctaw settlers started moving into the southeastern portion of their new country in the middle 1820's.

The big movement of Choctaws, however, which did not begin until after 1830, extended over a period of three years. While some Choctaws came by steamer as far as Little Rock, most of the migrants came on foot in parties of 500 to 1,000 persons each. Tribal leaders, missionaries, and United States agents and officers accompanied each group.

Blizzards, cholera epidemics, exposure, and lack of supplies caused hundreds to die on the trail; and the Choctaw exodus rivaled the Cherokee Trail of Tears for misery and hardship. The cost in human life is evident from the statistics. Just before removal in 1831, the Mississippi and Alabama Choctaw population numbered 20,000. (See *Senate Document*, No. 512, 23 Congress, 1st sess.) In 1843, the missionary, Cyrus Byington, enumerated 12,690 Choctaws in the West. These figures reveal the losses attendant to removal (Thwaites, 1905, p. 317).

Settlers were attracted to three areas in the Choctaw Country. One big Choctaw settlement was established northeast along the Poteau River in present Le Flore County and along the Arkansas River into Haskell County. Another string of

settlements ran southeast on the tributaries of Little River onto the Red in present McCurtain County. The third settlement area ran west from the Kiamichi River into present Choctaw County.

Trading towns mushroomed around strategic water and land points. Eagletown, Doaksville, Towson, Skullyville, Boggy Depot, Tamaha, Perryville, and Mayhew served as important trade centers before the Civil War. Each of these towns had a post office, a market center for livestock and agricultural produce, stores stocking a variety of commodities, blacksmith shops, and hotels. Several towns published newspapers both in English and Choctaw. The most notable was the *Choctaw Telegraph-Intelligencer*, produced at Doaksville, and edited by David Folsom, a Choctaw mixed-blood.

Several important highways crossed the Choctaw Nation and kept the tribe in close contact with developments in the States. These included the military road from Fort Smith to Towson, the Washita-Towson Road, and the Texas Road. Texas immigrants filled these highways during the 1830's and 1840's (Goode, 1836, p. 189). When the Butterfield Stage Line inaugurated service to California in 1858, the Texas Road through the Choctaw Country was an important link. Choctaws maintained stage stands, ferries, and turnpikes along the route.

From Boggy Depot a road ran west to the California gold fields, and, from 1849 to 1860, old Boggy's hotels and inns were filled from time to time with California migrants. South of Towson Choctaw merchants built landings and warehouses on the Red, and Choctaw farmers and traders became linked with the rich trade at Natchitoches and New Orleans.

Steamboats brought machinery, slaves, furniture, carpets, and other trappings to decorate elegant town homes and plantations in the Choctaw Country. These steamboats carried to southern markets Choctaw furs, hides, grain, meat products, and cargoes of cotton raised by slaves on Choctaw plantations.

The full-bloods usually settled in the hills and mountains away from the stream of commerce and industry. Living in crude cabins, they farmed small subsistence patches and hunted and fished for a living. The more aggressive mixed-

bloods, besides operating businesses in the towns, established stock ranches, farms, and plantations along the fertile river valleys. Even on the cotton plantations, the curse of the one-crop system was avoided, for besides cotton, they planted orchards, cultivated corn and other crops, and ran herds of cattle, hogs, and horses. Each operator sought to be as self-sufficient as possible (Goode, 1836, p. 187).

As had been their custom in the East, lands in the Choctaw Country were held in common, title being vested in the tribe. A Choctaw could settle anywhere in the nation and take over as much land as he chose so long as he did not trespass on a fellow tribesman's holdings. He could bequeath or sell all improvements made on the land, but not the land.

An example of remarkable initiative in the use of Choctaw County resources is found in the life of Robert M. Jones. This mixed-blood Choctaw was born in Mississippi in 1808. Educated in the mission schools of his nation, he was graduated from the Choctaw Academy in Kentucky at the age of nineteen. Upon his return to Mississippi, Jones found that his guardian had saved \$1,800 for him from annuity payments. The youth invested this sum in trade merchandise and left Mississippi for the Choctaw Country in 1832.

Jones established trading posts at Doaksville, Lukfata, Skullyville, and Boggy Depot. Profits from these ventures were used to purchase slaves. These were put to work clearing bottom land on the Red, building dwellings, roads, and landings, and opening new cotton lands. By the outbreak of the Civil War, Jones was one of the wealthiest men in the American West. Owner of 500 slaves, he operated six plantations on the Red. Besides the 5,000-acre Rose Hill, the parent enterprise, the plantations were named Lake West, Boggy, Root Hog, Shawneetown, and Walnut Bayou.

Multimillionaire Jones added to his economic empire in the 1840's by acquiring a sugar plantation in Louisiana. His fleet of steamboats plied between Red River Landing and New Orleans, and several ranches on the upland pastures of the Kiamichi were filled with livestock bearing the "RJ" brand. (See *The Daily Oklahoman*, March 11, 1928.)

Cotton was the most important export from

the Choctaw Nation, and by 1860, probably as many as 300,000 bales were shipped to New Orleans annually. In addition, the Choctaws exported hides, grain, honey, furs, pecans, lumber products, and salt.

Much of the Choctaw economic success in the ante-bellum period was due to the tribal interest in education. The first educators among the Choctaws were missionaries. About 1800 the tribe received the interest of Protestant missionary groups, and by the 1820's the influence of their teachings was evident in various facets of tribal life. The general pattern for missionaries was to establish a mission and a school, based on the simple and practical objective of educating the heart, head, and hand of Indian enrollees.

Other basic subjects taught by the missionaries imparted the rudiments of Western learning. Vocational education, supplied through the school farm and shops, was aimed at making the Indian children competent to earn a living as adults. Besides attending mission schools within the nation, Choctaw youths could continue their education at Choctaw Academy at Blue Springs, Kentucky, established in 1824 by the Baptist Missionary Society. This school had been made possible by a provision in the Treaty of Doak's Stand, 1820, which provided that proceeds from the sale of fifty-four sections of Choctaw land in Mississippi be set aside for educating Choctaw children. For a quarter of a century, Choctaw youths were educated at this academy, and many of its graduates became outstanding in the political, social, and business life of the tribe in the Choctaw Country.

Missionaries accompanied the tribe to the West and in a short time had substantial schools and missions in operation. The American Board of Commissioners for Foreign Missions, consisting of Congregationalists and Presbyterians, was active from the beginning. Cyrus Kingsbury, Alfred Wright, Cyrus Byington, and Ebenezer Hotchkin were outstanding as builders of Presbyterian churches and schools in the Choctaw Country. Baptists and Methodists were active, too. By 1838 there were twelve neighborhood schools in the West for Choctaw children. Advanced education was available at Goodland, Fort Coffee, Spencer, and Armstrong Academies for boys, and at Good-

water, Pine Ridge, Wheelock, and New Hope Seminaries for girls (Goode, 1836, p. 181).

The Choctaw Nation helped support these boarding schools through appropriations, and each year sought to increase the number of local or neighborhood day schools. Adult education to increase literacy in the tribe among those above school age was undertaken, too. Missionaries set these adult classes up as "Sunday Schools," and the program was subsidized by tribal appropriations. "Whole families came and camped near the church or schoolhouse, attended school on Saturday and Sunday, and received instruction in the rudiments of arithmetic, and reading and writing in the Choctaw language" (Debo, 1934, p. 61, 62). Missionaries had reduced the Choctaw language to the Roman alphabet, and in less than twenty-five years following removal, the Choctaws, young and old alike, had become a "literate people" (Debo, 1934, p. 62).

Besides achieving a remarkable intellectual success in the Choctaw Country, missionaries also induced many tribesmen to accept the Christian religion. This was done by missions and churches, visitation, circuit preaching, and the ever-popular camp meeting. Everyone in the community enjoyed the annual camp meeting and anticipated it with considerable preparation, for a camp meeting in the Choctaw Country was a social as well as a religious event (Benson, 1860, p. 142, 143). Frequently the meeting, held during the summer and lasting from ten to twenty days, was interdenominational, involving Baptists, Presbyterians, and Methodists. Choctaw families camped on the edge of the clearing, where brush arbors had been constructed around a permanent log church. Each day after a series of hymns, sermons, and testimonies, the worshippers shared in a feast of beef, pork, yams, tam-fula (Choctaw hominy), and coffee (Morrison, 1951, p. 40-47).

The impact of the missionary on Choctaw culture is readily apparent. In terms of number of converts, by 1861 the Choctaw Nation could be called a Christian nation, for twenty-five percent of the tribe was Presbyterian, Methodist, or Baptist; Choctaw tribal law required Sunday observance; ball games, horse racing, gambling, and hunting were forbidden on the Lord's Day; and the Choctaw Council opened and closed its

sessions with prayer (Debo, 1934, p. 64, 65).

Whiskey, the scourge of the Indian, was a problem in the Choctaw Country, and missionaries carried on a lively temperance program, working it into the adult education system. The Choctaw Council supported this aim by law. In discussing one session of the Council, Debo (1934, p. 65) wrote:

... many speeches were made against the evils of drink, and it was voted by acclamation that any citizen who should introduce intoxicating liquors into the Nation would be punished by one hundred lashes and the destruction of his stock. The law, however, was not made retroactive, and after adjournment the members of the Council began to realize that liquor would continue for some time until the stock on hand should be exhausted. Accordingly, they decided to drink up the available supply, a feat which they accomplished in two hours. The immediate effect upon those who performed this necessary public service is said to have been rather appalling.

Missionary influence temporized the old tribal application of law of vengeance, the Choctaw *lex talionis*, and substituted public punishment for offenders. Witchcraft and tribal superstitions gradually fell before the enlightenment of mission-school education. Polygamy, a long-standing practice in the tribe, was abolished by tribal law in 1849, again showing the effects of the incessant campaigning of missionaries and Christian teachings.

The extent of the Choctaws as a Christian nation is evidenced by their concern for others. One example is found in 1847, when news of the potato famine in Ireland stirred the Choctaw leaders to call a meeting of citizens at Skullyville. After adopting a resolution of sympathy for the unfortunate, a collection of \$710 was taken on the spot to help ease the Irish distress. (See *Niles Register*, 1847, vol. 72, p. 139.)

In no field did the Choctaws show greater skill than in politics. In 1826 the Choctaws replaced their old common law and tribal government with a written constitution. Very similar to the United States Constitution, the Choctaw document provided for a bill of rights, including trial by jury, and three coordinate departments of government. Also, the nation was divided into three districts, with a chief elected from each district

to serve as the chief executive. This comprised a sort of triumvirate similar to the classic Roman system. The Choctaw legislature, a bicameral body called the Council, was supreme in governmental affairs, for besides regular law-making powers, the Council also had general oversight powers over the executive and judicial branches.

Soon after removal to the Choctaw Country, a new constitution was adopted. Largely based upon the Constitution of 1826, this document provided for a more elaborate judicial system. Again in 1857, the Choctaws wrote a new constitution, modeling it on the constitutions of the states, even going so far as to change the title Principal Chief to Governor. This change was very unpopular with the full-bloods, so to quiet the opposition, the so-called Doaksville Constitution was produced in 1860. Among other minor changes, the old title of Principal Chief was restored. Except for changes required by the close of the Civil War, including abolition of slavery and citizenship for freedmen, the Doaksville Constitution remained the guide for government in the Choctaw Country until 1907 when all tribal governments were abolished.

The tribal capitol for carrying on government in the Choctaw Country was situated at various places. Following removal, the first Choctaw capitol, a log council house, was located two miles west of Tuskahoma in Pushmataha County and was named Nanih Waya for the Choctaw sacred mountain in Mississippi. In succession the Choctaw capitol was situated at Doaksville, Boggy Depot, and Chata Tamaha (Armstrong Academy). Finally a permanent brick capitol, erected at Tuskahoma in 1883, served the Choctaw Nation as its political center until tribal governments were abolished in 1907. (See *The Daily Oklahoman*, June 16, 1929.)

The area administered by the Choctaw government varied through the years, as the Choctaw Country was gradually reduced in size. When the Choctaws arrived in the West in the early 1830's, their domain extended from Arkansas to the one-hundredth meridian. In 1837, the Choctaws agreed by the Treaty of Doaksville to share their country with the Chickasaws. Soon the latter grew restive under a government dominated by the more numerous Choctaws. To quiet Chicka-

saw complaints, in 1855 the Choctaw domain was reduced by about two-thirds. The center third of the Choctaw Country was granted to the Chickasaws. The western third, extending from the ninety-eighth to the one-hundredth meridian, was taken over by the United States on a lease basis to provide a home for the plains tribes.

Law and order were maintained, and life and property were protected in the Choctaw Country by the Indians themselves. A domestic tranquility in the ante-bellum period, which would compare favorably with that of the best-ordered eastern states, was created by the establishment of county and district courts with a supreme court for appellate work only. A grand-jury system was used for indictments, and a petit jury for trials. Each Choctaw county had a sheriff and a courthouse. Jails were seldom used, for Choctaw offenders followed a code of reporting to authorities at the appointed time. A perverse criminal might



Figure 10. Indian Territory Rangers—two Choctaw Lighthorsemen (From Division of Manuscripts, the University of Oklahoma Library).

be chained to a tree on the courthouse green as a precaution (Benson, 1860, p. 215).

Besides county enforcement officers, the Choctaw Nation maintained a system of light-horsemen. These were rangers who were vested with extraordinary powers and who served as messengers, guards, and special agents to enforce liquor laws and apprehend criminals that local sheriffs couldn't handle.

Punishment in the Choctaw Nation explains in part the remarkable order that prevailed there. Public whipping on the courthouse green was common punishment for minor offenses like theft, and on first occasion the offender received fifty lashes on his bare back. A second offense brought one-hundred lashes; and a third offense, automatic death. Thus there were few habitual criminals. Homicide brought an automatic death penalty. The rifle, rather than hanging, was used for execution because "Choctaws regarded hanging with superstitious horror as a mode of death that condemned the spirit to eternal wandering" (Debo, 1934, p. 47).

If Choctaw executions were sordid, they had their dramatic side too, for a condemned Choctaw was seldom imprisoned, but presented himself quietly on the appointed day. There are cases where executions were delayed so that the condemned could help his team play a scheduled ball game, or to enable him to harvest the crops and make provision for his widow-to-be. On the appointed day he appeared at the execution post, a small piece of black paper was pinned over his heart, and then, hoodwinked with a black neckerchief, he faced the executioner's rifle. (See *The Daily Oklahoman*, May 13, 1928.)

The advancement of these people of the Choctaw Country in government, economic prosperity, religion, and the arts was suddenly interrupted by the Civil War. The persuasiveness of the Confederate cause promoted by Albert Pike, special commissioner to the Indian Territory, helped induce the Choctaws to align with the South. Pike's treaty with the Choctaws was signed on July 12, 1861. Whereas in the Cherokee, Creek, and Seminole nations there was indecision, wavering, and disunity, the Choctaws almost to the man sided with the Confederacy. Choctaw regiments served

with valor in Arkansas and the Indian Territory, and raided into southern Missouri.

The Choctaw Country became an arsenal for the Confederacy in the West, its farms and plantations producing food and other necessary supplies, and its craftsmen turning out shoes, uniforms, and weapons. Fort McCulloch and Boggy Depot became important supply depots and defensive points.

The Choctaw Country did not feel the brunt of war until a massive Union offensive smashed through Fort Gibson and Fort Smith late in 1863 and penetrated the northern fringe, destroying Perryville and Scullyville. Thereafter roads throughout the Choctaw Country were clogged with Cherokee, Creek, and Seminole refugees, fleeing the terror of Union reprisal.

For more than two years the Choctaw Council was hard pressed to provide the means for feeding these unfortunates, but somehow the hospitable Choctaws managed to furnish the refugees with the basic essentials for survival. The Civil War ended officially for the Choctaws on June 19, 1865, when Principal Chief P. P. Pitchlynn surrendered all Choctaw forces to Federal officials in Doakville (U. S. War Dept., 1885, p. 1105-1106).

Following the Civil War, the Government of the United States undertook to punish the Confederate states and territories by an elaborate process called reconstruction. The vindictiveness of the government at Washington toward the states of the Confederacy extended to the Indian Territory. The Choctaws, together with the Cherokees, Creeks, Seminoles, and Chickasaws, were summoned to Fort Smith on September 8, 1865, to meet with United States commissioners, there to learn their fate.

Reconstruction for the Indian Nations formerly allied with the Confederacy meant the abolition of slavery, adoption of freedmen into tribal citizenship, and amnesty for northern sympathizers. United States commissioners also sought to force the surrender of one-third of the Choctaw Country for the settlement of other Indian tribes, cession of the Leased District, and a general agreement to consolidate all Indian tribes of the territory under one government.

The Choctaws were represented at the Fort Smith Council by Robert M. Jones. Since he had served as delegate for the Choctaws to the Confederate Congress in Richmond during the Civil War years, Jones was well informed on the issues. The terms of reconstruction were completely unacceptable to Jones and other tribal delegates, and each carried on a program of obstruction and delay so effectively that the United States commissioners gave up in disgust and recessed the council to resume in Washington the following year.

Before leaving for Washington, the Choctaw delegation, headed by Allen Wright, was carefully instructed by the Council. The delegation was authorized to cede no part of the Choctaw Country. Any concessions required could be made on the Leased District, but even on this, payment must be made before the Choctaws would surrender title.

The Treaty of Washington, signed in 1866 by the members of the Choctaw delegation, was a credit to their skill in negotiation, for they were able to follow the Choctaw Council's instructions to the letter. Not a single acre of the Choctaw Country was surrendered. The Leased District was purchased by the United States. The plan for a union government for the Indian Territory was subscribed to in principle, and Allen Wright supplied the name for the proposed organization—Oklahoma.

The Choctaws, now at peace with the United States, turned to the heavy burden of rehabilitating the war-torn Choctaw Country. The energy and resources of the Choctaw Nation were so absorbed in the task of meeting the various post-war problems that the remarkable progress made in the ante-bellum period was never matched.

One of the most pressing problems was that of the freedman, and this problem was two-fold. Not only were the Choctaws required by treaty to grant citizenship to their former slaves and to provide for them, but in addition there was every possibility that the Choctaw Country would have to absorb Negroes from various southern states. The Freedman's Bureau worked out a plan whereby the Choctaw Country would be surveyed, Negro colonies would be moved in from the

Deep South, and each Negro family would be awarded 160 acres. Choctaw families were to receive eighty acres each. Great blocks of land were to be taken up in the Choctaw Country for settlement of Kansas Indians and railroad grants. Any land remaining was to be awarded to white settlers under the land laws of the United States.

A dismal future faced the Choctaws, and only by prompt and astute dealing were they able to forestall disaster. The problem of handling their own former slaves was not so great. The Choctaw Council passed laws requiring freedmen in the Choctaw Country to be gainfully employed, curfews were set, and each freedman family could occupy and use no more than forty acres of land in the Choctaw Country. The Choctaw Council repeatedly demurred on giving these freedmen citizenship, despite constant pressure from the United States. Finally in 1883, eighteen years after this requirement was laid down, the Choctaw Nation extended citizenship to its 3,000 former slaves.

The pride of the Choctaw Country was its schools, and early in the post-war period, the Choctaw Council turned to the problem of education. Concerned about a generation of children growing up without education, the Council spent most of its annual budget between 1866 and 1870 replacing burned and wrecked buildings, purchasing books and supplies, hiring teachers, and gradually up-grading scholastic standards until by 1870 eighty-four neighborhood schools were in operation, the major Choctaw academies and seminaries had been reopened, and advanced Choctaw students were attending colleges in the States.

Law and order problems complicated administration of the Choctaw Country and placed an added drain on the Council. Whites and Negroes roamed the Choctaw Country in bands, looting, raping, and pillaging citizens on farms and in villages. Cattle thieves were everywhere and the great Choctaw ranch herds were practically eliminated. Life and property were in danger. Communities formed Vigilance Committees, a counterpart of the Ku Klux Klan, and by warnings, whippings, and hangings soon restored order.

The number of lighthorsemen was increased too, and these ranger units handled situations too big for local committees. By 1870, normal business was carried on, people moved freely throughout the Choctaw Country without fear for person or property, ranches and farms had been restored, and annual cotton production was approaching the pre-war high of 300,000 bales.

The most disturbing and persistent problem facing the Choctaw Country in the post Civil War period was the ever-increasing influx of whites. Not only were these immigrants leasing farm and ranch lands, but they were also developing lumber mills and coal mines. Whites also served as tenants on Choctaw farms and plantations and developed stores, shops, and banks.

The building of railroads north and south

through the Indian Territory increased white migration, for railroads afforded ready access to lumber, coal, and agricultural products and easy transportation to markets north and south. The first line through the Choctaw Country was the Missouri-Kansas-Texas line, which entered from the north in 1872, and within a year crossed the Red River into Texas.

Commercial coal mining began at McAlester in 1872, and the Choctaw government leased the coal fields to eastern operators in return for a royalty on each ton of coal mined. The coal companies, finding Choctaws unwilling miners, imported workers from the East and from Europe. Mining camps mushroomed over the coal veins; and McAlester, Hartshorne, Haileyville, Krebs, Alderson, and Lehigh became the sites of some



*Figure 11. Tuskahoma Female Institute, Choctaw Nation, 1896 (From Division of Manuscripts, the University of Oklahoma Library).*

of the heaviest coal production in the United States.

By 1889 more than 15,000 miners and their families lived in these camps, most of them foreign-born and including Italians, Swedes, English, Welsh, Germans, Lithuanians, Slovaks, Poles, Magyars, and Russian Jews. By 1907 the mining-camp population of the Choctaw Nation was nearly 25,000 and thereby exceeded the number of Choctaws (Morrison, 1951, p. 158).

Prompted by railroads, the coal fields of the Choctaw Nation increased production each year until by 1887, fifteen years after the opening of the first commercial mine, Choctaw mines were producing more than half a million tons of coal each year. (See *Annual Report of the Commissioner of Indian Affairs for 1887*, p. 119).

The last twenty-five year period in the Choctaw Country was a troubled one, exceeded possibly only by those of the Civil War and its immediate aftermath for confusion and tribal difficulty. Strikes in the coal camps and increasing white migration created disorders unknown before in the Choctaw Country. But even greater trouble was in the offing. About 1879, well-organized Boomer groups began a campaign to force the opening of the entire Indian Territory to white settlement. Various government officials encouraged the Choctaws and other tribes to abandon common ownership of land, accept allotments in severalty, and sell all surplus lands to the government to provide homesteads for settlers.

The Choctaw Council refused to discuss the subject of breaking up the Choctaw Country. A well-instructed delegation was maintained in Washington at all times to lobby against proposals to break up the Choctaw Country and to carry out the allotment program. The Choctaw Council condemned the Boomers by resolution, and in 1880 appropriated \$1,500 to insure the prosecution of Boomer leader, David L. Payne, who was in jail at Fort Smith awaiting trial for trespassing on Indian lands. Despite the bitter offensive waged by the Choctaws to preserve the integrity of the Choctaw Country, a more powerful and merciless government, spurred on by national farm, railroad, and business lobbies, moved relentlessly toward dissolution of the Choctaw Nation.

In 1890, Congress passed the Organic Act providing for the organization of territorial government for Oklahoma Territory. A provision in this act extended the laws of Arkansas to Indian Territory. (See *United States Statutes at Large*, vol. 19, p. 230.) This meant that all legal matters, except those of a strictly local character, were no longer under the dominion of Choctaw, Chickasaw, Creek, Seminole, or Cherokee jurisdiction.

Next came the Dawes Commission. Appointed in 1893, this group was assigned the task of preparing rolls for each of the Five Civilized Tribes, having the Choctaw Country and other nations surveyed, assigning each enrollee an allotment, and preparing the tribal governments for dissolution, thereby making statehood for the Indian Territory only a matter of time.

In June 1898, Congress passed the Curtis Act, a measure which set forth the steps for carrying out the allotment program and bringing tribal affairs to a close. Before the passage of this act, the Choctaws had joined at Atoka with the Chickasaws to sign the Atoka Agreement, whereby the two tribal governments agreed to abolish their tribal governments and permit the allotment of their lands. The chief value of the Atoka Agreement was that it insured that each enrolled man, woman, and child would receive a fair and equitable share of the Choctaw Country. (See *United States Statutes at Large*, vol. 30, p. 495.)

As it worked out each enrolled Choctaw was to receive an allotment of 320 acres of average land, and each Choctaw freedman 40 acres of average land (Wright, 1951, p. 111). In each of the Indian nations conservative elements refused to cooperate with the allotment program, holding that the Great Spirit had foreordained that the Indians should hold land in common. In the Creek Nation civil war nearly erupted around the Crazy Snake movement.

The conservatives in the Choctaw Nation, distressed to see the Choctaw Country carved up with allotments and the historic tribal institutions destroyed, sought through the Choctaw Council to gain passage of a law providing for the death penalty for anyone in favor of changing the common ownership of the Choctaw Country. This barely failed to pass. Thereupon, the conservatives

organized a Crazy Snake movement in the Choctaw Nation. Leaders of this group visited Mexico with an intent to purchase land there from the Mexican Government, to move to Mexico, and to hold land in common. The Crazy Snake group also held that the Dawes Commission had no legal authority, and members who cooperated with the allotment program were threatened. When several conservatives refused to choose allotments, the commission made selections for

them. Only with time did the irreconcilables accept allotments (Debo, 1934, p. 267).

The Choctaw government, an empty shell after 1900, continued to exist until the eve of statehood, when Indian Territory and Oklahoma were merged. Thereafter tribal government was largely an empty, honorary operation, with the offices of Principal Chief, national attorney, and mining trustee serving under and supervised by the Department of the Interior (Wright, 1951, p. 113).



*Figure 12. Corn and cotton fields on a Choctaw allotment, McCurtain County  
(From Division of Manuscripts, the University of Oklahoma Library).*

# INVERTEBRATES OF BEAVERS BEND STATE PARK

CLUFF E. HOPLA

The most extensive living fauna at Beavers Bend State Park is the invertebrates, or, as they are commonly known, "animals without backbones." To present a complete check list of this group would be a most arduous task and would take the time of several specialists for many years. For example, it is believed that there are approximately 1,000,000 species of insects in the world; and it is estimated that in an area slightly larger than this park 26,000 species of this particular group of animals exist. The latter figure is greater than the total vertebrate species in North America. For this reason, our list of invertebrates will be concerned only with the common forms that can be observed without the aid of optical equipment.

Beavers Bend State Park has an invertebrate fauna of special interest for those of us who live in the central and western parts of the state. It is a blend of eastern and southern forms. No species is distinctive of the park alone, the fauna being similar to that of the surrounding area.

It is hoped that the list which follows, based upon general habitats, will prove useful.

## *In and Adjacent to the Mountain Fork River*

### *In the river:*

Moss animals (Bryozoa) are often abundant upon sticks and logs submerged in the water.

Mollusks (phylum Mollusca) Freshwater clams (class Pelecopoda) are reasonably abundant. Often one can see the raccoon searching for them during the night. Snails (class Gastropoda) are usually abundant upon the emergent vegetation.

Arthropods, crawdads or crayfish (class Crustacea, order Malacostraca), and amphipods (order Amphipoda) are common forms.

Aquatic insects (class Insecta), particularly those whose immature forms are aquatic, are abundant during certain seasons of the year. The dragon and damselflies (Odonata), mayflies (Ephemeroptera), stoneflies (Plecoptera), caddisflies (Trichoptera), and the dobsonfly or hellgrammite (Megaloptera) are the dominant forms encountered. These insects are important in the food chain of several game fish. Many of them are attracted to light at night and are easily captured when in season. Several families of aquatic beetles are represented; especially conspicuous during the early spring are the whirligig beetles belonging to the family Gyrinidae.

Water bugs (Hemiptera) are also abundant; water striders (Gerridae), giant water bugs (Belostomatidae), and water scorpions (Nepidae) are common forms, usually found in quiet water with emergent vegetation.

### *Along the banks:*

Arachnids (Arachnida) spiders, mites, and ticks: Many spiders may be found, but the most common form is likely to be the wolf spider (Lycosidae), often seen carrying a sack of eggs attached to the tip of the abdomen. If one looks closely, the young spiderlings, for a short while after hatching, are seen in a cluster on the cephalothorax or on the abdomen. The orb weavers (Argiopidae) are common in the late summer and early fall. They are large specimens, brilliantly marked with yellow, orange, and black, and, like practically all spiders, are beneficial to man because they destroy large numbers of insects.

Insecta: Pygmy locusts (Orthoptera, Tetri-

gidae) are usually drab, flightless little grasshoppers. They are easily separated from the small nymphs of other grasshoppers by the fact that the pronotum forms a projection over the dorsal area of the abdomen. Of course, other families of grasshoppers may be seen throughout the various areas of the park.

Toad bugs (Hemiptera-Gelastocoridae) Small hopping insects; their robust, warty, dull-colored bodies with large protruding eyes strongly suggest a tiny toad. They are protectively colored and would be easily overlooked if they did not jump. Often they hop into the water, but they are very poor swimmers and are thus easily captured. They are abundant near the swimming and boating area.

#### Flood plains:

As this area is a moist habitat, the kinds of invertebrates found here are often the same as those found along the banks of the river. Winged forms, such as the moths and butterflies, are conspicuous. From the middle of May through most of September the singing of the cicada provides the major chorus from the animal kingdom. Large centipeds (Chilopoda) and millipeds (Diplopoda) are likely to be found here. An especially striking centipede, *Scolopendra*, is present. Earthworms (phylum Annelida, class Oligochaeta) are abundant during certain times of the year and can be seen with the aid of a light during the darker hours of the day. Myriads of damselflies (Odonata) are seen; and especially interesting are the broad-winged forms (Agrionidae) which, though rare in most of Oklahoma, are relatively common in the park and adjacent areas.

#### Mountain Slopes

This is the largest habitat in the park; it is, in general, heavily wooded and supports an abundant population of arthropods. Certain of these forms are pestiferous, such as the "chigger" mites and ticks. Of the latter, *Amblyomma americanum* (lone star tick) is unusual in its feeding habits for a tick, since it is not host specific in any of the

stages of its development; thus the larvae (seed-ticks), nymphs (yearling ticks), and adults will feed with equal avidity upon man or other mammals. The deer is probably the favorite host of this tick; and, should deer become more abundant in the park and adjacent areas, the tick is also likely to increase in numbers.

Most of us react unfavorably to chigger bites; but contrary to popular opinion, the chigger does not bore underneath the skin. Its method of attachment to the host is almost identical to that of a tick. Only the larvae stage is parasitic upon vertebrates, and, after feeding, it drops from the host (if it has not been killed by scratching) and completes its development. In subsequent stages of development, the chigger is predacious upon the eggs of other arthropods and may be considered beneficial.

Other invertebrates are numerous. Each is listed under the name of its favorite niche.

On the ground (under rocks and logs):

Tarantulas (Araneae, Theraphosidae) are large hairy-looking specimens commonly seen running over the ground early in the spring and again in the fall. Quite likely they live longer than any other invertebrates in the park; records indicate that they can live up to 28 years and that it takes 7 to 10 years for them to complete their development. Contrary to popular belief, they are not venomous to man. Some people think that they make excellent pets.

Scorpions (Scorpionida) The forms known for this area are not the "deadly poisonous" creatures most people assume them to be; generally, a sting is no worse than that of the honey bee. People express great interest upon finding a female scorpion with the young, still attached to the body, being carried wherever the mother goes. Certainly this does not produce a "baby sitting" problem.

Harvestman (daddy longlegs) (Phalangida)

An extremely long-legged form is abundant in the park during the fall months.

Spiders (Araneae) The jumping and crab

spiders are likely to be the most numerous. An occasional black widow may be encountered.

Millipeds (Diplopoda) of various sizes are found and are also abundant in the leaf mold.

Centipedes (Chilopoda) These also vary considerably in size and form. Except in an extremely dry season, old logs contain an abundant number of specimens.

Beetles (Coleoptera) This is the largest order of insects and presents the larger number of species in the park. The most common family is the Carabidae, and a youngster can have an entertaining afternoon attempting to collect the various forms represented. The dung beetles or tumble bugs, (Scarabaeidae), though common, provide an unusual amount of entertainment as they push the ball of dung to a particular site, where it is then buried (an egg laid upon it), and serves as food for the larva, or grub.

Roaches (Orthoptera, Blattoidae) The wood roach usually is a creature of nature and should be considered but a distant cousin of the forms which frequent our houses.

Flies and gnats (Diptera) Several species of this order are found. Most of the dipterans found in this habitat are small, and are spoken of collectively as fungus gnats. A larger form is the crane fly.

Termites (Isoptera) are commonly called white ants. Moist soil and decaying wood usually present in the park cause a heavy population of this insect.

Land snails (Pulmonata, Pupillidae) These also may be numerous in the leaf mold.

#### In the trees:

Spiders (Araneae) Various families are represented; the orb weavers (Tetragnathidae) are slender spiders which often assume a sticklike pose. Garden spiders (Argiopidae) are large, robust specimens with brilliant yellow and black colors.

Walking sticks (Orthoptera, Phasmatidae)

and the praying mantis (Mantidae) are insects which are especially easy to see in the fall.

True bugs (Hemiptera), cicadas, tarnished plant bugs, and the rough shield bugs are usually the most easily seen. Cicadas are large, robust insects of rather uniform appearance, with broad heads and protruding eyes. The wings are in two pairs, with few cross veins and are held in a rooflike posture over the body. The leafhoppers (Cicadellidae) resemble the cicadas in general characteristics; however, they are much smaller, and the fore wings are usually opaque or with various color patterns.

#### Aerial forms:

Among the invertebrates, only the insects have evolved wings. Although most orders of insects possess these special structures, certain orders completely lack them. Those groups lacking wings are frequently parasitic forms, such as lice and fleas; and it is thought that they lost their wings secondarily while specializing as parasites.

The dragon flies (Odonata) are large insects and expert flyers. The aeshnids (Aeshnidae) have enormous eyes which are united for some distance above, distinguishing them from other dragon flies; also, they are usually found a distance away from the water. On the other hand, the libellulids (Libellulidae) have slightly smaller eyes, their bodies are covered by a chalky bloom and they are usually found flying low over the water of ponds and sloughs. For this reason, members of the latter family are often called skimmers. Their wings are frequently spotted and partly clouded with white.

Moths and butterflies (Lepidoptera): The adult of this order has always been one of the most admired of the insects. The early Greeks gave butterfly wings to Psyche, the maiden personifying the human soul. For insects, the Lepidoptera are rather slow-flying creatures with large, often brightly colored wings, which are covered with minute scales

that rub off like dust on the fingers. Butterfly antennae are filaments ending in knobs or thickenings. Those of most moths are featherlike but some are simple, tapering filaments; however, in no case are moth antennae thickened at the ends. Butterflies are day flyers; moths are usually nocturnal. The larvae, or young, are called caterpillars, and it is this stage which is so destructive. The Lepidoptera is one of the most important orders of insects from the economic standpoint. The following is a list of the more common families likely to be encountered in the park.

Bagworm moths (Psychidae) the case-carrying larvae give this family its common name.

Arctiid moths (Arctiidae) These are medium to large insects with densely hairy bodies which are usually white, brown, or orange, with darker spots or stripes.

Sphinx moths (Sphingidae) These are swift-flying moths with long, narrow, rather pointed forewings which may span up to five inches and are much longer than the hind wings. The larvae are usually called hornworms.

Tent caterpillars (Lasiocampidae) The larvae are the most conspicuous members of this family. They are rather brightly colored and hairy, living gregariously inside large, many-layered webs in the forks of trees.

Saturniid moths (Saturnidae) are large moths with hairy bodies and wing bases; usually each wing has a small transparent area. They are often called giant silkworms and are extremely beautiful insects.

Skippers (Hesperiidae) are considered the first family of butterflies but have many features in common with moths. They are small butterflies; their antennae have a short hook at the tip which is directed backwards.

Swallowtails (Papilionidae) These are our largest butterflies; they are brightly colored and have taillike extensions on each hind wing.

Pierid butterflies (Pieridae) are of average size; are orange, yellow, or white in many cases with dark wing margins, spots, or mottlings; and gather in dry weather along roadsides and stream beds on the exposed mud.

Milkweed butterflies (Danidae) The monarch is remarkable for congregating in enormous numbers and migrating en masse from the northern to the extreme southern regions.

Nymphalid butterflies (Nymphalidae) The forelegs are much reduced and are not useful for walking. The mourning cloak, painted lady, and buckeye are common forms in the park.

Diptera: The true flies differ from most other adult insects in having but a single pair of wings. The larvae are called maggots and are legless. It is one of the largest orders of insects, with many species yet to be named in our area. Usually the life cycle is short, with several generations each year being customary.

Moth flies (Psychodidae) are small insects, not more than 1/8-inch long. They are found in moist places, are weak flyers, and have wings held rooflike over the body.

Mosquitoes (Culicidae) are small insects, long-legged, with scales on the body, and have mouth-parts fitted for piercing and sucking. Only the female is able to obtain a blood meal from the host. The larvae are found in the water, usually in small pools, ponds, and puddles of quiet, shallow water.

Biting midges (Heleidae) are minute insects; usually we feel them before they are seen. They are often called no-see-ums or punkies.

Soldier flies (Stratiomyidae) are average-sized insects, with flat bodies, and the last segment of the antennae bends outwards at right angles.

Horse and deer flies (Tabanidae) are large dipterans; the head is large and mainly occupied with the eyes. As is true with

the mosquitoes, the females drink the blood of warm-blooded animals. Certain species annoy man.

Bee flies (Bombyliidae) are fuzzy. When short and robust, they resemble bees; when long and slender, they look like wasps. They are swift flyers, often hovering in the air as they go from one flower to the next.

Robber flies (Asilidae) have the eyes protruding above the top of the head, giving it a notched appearance. The mouth parts are stout and appear bearded due to the long hairlike bristles. These are predacious on other insects.

Syrphus flies (Syrphidae) are frequently called flower flies or bee flies. They can be separated from the bombyliids by the fact that they are not fuzzy.

Green or blue bottle flies (Calliphoridae) are common and are most abundant around decaying carcasses and other refuse; in nature they largely constitute the garbage disposal system.

Hymenoptera (bees, ants, and wasps) Insects of this order are largely beneficial. They have two pairs of membranous wings and are the only insects which have a true stinger. The sting is the modified ovipositor of the female; no male, therefore, can sting.

Saw flies (Tenthredinidae) and a closely

related family, Siricidae, lack the constriction of the second abdominal segment. The color is generally black, with some yellow or brown markings.

Ichneumon wasps (Ichneumonidae) are medium-sized insects, exclusively parasitic. The ovipositors are of various lengths, some being much longer than the body.

Gall wasps (Cynipidae), as adults, are small or minute insects; however, the larvae are responsible for most of the galls on the leaves and twigs of oak trees, the oak apple being a very common form.

Hornets and potter wasps (Vespidae) are a large family of social insects (except the potter wasps) which construct nests of coarse paper made from wood fiber. The wings are folded along the body when not in use; the eyes are notched on the inner margins adjacent to the bases of the antennae.

Honey, bumble, and carpenter bees (Apidae) compose one of the best known groups of insects. Most of them are social insects. The bodies have a hairy appearance.

Coleoptera (beetles) Beetles are capable of flight, but most of them are not found on the wing nearly so often as are the preceding orders. However, certain ones fly to lights; the most common such forms are the May and June beetles which belong to the family Scarabeidae.

## FISHES IN BEAVERS BEND STATE PARK

CARL D. RIGGS AND GEORGE A. MOORE

<i>Lepisosteus osseus</i>	longnose gar	<i>F. olivaceus</i>	blackspotted topminnow
<i>L. oculatus</i>	spotted gar	<i>Gambusia affinis</i>	mosquitofish
<i>Hiodon alosoides</i>	goldeye	<i>Labidesthes sicculus</i>	brook silversides
<i>Dorosoma cepedianum</i>	gizzard shad	<i>Micropterus punctulatus</i>	spotted bass
<i>Esox americanus</i>	grass pickerel	<i>M. salmoides</i>	largemouth bass
<i>Carpionodes carpio</i>	river carpsucker	<i>M. dolomieu</i>	smallmouth bass
<i>Moxostoma carinatum</i>	river redhorse	<i>Chaenobryttius gulosus</i>	warmouth
<i>M. erythrurum</i>	golden redhorse	<i>Lepomis cyanellus</i>	green sunfish
<i>M. duquesnei</i>	black redhorse	<i>L. megalotis</i>	longear sunfish
<i>Cyprinus carpio</i>	carp	<i>L. macrochirus</i>	bluegill
<i>Notemigonus crysoleucas</i>	golden shiner	<i>Pomoxis annularis</i>	white crappie
<i>Notropis fumeus</i>	ribbon shiner	<i>P. nigromaculatus</i>	black crappie
<i>N. perpallidus</i>	colorless shiner	<i>Percina copelandi</i>	channel darter
<i>N. rubellus</i>	rosyface shiner	<i>P. pantherina</i>	leopard darter
<i>N. umbratilis</i>	redfin shiner	<i>P. caprodes</i>	logperch
<i>N. cornutus</i>	common shiner	<i>P. sciera</i>	dusky darter
<i>N. whipplei</i>	steelcolor shiner	<i>Etheostoma chlorosomum</i>	bluntnose darter
<i>N. boops</i>	bigeye shiner	<i>E. nigrum</i>	Johnny darter
<i>N. volucellus</i>	mimic shiner	<i>E. radiosum</i>	orangebelly darter
<i>Pimephales vigilax</i>	parrot minnow	<i>E. spectabile</i>	orangethroat darter
<i>P. notatus</i>	bluntnose minnow	<i>Aplodinatus grunniens</i>	freshwater drum
<i>Campostoma anomalum</i>	stoneroller		
<i>Pylodictis olivaris</i>	flathead catfish		
<i>Ictalurus punctatus</i>	channel catfish		
<i>I. melas</i>	black bullhead		
<i>Schilbeodes nocturnus</i>	freckled madtom		
<i>Anguilla rostrata</i>	American eel		
<i>Fundulus notatus</i>	blackstripe topminnow		

Undoubtedly there are other species that occur in this area, but since no specimens are in the collections of either The University of Oklahoma or Oklahoma State University, they are not listed here.

## AMPHIBIANS AND REPTILES OF McCURTAIN COUNTY

CHARLES C. CARPENTER

### AMPHIBIA

#### CAUDATA

1. Spotted salamander (*Ambystoma maculatum*)
2. Marbled salamander (*Ambystoma opacum*)
3. Mole salamander (*Ambystoma talpoidium*)
4. Small-mouthed salamander (*Ambystoma texanum*)
5. Tiger salamander (*Ambystoma tigrinum tigrinum*)
6. Three-toed Amphiuma (*Amphiuma means tri-dactylum*)
7. Central dusky salamander (*Desmognathus fuscus brimleyorum*)
8. Many-ribbed salamander (*Eurycea multiplicata*)

9. Ouachita red-backed salamander (*Plethodon cinereus serratus*)
10. Slimy salamander (*Plethodon glutinosus glutinosus*)
11. Western lesser siren (*Siren intermedia nettingi*)
12. Central newt (*Notophthalmus viridescens louisianensis*)

#### SALIENTIA

13. Northern cricket frog (*Acris crepitans blanchardi*)
14. Red-spotted toad (*Bufo punctatus*)
15. Dwarf American toad (*Bufo terrestris charlesmithii*)
16. East Texas toad (*Bufo woodhousei velatus*)
17. Fowler's toad (*Bufo woodhousei fowleri*)

18. Green treefrog (*Hyla cinerea cinerea*)
19. Northern spring peeper (*Hyla crucifer crucifer*)
20. Eastern gray treefrog (*Hyla versicolor versicolor*)
21. Southern gray treefrog (*Hyla versicolor chrysoscelis*)
22. Western chorus frog (*Pseudacris nigrita triseriata*)
23. Eastern narrow-mouthed toad (*Microhyla carolinensis carolinensis*)
24. Southern crawfish frog (*Rana areolata areolata*)
25. Rio Grande leopard frog (*Rana pipiens berlandieri*)
26. Bullfrog (*Rana catesbeiana*)
27. Bronze frog (*Rana clamitans clamitans*)
28. Pickerel frog (*Rana palustris*)
29. Hurter's spadefoot (*Scaphiopus hurterii hurterii*)

## REPTILIA

### CHELONIA

1. Common snapping turtle (*Chelydra serpentina serpentina*)
2. Alligator snapping turtle (*Macrochelys temminckii*)
3. Razor-backed musk turtle (*Sternotherus carinatus carinatus*)
4. Stinkpot (*Sternotherus odoratus*)
5. Mississippi mud turtle (*Kinosternon subrubrum hippocrepsis*)
6. Three-toed box turtle (*Terrapene carolina triunguis*)
7. Ouachita map turtle (*Graptemys pseudogeographica ouachitensis*)
8. Southern painted turtle (*Chrysemys picta dorsalis*)
9. Missouri slider (*Pseudemys floridana hoyi*)
10. Red-eared turtle (*Pseudemys scripta elegans*)
11. Chicken turtle (*Deirochelys reticularia*)
12. Western spiny softshell (*Trionyx ferox hartwegi*)
13. Smooth softshell (*Trionyx muticus*)

### SAURIA

1. Carolina anole (*Anolis carolinensis*)
2. Eastern collared lizard (*Crotaphytus collaris collaris*)
3. Northern fence lizard (*Sceloporus undulatus hyacinthinus*)
4. Eastern glass lizard (*Ophisaurus ventralis*)
5. Six-lined racerunner (*Cnemidophorus sexlineatus*)

6. Ground skink (*Lygosoma laterale*)
7. Five-lined skink (*Eumeces fasciatus*)
8. Broad-headed skink (*Eumeces laticeps*)
9. Southern coal skink (*Eumeces anthracinus pluvialis*)

### SERPENTIA

1. Glossy water snake (*Natrix rigida*)
2. Blotched water snake (*Natrix erythrogaster transversa*)
3. Diamond-backed water snake (*Natrix rhombifera rhombifera*)
4. Northern water snake (*Natrix sipedon sipedon*)
5. Texas brown snake (*Storeria dekayi texana*)
6. Northern red-bellied snake (*Storeria occipitomaculata occipitomaculata*)
7. Western ribbon snake (*Thamnophis sauritus proximus*)
8. Red-sided garter snake (*Thamnophis sirtalis parietalis*)
9. Rough earth snake (*Haldea striatula*)
10. Western earth snake (*Haldea valeriae elegans*)
11. Eastern hognose snake (*Heterodon platyrhinos platyrhinos*)
12. Prairie ringneck snake (*Diadophis punctatus arnyi*)
13. Western worm snake (*Carphophis amoenus vermis*)
14. Western mud snake (*Farancia abacura reinwardti*)
15. Eastern yellow-bellied racer (*Coluber constrictor flaviventris*)
16. Eastern coachwhip (*Masticophis flagellum flagellum*)
17. Rough green snake (*Opheodrys aestivus*)
18. Black rat snake (*Elaphe obsoleta obsoleta*)
19. Great Plains rat snake (*Elaphe guttata emoryi*)
20. Prairie kingsnake (*Lampropeltis calligaster calligaster*)
21. Speckled kingsnake (*Lampropeltis getulus holbrooki*)
22. Louisiana milk snake (*Lampropeltis dolia amaura*)
23. Great Plains ground snake (*Sonora episcopa episcopa*)
24. Slender flat-headed snake (*Tantilla gracilis gracilis*)
25. Northern copperhead (*Agkistrodon contortrix mokeson*)
26. Western cottonmouth (*Agkistrodon piscivorus leucostoma*)
27. Canebrake rattlesnake (*Crotalus horridus atricaudatus*)

## BIRDS OF BEAVERS BEND STATE PARK

GEORGE MIKSCH SUTTON

Beavers Bend State Park is so heavily wooded that prairie-inhabiting birds, such as pipits, meadowlarks, horned larks and longspurs, all of which are common in many unwooded parts of Oklahoma at one season or another, are rarely seen in the park. This does not mean that no open-country birds inhabit the area. That odd, southwestern, ground-inhabiting cuckoo known as the chaparral cock or road runner (*Geococcyx californianus*) has followed the highways into the very heart of southeastern Oklahoma's forest lands. Strictly nonmigratory, it remains the year round wherever it is found. It is not known to nest in the park, but it feeds along the roadsides, being especially fond of grasshoppers. The scissor-tailed flycatcher\* (*Muscivora forficata*), another open-country bird, nests in scattered pairs in McCurtain County. The mourning dove (*Zenaidura macroura*), loggerhead shrike (*Lanius ludovicianus*), field sparrow (*Spizella pusilla*) and lark sparrow (*Chondestes grammacus*) all nest in open woods in and close to the park, especially along the highways. Two open-country birds that fly over the park in migration but rarely alight there are the Swainson's hawk (*Buteo swainsoni*) and upland plover (*Bartramia longicauda*). The liquid *whee-di-ly* call note of the latter species is a familiar sound throughout the whole of Oklahoma in April and May and from early July to the end of October.

Bird students do not ordinarily classify water birds as woodland birds and open-country birds, yet according to my observations many water birds which are common throughout most of Oklahoma are rare in wooded parts of the southeastern part of the State. The killdeer (*Charadrius vociferus*) is an example. The killdeer is not common in the park except locally in midsummer when flocks gather to feed in shallow parts of the Mountain Fork River. The solitary sandpiper

(*Tringa solitaria*) and spotted sandpiper (*Actitis macularia*), on the other hand, feed along the water's edge even when there is only a narrow strip of open bank, so both these species stop regularly in the park in spring and fall, though neither nests there. The American woodcock (*Philohela minor*), a short-legged woodland snipe, migrates through and occasionally nests in McCurtain County. The great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), yellow-crowned night heron (*Nyctanassa violacea*), little blue heron (*Florida caerulea*), common egret (*Casmerodius albus*), snowy heron (*Leucophoyx thula*), American bittern (*Botaurus lentiginosus*), and least bittern (*Ixobrychus exilis*) are to be looked for along the Mountain Fork and about the major impoundment in the park. Of these, the one most likely to be found nesting is the green heron.

A wholly different sort of water bird that finds food along the Mountain Fork River but that does not, so far as I know, nest in the park is the belted kingfisher (*Megaceryle alcyon*). A fish-eating hawk known as the osprey (*Pandion haliaetus*) occasionally fishes along the Mountain Fork River during the season of migration.

Any of the ducks which migrate regularly through Oklahoma are to be looked for in the park. The species most likely to be seen are the mallard (*Anas platyrhynchos*), blue-winged teal (*A. discors*) and wood duck (*Aix sponsa*). The wood duck probably nests occasionally. The pied-billed grebe (*Podilymbus podiceps*) and coot (*Fulica americana*) migrate along the Mountain Fork. The geese that winter in, or migrate across, Oklahoma fly over the park occasionally; but since there are no broad sandbars or tempting grainfields in the area, they do not ordinarily even attempt to alight.

Large birds that may be seen at any time of the year in the park are the turkey vulture

\* The scissor-tailed flycatcher was designated as the state bird by the Oklahoma legislature by an act passed in May 1951.

(*Cathartes aura*), black vulture (*Coragyps atratus*), great horned owl (*Bubo virginianus*), barred owl (*Strix varia*), red-tailed hawk (*Buteo jamaisensis*), red-shouldered hawk (*B. lineatus*), Cooper's hawk (*Accipiter cooperi*) and bob white (*Colinus virginianus*). The great horned owl and red-tailed hawk usually inhabit upland woods, the barred owl and red-shouldered hawk swampy woods. Both the vultures are less common in winter than in summer as a rule, and both nest in the region. The broad-winged hawk (*Buteo platypterus*) nests in small numbers in McCurtain County but leaves the United States entirely in winter. The screech owl (*Otus asio*) nests in the park but is hard to find at any season. The sharp-shinned hawk (*Accipiter striatus*) is a transient and winter visitant. The sparrow hawk (*Falco sparverius*), which is common throughout most of Oklahoma in winter and which nests locally in the State, is uncommon in the park. A not very well-known bird of prey, the Harlan's hawk (*Buteo harlani*), is sometimes fairly common in wooded parts of eastern Oklahoma in winter. Harlan's hawk is black with white streaking or mottling on the chest and with a more or less grayish-white tail. Both the golden eagle (*Aquila chrysaetos*) and bald eagle (*Haliaeetus leucocephalus*) have been seen in southeastern Oklahoma, but neither is common or regular in occurrence there.

Small birds likely to be seen in winter are the following largely nonmigratory species: cardinal (*Richmondia cardinalis*), Carolina wren (*Thryothorus ludovicianus*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), white-breasted nuthatch (*Sitta carolinensis*), pine warbler (*Dendroica pinus*), red-bellied woodpecker (*Centurus carolinus*), hairy woodpecker (*Dendrocopos villosus*) and downy woodpecker (*D. pubescens*); the following more or less migratory species: crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), yellow-shafted flicker (*Colaptes auratus*), Bewick's wren (*Thryomanes bewicki*), mockingbird (*Mimus polyglottos*) and common goldfinch (*Spinus tristis*); and the following winter visitants from the north: red-shafted flicker (*Colaptes cafer*), brown creeper

(*Certhia familiaris*), slate-colored junco (*Junco hyemalis*), purple finch (*Carpodacus purpureus*), pine siskin (*Spinus pinus*), Harris's sparrow (*Zonotrichia querula*), white-crowned sparrow (*Z. leucophrys*), white-throated sparrow (*Z. albicollis*), song sparrow (*Melospiza melodia*), myrtle warbler (*Dendroica coronata*) and golden-crowned kinglet (*Regulus satrapa*). With the slate-colored juncos may be occasional juncos of other species, but mixed flocks of juncos are not the rule in southeastern Oklahoma.

If the observer is lucky, he will hear and see the glorious big pileated woodpecker (*Dryocopus pileatus*), a resident species not by any means as rare as it is widely thought to be; but let no one expect to see the ivory-billed woodpecker (*Camp-eophilus principalis*) in Oklahoma. The citizens of Broken Bow cling fondly to the belief that ivory-bills still inhabit wild parts of McCurtain County, but that wonderful bird disappeared from this part of the continent decades ago, along with the Carolina parakeet (*Conuropsis carolinensis*) and passenger pigeon (*Ectopistes migratorius*). The wild turkey (*Meleagris gallopavo*) is another bird which once abounded in Oklahoma. Efforts have been made to reestablish the species, but so far as I know there are no wild turkeys in the park at this time.

Two rare pinelands residents of southeastern Oklahoma are the brown-headed nuthatch (*Sitta pusilla*) and the red-cockaded woodpecker (*Dendrocopos borealis*). The former moves about in noisy companies, often high in the biggest pines. The latter has never, so far as I know, been seen in the park, but I have seen it and found its nest a few miles northeast of the park, near Hochtown.

A transient and winter visitant to be looked for in thickets is the hermit thrush (*Hylocichla guttata*), a species easily confused with the fox sparrow (*Passerella iliaca*), which also has a noticeably reddish-brown tail. Two towhees are transient and winter visitant species—the red-eyed towhee (*Pipilo erythrophthalmus*) and the spotted towhee (*P. maculatus*), the latter with noticeable white streaking on the back. Species found in winter, sometimes commonly, are the robin

(*Turdus migratorius*), eastern bluebird (*Sialia sialis*), cedar waxwing (*Bombycilla cedrorum*), red-headed woodpecker (*Melanerpes erythrocephalus*) and brown thrasher (*Toxostoma rufum*). All of these except the cedar waxwing nest in the region—the robin in small numbers within the city limits of Broken Bow and Idabel but nowhere else. An uncommon winter visitant to be looked for in brush piles along streams is the tiny, stub-tailed winter wren (*Troglodytes troglodytes*).

Birds that breed in the park or in areas close by are the following: chuck-will's-widow (*Caprimulgus carolinensis*), ruby-throated hummingbird (*Archilochus colubris*), yellow-billed cuckoo (*Coccyzus americanus*), crested flycatcher (*Myiarchus crinitus*), eastern phoebe (*Sayornis phoebe*), eastern wood pewee (*Contopus virens*), Acadian flycatcher (*Empidonax virescens*), rough-winged swallow (*Stelgidopteryx ruficollis*), red-eyed vireo (*Vireo olivaceus*), yellow-throated vireo (*V. flavifrons*), white-eyed vireo (*V. griseus*), black-and-white warbler (*Mniotilta varia*), prothonotary warbler (*Protonotaria citrea*), parula warbler (*Parula americana*), yellow-throated warbler (*Dendroica dominica*), prairie warbler (*D. discolor*), hooded warbler (*Wilsonia citrina*), Kentucky warbler (*Oporornis formosus*), American redstart (*Setophaga ruticilla*), Louisiana water thrush (*Seiurus motacilla*), yellow-breasted chat (*Icteria virens*), blue-gray gnatcatcher (*Polioptila caerulea*), wood thrush (*Hylocichla mustelina*), summer tanager (*Piranga rubra*), orchard oriole (*Icterus spurius*), brown-headed cowbird (*Molothrus ater*), common grackle (*Quiscalus quiscula*), blue grosbeak (*Guiraca caerulea*), indigo bunting (*Passerina cyanea*), painted bunting (*P. ciris*) and chipping sparrow (*Spizella passerina*). The Bell's vireo (*Vireo belli*), a common nesting bird in central Oklahoma, I have not thus far found in the park. The pine-woods sparrow

(*Aimophila aestivalis*), which my party found nesting near the village of Bethel in the summer of 1937, has not been seen in Oklahoma since that year. The Swainson's warbler (*Limnethlypis swainsoni*) I have found in small numbers along the Little River between Broken Bow and Idabel, but not in the park.

Birds that probably would nest in the park were the right sort of nesting place available to them there include the introduced English sparrow (*Passer domesticus*) and starling (*Sturnus vulgaris*), as well as the chimney swift (*Chaetura pelagica*), purple martin (*Progne subis*), barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), nighthawk (*Chordeiles minor*), red-winged blackbird (*Agelaius phoeniceus*), and yellowthroat (*Geothlypis trichas*). All of these are irregularly common as migrants.

The following species are regular transients in spring and fall: yellow-bellied sapsucker (*Sphyrapicus varius*), eastern kingbird (*Tyrannus tyrannus*), least flycatcher (*Empidonax minimus*), olive-sided flycatcher (*Nuttallornis borealis*), house wren (*Troglodytes aëdon*), catbird (*Dumetella carolinensis*), ruby-crowned kinglet (*Regulus calendula*), blue-headed vireo (*Vireo solitarius*), Swainson's thrush (*Hylocichla ustulata*), gray-cheeked thrush (*H. minima*), orange-crowned warbler (*Vermivora celata*), black-throated green warbler (*Dendroica virens*), yellow warbler (*D. petechia*), northern water thrush (*Seiurus noveboracensis*), Wilson's or black-capped warbler (*Wilsonia pusilla*), mourning warbler (*Oporornis philadelphia*), scarlet tanager (*Piranga olivacea*), Baltimore oriole (*Icterus galbula*), rusty blackbird (*Euphagus carolinus*), Lincoln's sparrow (*Melospiza lincolni*), rose-breasted grosbeak (*Pheucticus ludovicianus*), and clay-colored sparrow (*Spizella pallida*). The last-named bird is western, but it has been observed in eastern Oklahoma repeatedly, in thickets along the edges of the woodland.

# MAMMALS OF BEAVERS BEND STATE PARK

ROBERT D. BURNS

Because most of the mammals listed below are active only at night, it is doubtful that you would encounter many of them running about the park. Two tree squirrels, the fox squirrel and the gray squirrel, can be seen. The former is the reddish-brown squirrel with a bushy tail. This creature is present wherever there are trees in eastern North America and is no doubt familiar to most people. The gray squirrel has two color phases, one black and the other gray with white tips on many of the hairs. The gray squirrel may have some brown in its pelt, but no fox squirrel has white in its coat.

Mounds of sandy soil on the ground about six to eight inches high are the work of the pocket gopher. Most burrows are dug in late

summer and fall. In the damper soils the raised pathways of the mole will be found. Mole burrows can be distinguished from gopher burrows because the raised pathways are characteristic of mole burrows. The pocket gopher excavates more soil from its burrow and the excavated soil forms the numerous mounds. The entrance to the burrow is not in the mound. The hole from which the soil was pushed out of the burrow is plugged, and digging into such a mound seldom produces a hint of the burrow.

The two species of rabbits are difficult to tell apart when only a fleeting glimpse is obtained. The swamp rabbit is larger and has rust-colored feet, whereas the cottontail is smaller and has light-tan feet.

Opossum	<i>Didelphis virginiana virginiana</i>
Eastern mole	<i>Scalopus aquaticus pulcher</i>
Little shrew	<i>Cryptotis parva parva</i>
Pipistrelle	<i>Pipistrellus subflavus subflavus</i>
Red bat	<i>Lasiurus borealis borealis</i>
Evening bat	<i>Nycticeius humeralis humeralis</i>
Eastern striped skunk	<i>Mephitis mephitis mesomelas</i>
Gray squirrel	<i>Sciurus carolinensis carolinensis</i>
Fox squirrel	<i>Sciurus niger rufiventer</i>
Pocket gopher	<i>Geomys bursarius dutcheri</i>
Fulvous harvest mouse	<i>Reithrodontomys fulvescens aurantius</i>
Cotton mouse	<i>Peromyscus gossypinus megacephalus</i>
Golden mouse	<i>Peromyscus nuttalli aureolus</i>
Cotton rat	<i>Sigmodon hispidus texianus</i>
Wood rat	<i>Neotoma floridana osagenis</i>
Cottontail rabbit	<i>Sylvilagus floridanus alacer</i>
Swamp rabbit	<i>Sylvilagus aquaticus aquaticus</i>

## VEGETATION OF BEAVERS BEND STATE PARK

ELROY L. RICE

Beavers Bend State Park probably has a larger number of woody species of plants than can be found in any other area of equal size in Oklahoma. A few woody species in the park are quite rare elsewhere in the state. Two such species are *Ilex vomitoria* (yaupon, a type of holly) and *Symplocos tinctoria* (horse sugar). Yaupon is one of the dominants in the shrub zone along the Atlantic coast of southeastern United States. Another shrub which is of considerable interest in the park, even though it is fairly common throughout eastern Oklahoma, is *Rhododendron canescens* (rhododendron).

In this brief discussion of the vegetation of Beavers Bend State Park we will not consider many details concerning the herbaceous plants, although a large number of such species is present in the park. Many beautiful flowers are in evidence from early spring when the dog's-tooth violets, wakerobins, and other species flower to the late fall when asters, goldenrods, and other species are prominent.

In the park, the vegetation in the Mountain Fork River and immediately next to it is dominated by *Platanus occidentalis* (sycamore) and *Taxodium distichum* (bald cypress). Less abundant species of trees are *Acer saccharinum* (silver maple), *Acer rubrum* (red maple), *Betula nigra* (river birch), and *Salix nigra* (black willow). Other common species in this zone are *Arundinaria tecta* (river cane or bamboo), *Cephalanthus occidentalis* (button-bush), *Justicia americana* (water-willow weed), *Uniola latifolia* (spangle grass), and *Zizaniopsis miliacea* (cut grass).

The vegetation of the flood plain of the Mountain Fork River between the zone described above and the hills is somewhat variable, depending on the actual location. In the area near the swimming pool, the major dominants are *Quercus alba* (white oak) and *Acer saccharum* (sugar maple). Other species of large trees present are

*Carya tomentosa* (mockernut hickory), *Fraxinus americana* (white ash), *Liquidambar styraciflua* (sweet gum), *Quercus velutina* (black oak), and *Ulmus americana* (American elm.) A lower stratum of trees is present also and includes such species as *Ostrya virginiana* (hop-hornbeam), *Carpinus caroliniana* (blue beech, not actually a beech), and *Ilex opaca* (holly). *Arundinaria tecta* is common in the ground cover, and *Polypodium polypodioides* (rabbit's-foot fern) is common on the branches of the larger trees.

In some areas the flood-plain forest of the Mountain Fork River has sweet gum and *Carya cordiformis* (bitternut hickory) as dominant species. *Morus rubra* (red mulberry), *Quercus shumardii* (Shumard's red oak), and *Juglans nigra* (black walnut) are often present in the top tree layer along with the dominants. The second tree layer in such a forest in many places has holly, blue beech, *Robinia pseudo-acacia* (black locust), and *Nyssa sylvatica* (sour gum). The lowest layer of trees in such a forest will often have *Cornus florida* (flowering dogwood) and *Asimina triloba* (pawpaw). Common shrubs and vines are river cane, *Vitis spp.* (grapes), *Rhus radicans* (poison ivy) *Smilax spp.* (greenbrier), and *Symphoricarpos orbiculatus* (buckbrush or coral berry).

The next type of habitat to be considered in progressing from the most mesic (moist) to the least mesic would be the north- and northeast-facing slopes of the mountains. These slopes generally have quite similar vegetation and are here considered together. The vegetation on such slopes differs somewhat from place to place depending on the steepness and length of the slope, depth of soil, and disturbance. In many places two distinct types of plant communities are present on north- and northeast-facing slopes in the park. The lower parts of many such slopes have an oak or oak-hickory community, whereas the upper

part will have an oak-pine community. The oak community usually has *Quercus alba* (white oak) as a dominant and sometimes Shumard's red oak as a codominant. Less prominent species of trees in this community include sugar maple, mockernut hickory, white ash, sour gum, hop hornbeam, American elm, *Pinus echinata* (shortleaf pine), *Celtis laevigata* (hackberry), *Tilia americana* (basswood), flowering dogwood, and *Cercis canadensis* (redbud). If the lower part of the slope has an oak-hickory community, more mockernut hickory trees are present and this species becomes a dominant tree together with the oaks.

The oak-pine community on the upper parts of the north- and northeast-facing slopes has shortleaf pine as a dominant along with one or more of the following species of oaks: black oak, *Quercus falcata* (southern red oak), and *Quercus stellata* (post oak). Common shrubs and vines on the mesic slopes include such species as *Vaccinium* spp. (huckleberry), buckbrush, greenbrier, poison ivy, grape, and *Callicarpa americana* (French mulberry).

All the more xeric areas are characterized by having an oak-pine community, with shortleaf pine being dominant along with one or more species of oaks. The northwest-, west-, southwest-, south-, southeast-, and east-facing slopes are included here along with the ridge-tops. The ridge-tops are generally the most xeric, followed closely by the southwest-, the south-, and the west-facing slopes. As a general rule, in the more xeric areas the trees are more widely spaced and are smaller. Moreover, the species of oaks present differ somewhat from site to site. In sites that have soil deposition and sluggish drainage, black oak is often prominent, along with post oak and sometimes with southern red oak. These sites even have some mockernut hickory in places. In the better

drained sites with shallow soil and on the ridge-tops, the most prominent oak is post oak. *Quercus marilandica* (blackjack oak) is often fairly prominent on shallow soils. Any hickory trees present on these sites are likely to be the species *Carya texana* (black hickory). The same kinds of shrubs and woody vines occur on the xeric sites as in the oak-pine community on the upper parts of the mesic slopes. They are spaced considerably farther apart, however, and the relative importance of certain species changes somewhat. For example, *Vaccinium arboreum* (tree huckleberry) becomes more prominent than on mesic slopes, while *Vaccinium stamineum* and *Vaccinium neglectum* become less common.

The following is a list of most of the woody species of plants in Beaver Bend State Park and adjacent areas of McCurtain County. A few of these have not been found within the boundaries of the park.

Pinaceae—Pine Family	
<i>Juniperus virginiana</i>	red cedar
<i>Pinus echinata</i>	shortleaf pine
<i>Taxodium distichum</i>	bald cypress
Liliaceae—Lily Family	
<i>Smilax bona-nox</i>	greenbrier
<i>Smilax rotundifolia</i>	greenbrier
Dioscoreaceae—Yam Family	
<i>Dioscorea villosa</i>	hairy yam
Salicaceae—Willow Family	
<i>Populus deltoides</i>	cottonwood
<i>Salix caroliniana</i>	carolina willow
<i>Salix nigra</i>	black willow
Juglandaceae—Walnut Family	
<i>Carya aquatica</i>	water hickory
<i>Carya cordiformis</i>	bitternut hickory
<i>Carya illinoensis</i>	pecan
<i>Carya ovata</i>	shagbark hickory
<i>Carya texana</i>	black hickory
<i>Carya tomentosa</i>	mockernut hickory
<i>Juglans nigra</i>	black walnut

Figure 13. Woody plants of Beavers Bend State Park.

- |                                   |                               |
|-----------------------------------|-------------------------------|
| 1. Hickory                        | 7. Grape                      |
| 2. White ash                      | 8. Black willow               |
| 3. Black locust                   | 9. Redbud                     |
| 4. Black walnut                   | 10. Two species of greenbrier |
| 5. Three variations of poison ivy | 11. Bald cypress              |
| 6. Sycamore                       |                               |

Figures 1-7 are  $\times \frac{1}{4}$ . Figures 8-11 are  $\times \frac{1}{2}$ .

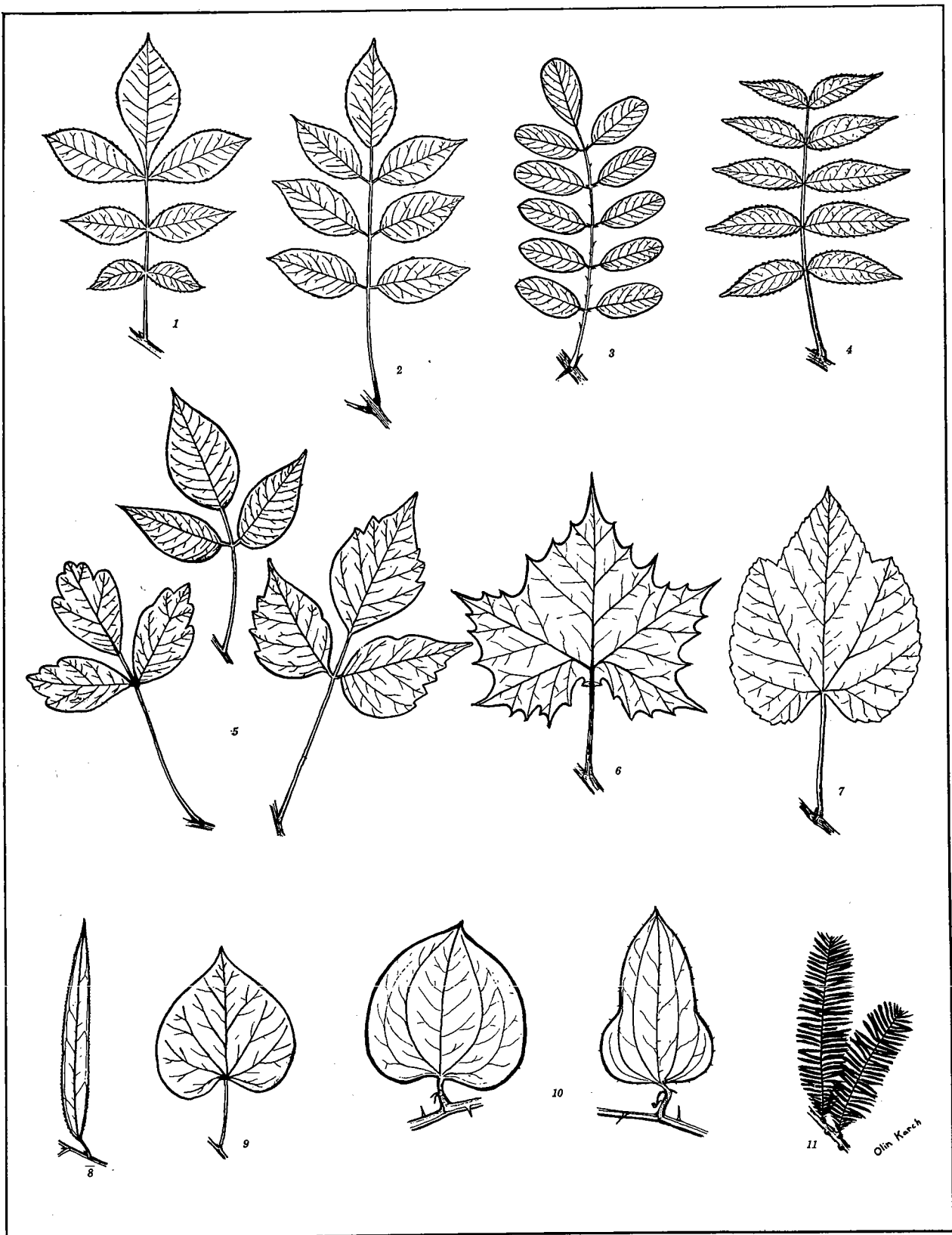


Figure 13.

Betulaceae—Birch Family		Platanaceae—Sycamore Family	
<i>Alnus serrulata</i>	alder	<i>Platanus occidentalis</i>	sycamore
<i>Betula nigra</i>	river birch	Rosaceae—Rose Family	
<i>Carpinus caroliniana</i>	blue beech	<i>Amelanchier arborea</i>	service-berry
<i>Ostrya virginiana</i>	hop hornbeam	<i>Crataegus marshallii</i>	red haw
Fagaceae—Beech Family		<i>Crataegus spathulata</i>	red haw
<i>Quercus alba</i>	white oak	<i>Crataegus viridis</i>	red haw
<i>Quercus bicolor</i>	swamp white oak	<i>Prunus mexicana</i>	Mexican tree plum
<i>Quercus falcata</i>	southern red oak	<i>Prunus serotina</i>	wild black cherry
<i>Quercus lyrata</i>	overcup oak	<i>Rosa carolina</i>	Carolina rose
<i>Quercus macrocarpa</i>	bur oak	<i>Rosa setigera</i>	prairie rose
<i>Quercus marilandica</i>	blackjack oak	<i>Rubus spp.</i>	blackberries
<i>Quercus muhlenbergii</i>	chinquapin oak	Leguminosae—Legume Family	
<i>Quercus nigra</i>	water oak	<i>Cercis canadensis</i>	redbud
<i>Quercus palustris</i>	pin oak	<i>Gleditsia triacanthos</i>	honey locust
<i>Quercus phellos</i>	willow oak	<i>Robina pseudo-acacia</i>	black locust
<i>Quercus shumardii</i>	Shumard's red oak	Rutaceae—Rue Family	
<i>Quercus stellata</i>	post oak	<i>Ptelea trifoliata</i>	wafer ash
<i>Quercus velutina</i>	black oak	<i>Xanthoxylum clava-herculis</i>	prickly ash
Ulmaceae—Elm Family		Anacardiaceae—Cashew Family	
<i>Celtis laevigata</i>	hackberry	<i>Rhus aromatica</i>	aromatic sumac
<i>Planera aquatica</i>	water elm	<i>Rhus copallina</i>	winged sumac
<i>Ulmus alata</i>	winged elm	<i>Rhus glabra</i>	smooth sumac
<i>Ulmus americana</i>	American elm	<i>Rhus radicans</i>	poison ivy
<i>Ulmus rubra</i>	red elm	Aquifoliaceae—Holly Family	
Moraceae—Mulberry Family		<i>Ilex decidua</i>	deciduous holly
<i>Maclura pomifera</i>	bois d'arc	<i>Ilex opaca</i>	evergreen holly
<i>Morus rubra</i>	red mulberry	<i>Ilex vomitoria</i>	yaupon
Loranthaceae—Mistletoe Family		Celastraceae—Staff-Tree Family	
<i>Phoradendron flavescens</i>	mistletoe	<i>Euonymus americanus</i>	strawberry-bush
Polygonaceae—Buckwheat Family		<i>Euonymus atropurpureus</i>	wahoo
<i>Brunnichia cirrhosa</i>	ladies' eardrops	Staphyleaceae—Bladdernut Family	
Anonaceae—Pawpaw Family		<i>Staphylea trifolia</i>	bladder-nut
<i>Asimina triloba</i>	pawpaw	Aceraceae—Maple Family	
Lauraceae—Laurel Family		<i>Acer negundo</i>	boxelder
<i>Lindera benzoin</i>	spice bush	<i>Acer rubrum</i>	red maple
<i>Sassafras albidum</i>	sassafras	<i>Acer saccharinum</i>	silver maple
Saxifragaceae—Saxifrage Family		<i>Acer saccharum</i>	sugar maple
<i>Hydrangea arborescens</i>	hydrangea	Hippocastanaceae—Buckeye Family	
<i>Itea virginica</i>	Virginia willow	<i>Aesculus discolor</i>	particolored buckeye
Hamamelidaceae—Witch-Hazel Family		<i>Aesculus glabra</i>	Ohio buckeye
<i>Hamamelis vernalis</i>	witch-hazel	Sapindaceae—Soapberry Family	
<i>Liquidambar styraciflua</i>	sweet gum	<i>Sapindus drummondii</i>	chinaberry

Figure 14. Woody plants of Beavers Bend State Park

- |                              |                                    |
|------------------------------|------------------------------------|
| 1. American elm              | 9. Sour gum                        |
| 2. Blue beech                | 10. Flowering dogwood              |
| 3. Hop hornbeam              | 11. Button bush                    |
| 4. Yaupon                    | 12. Horse sugar ( $x\frac{1}{4}$ ) |
| 5. Evergreen holly           | 13. Rhododendron                   |
| 6. River birch               | 14. Huckleberry                    |
| 7. Basswood                  | 15. Buckbrush                      |
| 8. Pawpaw ( $x\frac{1}{4}$ ) | 16. Hackberry                      |

All illustrations are  $x\frac{1}{2}$  except as indicated

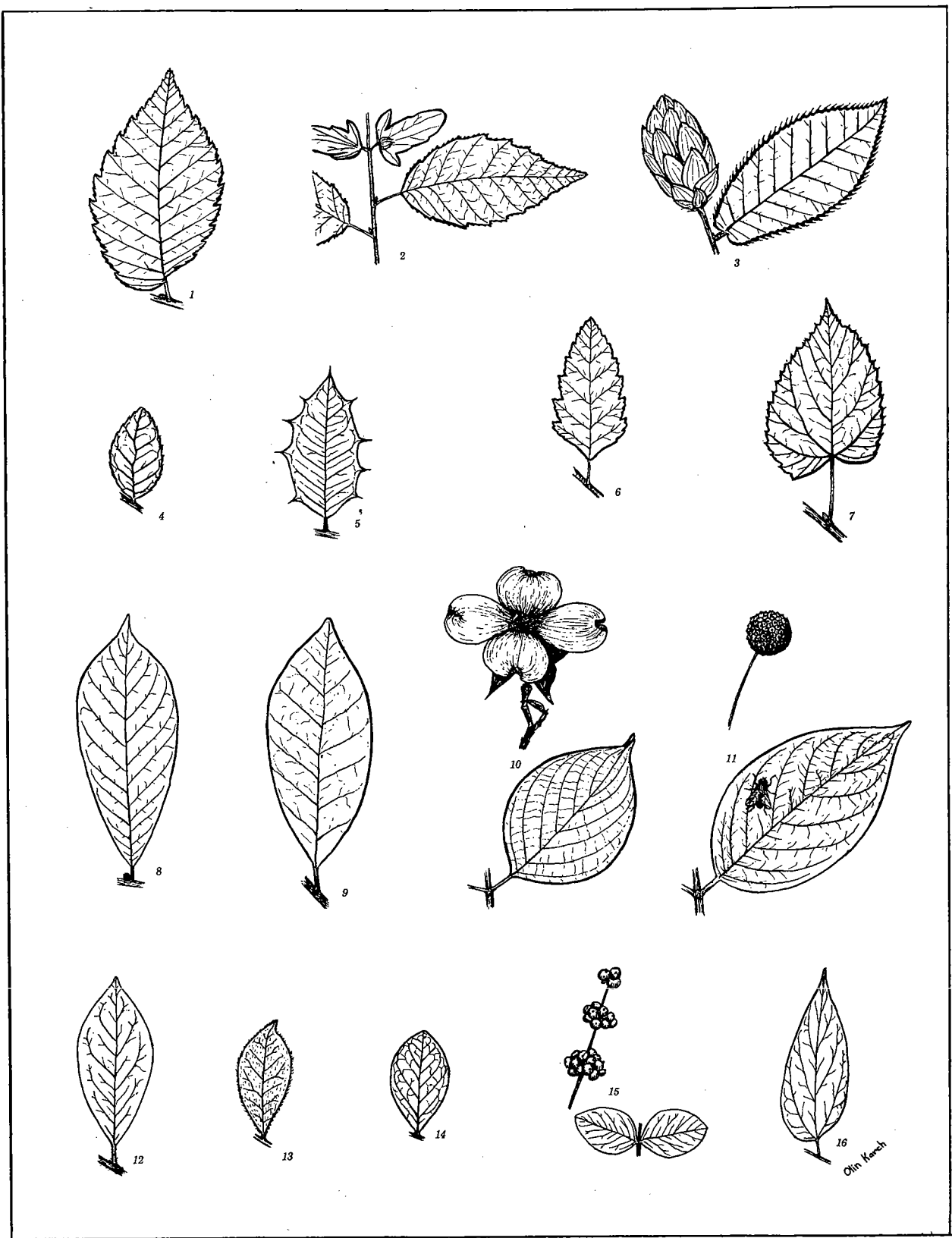


Figure 14.

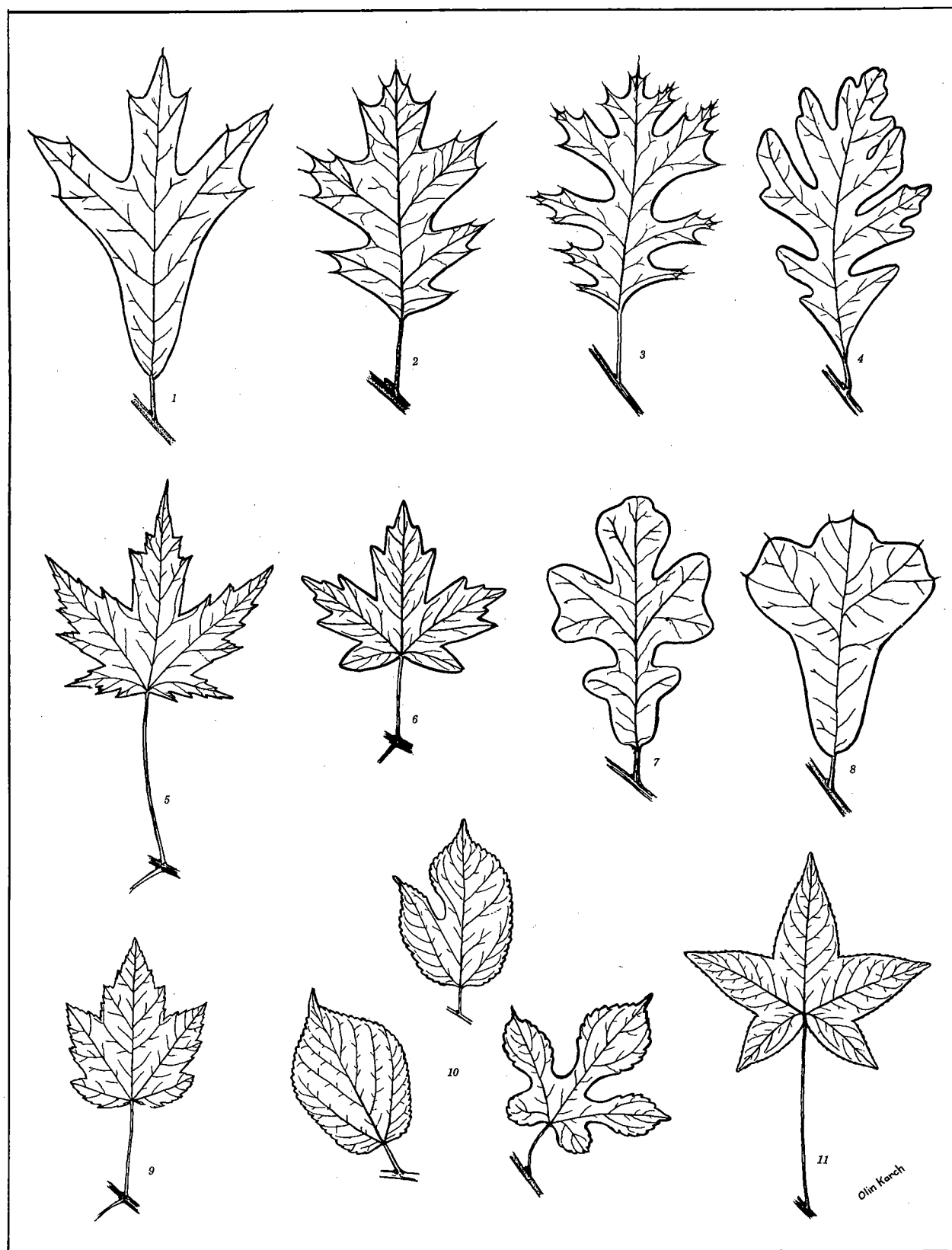


Figure 15.

Rhamnaceae—Buckthorn Family  
*Berchemia scandens* supple jack  
*Ceanothus americanus* New Jersey tea  
*Ceanothus herbaceus* New Jersey tea  
*Rhamnus caroliniana* Carolina buckthorn

Vitaceae—Grape Family  
*Ampelopsis arborea* pepper vine  
*Parthenocissus quinquefolia* Virginia creeper  
*Vitis spp.* grapes

Tiliaceae—Basswood Family  
*Tilia americana* basswood

Guttiferae—St. John's-Wort Family  
*Ascyrum hypericoides* St. Andrew's cross  
*Hypericum densiflorum* St. John's wort  
*Hypericum spathulatum* St. John's wort

Tamaricaceae—Tamarisk Family  
*Tamarix gallica* salt cedar

Thymelaeaceae—Mezereon Family  
*Dirca palustris* leatherwood

Nyssaceae—Sour-Gum Family  
*Nyssa sylvatica* sour gum

Araliaceae—Ginseng Family  
*Aralia spinosa* devil's-walking-stick

Cornaceae—Dogwood Family  
*Cornus drummondii* rough-leaved dogwood  
*Cornus florida* flowering dogwood

Ericaceae—Heath Family  
*Lyonia ligustrina* maleberry

*Rhododendron canescens* rhododendron  
*Vaccinium arboreum* tree huckleberry  
*Vaccinium stamineum* squaw huckleberry  
*Vaccinium neglectum* squaw huckleberry

Sapotaceae—Sapodilla Family  
*Bumelia lanuginosa* chittamwood

Ebenaceae—Ebony Family  
*Diospyros virginiana* persimmon

Symplocaceae—Sweetleaf Family  
*Symplocos tinctoria* horse sugar

Styracaceae—Storax Family  
*Halesia monticola* silverbell

Oleaceae—Olive Family  
*Forestiera pubescens* hairy privet  
*Fraxinus americana* white ash  
*Fraxinus pennsylvanica* var. *subintegerrima* green ash

Bignoniaceae—Bignonia Family  
*Campsis radicans* trumpet vine  
*Catalpa speciosa* catalpa

Rubiaceae—Madder Family  
*Cephalanthus occidentalis* button-bush

Caprifoliaceae—Honeysuckle Family  
*Lonicera spp.* honeysuckles  
*Sambucus canadensis* elderberry  
*Symphoricarpos orbiculatus* buckbrush  
*Viburnum rufidulum* black haw

Figure 15. Woody plants of Beavers Bend State Park

1. Southern red oak
2. Black oak
3. Shumard's red oak
4. White oak
5. Silver maple
6. Sugar maple
7. Post oak
8. Blackjack oak
9. Red maple
10. Three variations of red mulberry
11. Sweet gum

All illustrations are  $\times\frac{1}{2}$  to  $\times\frac{1}{4}$  due to variation within a species.

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