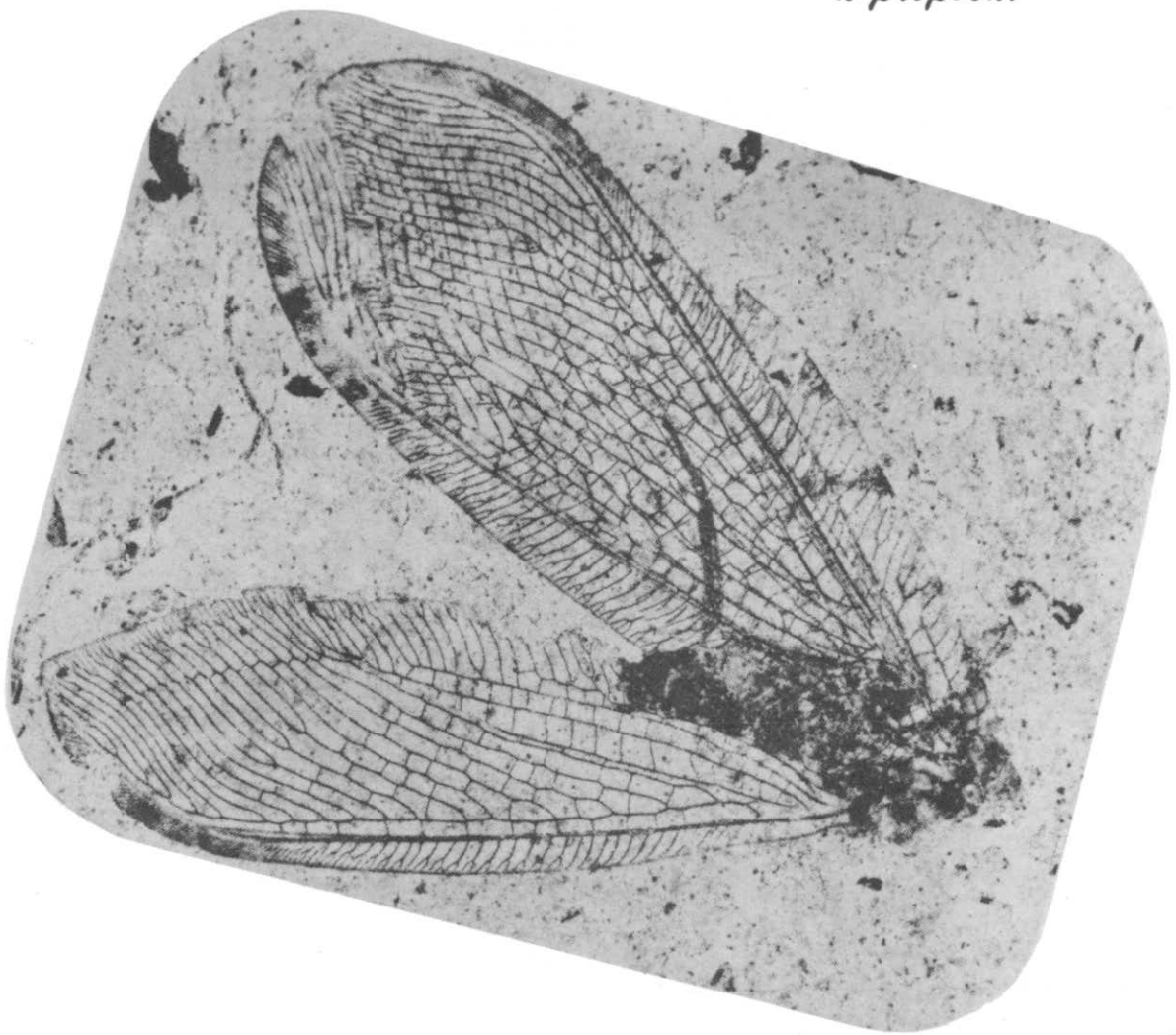
Florissant Fossil Beds
National Monument

a proposal



UNITED STATES
TMENT OF THE INTERIOR
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A Proposed

FLORISSANT FOSSIL BEDS

NATIONAL MONUMENT

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INTRODUCTION

The Florissant Lake Beds, a famous location of well-preserved insect and leaf fossils, and petrified tree stumps is located 35 miles west of Colorado Springs, Colorado, in the vicinity of the small community of Florissant.

It is a classic paleontological locality known to geologists, botanists, and entomologists, worldwide; mentioned in many textbooks of geology; and described in numerous scientific publications. Fossils taken from here may be found in the paleontological collections of many prominent museums and colleges throughout the Nation.

Careful studies were made of this site by the Midwest Region, National Park Service in 1959-61, as a part of long-range efforts to identify further areas of sufficient importance for inclusion in the National Park System. The eventual objective of these efforts is a well-rounded system of National Parks, Monuments, Historic Sites and related areas that will be truly representative of America's natural and cultural heritage. This report is the result of those studies.

GENERAL SETTING

The small basin containing the Florissant Lake Beds is located in the Front Range of the Southern Rocky Mountains at elevations ranging from 8,200 to 9,000 feet. In general, the climate is cool and pleasant from May through October, but is harsh and cold during the winter months. Precipitation averages about 18 inches. The basin lies in the Montane Life Zone, here characterized by tree-covered hills and ridges surrounding small grassland meadows. The hills and ridges, which rise 200 to 400 feet above the meadows, are covered predominantly with stands of ponderosa pine which are dense on the north slopes and more open on the south. Occasionally, exposed outcroppings of light-colored granite can be seen, contrasting picturesquely with the dark green of the pines.

The lake beds consist of north and south arms connected by a narrow strait. Each is about one-fourth to one and one-half miles wide and five miles long. They are drained northwestward by Grape and Twin Creeks, small intermittent tributaries of the South Platte River.

Two early descriptions of the area remain quite valid today. A. C. Peale (7th Annual Report, Hayden Survey - 1874) described the region as follows:

> ...around the settlement of Florissant is an irregular basin... not more than five miles in diameter. The deposits extend up the branches of the creek, which all unite near Florissant....just below Florissant on the north side of the road are bluffs not over 50 feet in height, in which are good exposures of the various beds.

Arthur Lakes in an article in Mines and Minerals (Vol. 20, 1899) had this to say:

> ...monotony of granite continues until we near Florissant station, where banks of white paper-like shales appear on either side....The basin...consists of parks and parklike valleys winding in and out among the hills, dotted over here and there by granite knobs which must have been islands in the lake, since the lacustrine shales... gather around them.

The petrified stumps are localized on the west side of the southern arm of the lake beds, within the privately developed Colorado, and Pike Petrified Forests. Here, between 20 and 30 of these silicified specimens once stood 16 to 19 feet high, the larger ones being 9 to 13 feet in diameter. But vandalism and weathering has long since leveled most of them to the ground, and their impressive dimensions have been revealed only by excavating around them.

Even under the protection of the existing private developments, vandalism and promiscuous collecting of fossils continues as it did soon after the discovery of the site was first made.

The Colorado Petrified Forest has been operated as a tourist attraction since about 1890. On display here are approximately twelve fossil tree stumps and the main quarry from which most of the insect fossils found in the Florissant Lake Basin have been taken. Here, also, the old Midland Railway station, transplanted from Florissant, is used as a museum, office, and quarters for employees.

The Pike Petrified Forest, adjoining property, was first operated as a tourist attraction in 1920. A former dwelling has been converted into a museum. About ten petrified tree stumps are displayed here. This development was closed down during the 1961 season.

GEOLOGIC HISTORY

Origin

For millions of years during the Upper Cretaceous Age, most of what is now Colorado lay beneath the waters of a great inland sea. About sixty-million years ago, as this period ended, the seas retreated and the continent rose. Profound movements within the earth's crust resulted in uplift of lofty and widespread mountains throughout the West. Then, for the next ten-million years or so, erosion attacked these early, lofty Colorado Rockies. Rock debris eroded from their flanks was carried eastward to the lowlands, and deposited widely for hundreds of miles by through-flowing streams--ancestors of today's Platte and Arkansas Rivers. These deposits, now exposed in the High Plains, make up the formations which are so well known for their richness in mammal fossils.

By Oligocene time, the mountains had been reduced generally to an upland, some of it almost a plain, but mainly a broad, gently rolling hill-land, possibly somewhat like our modern Ozarks. The upland still rose high enough to intercept warm, saturated air masses from the south and west, with consequent mild, moist climate and a rich vegetative response to these bland conditions. The rolling slopes were mantled by many types of deciduous trees and immense sequoia groves. Small lakes occupied depressions here and there in the eastern margin of this ancient upland. Probably there were many such lakes, but evidences of only a few survive. The present Florissant area possesses such evidence. From a fortuitous constellation of circumstances, the area adjacent to this particular Oligocene lake experienced little disturbance by the innumerable subsequent uplifts and rock disturbances; and mud and silt deposits accumulating in the lake bottom may well have finally silted up the lake

completely nearly 35 million years ago. But this alone does not make the area unusual. A far more spectacular geological process--volcanic eruption nearby--gave the Florissant area its unique fame.

For thousands of years, the scene was probably one of weirdtranquility with the silence broken only by the buzzing of insects in the subtropical foliage, an occasional bird-song, or the sounds of large mammals which have left no known trace here.

Then, violent geologic processes began. Volcanic eruptions, undoubtedly accompanied by severe earthquakes, began as a precursor of renewed mountain-making. Molten lava welled up from deep within the earth and piled up as a volcano, probably located only some 15 to 20 miles away from the lake. Eruptions were probably short--perhaps a week or so in duration--but violent; and they continued periodically over many thousands of years. Tremendous explosions of pulverized rock occurred, filling the air with dense clouds of dust and fine particles of volcanic ash. Swept forward by the prevailing wind, these great ash clouds rained down upon the lake and its forested shores. Much of the ash which fell into the lake carried flying insects to the bottom with it. And, too, as it brushed or pelleted against foliage in descending, it carried into the lake a wealth of leaves and a great number of insects which were feeding upon the lakeshore vegetation. Quickly buried and sealed off from the air, these remains did not decay. As ash fall followed ash fall, layer upon layer of paper-thin shale accumulated in the lake bottom. Such insect life and plant foliage as was carried down became pressed and sealed within these deposits.

The ash which fell on the ground near the lake accumulated to moderate depth, but each heavy rainstorm quickly washed much of it into the lake, where it spread out as layers of silt. Such ash and mud flows occasionally buried

the bases of standing trees on the lake margin. This killed them, but also, by burial, saved them from decay. Later, mineral solutions in ground-water filtered through the mud and the buried stumps to silicify and preserve them. These are now exposed as the great stumps which make up the area's "petrified forests."

These ancient events have been well described by Professor T.D.A. Cockerell in his 1920, Textbook of Zoology:

> Around the lake were active volcanoes, which sometimes threw out very finely divided ash, sometimes liquid mud,...At times of eruption there were, no doubt, violent gusts of wind and poisonous gasses, while hot cinders fell here and there and set fire to the forests. Thus leaves and even branches were torn from the trees, and charcoal may still be found to testify to the forest fires. Insects and other creatures were killed and fell into the shallow water of the lake, where they were presently covered by deposits of the finest ash, falling gently from above, Thus the various remains were hidden beneath successive layers of volcanic material and when a mass of lava flowed over the whole, its weight pressed the wet ash down, and in course of time converted it into hard shale. What had been the life of the locality now crushed flat, was hermetically sealed between the layers....

How long these dramatic processes continued is unknown, but they eventually ended, and within a few million years, the old upland was elevated again thousands of feet into another lofty mountain range. In this process the lake basin was slightly tilted, and its waters drained to the north leaving the lake bed dry.

Erosion once more began to plane away the "second generation" mountains. The drained lake basin, however, was not appreciably affected by these later events. It still remains shaped somewhat like its Oligocene counterpart, the existing streams which drain it having eroded away but a portion of the lake sediments. Only, the former lakeshore vegetation has now been replaced by a coniferous forest; and the blue waters of the former lake by a basin surfaced with light-colored, paper-thin shale carpeted with grass. Although

now consolidated to soft rock, the shale is clearly the modern counterpart of those repeated rains of volcanic ash, which entombed much tree foliage, untold thousands of insects, many thin-shelled fresh-water mollusks, and randomly scattered fragmentary bones of small vertebrate animals.

Here and there, stone tree stumps rise from the pits dug to expose them. They are silent monuments to and remnants of the forests which once bordered the lake but which were killed and buried by floods and mudflows, long since ended.

Ancient Life

The rare quality of the Florissant site lies not in dramatic exposures of big-boned creatures, but rather in the delicacy with which thousands of fragile insects, tree foliage, and other forms of life--completely absent, or extremely rare in most paleontological sites of this period--have been preserved. The fossils at Florissant are individually quite small, but in the aggregate are tremendous. Few fossil sites in the world have yielded some 60,000 specimens of over 1,000 different species of life. In addition to this vast number of individual fossil specimens, is the remarkable way in which the fine-grained ash has preserved, in minute detail, delicate features of the innumerable specimens sealed **within** the layers of shale.

Almost all the fossil butterflies of the new world have come from this one site (Cockerell, 1916, p. 444). An interesting occurrence of four species of Glossina (tse-tse flies) have given some paleontologists a possible cause for the extinction of certain Tertiary mammals (Cockerell, 1920, p. 161). Frank M. Carpenter, professor of entomology and curator of fossil insects at the Museum of Comparative Zoology, Harvard University, makes the statement (USDA Yearbook, 1952, p. 14) that fossil insects have been collected at nearly

150 localities in various parts of the world, but about 90 percent have been collected at twelve of these deposits. He estimates the number of specimens collected from the richest deposits are 150,000 from the Baltic amber; 60,000 from Florissant; 10,000 from the Elmo limestone in eastern Kansas; and 1,500 from Commetary, France.

Dr. H. B. MacGinitie, in his monograph, Fossil Plants of the Florissant Beds, Colorado (Carnegie Institute of Washington, Pub. 599, 1953) describes 114 species of leaf fossils.

The Florissant site is not restricted entirely to vast numbers of small fossils. The petrified tree stumps are impressive to all who see them because of their considerable bulk and silent, mysterious presence. These giant stumps--buried and preserved by volcanic ash mudflows--are very striking examples of fossilization of vegetable material. Preserved exactly where they were rooted and growing, they approach the ideal of a "petrified forest" more than do the great prostrate logs of Petrified Forest National Monument in Arizona.

Harry Andrews (Ancient Plants and the World They Lived In, 1947) in speaking of the degree of petrifaction of the stumps at Florissant says:

> In /some/ specimens a great deal of the organic tissue may be found intact after millions of years. In the huge petrified stump... most of the wood is well preserved as it was the day it last saw light as a living sequoia....Fragments of this wood may be soaked in hydrofluoric acid for a few days to dissolve the silica. This leaves the wood itself free of the petrifying mineral and it may then be cut just as living wood samples are preserved for microscopic study.

Most of the foliage associated with the petrified stumps is suggestive of the Coastal Redwood of California (Sequoia sempervirens). However, since it differs some from the living species in California, the fossil wood has been named Sequoioxylon pearsallii and the fossil foliage Sequoia affinis.

Other trees represented by fossil wood and leaves found here are pine and several deciduous species such as walnut, beech, willow, oak and maple.

Ranking below the fossil insects and leaves in numbers of specimens found here are thin-shelled mollusks and fresh-water fishes. As many as eight species and four genera of the latter have been found. Several bird feathers and a few bird carcasses have been found.

Sufficient samples of insect life have been already collected to suggest that few new species are likely to be found. However, there is no reason not to anticipate discovery of fragmentary remains, at least, of undescribed genera of birds, snakes, rodents, fish, and other small vertebrates, which may have inhabited the Oligocene uplands--the sources of streams which laid down the plains formations to the east which are so rich in large Oligocene mammal fossils.

During the Oligocene Epoch, the Florissant upland surely was populated by many of the same great beasts whose fossil bones are found in abundance at Badlands National Monument and other noted sites of this age in the plains to the east. Conditions simply were unfavorable for preservation of carcasses of such of these creatures as may have died near the lake. However, fossils of an ancient oppossum (Peratherium) and parts of an oreodont and a primitive horse have been found in the beds.

FOSSIL COLLECTING HISTORY

The Florissant fossiliferous shales were discovered by Dr. A. C. Peale of the Hayden Surveys, and were investigated by Dr. S. H. Scudder, then the authority on fossil insects, who spent the summer of 1877 in the region, collecting and studying the fossils. The material he obtained was reported on by other experts of the Hayden Survey organization: Scudder, the insects; Lesquereux, the fossil plants; Cope, the fossil fishes. In later years the U. S. National Museum acquired collections made by Professor Hambach; and the Colorado Museum of Natural History made collections. In the early 1900's W. B. Scott and H. F. Osborn led the so-called Princeton Expedition. They collected for the American Museum of Natural History and the British Museum. In 1905 and 1906, the University of Colorado, aided by several other institutions, made collections.

In 1909 George Sternberg, noted fossil hunter, made collections for the American Museum; and in 1912, H. F. Wickham of the University of Iowa collected over 90 species of butterflies (Cockerell, 1916, p. 445-6). Dr. H.B. MacGinitie of Humboldt State College, Arcata, California evidently had done much field work here as early as 1941. The results of his studies appear in his monograph, Fossil Plants of the Florissant Beds, Colorado. Harry N. Andrews collected in the area prior to publication of his semi-popular Ancient Plants and the World They Lived In(1947). Dr. Paul R. Stewart, President of Waynesburg College, Waynesburg, Pennsylvania, made collections here in 1951. Since then, scientists from various universities, including especially the University of Colorado, have made investigations.

Innumerable other traveling scientists have undoubtedly also made brief collection trips to the site. There is much Florissant material in many

museums of the country. Much of it is doubtless unidentified, awaiting the attention of specialists. It would appear from field examination of the area that the surface has scarcely been touched by field collectors.

SIGNIFICANCE

The Florissant site has been visited by scientists for nearly a century, and almost all have expressed admiration of the quantity and remarkable perfection of the fossils discovered there. Textbooks of paleontology and historical geology cite Florissant as an outstanding locality for fossil insects. Fossil leaves from here are noteworthy and have been described in paleontological and botanical literature. F. H. Knowlton, one of America's classical paleontologists, points out in his book, Plants of the Past, 1927, that Florissant is one of the most remarkable fossil deposits known anywhere in the world. He attributes this to the unusual circumstances of the paper-thin and fine-grained shale matrix, resulting from repeated eruptions of volcanic ash, which has preserved "thousands and thousands" of forms of life whose delicate anatomy has usually prevented their survival as fossils. It is generally said by paleontologists that this locality has supplied a greater number of specimens of finely preserved fossil plants and insects than any other single locality in the world.

The Pompeii-like origin of these fossil beds has tremendous public appeal and is a phenomenon very imperfectly, if at all, represented in existing units of the National Park System.

The petrified Sequoia stumps are themselves not unique; but they possess high visitor interest and are an especially noble representation of a rather large assortment of Tertiary fossil forests in the western United States. Too, they and other plant fossils represented here are significant to the total Florissant story.

The Oligocene lake beds rest directly upon crystalline rocks, mostly Pike's Peak granite of Pre-Cambrian Age. The Pike's Peak granite is some

500 million years old, the Oligocene lake beds only 35 million. This unconformity represents a geologic time gap of about 500 million years. This hiatus in time could be made to have much visitor interest, encompassing, as it does, the entire Paleozoic and Mesozoic Eras, during which time the great deposits of the Grand Canyon and the Utah plateaus were accumulating. This great series of sediments which once covered the Pike's Peak granite had been eroded away long before the Florissant lake deposits began to settle upon the granite.

The insect fossils at Florissant are of primary significance. They represent the evolution and modernization of insects better than any other known site in America. In addition, the fossil flora, emphasized dramatically by the petrified tree stumps and in more subtle tones by the great variety of leaf fossils, greatly adds to the primary values. The site itself has great significance in being a classic location known to many scientists--it has historic significance to the geologist, the paleontologist, the entomologist, the botanist; it is the home source for the numerous fossil insects and leaves that grace the exhibition halls and the research rooms of so many institutions of learning.

SUITABILITY

The natural appearance of the northern arm of the area containing the Florissant Lake Beds has been quite seriously altered by road construction, the little town of Florissant, and developments for the ever-increasing summer tourist traffic along U. S. Highway 24. In sharp contrast, however, is the area containing the southern arm, where the scene is comparatively undisturbed except for some unpaved roads, and a few ranches. A narrow strait between the two arms conveniently sets off the southern arm as a compact unit that would be easy to manage.

Quarrying for fossils has taken place at various locations in the beds for many years, but there is much that is untouched. The richest fossil-bearing shales appear to be the upper layers, which are within easy reach.

The most effective way of exhibiting and interpreting the fossil insects and leaves would be through in-place exhibits. However, the feasibility of this method would be aggravated by the fragile, crumbly nature of the fossil-bearing shale and the small size of the fossils themselves. In-place exhibition will depend upon devising practical display techniques. The large size and, in most cases, upright position of the petrified stumps makes them excellent in-place exhibits, but they, too, are fissile in character and require protective measures to prevent them from splintering apart.

The site alone is suitable for preservation and interpretation because it is so well known to scientists. Even without in-place exhibits, interpretation would be desirable and practical there through museum exhibits. And the concentration of the richest fossil beds, the most famous quarry, and the petrified stumps within a relatively compact location, makes that location quite suitable for the development of an interpretive center or museum.

The Florissant site is easily accessible and is located within short driving range of an already highly developed tourist area--the Colorado Springs-Pike's Peak region. U. S. Highway 24 passes through the north arm of the fossil beds and the north-south Interstate 25 is thirty-five miles to the east.

FEASIBILITY

All of the area within the preliminary boundary shown on the appended map is privately owned and consists of eleven ownerships. Five of these are without improvements, four include homes or ranches, and two have developed tourist attractions featuring petrified tree stumps--the Pike and Colorado Petrified Forests. Cattle ranching is the primary agricultural use in this region.

Potentially, the highest economic use for the Florissant vicinity is recreational, because of the inviting summer climate, the mountain scenery, and popular tourist attractions easily accessible by U. S. Highway 24. The northern arm of the lake beds has even now been so seriously altered by tourist and summer home developments as to eliminate it from further consideration as a park potential. In the fall of 1961, new cabin developments were under construction just south of Florissant, thus emphasizing the immediate threat to the southern arm of the lake beds which is nearby.

Development of interpretive in-place displays may be somewhat more difficult than in most other Park System units featuring fossil displays, because special preservation techniques will be required to deal with the soft fossil-bearing shale which crumbles soon after exposure to the air. This disadvantage would be partially offset, however, by the ease with which these beds can be exposed when compared with the harder rock, for example, at the quarry in Dinosaur National Monument.

The Pike's Peak region, one of the most popular and heavily used recreation areas in Colorado, and one which already has such popular tourist attractions as the Garden of the Gods, Manitou Springs, Cripple Creek, and

Pike's Peak itself, is nearby. A Florissant Fossil Beds National Monument would be an added attraction for visitors to this region. It is also within easy driving range of population centers such as Colorado Springs, Pueblo, and Denver.

The establishment, development, and management of such a National Monument would result in heavier tourist use; use that could be economically helpful to the nearby communities of Florissant, Lake George, Divide, and Woodland Park, as well as the larger communities such as Colorado Springs and Manitou.

The most important values of a National Monument at Florissant, however, would unquestionably be in the intangible benefits to the visitor who would receive a ready understanding of the meaning and significance of that portion of life's evolution portrayed here, and also those related values which might be attributed to the preservation of a classic fossil site. Intangibles such as these cannot reasonably be measured in terms of economics.

CONCLUSIONS

1. The Florissant Lake Beds are nationally significant because of their well-preserved Oligocene insect fossils. Other features of great interest and importance are the petrified tree stumps and fossil leaves.

2. Insect fossils, an important chapter in the history of life, are not represented in the National Park System today. The insect story can be complemented with the realistic portrayal of much, if not most, of the area's ecology and geology as it existed during the Oligocene Epoch.

3. The south arm of the Florissant Lake Beds is suitable for National Park purposes. The north arm does not meet suitability or feasibility requirements.

4. The opportunity for preserving a portion of these famous fossil beds will soon be lost because of the rapid encroachment of summer homes and commercial developments.

5. The acquisition, development, and management of a suitable portion of the Florissant Lake Beds area is feasible.

6. Although the most effective method of interpreting the Florissant fossils may be through "in-place" exhibits, special techniques may have to be developed because of the fragility of the fossil matrix, and the best solution may combine "in-place" display with other practical exhibition techniques.

RECOMMENDATIONS

Based on the foregoing conclusions, it is recommended:

1. That the area described in this report be established at the "Florissant Fossil Beds National Monument."

2. That the necessary steps be taken as soon as possible to achieve the establishment of this area as a unit of the National Park System.

THE PROPOSED AREA--ITS DEVELOPMENT AND USE

The suggested preliminary boundary for this proposed National Monument is shown on the attached map. It consists of a compact unit of approximately 5,500 acres, about two and one-half by four miles, which would preserve the more suitable southern arm of the Florissant Lake Beds themselves and the natural setting of the picturesque valley containing them; protect the immediate scene from unsightly developments; and provide for desired public and administrative facilities.

Hills and ridges which form a natural boundary enclosing the beds could be used to preserve the scenery as viewed from the meadows. Including these within the Monument would assure the preservation of an adequate portion of this geologically interesting country so that the visitor could better picture conditions as they probably existed long ago. Logging, quarrying, vacation cabin development, and other commercial uses that could be seen from the meadow would impair this setting. Bringing the hills and ridges at the edge of the basin within the proposed boundary would forestall this possibility. This boundary would also provide flexibility in location of facilities required for park operation.

The northern arm of the ancient lake basin has been excluded from the unit recommended for administration by the National Park Service because the topography has been modified too severely by developments, and acquisition and restoration of this portion is not feasible.

The interpretive program for the proposed Monument has a most promising potential. It would be possible to dig in many locations of the lake beds to locate fossil deposits, particularly along the ancient shoreline and around the prominences which once rose as islands above the former lake. Because

much is yet to be learned about the beds (the surface has been barely scratched, so to speak), a large-scale geological research program would be necessary for further exploration.

The research program should begin as soon as possible and should include:

a. Determining and mapping shorelines of the old lake (the location of the boundary of the Beds shown on the attached map is very approximate).

b. Locating and making initial exposure of some high quality concentrations of fossil leaves and insects.

c. Locating additional fossil stumps, with the objective of exposing a large assortment under a protective roofed shelter.

d. Based on this initial reconnaissance, initiating a detailed program to expose high quality fossil slabs for display as on-site exhibits.

e. Preparing a definitive account of the area's geology, paleontology, and paleogeography.

Based on the above research, an interpretive plan for the area would be developed. The story here would be made meaningful by a combination of techniques relying primarily on fossils left as they are found in the ancient beds, and by the display of specimens of unusually high quality or rarity in a Visitor Center.

Paleontology research could be accomplished under contract by well-qualified scientists. Exploratory excavations into the lake beds would be an important part of the interpretive program and would be of great visitor interest and appeal. The rich natural history of this area would be interpreted by park naturalists in popular language for the visitor. Conducted auto tours, nature walks, and campfire programs would enable those interested

to have memorable experiences here. Interpretive markers, self-guiding trails, and wayside exhibits would provide interesting details of the scientific story for the benefit of those exploring on their own.

The interpretive and information center of the park would be the Visitor Center, which would consist of a museum and administration offices.

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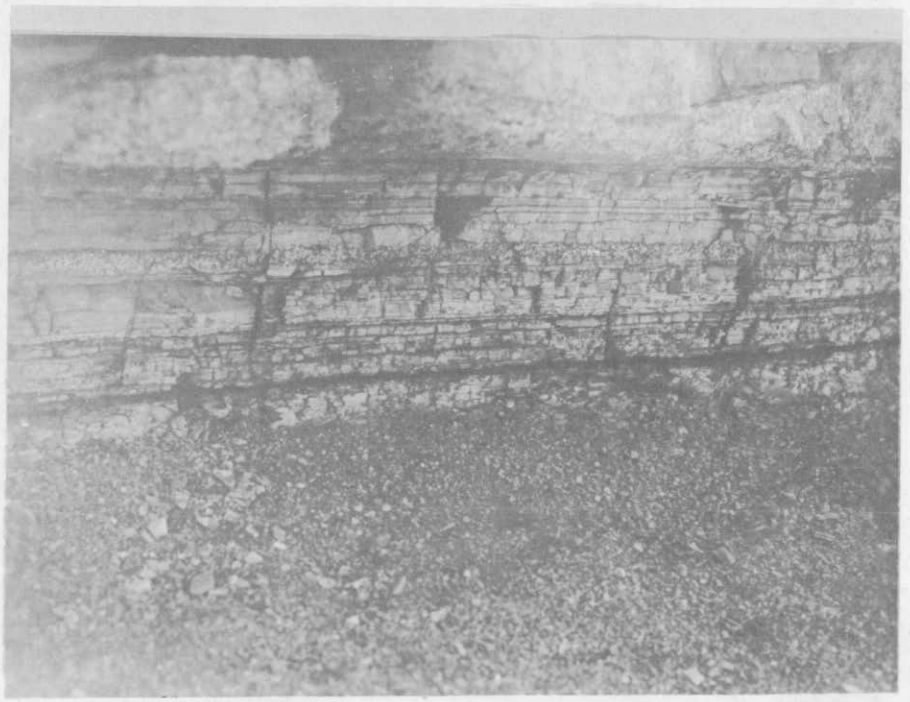
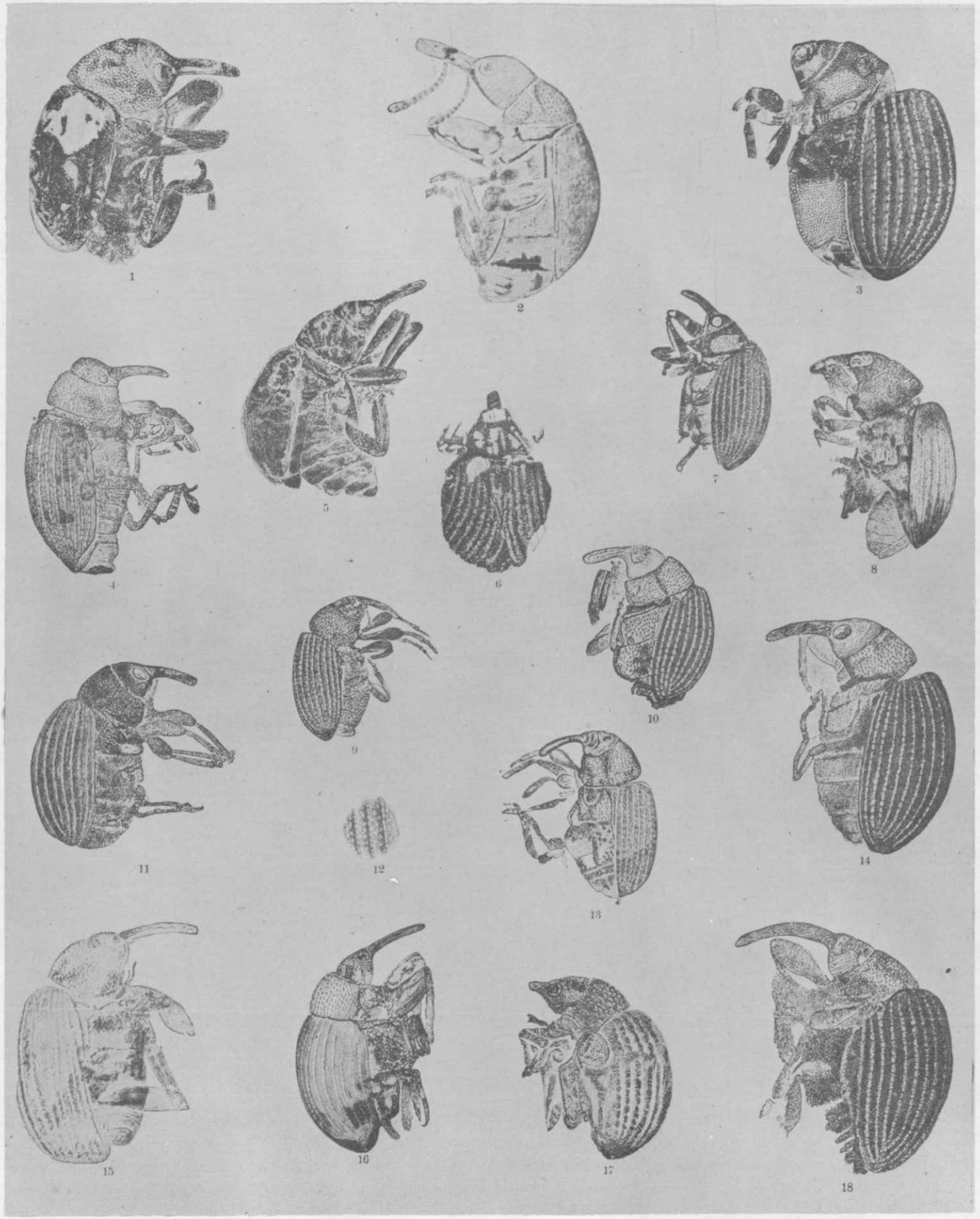
The ancient Florissant lake beds contain one of the world's most famous fossil insect deposits.

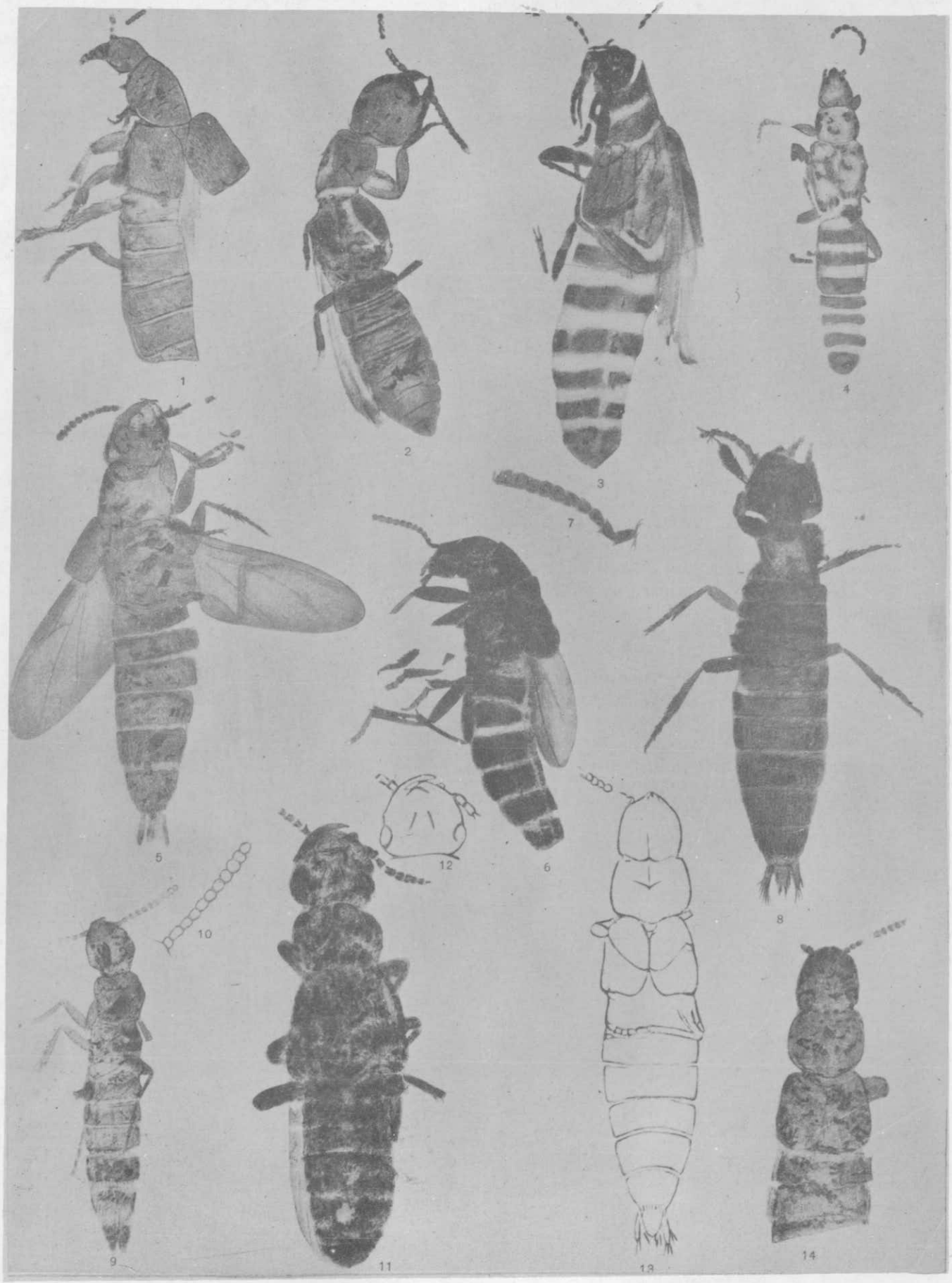
A rich variety of insect fossils have been collected at this quarry located a short distance from the Colorado Petrified Forest Museum.



A closer look at a typical outcrop of ancient lake bed deposits, here less than a foot thick, reveals their thin and fragile condition. A protective cap of volcanic material lies on top.

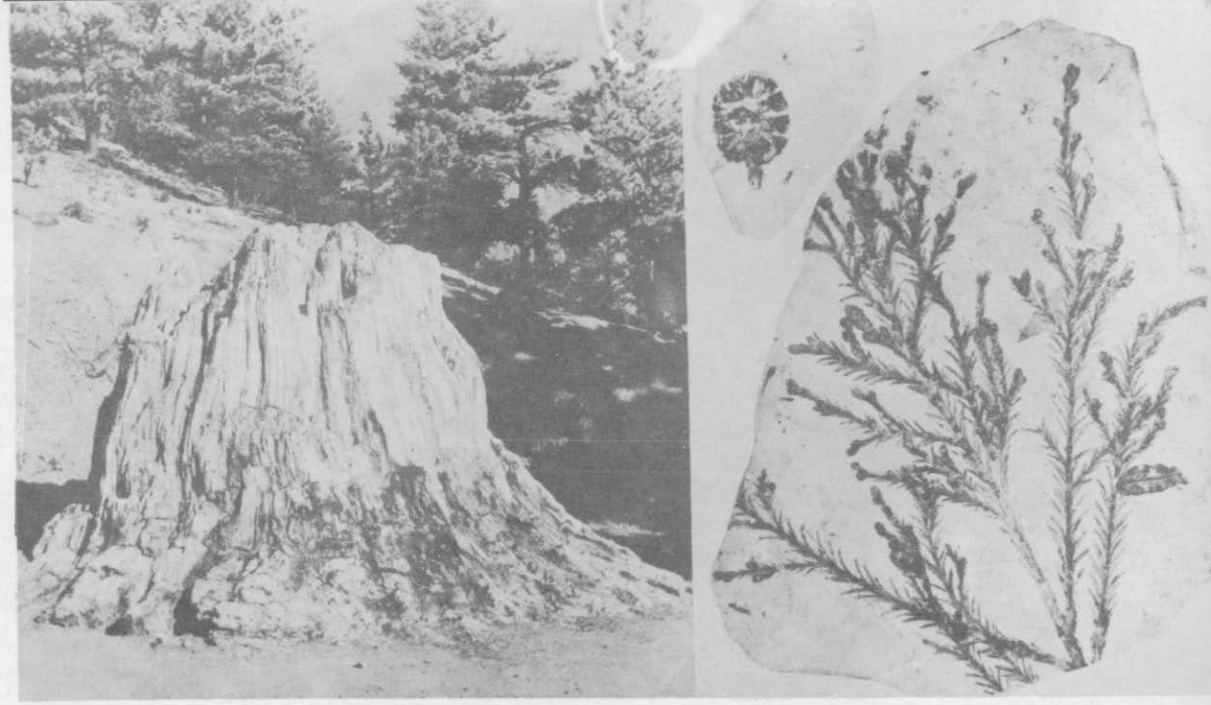


Fossil beetles (Rhynchophorous Coleoptera) from Florissant. From drawings by J. Henry Blake to illustrate United States Geological Survey Monograph XXI, by Scudder.

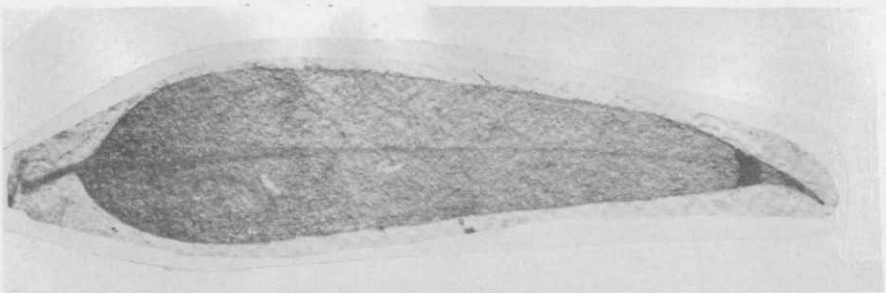


Fossil insects from Florissant. From drawings by J. Henry Blake to illustrate the United States Geological Survey Monograph XL, Adephagous and Clavicorn Coleoptera from the Tertiary Deposits at Florissant, Colorado, by Samuel H. Scudder.

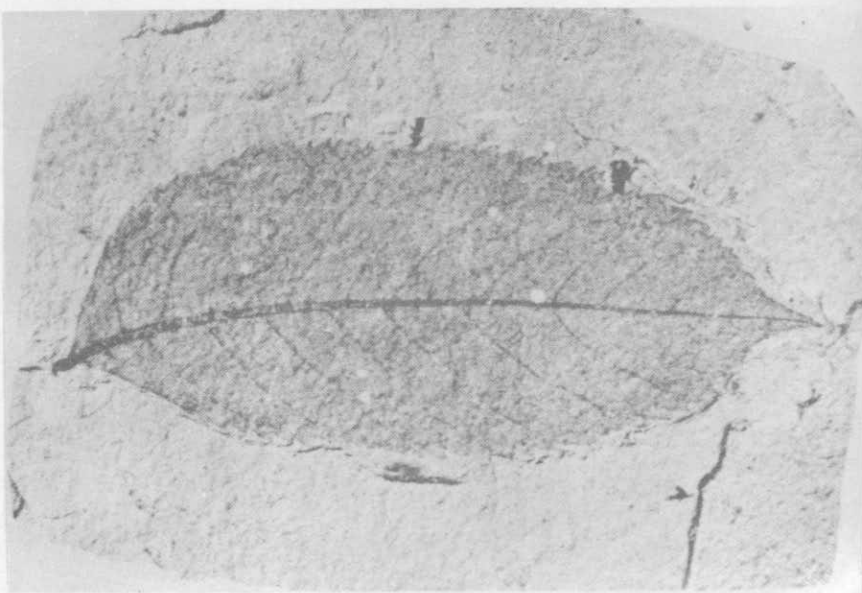
Fossil spiders (Arachnida) from the Florissant Basin.



Fossil stump, cone, and foliage of an ancient redwood tree (Sequoia affinis Lesquereux) from Florissant.



Prehistoric willow-like fossil leaf (Cedrela lancifolia) from Florissant.



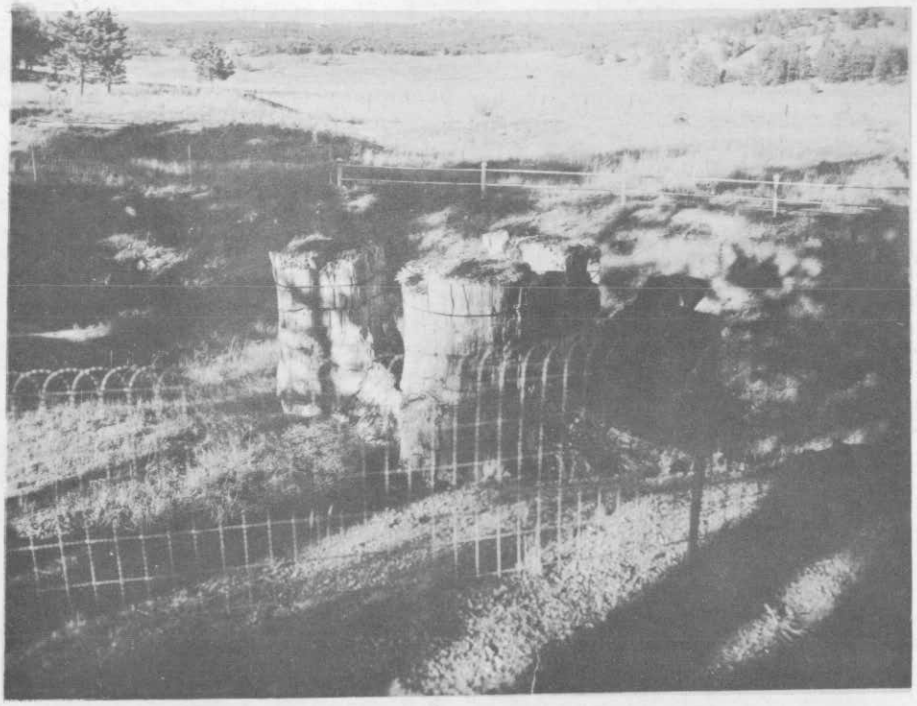
Leaf fossil from a walnut tree (Juglans magnifica Knowlton) from Florissant.

Entrance to the Pike Petrified Forest. This tourist development was closed during the 1961 season.

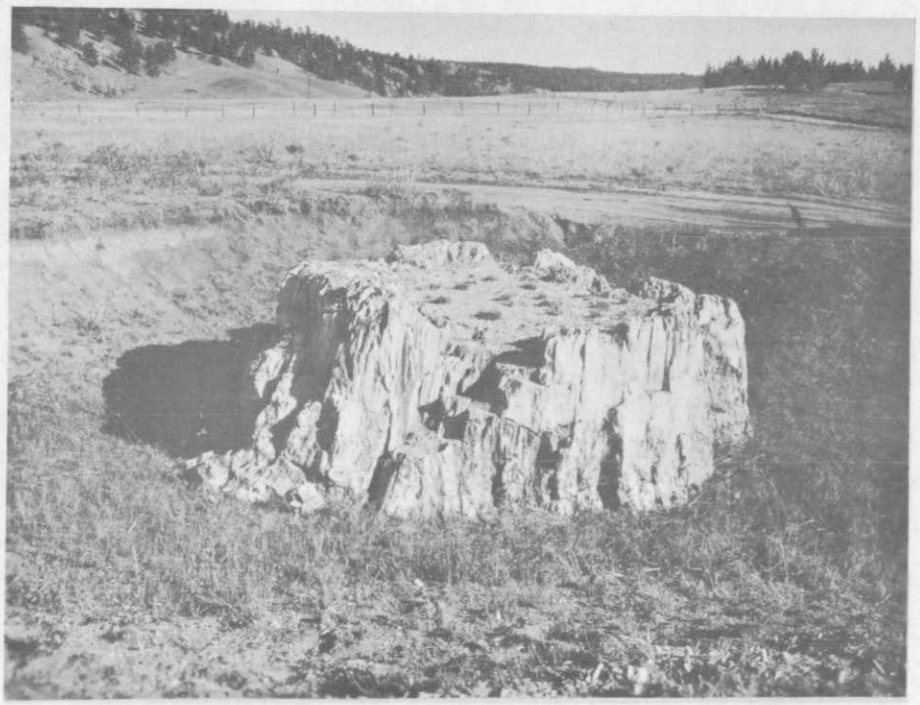
The "Trio" is a group of three petrified stumps on display at the Pike Petrified Forest.

The Museum of the Pike Petrified Forest is inconspicuous among the Ponderosa Pines.

A closer view of the Pike Petrified Forest Museum.



An unusual grouping of three petrified tree stumps, each about 19 feet in circumference and over 13 feet tall, is exhibited at the Pike Petrified Forest.



A petrified Sequoia stump in the Colorado Petrified Forest.

This Museum at the Colorado Petrified Forest was at one time the Midland Railway station in Florissant.

The Florissant lake beds, now pleasant intertwining grassy valleys flanked with picturesque rock and pine covered hills, once were gently rolling uplands where lush vegetation, caused by a climate much milder than today's, crowded the shoreline of an ancient lake.

LEGEND

PRELIMINARY BOUNDARY POSSIBILITY

FLORISSANT LAKE BEDS
NOTE: This location is approximate

0 1,320 2,640 5,280
SCALE OF FEET

CONTOUR INTERVAL 40 Feet

BASIC DATA FROM U.S.G.S. 7 1/2' QUADS: DIVIDE, 1954; LAKE GEORGE 1956; U.S. MAP FROM NATIONAL GEOGRAPHIC, 1958; MAP OF TERTIARY LAKE BASIN BY SAMUEL SCUDDER, 1890

ORIGINAL DRAWING BY: DARWIN E. ROGERS 4/3/59
REVISIONS BY: RICHARD K. WEAVER 3/13/62
APPROVED BY: LAWRENCE F. KNOWLES 3/13/62

PRELIMINARY STUDY OF

FLORISSANT FOSSIL AREA

TELLER COUNTY, COLORADO

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE