

# Ozark Society Bulletin

Summer 1980



**Horseshoe Falls** on Moore Creek near Boxley, Arkansas — Neil Compton

## OZARK SOCIETY BULLETIN

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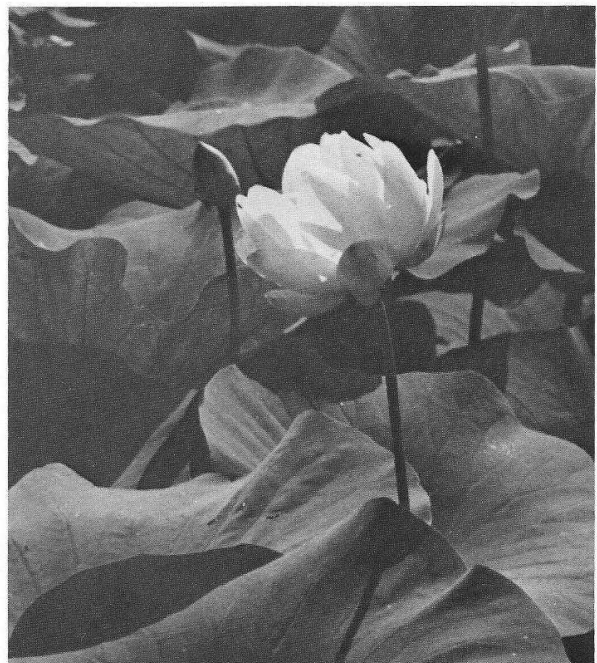
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**Wonkapin** - Lotus Lily - *Nelumbo lutea* — Neil Compton

# Seismic Belts of Arkansas and Neighboring States from Earth Quakes and Earthquake History of Arkansas

by  
Kern C. Jackson  
Professor of Geology, University of Arkansas

Arkansas Geological Commission, Information Circular 26

Six seismic belts can be more or less defined in Arkansas and the contiguous states (Figure 35). The most active in the New Madrid area. In reality this name implies a much too restricted area as the active belt extends along the Mississippi, Ohio, and Wabash Rivers into Indiana and beyond. Therefore this belt will be referred here to as the Mississippi-Wabash Belt. A second trend in Arkansas approximately parallels the boundary between the Ouachitas and Ozarks to the north and west and the Mississippi Embayment and Gulf Coastal Plain to the east and south. This will be referred to as the Fall Line Belt. A third and comparatively inactive trend extends across the northern Ouachita Mountains and related folded rocks south of the Arkansas River. This will be referred to as the Frontal Ouachita Belt. Westward in Oklahoma, Kansas and Texas there are two belts one of which has resulted in earthquakes which have been felt in Arkansas. This is a belt that extends south-southwest across Kansas from the Iowa border to central Oklahoma, and then south toward Texas. It is known as the Nemaha Belt. The second extends across southwest Oklahoma and the panhandle of Texas. It is associated with a series of partially buried to completely buried mountainous ridges and adjacent sediment filled basins. The old mountains are known as the Wichita and Amarillo Mountains. No earthquakes from this belt have been felt in Arkansas. Finally the eastern margin of the Ozark Plateau in Missouri is a seismically active region which is distinct from the Mississippi-Wabash Belt in spite of the fact that the two overlap. This region will be referred to as the Southeast Missouri Region.

## The Mississippi-Wabash Belt

A glance at a map will show that the general trend of the Mississippi River from about Arkansas City, Arkansas, to Cairo, Illinois, is an overall straight line trending about east-northeast. This same trend continues up the lower Ohio River and the lower Wabash River along the Illinois-Indiana border. This trend is not accidental but rather these rivers follow a major fracture zone in the Earth's crust which is one of the two most active seismic zones east of the Rocky Mountains. The other is likewise traceable very easily by observing the straight line pattern of the St. Lawrence River and the lower Great Lakes. Major earthquakes have occurred along the Mississippi-Wabash trend, the most famous being the New Madrid quakes of 1811-1812. Two other large events from this belt occurred in 1843 and 1859. Smaller

events are very numerous in this region and fully two thirds of the events listed in this Circular originated here.

The 1811-1812 New Madrid quakes were clearly not a unique series of events. The Indians of the area had traditions of earlier severe shaking and physical evidences, still visible at the beginning of this century, confirmed these traditions. In 1904 trenches identical to those produced in 1811 were recognizable in which 200-year old trees were growing. Similarly an uplifted dome near Blytheville is similar to domes uplifted in 1811 but shows effects of erosion by the Mississippi River at some earlier date. Thus the New Madrid was not a unique event and a similar earthquake probably will occur again in the region.

A series of small earthquakes extending from Memphis, Tennessee, to Mt. Carmel, Illinois, on the Wabash have been studied in detail from instrumental records by Street, Herrmann and Nuttli (1974). They found that the attitude of the fractures indicated by the majority of the eighteen events was approximately north-south although the trend of the belt is north-northeast. From the middle of the Missouri bootheel southward in Arkansas and Tennessee the sense of motion indicated tension in the crust. In contrast events north of the bootheel of Missouri, in Kentucky and in Illinois indicated compression in the crust. This complex pattern suggests that many of these small events are adjustments on secondary north-south fractures overlying the major fracture. In contrast the reconstruction of the 1811-1812 earthquakes on physical grounds indicates movement on the major north-northeast fracture. Perhaps only major events are the result of movement on the deep-seated major fracture.

## The Fall Line Belt

The term "Fall Line" was first applied to the eastern seaboard of this country where rivers coming out of the folded crystalline rocks of the Appalachians went over a series of rapids and falls in descending onto the soft younger sediments of the Atlantic Coastal Plain. The term is used here in a similar sense in that this belt roughly follows a similar boundary to the southeast and south of the Ouachitas. Earthquakes which are a part of this belt include at least some of those near Little Rock and Pine Bluff; those south of Arkadelphia; and westward into Oklahoma including those near Broken Bow, Idabel, and Hugo. The earthquakes in 1957 between Tyler and Lufkin, Texas, may belong to this belt.

The Paleozoic Ouachita Mountains were beveled on the south and east by erosion under the Mesozoic seas. This old platform has been bowed downward so that just south of the western part of the Arkan-



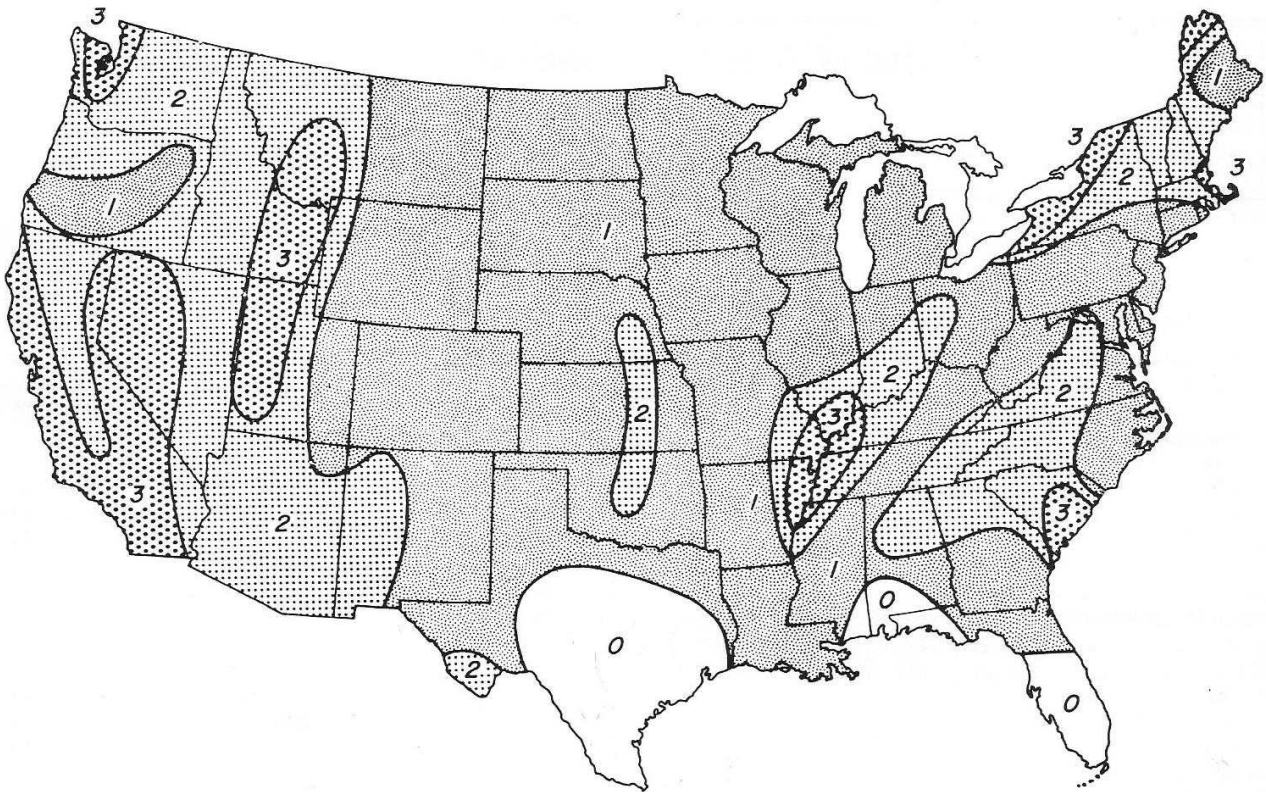


Figure 9 - Seismic risk map for conterminous United States. Zone 0 — no damage. Zone 1 — minor damage; corresponds to intensities V and VI of the M. M.\* scale. Zone 2 — moderate damage; corresponds to intensity VII of the M. M.\* scale. Zone 3 — major damage; corresponds to intensity VIII and higher of the M. M.\* scale. (\* — M. M. refers to the Modified Mercalli Intensity Scale.)

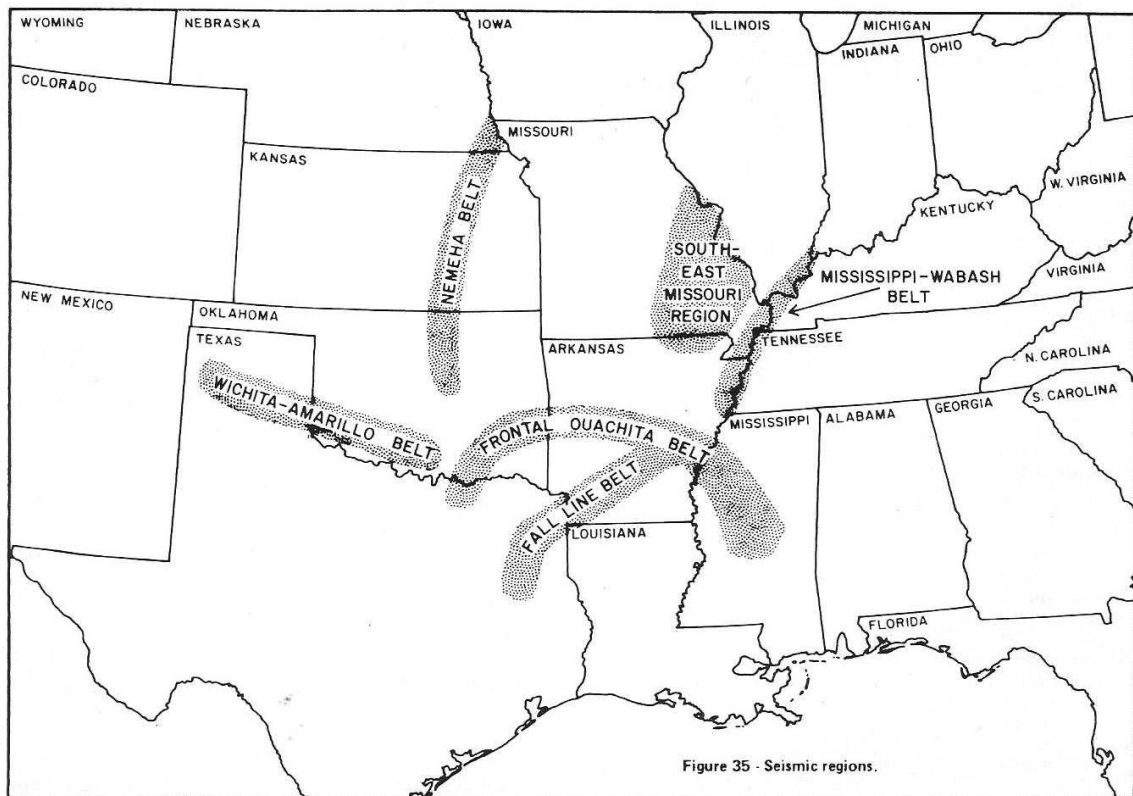


Figure 35 - Seismic regions.



sas-Louisiana border there is in excess of 12,000 feet of Mesozoic and Cenozoic sediments piled on the basement. To the east of Little Rock the Ouachita range has been obliterated by erosion and buried under younger sediments. The earthquakes of this belt are probably related to modern readjustments along this downwarp of the beveled basement.

Further south in Arkansas there is a trend of young faults which have been active from late Mesozoic to very recent times. These faults extend in a south facing arc from Miller County through Nevada and Ouachita Counties and appear to leave the state in southeast Union County. This trend is often called the Arkansas Graben System and consists of a series of blocks a few miles wide and up to a few tens of miles long which have been dropped on pairs of faults like a keystone block in an arch. This fault system overlies the northern limit of an extensive salt bed. At the grabens in northern Lafayette County the salt is at a depth of about 8,000 feet and is probably in the neighborhood of 700 feet thick. At these depths salt behaves as a very plastic material and the grabens are probably the result of slow plastic flowage of the salt. Only one earthquake in the lists is in the area where salt flow would be the cause. It is the small event south of El Dorado which occurred June 19, 1939.

#### **The Frontal Ouachita Belt**

The arbitrarily selected north margin of the Ouachita Mountains in Arkansas is defined by a fault system that extends in a south facing arc from North Little Rock to Y City (the intersection of highways 71 and 270). It extends westward into Oklahoma where it turns southwest and is buried under younger rocks south of Atoka. East of Little Rock the eroded and buried trend of the Ouachitas can be traced by deep drilling southeast across Mississippi. Faulting along this trend is old and complex but with a predominant sense of compression from the south. The folding and some faulting extends further north and is still quite evident as far north as the Arkansas River in western Arkansas and eastern Oklahoma.

A number of earthquakes appear in the list which are related to this trend. The January 1, 1969 event at Ferndale, Arkansas is the only one for which there is sufficient instrumental data to solve a mechanism. Street, Herrman, and Nuttli (1974) find an essentially east-west fault with compression in the crust. The only other event in Arkansas which would belong to this belt is that of 1882. Several small events in Oklahoma may be related. These include the Antlers events of 1956 and several at Hartshorne. The earthquake northeast of Greenville, Mississippi, on June 4, 1967, has been interpreted by Street, et al., as being on the subsurface eastward extension of the Ouachita front. There have been several other small events in that area of Mississippi.

Earthquakes occurring in the area between Little Rock and Pine Bluff present a special problem in assessing. In this area three recognizable belts cross. It is near the southern limit of the Mississippi-Wabash Belt, it is on the Frontal Ouachita Belt, and it is along the Fall Line. Therefore in order to assess the possible origin of any one event in this area it

would be essential to have a good instrumental determination of the fracture attitude and sense of motion. No earthquake from this area has been studied in detail.

#### **The Southeast Missouri Region**

The eastern margin of the Ozark dome is sharply separated in southeast Missouri from the adjacent basins to the east. The transition is marked by a series of faults some of which are still active and result in earthquakes. The seismic belt extends from near St. Louis south-southwest to Poplar Bluff, Missouri, and expands to the west. It includes some of the small earthquakes in north central Arkansas such as Salem 1883 and Ravenden Springs 1961.

The study by Street, Herrmann and Nuttli (1974) included thirteen minor events in this area between 1962 and 1973. Again, these were recorded instrumentally and many were not felt. The majority of these indicated an east-west trend of the faults with the predominant sense of motion indicating tension in the crust. A few, however, indicated compression in the crust. The minority of the earthquakes indicated a northwest-southeast trend and both compression and tension in the crust. John R. Gibbons studied the structure of a portion of this area as a doctoral dissertation for Syracuse University. His analysis of the fracture patterns indicated faults with the same trends found by Street, et. al. The faults are a type called up-thrusts. These faults are nearly vertical at great depth, but as they approach the surface they curve to about a 45° attitude with a relative motion which would result from compressional forces. This leaves the over-riding block at shallow depths unsupported and it collapses along a secondary series of faults which would appear as tension in the shallow crust. Thus the presence of both compressional and tensional affects is compatible with known structure of the area.

#### **The Nemaha Belt**

The 1952 earthquake at El Reno, Oklahoma, and its aftershocks represent the major recent activity in this belt in Oklahoma. The major shock of this series was felt in Arkansas, but the aftershocks were not, neither were other earlier events in 1918, 1929 and 1933. A small earthquake near Enid, Oklahoma, in January 1973 and one near Norman, Oklahoma, in December of 1974 belong to this trend as do several events near Manhattan, Kansas, and in southeastern Nebraska. Earthquakes in this belt are apparently related to an ancient fault controlled structure buried under a thick column of younger sediments. The structure begins in southwestern Nebraska and extends south-southwest across Kansas passing just east of Wichita. In southern Kansas it turns south and extends across Oklahoma through Oklahoma city. Further south its trend is lost as the trend of the Arbuckle and Wichita Mountains is approached. This structure is called the Nemaha Ridge or Arch.

This structure has been encountered in deep drilling for oil and gas in Kansas and Nebraska. Along the axis of the structure the late Paleozoic

rocks (Pennsylvanian in age) rest directly on an eroded surface of old granite. East and west of the axis the same Paleozoic sediments rest on the eroded edges of the older Paleozoic sediments, which were originally continuous across the axis. The data indicates that the arch was uplifted, probably in Mississippian time, as a long narrow mountain belt probably bounded by faults. Faults are mappable on one side of the ridge from the well data. The ridge was rapidly destroyed by erosion and buried under the younger sediments. Modern day readjustments on the old faults are the origin of this seismic belt.

### The Wichita - Amarillo Belt

The Wichita Mountains of Oklahoma are the only exposed portion of an old mountain chain that extends from southeast of Ardmore and west-northwest across southern Oklahoma and the panhandle of Texas. The rest of the chain is buried under younger sediments. The mountain block is bordered by faults on both sides and deep sediment filled basins occur to both north and south. Several earthquakes have been felt in this region, but none of them have been felt in Arkansas. An earthquake on July 30, 1925, in the panhandle of Texas was felt from Roswell, New Mexico, to Tulsa, Oklahoma. The events from the eastern end of the region have all been small, the most recent on September 30, 1975, near Ardmore, Oklahoma. A larger event from the Ardmore area would probably be felt in western Arkansas.

### THE NEW MADRID EARTHQUAKES 1811-1812

The great events in southeast Missouri and northeast Arkansas of 1811-1812 are generally known as "The New Madrid Earthquake", probably the greatest earthquake of historical times in North America. The following discussion of this series is taken from U.S. Geological Survey Bulletin No. 394 by Myron J. Fuller, published in 1912. Fuller's report was based on field examination of the area in 1904 and 1905, over 90 years after the event, but the effects were still plainly evident. Fuller's report makes use of all the older records and writings available and the reader is referred to that bulletin for greater detail.

One or more of the eight major shocks was felt at widely scattered points covering all of the United States east of the Rocky Mountains. Most of the felt effects were reported from cities along the major rivers or along the Atlantic Coastal Plain. This may be in part due to the location of population centers in those areas, but that is only a partial explanation. Daniel Drake of Cincinnati, Ohio, in describing the effects there says,

"It was so violent as to agitate the loose furniture in our rooms, open partition doors that were fastened by falling latches, and throw off the tops of a few chimneys in the vicinity of the town. It seems to have been stronger in the val-

ley of the Ohio than in adjacent uplands. Many families living on the elevated ridges of Kentucky, not more than twenty miles from the river, slept during the shock; which cannot be said, perhaps of any family in town." (Fuller, p. 16)

This statement is probably applicable to much of the eastern United States and to much of Arkansas. The Kentucky hills are an area in which solid bedrock is overlain by a thin layer of weathered rock and soil. In contrast the Ohio valley floor is underlain by a deep blanket of water saturated unconsolidated river gravels, sand and clays. Such thick saturated sediments amplify the effects of the seismic waves and result in much greater shaking and damage than is experienced in areas where bedrock is close to the surface. In much of Arkansas even the largest shocks of the 1811-1812 quakes probably caused no damage and would not have been felt by many persons. The area north and west of an arc from Nashville through Arkadelphia and Little Rock to Pochontas is an area of thin soil cover on bedrock, except immediately along the major rivers, and little felt effects would have been experienced. The area south and east of that arc would have experienced greater effects and might have sustained damage.

The most complete chronology of the New Madrid earthquakes was kept by Jared Brooks of Louisville, Kentucky. He set up a series of swinging pendulums of various lengths and weighted springs to show ground movement at Louisville. Between December 16, 1811, and May 5, 1812 he catalogues 1,874 separate events that he detected.

No correlation was found on analysis of his data. The frequency of nearly continuous motion recorded in the forenoon is probably a function of when Mr. Brooks was free to watch his instruments rather than when motions actually occurred. Apparently when he was away from his pendulums they made marks, but no time could be recorded unless the motion was obviously felt.

Mr. Brooks classified his recorded events into six levels. His classes are suggestive of the subsequently developed Rossi-Forel intensity scale, but include a final lowest class which were recorded by his pendulums but not actually felt. His classes as follows are abbreviated from Fuller (p. 33).

First Rate.	Most tremendous, so as to threaten the destruction of the town. . .buildings oscillate largely and irregularly. . . walls split. . .break and topple to the ground.
Second Rate.	Less violent but very severe.
Third Rate.	Moderate but alarming to people generally.
Fourth Rate.	Perceptible to the feeling of those who are still. . .
Fifth Rate.	Not defined.
Sixth Rate.	Although often causing a strange sort of sensation. . .the motion is not to be ascertained positively, but by the vibration of other objects placed for that purpose. (pendulums)

Table 1- The weekly listing of New Madrid events by "Rate" of Jared Brooks 1811-1812. The eight first rate shocks occurred on December 16, January 23, January 27 and February 7.

End of Week	Rate						Total
	1st	2nd	3rd	4th	5th	6th	
Dec. 22	3	2	3	1	12	66	87
29	--	--	--	--	6	150	156
Jan. 5	--	1	2	9	3	119	134
12	--	1	--	10	--	150	161
19	--	--	--	4	6	55	65
26	1	1	7	2	2	78	91
Feb. 2	1	--	4	6	7	191	209
9	3	5	7	5	15	140	175
16	--	--	3	6	12	65	86
23	--	--	4	6	4	278	292
Mar. 1	--	--	1	4	8	126	139
8	--	--	2	9	8	39	58
15	--	--	2	3	6	210	221
Totals	8	10	35	65	89	1,667	1,874

The loss of life as a result of these earthquakes was very minor, due primarily to the low population density. A similar event today would undoubtedly take a heavy toll from St. Louis to Memphis and possibly along the lower White and Arkansas Rivers. Only one person can be definitely established as having died on land during these events, and that one was a woman who ran until exhausted and died of fright. The cabins of the country and the frame houses of the towns were such as to give under the shocks and only falling chimneys were a real source of danger. An unknown number of people died on the Mississippi River as a result of bank caving, disappearance of islands, and swamping of boats. The position of the channel of the river was extensively altered by the banks slumping, disappearance of old and development of new islands and bars, and extensive changes of snags on the bottom as innumerable trees were washed into the river. Shipping on the river was hazardous for many months until new channel patterns became established and known.

The physical effects on the ground can be assigned to four types; landsliding or slump, uplift and depression, fissuring, and sand and water extrusion. Landsliding was confined to the river banks and to the bluffs east of the Mississippi River. The Chickasaw Bluffs rise above the river bottomlands in Kentucky and Tennessee. The Bluffs have been developed on a blanket of wind blown dust (loess) which had accumulated on top of older flood plain deposits. Over a distance of fifty miles from Hickman, Kentucky, to the mouth of the South Fork River southwest of Dyersburg, Tennessee, the bluffs failed by slumping. Slumping involves the development of a curved fracture behind the bluff and movement of large blocks downward and outward along those fractures. Smaller scale slumping occurred along the river banks.

Uplift and depression of the land was quite widespread throughout the Missouri bootheel and southward to about Marked Tree, Arkansas. Scattered areas of elevation change occurred further north in Missouri. The best line of evidence to indicate these changes (that was clearly evident to Fuller in 1904) was the uplift of swamp-land trees, such as cypress, and the drowning of upland trees such as oak and hickory. This type of evidence indicated local subsidences of up to twenty feet and local uplift of an equal magnitude. The most famous of these areas is

just east of the Mississippi River at the Tennessee-Kentucky border where Reelfoot Lake still occupies a depression formed during the earthquakes. West and south of Reelfoot Lake is an uplifted area, the Tiptonville Dome, also a result of these disturbances. The stumps of dry-land trees still stood in Reelfoot Lake and the channels of the old drowned bayous could be followed under twenty feet of water.

In Arkansas and Missouri the most extensive depressions were the sunk-lands along the St. Francis and Little Rivers. In 1904 Lake St. Francis and the Hatchie Coon Sunk Lands was a lake forty miles long averaging about a half mile wide. Water stood two to ten feet deep over old channels. On the Little River, Big Lake, between Blytheville and Manila was the largest sunk land. Extensive drainage and channelization throughout the area since 1910 has almost obliterated these lakes, but the Big Lake Wildlife Refuge and the St. Francis Sunken Lands Wildlife Management Area are the remnants. During spring floods much of the old sunken lands return to their former state in spite of levees and drainage ditches.

Fissuring was extensive. The eye witness accounts describe waves traveling over the surface of the ground up to five feet high. The wave crests ruptured to form open fissures a few inches wide and extending to depths of twenty feet. This type of fissuring developed where stronger clay-bound river sediments rested on clean water saturated sands. Such fissures were a few yards to one-to-two-hundred feet long. It was this type of fissure which resulted in sand and water extrusion. A second type of fissure was common in areas near streams and resulted in the development of trenches a few feet wide and deep and three-to-five-hundred feet long.

Sand and water extrusion was exceptionally abundant in an oval area between Crowley's Ridge and the Mississippi River from Marked Tree, Arkansas, to Sykestown, Missouri. Over much of this area a nearly continuous blanket of sand covered the surface. The early writings reported the sand to be as much as two feet deep and over much of that area the sand blanket smothered the vegetation and rendered the land sterile, in 1904 the sand was still quite evident as low circular mounds of linear patches. The sand, and water which brought it up, was derived from a water saturated sand zone a few tens of feet below the surface. In that zone the sand grains were not as close together as possible before the shaking so that when the earthquake vibrations came the sand grains moved closer together expelling the water. Fissuring of the surface allowed the excess water to escape upward and as it flowed it carried sand with it. The circular mounds, often with broad shallow craters, developed where the main expulsion of sand and water was up a small cylindrical vent where as the linear mounds developed where the fissure was elongated. Much organic material (lignite) was brought up with the sand along with pyrite (iron sulfide). These materials were probably the source of much of the sulphurous odor which was reported by the survivors.

Information Circular 26 contains 70 pages. It may be purchased from the Arkansas Geological Commission, 3815 West Roosevelt Road, Little Rock, Arkansas 72204 at \$3.00 per copy plus 75 cents mailing charge.





**Double Falls** in Copperhead Canyon — Neil Compton

## Among the Tall Ships, An Ocean-going Canoe

*The Boston Globe*, May 29, 1980  
By Margo Miller, *Globe* Staff

As 1976 proved, Tall Ships attract small ships, and among the smallest of the small here to marvel at tomorrow's Parade of Sail in Boston Harbor is a 19-foot canoe.

Casey Murphree and Rich Tyhurst left Greenville, Miss., on Feb. 12 in this canoe and tied up at Boston's Museum Wharf last week.

But this is not the kind of canoe trip that John McPhee, paddling in Thoreau's wake, celebrated in his New Yorker articles. This is not a bark canoe on the Penobscot but an aluminum "putt-putt" with a sail Murphree made from an old yellow parachute.

"We paddle only when we absolutely have to," said Murphree as the square-stern Grumman, with Tyhurst running the "4½ horse" outboard motor, took a visitor on a spin in Boston's inner harbor.

"We're not after a listing in the Guinness Book of Records. Paddling long distance has been done. So has surf boarding: 30 or 40 years ago someone went from New York to New Orleans. And we don't sail much either. When there's enough wind, the water's too choppy."

Nor have they traveled all the way here by canoe, Murphree is quick to say. All the way by water, yes. Three times they hitched rides on larger vessels, their canoe carried on the decks of sea-going tugs that guide freight up the coast. So if they have a literary antecedent, it would be Mark Twain who told how Tom Sawyer persuaded other kids it was an honor to paint his fence.

The most irresistible "hitch" lies ahead, Murphree says. "To New York on one of the Tall Ships. If we can only get a ride on a Tall Ship, it would be the most unusual craft of the trip." At New York, Murphree and Tyhurst would revert to their original itinerary, up the Hudson River to Lake Champlain and west to the Canadian capital, Ottawa, by river and canal.

Why this long and by their own account often uncomfortable trek?

"This will sound corny," says 20-year-old Rich Tyhurst, "but the thrill has been seeing the big city atmosphere." He grew up in Fayetteville, Ark., a town of about 30,000, where his mother manages the local outlet of Ozark Mountain Smoke Houses, a 10-store retail chain and catalogue operation. His late father was a chemist with a plastics manufacturing company. At the University of Arkansas he is an art major with an emphasis in photography, and he has been photographing wild life along the way. "Lots of birds and seabirds," he says. "But no mammals, except for a few otter and beaver along the Mississippi — and tracks around our campfire in the morning."

With freelance wildlife photography his goal, Tyhurst says he might buy his mother's mobile home and equip it with a dark room. Then he would do what Casey Murphree has done in the past, support himself by working on tugs, two weeks on, two weeks off.

And the worst part of this trip? For Tyhurst, it was not the wet clothes, as waves sprayed the canoe, or the steady diet of canned food when they camped out. "After the 2½ months getting (by canoe) to Brunswick, Ga., I had just about had it," he said. "He's very outgoing," Tyhurst said, nodding toward Murphree, "and I'm very shy. Sort of a conflict of personalities. It was good to be on the tug, with other people."

Tyhurst and Murphree "have been friends since the Boy Scouts," Tyhurst says. A vestige of those days is the big brown felt ranger hat that Murphree wears. He is 35, also a son of the Ozarks. He saw his intended career in scouting, specifically in running Boy Scout camps, vanish with the demand for "relevance" in the '60s and the resulting trend toward training scouts in urban living skills.

There is a need, and a market, for recreation, Murphree believes, and he has founded Ozark Mountains Christian Expeditions, Inc. It is a nonprofit, and a nondenominational organization, he says, and through it, he hopes to develop a camp ground at Eureka Springs — near a large Arkansas state park in the Ozarks — which could be used by churches and other groups too small to maintain their own camps: "Churches like the Assembly of God," Murphree says.

And so for Murphree one purpose of the canoe trip is to get the word out. He is in constant motion, a one-man secretariat, gathering information — he flips open a large notebook to take down a useful name — or dispensing a little publicity.

"Please mention them," he says, pointing to a decal on the canoe's starboard bow that reads Outdoor Adventures, West Monroe, La. That store provided the canoe, a 1977 model Grumman, selling that year for under \$400 and this year for about \$750, Murphree says. He installed the mast himself, also the triangular lateen sail which he hopes can be used on the calmer waters of the Canadian canals. The Grumman's heavy leeboards came from an "antique" Old Town lake freighter canoe, the kind used by Maine guides. As for the canoe's bumpers, they were water trash. "We just picked them up," he says.

Whether Murphree will actually pay the Louisiana outfitter for the canoe depends on how successful he is selling freelance articles on the trip and a "how-to" book on canoe cruising. "The amount of misinformation we have been given!" he exclaims. "And by the federal government, too." Allowing for inflation, the budget for the present eight-month excursion is between \$8000 and \$10,000, he says. The original plan called for a two-canoe convoy with six persons. (Another of Murphree's enterprises, based on the experiences of this trip, will be designing and guiding such canoe expedition packages. He says he has the necessary certification from the Red Cross and Coast Guard.) The interest of the five other people "disappeared at ante-up time," says Murphree. In January Rich Tyhurst signed on.

On Feb. 12 the Grumman and its crew left the Mississippi River town of Greenville. "We were supposed to leave on the 10th but it snowed," says Murphree. In fact, winter in the South was to prove as snowy and raw as winter in the north was snowless and dry.

At New Orleans, a tugboat captain told them that with stormy weather brewing "only fools" would attempt to cross the gulf to Florida. He gave them their first free ride — to Pensacola. Again under their canoe's own power, Murphree and Tyhurst skirted the Florida gulf coast to Fort Myers. Crossing Florida on the inland Okeechobee waterway, they entered the Atlantic waters at Jacksonville and went up the coast to Brunswick, Ga. There, they found a hospitable tug heading for Philadelphia.

Like the tug's crew they paid \$5.50 a day for their food. "Much better than what we had been eating," says Tyhurst. "We had done a lot of fishing from the canoe and caught nothing," said Tyhurst. "Only clams and oysters," amended Murphree, "because they couldn't get away."

With Philadelphia 6½ days away, Tyhurst painted the tug's roof to help pass the time, and both men helped with the cooking. "We found us another tug in Philly to get us to Boston in time for the Tall Ships," says Murphree. On Wednesday, May 21, they arrived in Boston Harbor. That night they camped on one of the harbor islands. The next day they made their way over to Museum Wharf and a temporary berth at the Museum of Transportation. (Says the MOT's Bill Lltant, "First I knew about them was a call from the lobby guard saying there were two guys outside in a canoe from Arkansas. And I said, 'Oh, sure, there are. And there were.'")

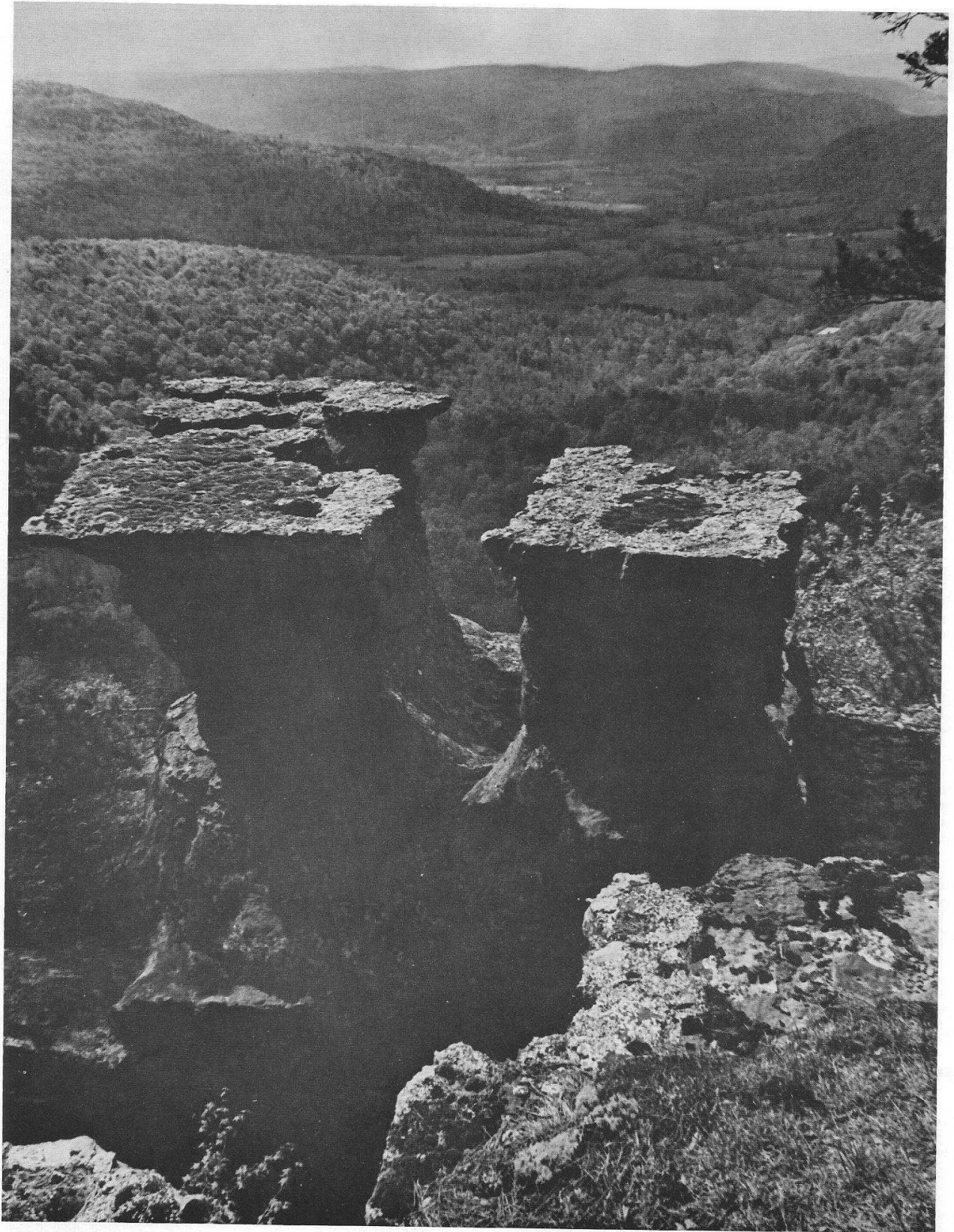
Another of Murphree's projects is a book "with a religious orientation" that he will call "Divine Coincidences." "The idea," says Murphree, is that you always meet the people you are supposed to meet." To hear Murphree tell it, the trip never lacked for such people.

A couple met in Florida gave them dinner in Philadelphia. In Boston, he and Tyhurst are staying with a Jamaica Plain couple, Wendell and Sue Drew, because in Clearwater, Fla., they had met her father, Bob Smydney, a retired submarine commander who lives aboard his sailboat. "You know what the Drews are going to give us to eat?" asks Murphree with an exclamatory hand clap. "Boston scrod!"

If the trip has taught one lesson, says Murphree, it is the essential kindness of most people. Not everyone, he allows, but most. More often than not, people are friendly toward this odd craft. "We do get some laughs but we get a lot of this," says Murphree making a "thumbs up" salute.

"I find as strangers in an unusual position that if we pose no threat to their jobs or their position in the community, people are all kindness."





**Home Valley and Big Piney** from bluff near Limestone, Arkansas — Neil Compton



# Timber Management Practices in the State of Arkansas

*comments delivered to Governor's Task Force on Timber Management Practices*

The following comments are delivered with respect to a request for input from the general public on the use, management and continued development of the state's forest lands, both public and private. These comments are generally brief in nature, being summarized descriptions of positions more thoroughly discussed elsewhere. As a general rule, the effort here is to develop arguments based on some prior understanding of past activities in the state, as well as on some prior knowledge of fundamental management and ecological concepts. Insofar as these limitations are understood, it is hoped that these comments will direct the attention of the Task Force to areas that have been of interest to many interested members of the conservation community.

The effort undertaken by the Governor in appointing a Timber Management Task Force to examine the issues of timber management practices in Arkansas is applauded. In the past a forum for raising these issues were less than balanced; oftentimes public meetings on specific resource use questions became shouting matches, with little real opportunity for compromise and resolution as a result. Objective review of the various positions being taken by resource managers and users in Arkansas will go a long way in defining the future quality of life for Arkansas residents.

Central to this concern for proper timber management and planning lies a basic conflict associated with the categorization of lands into public and private components. Certainly, private organizations, comprised of members that themselves are owners of lands, are sympathetic to the fears expressed by many landowners that state or federal attempts to assist in the "management" of private lands is one step closer to state or federal acquisition of these lands. There is nothing intended in these comments that would encourage this kind of development. The basic right of the private landowner to manage his own land provides an important sense of freedom and dignity to the private community, and it is felt that this is to be respected.

At the same time that certain rights of property usage are to be encouraged it seems important to recognize that certain responsibilities must also be incorporated into management concepts for private lands. In years past, many kinds of land and resource uses were permissible; uses that today might act to infringe on the health or well-being of other members of the overall public. In this respect, the private landowner's responsibility to be aware of the relationship between his activities and the needs and interests of the surrounding community is real. Where land use interests overlap and where there is divergent opinion about the use which a private landowner is making of his land, then the need to consider more compatible kinds of uses becomes real. The need to act in a fashion that is responsible and considerate of the community as a whole must be understood. Further, as the nation continues to grow, and as the world appears to shrink almost daily, it is necessary to consider the idea that the community to which we refer may be regional in nature. Important social concerns can often be tied to the attitudes and philosophies of a single landowner.

Thus, we see a kind of dilemma forming, one which attempts to encourage the rights of private landowners while at the same time remaining aware of the responsibilities of that landowner to the community as a whole. In this respect, a kind of balance must be encouraged; a balanced, aware sense of land management that is in the interests of both the individual and the group. In order to achieve this, we believe, long-range goals and objectives must be developed that transcend the short-term kinds of management schemes that we have seen in the past. Long-range planning can consider the timely needs of the overall community, can adjust smoothly to changes in community needs and interests, and can, at the same time, provide for the immediate needs of the individual as well. It is this kind of philosophy that seems important nowadays — one of well-thought-out objectives, responsive to individual and group needs, supported by the larger fabric of state and federal incentives — and it is this kind of philosophy that lies at the heart of the following specific comments regarding timber management practices in Arkansas.

## Hardwood Utilization and Management

It is recommended that, in the state as a whole, some assessment be made of the status and distribution of hardwood and mixed hardwood/pine forests in the state, with an eye towards

assessing the age distribution that occurs within the stands themselves. Realizing that wildlife and plant diversity is greatest when given a variety of age classes within which to develop, it seems necessary to encourage forest managers to maintain these hardwood stands, and to manage them in a fashion that will provide for the best or optimum mix of productive habitats and diverse niches. In this regard, rotation periods associated with hardwood timber management should be varied in accordance with the type and character of forest within which a timber program is contemplated. Two hundred year rotations are not inconceivable where specific niches can be utilized by special combinations of plant and animal species. As well, 50-year old or younger stands provide for a certain assemblage of species, adapted to take advantage of the habitat provided in this shorter term. Mixed age forest naturally maintains the greatest gross productivity, providing for an optimum range of wildlife and timber benefits where even selective cutting may be employed. Where clearing and subsequent monocultures cannot be avoided, however, they should be kept to a minimum size, and should be interspaced with old and medium aged forest to allow for ecotones and to encourage a similar distribution of niches found in the mixed age type. It is felt that 40 acre clearcuts are a maximum size, and that cuts on the order of 15-20 acres are preferred, when considering the needs of the forest as a whole.

Conversion of hardwood forest into softwood or pine forest should be discouraged wherever possible, since this leads to a reduction in the overall capability of the forest to support a diverse community of plants and animals. Where litter composition affects changes in soil chemistry, often leading to more acid conditions in the case of pine forests, vegetation diversity decreases. Where mast production declines or fails altogether, then wildlife diversity decreases accordingly. It is known that some species adapt very well to pine forests, but regarding the concept of diversity in its general sense, it can be seen that hardwood forest support a greater variety of species than do their softwood counterparts. Mixed forests may serve as an adequate balance between the needs of the ecosystem and the interests of the landowner. This should be examined on a case basis, however, in order to insure the continued ability of forest lands in the state to provide cover and rearing sites for wildlife, and to provide diverse soil conditions for vegetation.

Conversion of hardwood to pines is only one aspect of the conversion problem facing the state these days; lately, interest in the conversion of forestland to agricultural land has been more significant. In Arkansas, much of the conversion that has occurred has taken place in wetland areas, where farmers have attempted to take advantage of fertile soils within the two and three years flood plains. Agricultural productivity is of major importance to the economy of this state, and certainly the preservation of existing prime farm lands should be encouraged to the fullest extent, but the conversion of prime forestland to marginal agricultural purposes must be evaluated in its long-term sense. The disappearance of this resource cannot continue without terrific sacrifices to a major component of Arkansas' natural environment.

## Wildlife Habitat

Many of the comments related to wildlife management as a part of timber practices have been given above. One important comment should be given in addition to these others, and that is in relation to the concept of "game" management as opposed to the larger concern for wildlife management. Many times there is overt preference given to the management of forest tracts with the aim in mind of maximizing habitat for game species, but this is an over-simplification of the needs of the overall wildlife community. Important consideration must be given to managing habitats with the view of developing a balanced community in mind. The balanced community is one composed of a variety of trophic levels, including top carnivores that assist in the maintenance of other species. The balanced community is one that includes a complex web of interdependencies, so that adjustments can be made in the system as a whole if the need arises. To encourage game management above all else is to encourage an imbalanced system. Examples of this are prevalent at the federal level: the Featured

Species habitat development concept of the Forest Service has not widened its scope beyond such game animals as quail, turkey and deer. On public lands, especially, management activities should be developed that consider the needs of all segments of society. Therefore, over emphasis given to game animals belies the interests and needs of a large segment of forest users that are not hunters.

Again, diversity of forest type is the best way to ensure a diverse assemblage of wildlife. Diverse forest age groups, diverse vertical profiles that encourage understory and midstory growth as well as crown or overstory growth, ecotones between forest and field environments (15 - 40 acres), and so forth, will go far in assuring the state of a well balanced, continuing wildlife population.

It is well to mention that recent trends in the management of special forest species, those animals and plants that are considered rare, unusual or threatened, be continued in earnest. Programs underway to locate and categorize habitat types that will assist in preserving our naturally rich heritage of diverse floral and faunal types are to be congratulated and encouraged. It follows that, especially on private lands, educational efforts related to the long-term survival of these species should be considered as the next step in insuring their perpetuation. Given proper understanding and information, much can be accomplished by the private community. Along with educational efforts, consideration might be given to economic incentives associated with private management of especially sensitive species.

One last comment should not escape the notice of the Task Force, and this relates to justification that is often given by land managers intent on large-scale clearing operations and the effects of these on wildlife populations. Often it has been said that clearing activity has its major impact upon non-mobile species, that mobile ones will move out of the area of immediate impact and relocate in a suitable habitat. This should not be taken as the absolute truth, however. More and more, habitat constraints are such that fierce competition exists for available niches, even within an undisturbed area. When animals are driven away from an existing, stable habitat, they are faced with near certain death in trying to locate a suitable, unoccupied niche in surrounding areas. As Edward Abbey has been known to say, somewhat tersely, "There are no empty apartments in Nature."

Steady-state forests provide more stable, more predictable conditions wherein animal populations can live out their lives. Continuous perturbations in a forest community due to clear-cutting, conversion and too-rapid rotation only aggravates the already worn thread that supports many special species. Thus, long-term, diverse, balanced forest management practices can be seen to best serve the interests of a stable, diverse wildlife population.

Wildlife resources are considered to belong to the people of the state as a whole, and although there may be a variety of animal species that exist on public lands, it should not be forgotten by the private landowners that the general public has by law an interest in the activities of the individual in the way in which wildlife populations that exist on private lands are managed. In the best interests of both parties, then, cooperative programs directed to the long-term maintenance of this resource are to be encouraged.

#### **Recreation and Multiple-Use Management**

Public Law 94-588, The National Forest Management Act of 1976, provides a good characterization of the multiple-use concept.

"...the Secretary shall. . .provide for multiple-use and sustained yield of the products and services obtained. . .and, in particular include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness."

This recent definition attempts to consolidate the variety of active and passive "uses" of forestlands in a fashion that will guarantee the continued productivity of these lands consistent with the needs of the public as a whole. It is a balanced approach, and emphasizes the long-term aspect of forest planning.

Recreation, then, is a viable form of multi-use, and includes both intensive forms (resource consuming), such as hunting, fishing and motor boating, with more non-intensive forms, including canoeing, swimming, hiking and the like. Aesthetic appreciation of the forest as a recreational activity can be construed to be an important aspect of multiple-use, and the designation of some areas of the forest to wilderness, where there may or may

not be definable "uses," or where use may be limited to aesthetic or psychological relationship between people and the forest — all of this is reasonable multi-use.

On public lands this kind of differentiation has been important, especially where long-range forest planning has been initiated in order to satisfy public demands for forest products and services. Dr. Rupert Cutler, Undersecretary for Natural Resources and Environment for the U.S. Department of Agriculture, has recently said that —

"The National Forests should provide public benefits that cannot be supplied by private lands, usually because economic incentives for the private landowners are absent."

Thus, in the long-term, state and federal planners will have to incorporate into their management schemes the needs of those segments of society who seek recreation in forestlands, who have fewer and fewer private forests to visit; and thus, must depend on public lands for recreation outlets. Private management of forestlands has often resulted in reduced wildlife populations, fewer aesthetic experiences — reduced "opportunities" for recreation in general. As forest communities are modified, or eliminated, and as the need for and interest in recreation continues to grow, public lands will be faced with increasingly greater recreation demands. If private interests are not swayed to the concerns of the recreation seeking public, then the National Forest Lands, along with the state-owned properties, will bear the brunt of the demand for recreation. As Dr. Cutler has said, "...the role of the National Forest, in responding to recreation needs, will be to provide the natural, more primitive types of (recreation) sites." In this regard, demand for wilderness and specially scenic areas of the public lands will become the responsibility of state and federal government.

#### **Environmental Quality and Forest Management**

For many years, there has continued to be a great interest on the part of the conservation community related to questions of water quality, soil conservation and ecosystem health. Many of these issues are interrelated, exhibiting characteristic entities that link many of man's activities to the long-term perpetuation of a productive, balanced forest. Concerns for environmental quality affect both public and private land managers. In all cases, the need is to consider the long-term ramifications of activities that are directed to short-term returns on investment of energy and capital.

Chemical application within the state's forestlands is one example of questionable priorities. Despite the concern for human health and welfare whenever pesticides or herbicides are used, there is the lingering unknown association with ecosystem disturbance: Our experience with most chemical aids is so limited, and our understanding of the subtle and complex workings of ecosystem is so minimal that a long history of surprises will be ours on which to reflect the wisdom of this particular management tool. We have only begun to learn of the problems associated with bioaccumulation or biomagnification over the long-term. In many cases, information on the degradation rates of preferred chemical is incomplete. Always there is conflicting data; some researchers would describe the majority of chemicals as benign, while others warn against unknown or persistent after effects. In many cases, where the chemical itself may be relatively safe, improper application procedures or carelessness has resulted in damages to health and property, not to mention unwarranted damages to the forest itself. For example, aerial application often results in contaminated surface waterways where thick canopy cover and rapid aircraft speed prevent the pilot from knowing what lies on the forest floor beneath him during chemical releases. Within a mixed forest association the use of chemicals to alter the vegetative population makeup is antithetical to the very notion of a healthy, diverse, synergetic community, since rapid, large-scale population modifications result in interrupted nutrient flow, disturbed soil conditions, faunal population fluxes and general microclimate variations disruptive to the entire community. Where information is lacking, or where education has been inadequate to insure safe usage, it is in the interest of all to approach the question of chemical application with caution. Use should be discouraged wherever possible. When necessary, rigid constraints should be placed on both the chemical itself and on those who are licensed to apply the chemical. Chemical sales should be restricted only to those with the proper qualifications and with knowledge regarding application techniques and conditions. Wherever possible, alternative

control measures should be stressed.

A fundamental principle of soil conservation is that soil chemistry should be developed under conditions required to support the forest community, and that alteration in chemical composition or nutrient content should be avoided if we intend to maintain the existing complex of animals and plants within the community. Chemical applications belie this premise, affecting microbial organisms or altering the constituency of the nutrient base from which the forest must draw for growth. Artificial manipulation of this nutrient base cannot improve the character and quality of the forest system in the long-term; the most that we can see from such activities is short-term responses that may suit an immediate need, but that may be out of touch with future forest productivity. Again, caution should be the controlling guideline.

A second principle of soil conservation is that the soil should be held in place at all costs. Erosion due to improper management techniques will certainly affect our long-term capability to provide for forest growth. Indeed, there has been tremendous loss of soil capital already in this state (and this region), and this will undoubtedly result in reduced production capability if losses continue to occur. Timber harvesting techniques, including road building, cuts on steep slopes, burning of stubble, clearcutting and mechanical site preparation — all of these activities have continued to result in the loss of soil resources. More stringent controls must be applied to harvesting techniques in order to protect the resource. Educational programs must be improved so that small landowners will understand the results of soil losses and be discouraged from activities that create these problems. Even large landowners have been known to risk the loss of soils by carrying out harvesting activities designed for short-term economic conditions, and ignoring the disbenefits or externalities that may affect the industry during the next century. The loss of an inch of soil may take a hundred years to replace, assuming undisturbed conditions in a hardwood stand. Where is the interest in future resource management if tons of soil are allowed to wash down slopes and hillsides year after year? How effective will voluntary control programs be in controlling this sort of resource depletion?

Water quality concerns are intimately tied to the questions of soil loss and chemical applications, for what eventually washes off of the slopes during rainfall, must eventually influence the character and quality of rivers and streams. Surface waters are heavily affected by suspended solids where improper control measures are taken, and this not only illustrates the loss of a valuable soil resource, but will also impact the aquatic biota that have become adapted to traditionally clear and clean waters in this state. Runoff should be contained and controlled when necessary as a part of timber management activities, and in a fashion that is consistent with the recommendations of the 208 Plan developed for the State. Although the Plan involves the creation of only voluntary management practices related to controlling nonpoint discharges to waters of the state, voluntary programs are better than no programs at all. Until there is need to revise the Plan to consider appropriate, mandatory control measures, the Plan should be encouraged by the Task Force itself.

#### Preservationism

In an earlier section, mention was made of the need for wilderness within the state; this to help offset the demand for primitive recreation. Beyond the recreation idea, however, and more broad than wilderness needs alone, preservation of special portions of the state's remaining forestland is essential. In an unqualified manner, we should begin to consider that wild and untrammeled areas of the state should be left in their natural state for the benefit of future generations. These benefits are many-fold, spanning a range of ideas related to human health and welfare and to preservation and perpetuation of natural systems native to the state. Whether small Natural Areas, or Special Management Areas, or larger wilderness and wild and scenic areas, pristine communities require urgent attention at this crossroads in our management philosophy. Decisions made today to develop these remaining areas will be irreversible.

Roderick Nash, Professor of History and Environmental Studies at the University of California at Santa Barbara, has developed a ten-point system summarizing the need for preservation of remaining wildlands in this country. Insofar as these relate to the questions of public and private management of forestlands in Arkansas, they are provided for consideration below.

1. Wildlands take on importance as **models** of ecological bal-

ance and land health.

2. As a crucible of American **character**, the frontier has been characterized as a boundary between wilderness and civilization. Preservation of the extremes, then, through preservation of wilderness might be the best assurance of keeping alive the traditional American spirit.
3. There is a connection between wildlands and **creativity**. We need to know if the challenge of the undeveloped wildland has intellectual dimensions that are not available to us in a completely known and controlled world.
4. Historians are beginning to realize that understanding the past involves understanding the **landscape** within which people thought and grew just as much as the people themselves. Wild lands can serve as a document, in effect, revealing more than conventional records about the character of a people.
5. The importance of **challenge** and perceived danger in our society has been underestimated, but time and again it has been shown to provoke great deeds, provide for breakthroughs and discovery of self. Psychological health is intimately tied to these processes, and wildlands provide this setting which may stimulate the individual.
6. Wilderness has been called "part of the geography of hope," and for Americans this notion of wilderness as a source of **freedom**, individual **dignity** and **diversity** is especially significant; the entire foundation from which the Nation evolved essentially mirrors this concept.
7. An important value of the wild is as a setting for **religious activity**. Meaning and tranquility, meditation and introspection, insight into the unity of things — all of this provides a sense of mystical or metaphysical experience that underlies religious ideals.
8. As a source of emotional and psychological stability, wildlands affect an awareness of **self-confidence** and **self-sufficiency**, placing us more in touch with our biological roots. People seek the wilds in an effort to simplify their existence, and return to civilization refreshed and prepared to cope with daily problems once more. Again, we see the psychological implications of preservationism.
9. Wilderness can serve as the best and most fundamental teacher of interrelationship and connections. Wildlands can show that the community is a concept that does not end with man or that which he controls. In wilderness we see ourselves as members of a wild community, not masters. We understand limitations. From this recognition emerges an expanded awareness, an **environmental ethic**, and from this rises a new sense of harmonious relationships with the earth. As a way of dealing with the morass of ecological problems that we have described in this paper, this may serve as an essential option for the future.
10. The wild world is good for itself, **for its own reasons**, just because it exists. This rationale is apart from the other nine explanations of preservationism, which are all arguable in terms of human interests. The non-human world has a right to exist apart from man's realities and interests; indeed, it was there long before our advent, and will continue in some form after our passing. Some would argue that, for this reason alone, wilderness or wildlands deserve respect, or love, or maybe even our awe.

#### Summation

The management of private forestlands has economic incentives at its heart. For this reason, short-term thinking has developed a heavy hand in describing options and techniques of timber harvesting and forest perpetuation. Long-term thinking needs to be instilled at this management level. Understanding of the relationships between man's activities and the needs of the natural system must be fostered. Management practices related to harvesting procedures, wildlife management, soil management, and water quality maintenance must be followed in a strict sense of adherence to recommendations of state and federal guidelines. Incentives should be developed to encourage the private landowner to leave portions of his land in a pristine state, protective of the processes already at work within the natural system itself.

The management of public forestlands has both economic and non-economic incentives at its heart, since the concept of multiple use includes non-intensive or passive forms. Tradeoffs between short-term and long-term interests must be continually made, with the realization that short-term decisions may preclude options for the future; wilderness or wetlands preservation, for example. Recalling Dr. Cutler's remarks: "There is little

continued on page 15



## Senate Passes Bill on Alaskan Lands; House Warned, 'It's That or Nothing'

•ARKANSAS GAZETTE, Wednesday, Aug. 20, 1980.

WASHINGTON — The Senate voted 78 to 14 Tuesday to put 104 million acres of Alaska's vast wilderness into national parks and wildlife refuges, but it left the final legislative fate of the unspoiled lands in the hands of the House.

Both Arkansas senators, Dale Bumpers and David Pryor, voted for the bill.

Senators warned that unless the House accepts the Senate's compromise bill as is, it will be filibustered to death by Senator Mike Gravel (Dem., Alaska).

"It's either that or nothing," Senator Henry Jackson (Dem., Wash.), a key sponsor of the Senate bill worked out in off-the-floor negotiations after the legislation bogged down late last month.

The bill would put about 43 million acres of land into the National Park System and about the same acreage into wildlife refuges. Additional lands would go into the National Wild and Scenic River System and into national forests.

Those scattered parks and refuges, adding up to an area larger than California, would include majestic mountains, white-water rivers, vast expanses of tundra, the summer nesting grounds of millions of birds and the habitat of caribou, moose and other wild animals.

### Demands Balanced

The compromise bill was worked out in an effort to balance demands for preservation of the lands in their unspoiled state with demands for greater access to Alaska's huge mineral, oil and timber resources.

Passage of the bill was assured Monday when the Senate voted 63 to 25 to end delaying tactics by Gravel and then decided 72 to 16 to substitute the compromise for a Senate committee bill that was less acceptable to environmentalists.

### Can't Stop Filibuster

Jackson and Senator Paul Tsongas (Dem., Mass.) — key sponsors of the compromise — predicted that any future motion to shut off debate would fail if the bill comes back to the Senate again.

They noted that Gravel would have three chances to filibuster if the bill is sent to a House-Senate conference committee to work out differences between it and a bill passed by the House early last year.

The House bill, passed 360 to 65, would set aside 128 million acres and calls for stronger safeguards to protect scenic lands from the ravages of mining, oil drilling and logging.

Senator Ted Stevens (Rep., Alaska) voted against the Senate bill but said it was preferable to no bill and expressed hope the House would accept it.

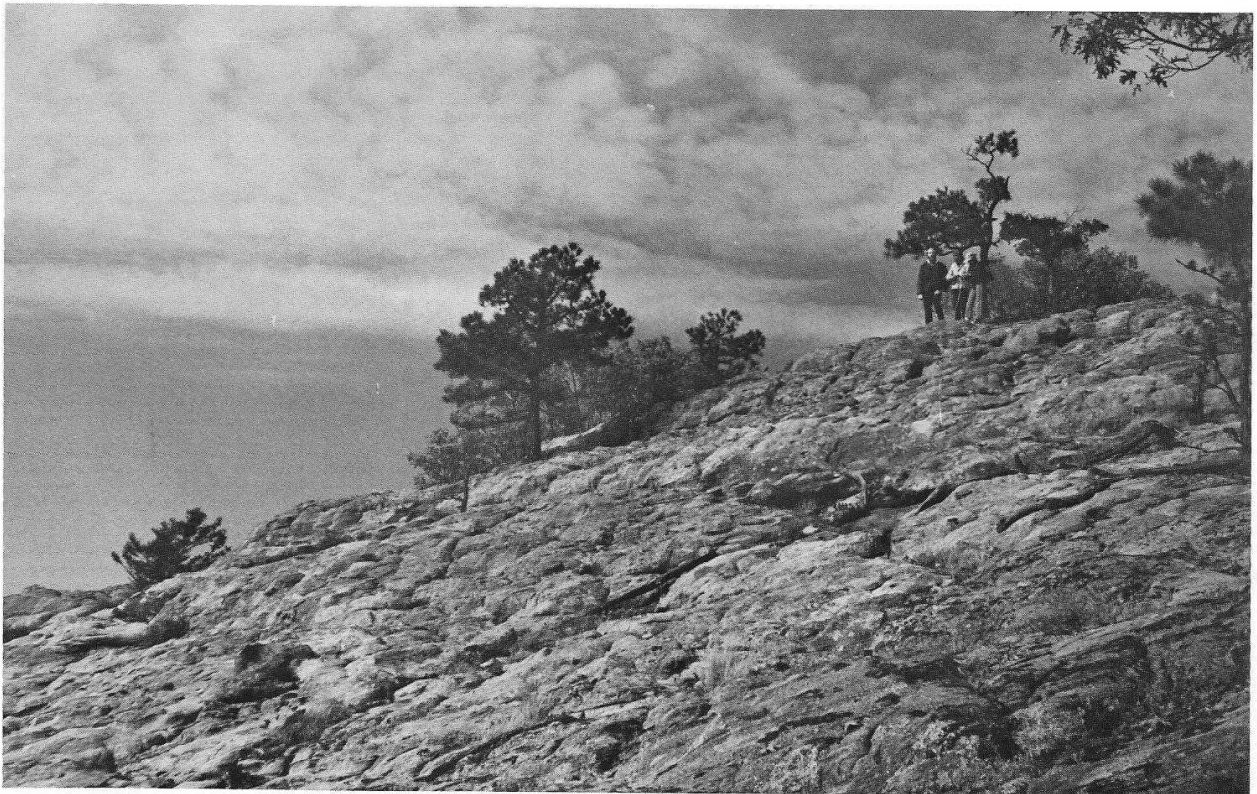
"If they send the bill to conference, it's dead," Stevens said.

Gravel denounced the bill as "going far beyond what is reasonable \* \* \* in locking up" oil and other resources. He said it would prevent development of "\$9 trillion worth of minerals for the next generation."

The bill has the support of President Carter, who declared some of the lands national monuments in 1978 to protect them while Congress considered the historic conservation measure. Mr. Carter praised the Senate action calling the bill "the conservation issue of the century."

Charles Clusen, chairman of the Alaska Coalition, welcomed Senate passage of the bill and said, "We now look to the House of Representatives to improve this bill." Clusen said the Senate bill would not provide sufficient protection for the scenic wildernesses of the Misty Fjords and Admiralty Island.

Thomas Kimball of the National Wildlife Federation said the compromise was "a definite improvement" over the original Senate bill and "goes a long way toward solving some very difficult problems."



East Rim, Busby Bluff near Ponca, Arkansas — Neil Compton

# ANNUAL FALL MEETING SEPTEMBER 13-14, 1980 SCHOOL OF THE OZARKS POINT LOOKOUT, MISSOURI

## September 13, 1980

- 8:00 a.m. Registration - Cummings Auditorium, 2nd floor, Good Memorial College Center
- 9:15 President's Address - **Dr. J. W. Wiggins**
- 9:30 Ozark Trail Development - **Al Schneider**, Missouri Division of Natural Resources
- 10:15 Mark Twain National Forest Planning Update, **Bill Alden**, Planning Officer
- 11:00 Resource Management on the Ozark National Scenic Riverways, **Art Sullivan**, Superintendent
- 11:45 Lunch - on your own
- 1:00 p.m. Planning on State Forests - **Kerwin Hafner**, Assistant State Forester, Missouri Department of Conservation
- 1:45 Hydrology of the Ozarks - **Tom Aley**, Director, Ozark Underground Laboratory
- 2:30 Address - **Dan Sauls**, Missouri Outdoor Writer
- 3:15 Break
- 3:30 Wild Areas on State Park Lands - **Paul Nelson**, Missouri Division of Natural Resources
- 4:00 Ozark Society Advisory Council - Chapter Activities, **David Millsap**, Chairman
- 5:00-7:00 Supper - West Room, College Center Cafeteria
- 8:00 Special Program, to be announced

## September 14, 1980

- 9:00 a.m. Business Meeting - West Room College Center
- 10:30 Board of Directors Meeting

### Timber Management—from page 13

economic incentive for private landowners to keep large tracts undeveloped. Therefore, State and Federal governments, by necessity, have the lead in establishing and maintaining wild areas."

Massively intensive forest management practices should be discouraged wherever possible, since subsidies of chemicals, mechanized equipment and the like have the potential to result in wide-ranging, little understood effects. Also, as petrochemical products begin to decline in supply and increase in price, alternative measures will eventually have to be found. It should suit our purposes now if this can be encouraged.

Preservation of pristine and untrammeled lands should be encouraged, from small tracts of representative natural areas to large wilderness forests, swamplands or prairies. Preservationism serves a variety of social functions, as we have seen. Also, in the spirit of respect for fundamental values, and perhaps at the very heart of this discussion, such areas deserve consideration and protection in their own behalf and for reasons apart from the immediate interests of man. ♻

Respectfully submitted,  
Bill Coleman  
Chairman Conservation Committee  
The Ozark Society

## MOTEL INFORMATION

Point Lookout, Missouri, is on highway V, ½ mile west of U.S. 65 at a point 8 miles north of the Arkansas state line. Point Lookout is 2 miles south of Branson, 1 mile west of Hollister, and 45 miles south of Springfield.

There is an excellent motel facility located in the College Center on the same floor as the Cummings Auditorium. The rooms are equipped with two beds, bath, colour TV, and lounge area. The rates are as follows: 1 person - \$18.00; 2 persons - 22.00; 3 persons - 24.00; 4 persons - 26.00; children under 12, free. For reservations write: Motel Manager, Point Lookout, Missouri, 65726, or phone (417) 334-6411. There are many motels in the area, including the Old English Inn in Hollister, Missouri. A check with Ozark Wide Reservation Service, Main Street, Rockaway Beach, Missouri 65740, (417) 561-4191, will provide more information concerning lodging and area attractions. There is a commercial campground near the campus while more aesthetically pleasing camping may be had 6 miles west on highway 165 at Table Rock State Park.

## Ten-Tom is No Bargain

### Pulaski Chapter Paddle Trails

Have you ever wondered why Congress can't ever seem to find funds for our national parks, wildlife refuges, forests, endangered species or other useful public projects, yet can find millions to squander on wasteful water project construction like the outrageous Tennessee-Tombigbee Waterway in Alabama and Mississippi? So does the National Wildlife Federation, who is asking all conservationists to gird up and inform their senators and representatives to fight a recommendation by the administration that Ten-Tom receive a half billion dollars in fiscal years 1980-81. In late June, Congress was slated to vote on a 1980 supplemental appropriation of \$58 million for Ten-Tom (H.R. 7325). In July, Congress will vote on a \$225 million appropriation for 1981; monies that should be directed to more worthy goals. Developers want a ditch, while we go without hot showers at Buffalo Point Campground. It's time to change that. Please note that Tom-Tenn will generate no power, has no flood control or water supply benefits and will parallel the Mississippi River, which is much better for barges, and serve an area with an existing rail network. You can have all these marvelous non-benefits for a paltry \$3 BILLION. Ten-Tom is nothing but a brass-button WPA, without the benefits of the good works of the depression-era Works Progress Administration.

## Missouri Wilderness

The White Water News

July

On Tuesday, July 1, legislation passed the U.S. House of Representatives to protect Piney Creek, Devil's Backbone, Bell Mountain, and Rockpile Mountain in the National Wilderness Preservation System. Thanks to all of you who helped by writing letters or worked in other ways to secure protection for these beautiful Missouri wilderness areas. We're only halfway there, however; legislation still must pass the U.S. Senate. If you have not already written Missouri's two senators, Thomas Eagleton and John Danforth to express your interest in these lands, now would be a good time to do so.

## Dues Notice

Please send in your dues for 1980.

Fill out the blank below and send it with your check to Steve Shepherd,  
Membership Chairman, The Ozark Society, Box 2914, Little Rock, Arkansas 72203

Dues are for the calendar year. They are regular (and family), \$5; contributing, \$10; sustaining, \$25; life, \$100

Please check: new member: \_\_\_\_\_ renewal \_\_\_\_\_ Date \_\_\_\_\_

Last name \_\_\_\_\_ first names of husband and wife \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_



**The Falls of Long Creek** - Mark Twain National Forest, Taney Co., Missouri — Roger Pryor