Form 10-300
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

# NATIONAL REGISTER OF HISTORIC PLACES INVENTORY – NOMINATION FORM

*(Type all entries – complete applicable sections)*

STATE: Kentucky
COUNTY: Boone
FOR NPS USE ONLY
ENTRY NUMBER | DATE

SEE INSTRUCTIONS

## 1. NAME

COMMON: Big Bone Lick State Park
AND/OR HISTORIC: Big Bone Lick

RECEIVED AUG 1971 NATIONAL REGISTER

## 2. LOCATION

STREET AND NUMBER: Route # 1
CITY OR TOWN: Union
STATE: Kentucky | CODE: 21 | COUNTY: Boone | CODE: 015

## 3. CLASSIFICATION

| CATEGORY (Check One) | OWNERSHIP | | STATUS | ACCESSIBLE TO THE PUBLIC |
|---|---|---|---|---|
| ☐ District ☐ Building<br>☒ Site ☐ Structure<br>☐ Object | ☒ Public<br>☐ Private<br>☐ Both | Public Acquisition:<br>☒ In Process<br>☐ Being Considered<br>Additional Park acreage | ☐ Occupied<br>☒ Unoccupied<br>☐ Preservation work in progress | Yes:<br>☒ Restricted<br>☐ Unrestricted<br>☐ No |

PRESENT USE *(Check One or More as Appropriate)*

| | | | | |
|---|---|---|---|---|
| ☐ Agricultural | ☐ Government | ☒ Park | ☐ Transportation | ☐ Comments |
| ☐ Commercial | ☐ Industrial | ☐ Private Residence | ☒ Other *(Specify)* Day - use park with camping facilities | |
| ☐ Educational | ☐ Military | ☐ Religious | | |
| ☐ Entertainment | ☐ Museum | ☐ Scientific | | |

## 4. OWNER OF PROPERTY

OWNER'S NAME: Kentucky Department of Parks
STREET AND NUMBER: State Office Building Annex
CITY OR TOWN: Frankfort | STATE: Kentucky | CODE: 21

## 5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC: Boone County Courthouse
STREET AND NUMBER: Main Street
CITY OR TOWN: Burlington | STATE: Kentucky | CODE: 21

## 6. REPRESENTATION IN EXISTING SURVEYS

TITLE OF SURVEY: Survey of Historic Sites in Kentucky
DATE OF SURVEY: March 1971 ☐ Federal ☒ State ☐ County ☐ Local
DEPOSITORY FOR SURVEY RECORDS: Kentucky Heritage Commission
STREET AND NUMBER: 401 Wapping Street
CITY OR TOWN: Frankfort | STATE: Kentucky | CODE: 21

STATE: | COUNTY: | FOR NPS USE ONLY: ENTRY NUMBER | DATE

## 7. DESCRIPTION

| CONDITION | (Check One) | | | | | |
|---|---|---|---|---|---|---|
| | ☐ Excellent | ☐ Good | ☒ Fair | ☐ Deteriorated | ☐ Ruins | ☐ Unexposed |
| | (Check One) | | (Check One) | | | |
| | ☒ Altered | ☐ Unaltered | ☐ Moved | ☒ Original Site | | |

DESCRIBE THE PRESENT AND ORIGINAL *(if known)* PHYSICAL APPEARANCE

The property proposed is now in acquisition as an addition to Big Bone Lick State Park. The 80 acres contain nearly all areas of historic significance. The 1,200 square feet comprising the Baker Cemetery is adjacent to the road leading towards the camping area. It is surrounded by a low wall.

Pleistocene remains were excavated by a group from the University of Nebraska funded in part by a grant from the National Science Foundation. The project was conducted from July 1962 until June 1967. All fossils removed were numbered and shipped to the University of Nebraska State Museum for preparation, identification and further study. The sites were occasionally open to the public while the excavations were in progress. A representative collection of artifacts is to be returned to the park when a museum is ready.

No structures remain that were associated with the area's history as a health resort, but the location of these structures is known. The Springs are less active than they were in the 19th century.

From the location of the old fort and salt works, relics have been recovered. These include a hogshead in which the salt produced had been stored.

The original appearance of the site in the 18th and 19th centuries is described in the statement of significance, #8.

SEE INSTRUCTIONS

## 8. SIGNIFICANCE

PERIOD *(Check One or More as Appropriate)*

- [X] Pre-Columbian
- [ ] 15th Century
- [ ] 16th Century
- [ ] 17th Century
- [X] 18th Century
- [X] 19th Century
- [ ] 20th Century

SPECIFIC DATE(S) *(If Applicable and Known)*

AREAS OF SIGNIFICANCE *(Check One or More as Appropriate)*

- [ ] Aboriginal
- [XX] Prehistoric
- [ ] Historic
- [ ] Agriculture
- [ ] Architecture
- [ ] Art
- [ ] Commerce
- [ ] Communications
- [ ] Conservation
- [ ] Education
- [ ] Engineering
- [ ] Industry
- [ ] Invention
- [ ] Landscape Architecture
- [ ] Literature
- [ ] Military
- [ ] Music
- [ ] Political
- [ ] Religion/Philosophy
- [XX] Science
- [ ] Sculpture
- [XX] Social/Humanitarian
- [ ] Theater
- [ ] Transportation
- [ ] Urban Planning
- [ ] Other *(Specify)*

STATEMENT OF SIGNIFICANCE

During the Pleistocene age, enormous members of Herbivorous animals existed in this vicinity. The area is recognized as the key to understanding the life of the Ice Age on this continent over 10,000 years ago. The mammoth and the mastodon were among the mammals to visit the Lick. Ancestors of the sloth, bison and horse also frequented the area. All these came to eat the vegetation and to lick the salty earth around the springs. The land was soft and marshy and many of the animals became mired in the bogs and died, their bones trampled into the soft soil.

The area was widely known by the aboriginal tribes that inhabited the Ohio Valley. The Indians relied on these centrally located springs for much of their salt and a large amount of their game. An unexcavated mound in the area attests to their presence. White man learned of the existance of Big Bone Lick from Indians, such as the Delaware and Shawnee, who had visited there before.

The first explorer to visit was a French Canadian, de Longueil, in 1739. His was the first of many expeditions to the site. A map of Louisiana, dated 1744, marks the lick as the "place where they found the elephant bones in 1739." 1744 marked the first recorded removal of fossil bones from the lick by Indian trader Robert Smith. As word spread of the abundance of large bones, more explorers came and removed quantities of the relics.

The Shawnee Indians brought the first white woman to Kentucky. Mary Ingles had been captured and was accompanying the Indians when they came to Big Bone Lick on a salt making expedition. During this stay in 1756, she escaped and returned to her home in Virginia.

(see continuation sheet)

SEE INSTRUCTIONS

## 9. MAJOR BIBLIOGRAPHICAL REFERENCES


----, Baker Cemetery; M.L. Risner, Superintendent, Big Bone Lick S.P.

----, Big Bone Lick State Park; Spindletop Research Project No. 311, 1971.

----, Prospectus; Big Bone Lick Historic Shrine and State Recreation Park; Big Bone Lick Historical Association, Florence, Kentucky.

Collins, Lewis, Historical Sketches of Kentucky; J.A. & U.P. James, Cincinnati 1847. Page 52.


## 10. GEOGRAPHICAL DATA

| LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY | | | | | | OR | LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CORNER | LATITUDE | | | LONGITUDE | | | | LATITUDE | | | LONGITUDE | | |
| | Degrees | Minutes | Seconds | Degrees | Minutes | Seconds | | Degrees | Minutes | Seconds | Degrees | Minutes | Seconds |
| NW | 38° | 53' | 16" | 84° | 45' | 25" | | ° | ' | " | ° | ' | " |
| NE | 38° | 53' | 20" | 84° | 45' | 05" | | | | | | | |
| SE | 38° | 53' | 01" | 84° | 45' | 10" | | | | | | | |
| SW | 38° | 53' | 04" | 84° | 45' | 30" | | | | | | | |

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: 80

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

| STATE: | CODE | COUNTY | CODE |
|---|---|---|---|
| | | | |
| STATE: | CODE | COUNTY: | CODE |
| | | | |
| STATE: | CODE | COUNTY: | CODE |
| | | | |
| STATE: | CODE | COUNTY: | CODE |
| | | | |

UTM
NE 16/685060/4306630
SE 16/694920/4306060
SW 16/694520/4306130
NW 16/694600/4306510

SEE INSTRUCTIONS

## 11. FORM PREPARED BY

NAME AND TITLE:
Kathy C. Lambert, Assistant Curator

ORGANIZATION
Kentucky Department of Parks

DATE
7/25/71

STREET AND NUMBER:
State Office Building Annex

CITY OR TOWN:
Frankfort

STATE
Kentucky

CODE
21

## 12. STATE LIAISON OFFICER CERTIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National ☐ State ☐ Local ☐

Name _____

Title SLO

Date August 11, 1971

## NATIONAL REGISTER VERIFICATION

I hereby certify that this property is included in the National Register.

_____
*Chief, Office of Archeology and Historic Preservation*

Date 6/13/72

ATTEST:

_____
*Keeper of The National Register*

Date _____

Form 10-300a
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

**NATIONAL REGISTER OF HISTORIC PLACES**
**INVENTORY - NOMINATION FORM**

*(Continuation Sheet)* # 1



| STATE | |
|---|---|
| Kentucky | |
| COUNTY | |
| Boone | |
| FOR NPS USE ONLY | |
| ENTRY NUMBER | DATE |
| | |

*(Number all entries)*

#8 Statement of Significance:

In 1773, a survey party reported using the enormous ribs of the mammoth and mastodon for tent poles and the vertebrae as stools or seats. Explorers noted that the large bones lay scattered throughout the valley.

The first map of Kentucky, prepared by John Filson in 1784, bore on the legend: "Big Bone Lick; Salt and Medicinal Spring. Large bones are found there."

The expedition made by Captain William Clark to Big Bone Lick for President Jefferson was the first organized vertebrae paleotology expedition in the United States. (1807)

President Jefferson devoted much time to the study of Big Bone Lick and believed that some of the large animals might still be living in the country to the west. He had a room set aside in the White House for the display of the Big Bone collection. The collection was divided; parts went to Paris, France, Philadelphia and Jefferson's personal collection. His collection was unfortunately ground into fertilizer by a servant.

From 1831 to 1848, Big Bone Lick was visited by various Palenntologists and geologists. The lick was included in indexes of all the principal geological, palenntological and scientific journals in the United States, England, Germany and France.

The latest investigation of Big Bone Lick was conducted by the University of Nebraska. The five year dig was financed by grants from several research organizations (1962-1966)

Between 1756 and 1812, while excavations were continuing, the salt industry developed at Big Bone. The men at the salt works were threatened by Indian attacks and a fort was built for their protection. It required 500 or 600 gallons of water to make a bushel of salt. Two furnaces were erected to speed the process of evaporating the water from the salt, but the operation still proved too expensive to be profitable. The business was finally abandonned in 1812.

(see continuation sheet No. 2)

Form 10-300a
(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

**NATIONAL REGISTER OF HISTORIC PLACES**
**INVENTORY - NOMINATION FORM**

*(Continuation Sheet)* #2

| STATE | |
|---|---|
| Kentucky | |
| COUNTY | |
| Boone | |
| FOR NPS USE ONLY | |
| ENTRY NUMBER | DATE |
| | |

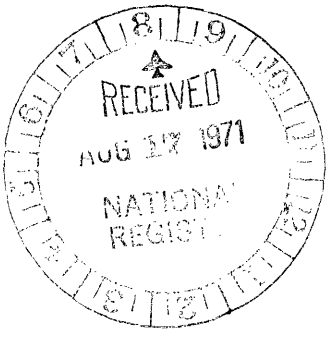
*(Number all entries)*

Besides salt the springs were known for their medicinal qualities. In 1821, Big Bone Lick was one of the most celebrated resorts in that part of the Ohio Valley. A large hotel was erected and named Clay House, in honor of Henry Clay, the famous statesman from Lexington. The structure stood west of the springs on the old road to Louisville. Representatives of the best families in Kentucky visited here for health and pleasure.

Northeast of Clay House, with its spacious verandah, and across the road, stood a row of bath houses and a large open pavillion. But the popularity of the resort waned, possibly due to the drying up of the salt springs and in 1847 the place was deserted.

Another hotel was built about 1870 on the hill above the road north of the springs. This was never very popular and today is entirely gone.

The Baker Cemetery, located on the park, contains graves that date from the nineteenth century. The graves mark the remains of the members of the Steward Baker family by whom this land was owned. They maintained a large farm with numerous slaves. Local traditions state that many of the slaves were buried on the hill where campsites are now located.



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(July 1969)

UNITED STATES DEPARTMENT OF THE INTERIOR
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**NATIONAL REGISTER OF HISTORIC PLACES**
**INVENTORY - NOMINATION FORM**

*(Continuation Sheet)*

| STATE | |
|---|---|
| Kentucky | |
| COUNTY | |
| Boone | |
| FOR NPS USE ONLY | |
| ENTRY NUMBER | DATE |
| | |

*(Number all entries)*

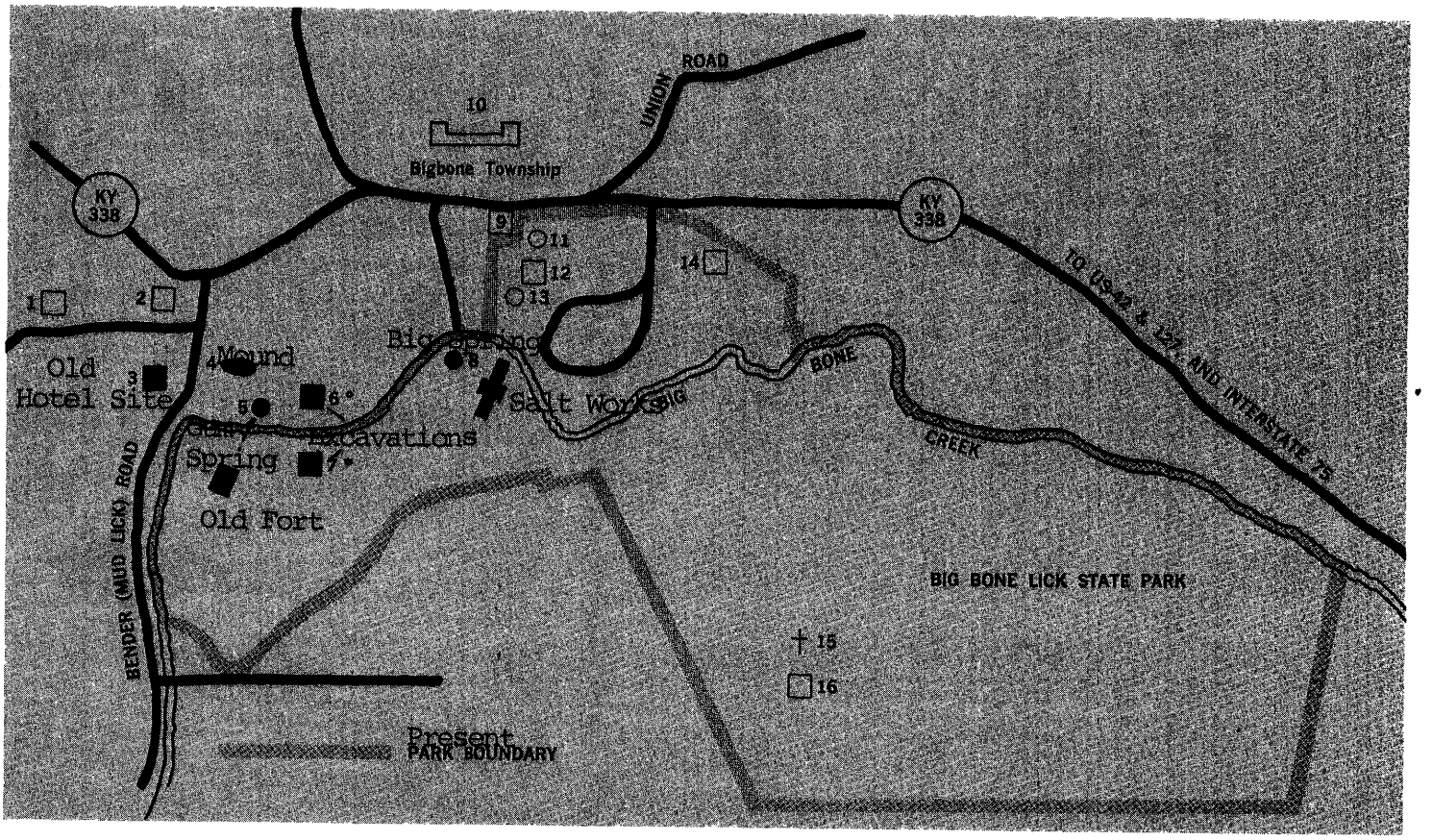
# 9 Bibliographical References (Cont'd)

Coleman, J.Winston, The Springs of Kentucky; The Winburn Press Lexington, Kentucky. 1955. pages 62 and 63.

Yealey, A. M., "Big Bone Lick," The Boone County Recorder

Revised Map Showing Areas Of Significance
November 24, 1971

Area: Big Bone Lick
State: Kentucky
County: Boone



UNIVERSITY OF NEBRASKA NEWS

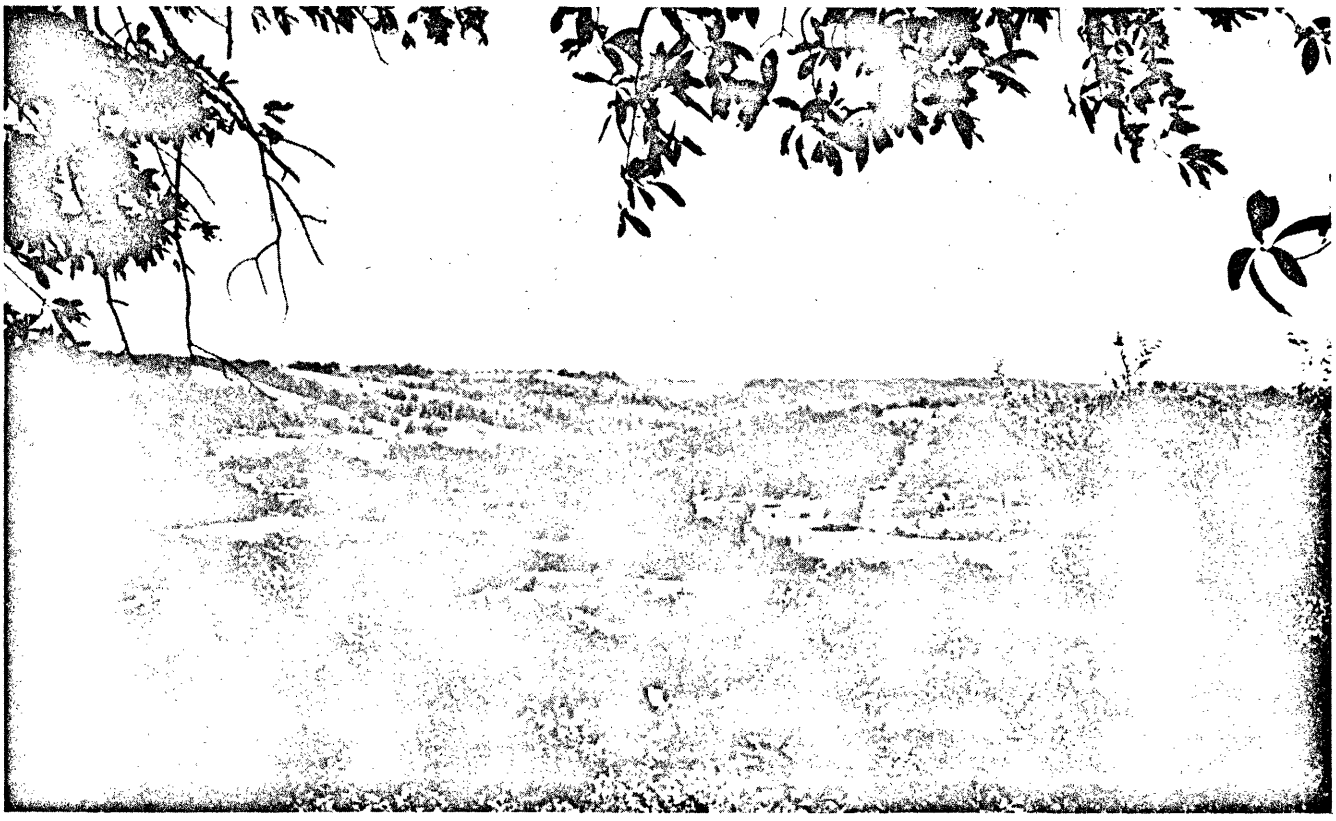
Museum Notes

From the University of Nebraska State Museum, 14th and U Streets

Number 33 March, 1967

# BIG BONE LICK, KENTUCKY

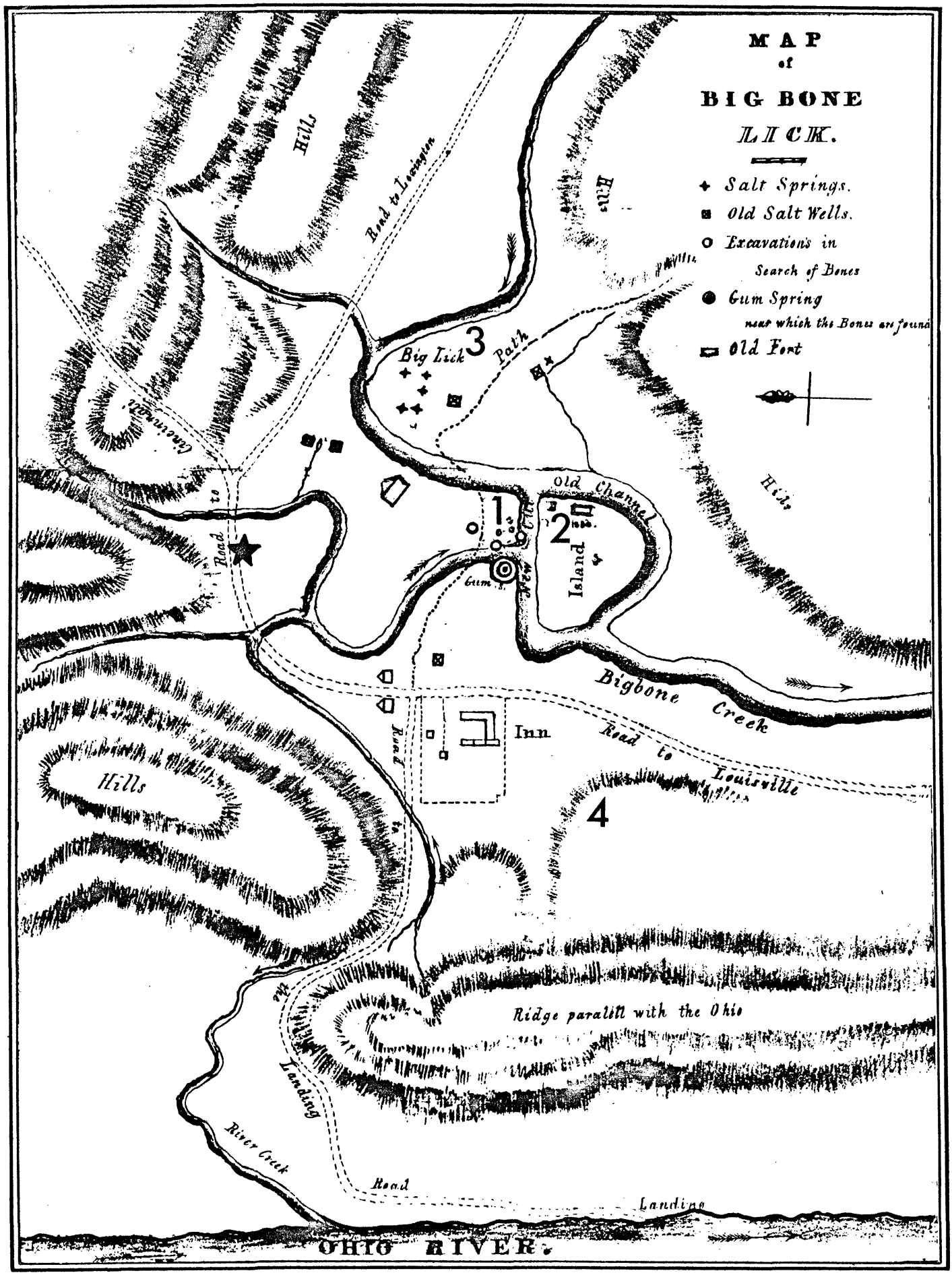
## A Pictorial Story of the Paleontological Excavations at this Famous Fossil Locality from 1962 to 1966



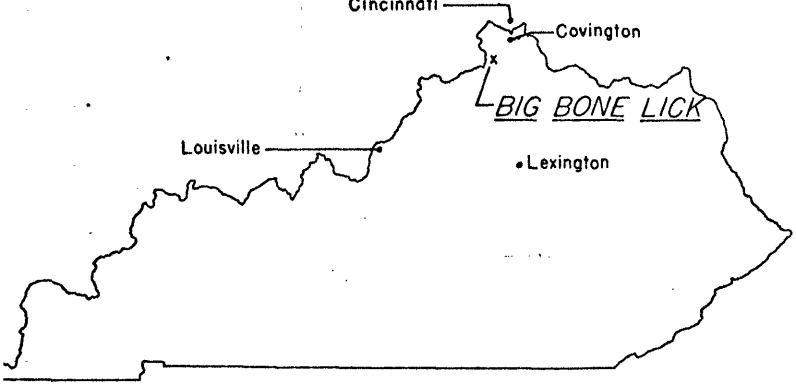
*Big Bone Creek Valley in Boone County, Kentucky, looking east from Mastodon Hill. This world-famous fossil locality dates back to 1739, when the site was first discovered by early French explorers. The extensive paleontological excavations of the University of Nebraska State Museum were carried on from 1962 to 1966 in the area shown in the center of the picture. The William P. Behringer Memorial Museum, Covington, Kentucky; the Kentucky State Department of Parks; the United States Geological Survey; and the Big Bone Lick Historical Association cooperated with the Museum in this project.*

Big Bone Lick was the first widely known collecting locality for vertebrate paleontology in North America. Some of the foundations for the science of vertebrate paleontology in the New World were built there at the beginning of the 19th Century. Many of the Pleistocene (Ice Age) mammals, so well known in Nebraska, were first recorded from Big Bone Lick. Still very little precise scientific information was known about this famous locality until the 1960's.

Big Bone Lick, a swampy area surrounding salt and sulfur springs, is located at the confluence of Big Bone Creek and Gum Branch in Boone County, Kentucky, some 20 miles south and west of Cincinnati, Ohio, and about two miles east of the Ohio River. This well-known fossil locality is now largely included in the Big Bone Lick State Park, which has been developed by the Commonwealth of Kentucky during the past six years.




*Map of Big Bone Lick area, copied from original published in 1831 (Monthly American Journal of Geology and Natural Science, Vol. 1, No. 4). Location of present village of Big Bone is shown by the star; paleontological excavation sites of 1962–1966 are indicated by numbers 1, 2, and 3; and Mastadon Hill is designated by number 4.*




*Outline map of the State of Kentucky, showing location of Big Bone Lick. Over the centuries animals came here to "lick" the mud and drink the waters which contained salts and minerals. Many of the animals were trapped and their bones are a grim reminder of their fate.*

The first white men to visit the Big Bone Lick area apparently were some French soldiers from Fort Niagara who were under the leadership of Major Charles LeMoyne de Longueuil,[1] the Commander of French and Indian troops in Canada. In 1739, Major Longueuil found many large bones and teeth at the edge of a marshy area and made a small collection of the fossils, some of which are still preserved in the Musée National d'Histoire Naturelle in Paris, France.

*Present day Gum Spring flows through an old hollow sycamore log, which was placed there as a casing by early settlers. Gum Spring, located in center of the 1831 map to the left, is an odoriferous salt-sulfur spring, but it has attracted large mammals including man for many thousands of years. Bones of various animals have been found in abundance near the spring since 1739.*

Since the days of Longueuil several large and many small collections of late Pleistocene and modern bones have been made at Big Bone Lick. Although thousands of bones were reported to have been collected in the early days, few found before 1807 have survived.

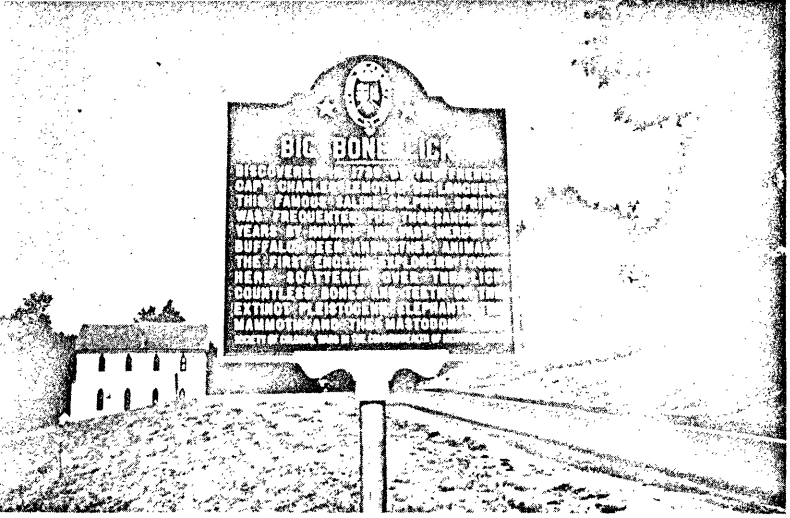
President Thomas Jefferson, one of the founders of Vertebrate Paleontology in the United States, had been interested in Big Bone Lick for many years prior to 1807. Fossil bones had been brought to him in Washington, D. C., from this fossil locality.

Information also had reached President Jefferson that the Indians reported that their ancestors had seen the last of the mastodons leaving Big Bone Lick going west, over a hill now known locally as Mastodon Hill. Jefferson thought that perhaps some of these mastodons and other prehistoric creatures might still be living in western United States. He had instructed Lewis and Clark in 1803 to be sure to record all of the fauna in their journals and to be especially alert to see if any of the prehistoric monsters were still alive in the Louisiana Territory. When the explorers failed to note any of these animals, President Jefferson sent William Clark with a party of ten men to Big Bone Lick to collect fossils and record the natural history of this interesting locality. The Clark-Jefferson Expedition seems to have been the first organized paleontological expedition in the New World. President Jefferson's interest in fossils had been well known for some time, and only a year prior to the sending of the expedition to Big Bone Lick young William Cullen Bryant, a critic of the President, had strongly suggested the following to Jefferson in his poem, "The Embargo": "Go, wretch, resign thy presidential chair—, where the Ohio rolls his turbid stream [go] dig for huge bones, thy glory and thy theme."

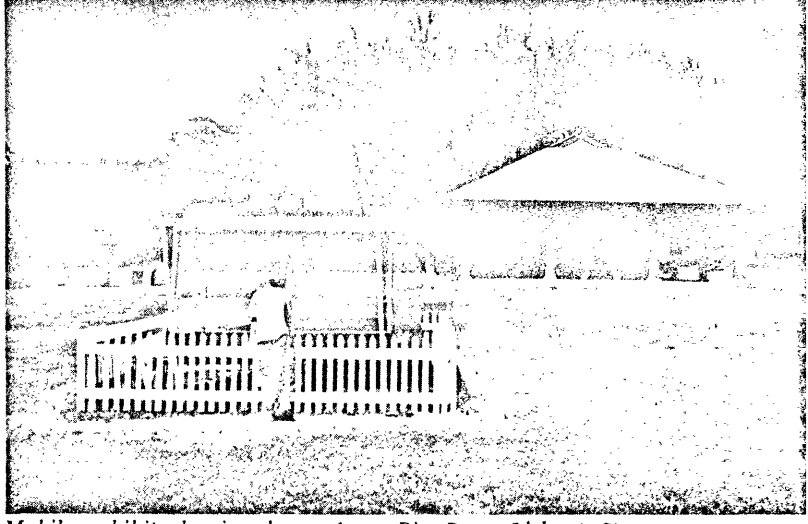
The Clark-Jefferson expedition to Big Bone Lick near the turbid Ohio River was very successful and some 300 bones were obtained and shipped to Washington. In 1808 they were installed in the White House so that President Jefferson and others could study them. For several months the collection was examined by Jefferson and Caspar Wistar, one of the foremost anatomists of that time. The collection was then divided into three parts: one for the American Philosophical Society (now preserved in the Academy of Natural Sciences of Philadelphia); one for the Musée d'Histoire Naturelle de France in Paris (still preserved in that institution); and a smaller one for the President's personal collection, which was later lost.

The Clark-Jefferson collection of bones and a few exceptionally good specimens collected and preserved by others during the early years of the 19th Century have provided the basis for most studies of the Big Bone Lick fauna. Since the time of Jefferson and prior to 1962, perhaps the largest collection made at Big Bone Lick was that of N. S. Shaler, in 1868, for the Museum of Comparative Zoology at Harvard College. Although Shaler tried to determine a strat-

[1] Longueuil is also spelled "Longueil" by some writers (Jillson, 1936, p. 1).




*Historical site marker along the road at Big Bone Lick State Park. Hundreds of thousands of people visit the State Park each year.*



*Mobile exhibit showing bones from Big Bone Lick at State Park. Mastodon Hill is shown in distant background to the left of the exhibit.*

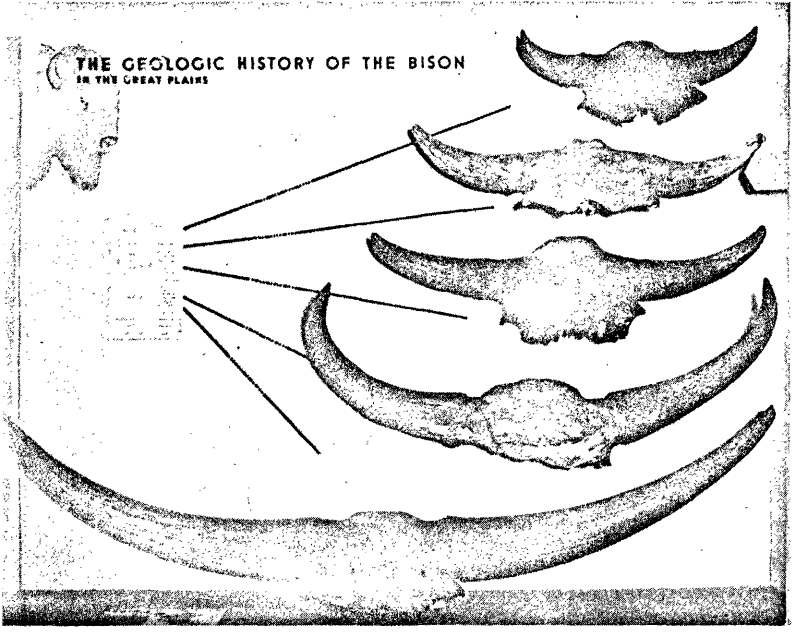
igraphic succession at the site no field records associated with the collection have been found. It appears, however, that a depth of only eight feet was reached in the excavations, and most of the bones recovered were those of the recent species of bison, *Bison bison*. In 1923 O. P. Hay, a specialist on the Pleistocene faunas of North America, reported that: "Notwithstanding the amount done at Big Bone Lick, the geology of the locality and especially of the bone-bearing levels is not well known. Most persons who have labored there were interested almost wholly in getting as many bones as possible and then in getting away." This statement still aptly summarized the state of scientific affairs at the locality until the early 1960's. The staff of the University of Nebraska State Museum became interested in Big Bone Lick in the 1930's, when it was decided that the Museum's paleontologic research program would be directed toward Late Tertiary and Quaternary mammals. In the Great Plains too, little was known of the faunal sequence of the Pleistocene (Ice Age). As the sequence was gradually worked out in the Nebraska region it became apparent that there must be many misconceptions and errors in observation concerning the association of the fossils at Big Bone Lick. Eight brief trips were made by C. Bertrand Schultz to Big Bone Lick to assess the site and to see if anything could be learned by reconnaissance or a surface study of the area, but it was so overgrown with vegetation that little could be learned. It became apparent after some test pits were dug in 1959 by Ellis Crawford of the William Behringer Museum of Covington, Kentucky, Frank C. Whitmore, Jr., of the United States Geological Survey, Washington, D. C., and Bertrand Schultz that only by extensive excavations could the geologic and paleontologic history of the area be determined with any certainty.

One of the paleontological problems that confronted the researchers was the association of the various species of bison, namely *Bison bison, Bison antiquus,* and *Bison latifrons.* All three had been reported in various publications as having been associated with each other in the same deposits at Big Bone Lick. The exact origin of the type specimens of the musk oxen (*Bootherium bombifrons*), the large ground sloth (*Mylodon harlani*), and the tapir, (*Tapirus haysii)* also was not known. The remains of other animals had been collected, but much of the information concerning the age of the bones, which had been recorded up to that time, seemed to conflict with the evidence more recently gathered in the Central Great Plains area. It seemed necessary to plan a five-year project and get it started as soon as possible. The lack of stratigraphic control at such an important collecting locality made it necessary to make new collections.

The stratigraphic history of the Big Bone Lick area, before modification by human activities during the past two centuries, corresponds very closely to that of the nearby valley of the Ohio River to which Big Bone Creek is a tributary. Although glacial tills of Kansan and Illinoian age crop out near the fossil locality, the bone-bearing deposits are entirely related to events during and subsequent to the Wisconsin glacial age. Since 1959 Louis L. Ray has been studying the geomorphology and Quaternary stratigraphy in this region of the Ohio River Valley. His studies of the adjacent Ohio Valley have been coordinated with his work at Big Bone Lick.

The first University of Nebraska field party arrived at Big Bone Lick in July of 1962. The area of Big Bone Creek and Gum Branch was mapped in the general vicinity of the bone deposits. A rod and plane table were utilized in the mapping, and a U.S. Coast and Geodetic Survey bench mark was used to establish the correct elevations.

Site No. 1, indicated on the accompanying 1831 map, was opened first in 1962. This became University of Nebraska Collecting Locality KEN-1 in the field records, and was excavated during all five years of the project. This locality is in the lower terrace of post-Tazewell age and is located directly north of Big Bone Creek and east of the mouth of Gum Branch. From the terrace surface, 10 feet above the level of Big Bone Creek, approximately 7 feet of barren surficial ma-




*An exhibit in the University of Nebraska State Museum showing the development of the horn-cores of the bison since medial Pleistocene times. The skulls have gradually diminished in size since the bison first migrated to North America from Asia. The large form of bison* (Bison latifrons) *at the bottom of the exhibit was first found and described from a locality near Big Bone Lick in Boone County, Kentucky. The skull next to the top of the exhibit is that of* Bison antiquus, *which was first found and described from Big Bone Lick. Modern bison skulls* (Bison bison), *similar to the one shown at the top of the display, are commonly found at Big Bone Lick, but in later deposits than those which contain the remains of* Bison antiquus. *The bones of* Bison latifrons, *the medial Pleistocene form, do not occur at Big Bone Lick.*

terial was removed by bulldozing an area 130 by 80 feet. This area then was surveyed and laid off into a grid of 10-foot squares. Excavation was begun in one square at a time, but as work progressed, several squares were excavated simultaneously. Faces of the walls or sides of the excavations were kept smooth and were photographed, sketched, and sampled. Bones, shells of invertebrate animals, plant remains, and sediment samples were collected and located by grid square number, position in square, and depth below ground surface. A description of the character of the alluvium also was recorded.

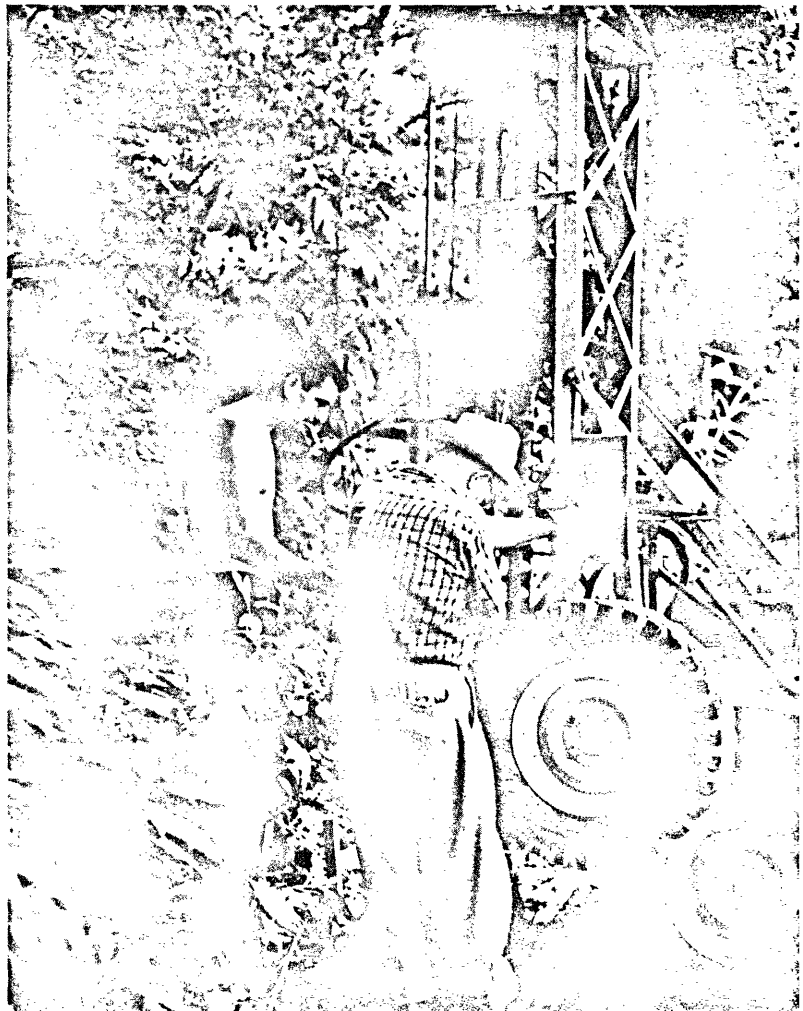
Bones at Site No. 1 were encountered at three faunal zones below the terrace surface, namely zones A, B, and C.

Zone A is a buff-brown, mottled silt layer located 7 to 8.5 feet below the surface of the terrace. This zone included evidence of the following animals: domesticated dog *(Canis familiaris),* domesticated cow *(Bos taurus),* modern bison *(Bison bison),* domesticated pig *(Sus scrofa)* white-tail deer *(Odocoileus virginianus),* and domesticated horse *(Equus caballus).* Associated with these modern native and domesticated animal bones were fragments of crockery and china, bricks, worked building stones, hand hewn wood, logs and branches of trees, seeds, and occasional reworked bones of extinct animals. It appears that some 7 to 8.5 feet of silt has been deposited into Big Bone Creek valley since the early part of the 19th Century.

Zone B is a dark gray to dark brown humic silt and sand located from 8.5 to 11 feet below the terrace surface. Bones recovered in this zone represent: modern bison *(Bison bison),* wapiti or American elk *(Cervus canadensis),* and modern deer *(Odocoileus* sp.). The fragmentary bones of the following extinct animals also were encountered in this zone, but these appear to have been derived from the underlying clayey silt and reworked by stream action: Mammoth (*Mammuthus* sp.), mastodon (*Mammut americanus*), musk ox (*Ovibos* sp. or *Bootherium* sp.) bison (*Bison* cf.*antiquus*), caribou (*Rangifer* sp.), and horse (*Equus* cf. *complicatus*). The bones of the modern bison (*B. bison*) are very abundant at this level and are associated with wood, roots, nuts, leaves, broken shells of large mollusks, and pieces of flint.

Zone C is a blue-gray sandy silt layer located from 10 to more than 15 feet below the surface of the terrace. Bones found in this zone represent: giant ground sloth (*Mylodon* sp.), mastodon (*Mammut americanus*), large bison (*Bison antiquus*), musk ox (*Bootherium* sp.), giant moose-like deer (*Cervalces scotti*), caribou (*Rangifer* sp.), and horse (*Equus* cf. *complicatus*). Not

*Drilling rigs, both rotary and core types, were successfully used in 1962 by the paleontological expedition to determine the thickness of the various Pleistocene (Ice Age) deposits above the bed rock in the valley of Big Bone Creek.*



**Museum Notes Edition—University of Nebraska News**

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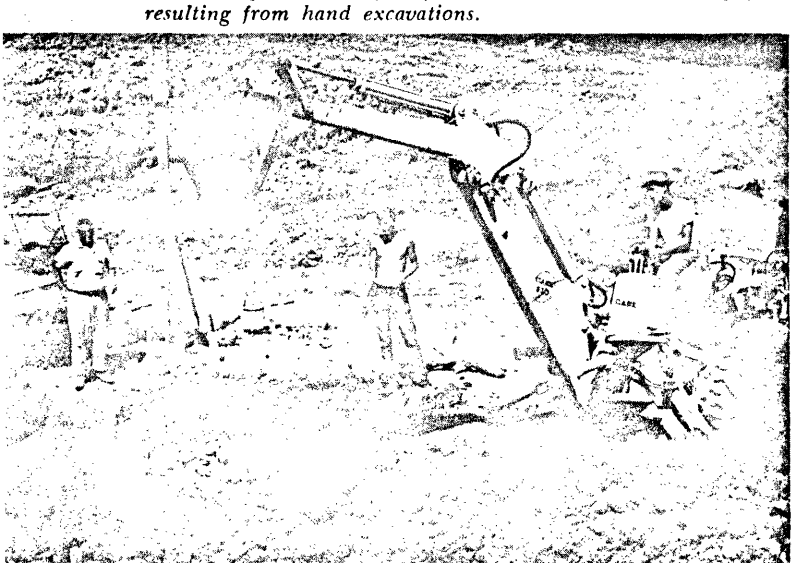
*Detailed contour mapping of the site was made by rod and plane table methods in 1962 before the extensive bulldozing of the sites was commenced. The bulldozers were used to remove the overburden which covered the bone layers.*

all of the bones from this zone have been studied and identified. The dark greenish-gray to bluish-gray clay under Zone C contains occasional bones and extends to 29 or more feet below the terrace surface.

Site No. 2 (KEN-2) is in the higher terrace of post-Tazewell age, the surface of which is approximately 22 feet above the normal water level of Big Bone Lick, just south of Gum Spring and Site No. 1 (KEN-1). In 1962 the face of the exposure of the terrace-fill was cleared of vegetation for 80 feet along Big Bone Creek, and the site was tied into the 10-foot grid system established in Site No. 1. Some bones were excavated from the profile and the stratigraphic evidence was studied and recorded. The overburden was removed from this site in 1963 and it was worked during the summers of 1963 to 1966 inclusive. The bones occur in a single zone ranging from 12.5 to 16.6 feet below the terrace surface. The bone-bearing layer is an iron-stained, calcareous, gravelly sandy silt, 1 to 3 feet thick, which unconformably overlies a "blue" clayey silt. The faunal assemblage included the following: giant ground sloth (*Mylodon* sp.), bear (*Ursus* sp.), mastodon (*Mammut americanus*), mammoth (*Mammuthus* sp.), bison (*Bison antiquus*), musk ox (*Bootherium* sp.), giant moose-like deer (*Cervalces* sp.), deer (*Odocoileus* sp.), and horse (*Equus* cf. *complicatus*).

*Backhoes were used to remove some of the overburden and also to keep the fossil quarry areas free of extensive dump piles resulting from hand excavations.*



Site No. 3 (KEN-3) was opened in 1966. It was not too productive paleontologically but important geologic data were obtained. The main part of the site is an erosional remnant of the same fill as Site No. 2 (KEN-2). Near the surface and to the north and west toward the spring area ("Big Lick" springs on the 1831 map), deposits similar to the historic level in site No. 1 (KEN-1) were encountered overlapping the older deposits. An early pioneer salt works and associated historic objects were found, including a fairly well preserved hogshead (barrel) of the early 1800's.

No bones or teeth of very small mammals were found during the 1962 to 1966 excavations, although an extensive screening program was carried on each year. Several types of screens were used, including the square box types commonly used by vertebrate

*Site No. 1 (shown on 1831 map), designated in records as University of Nebraska State Museum Collecting Locality KEN-1, was layed out in 10-foot squares in 1962. This grid system was later extended to include the other sites. Each specimen collected was precisely located stratigraphically and geographically in relation to the square in which it was found.*

*Much of the excavation at Site No. 1 was at or below water level, thus making work very difficult. Water constantly seeped into the excavation areas. Note that the bone shown in the picture below the trowel is partly submerged in water.*

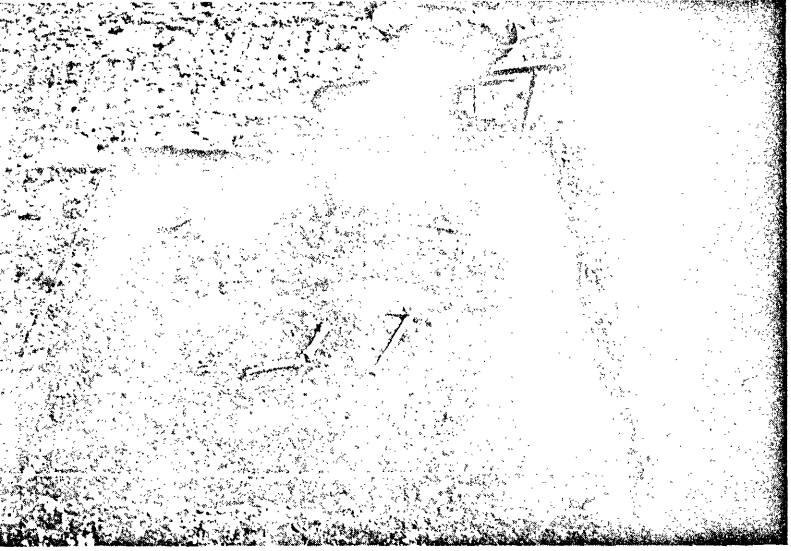
*An electric power line was brought to the excavation areas so that a sump pump could be used to keep the water table at a low level. The excavations thus could be carried on under comparatively dry conditions, and the scientific evidence could be more readily recovered and interpreted.*

paleontologists during the past ten years. The running water of Big Bone Creek between sites No. 1 and No. 2 made it convenient for the screening projects.

In addition to major excavations at Big Bone Lick numerous test holes were drilled by both rotary (auger) and core methods. The drilling equipment

*Much time was spent in studying and recording the profiles exposed in the sides of each 10-foot square in Site No. 1. Precise stratigraphic records were kept for each specimen recovered. The large hoe in the picture was used to prepare the profiles for study.*

*Close-up view of the same profile shown in the picture to the left. Bones and wood can be seen in a former depression in an area near Gum Spring. The pick, tape, and notebook, as well as a camera, were used in obtaining and recording the geological events shown in the profile.*



*Cow bones and a fragment of a skull of a domesticated dog were found in 1966 preserved eight feet below the surface of the terrace in a 10-foot square in Site No. 1.*

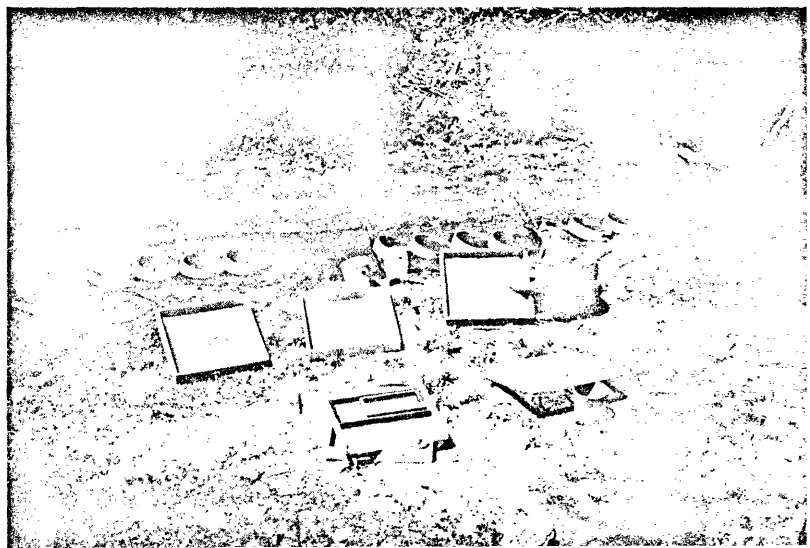
*A hand hewn board was found directly below the cow and dog bones mentioned above. An old early 19th Century shoe and some old logs and limbs of trees also were found associated with the board in this square.*

*Modern bison bones dating back several hundreds of years were found in the stratigraphic level below historical items such as mentioned above. Various fossil bones were found in a blue-gray silt and silty clay immediately below the bison bones.*

and operators were furnished by the Commonwealth of Kentucky through the Department of Parks and Department of Roads. Samples from the various stratigraphic zones in the test holes were preserved for analysis and for examination of microfauna and microflora. Wood was collected for carbon-14 analysis. Also in strategic areas where more subsurface data were needed, the backhoes were used to excavate large test holes, 4 feet wide, 6+ feet long, and some 10 feet deep. All test holes were plotted on the topographical map which was made of the area. The map, which has a scale of 1 inch to 100 feet with a 1-foot contour interval, also has all collecting localities plotted on it as well as the location of the temporary bench marks which had to be established.

The extensive field studies at the Kentucky locality, which commenced in July 1962, will be completed in June 1967, and a monographic report will be published on the results of the project. The research work at Big Bone Lick for the five year period was carried on by the staff members of the Division of Vertebrate Paleontology, University of Nebraska State Museum in cooperation with the William P. Behringer Memorial Museum, Covington, Kentucky; the Big Bone Lick Historical Association; the Kentucky State Department of Parks; and the United States Geological Survey. The principal investigators were C. Bertrand Schultz and Lloyd G. Tanner from the University of Nebraska; and the associate investigators were Frank C. Whitmore, Jr., and Louis L. Ray of the United States Geological Survey, and Ellis C. Crawford of the William P. Behringer Museum. The work for the first season was financed chiefly by the American Philosophical Society of Philadelphia, the

*Screening for small bones, also for shells of snails and other invertebrates, and for seeds and nuts. The sediments associated with the larger bones at the excavation sites were examined for small fossils and other items of scientific interest. These sediments were taken from the excavation sites and put into a series of screens emersed in the flowing water of Big Bone Creek between Sites No. 1 and No. 2. The fine textured sediments gradually washed away by the moving water passing through and over the screens leaving a coarse concentrate of small pebbles, rocks, bone fragments, shells, and vegetable material. The concentrate was then dumped into the large square screens to dry. The dried material was later carefully examined for items which might be of scientific importance. The provenience of each screen load of material was carefully recorded.*



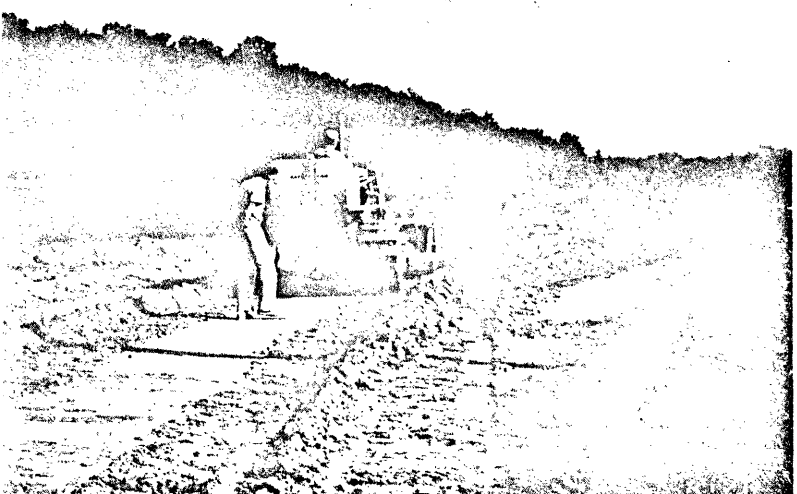
*The backhoe was used to dig deep test holes below the regular bone levels in order to see how deeply the bones occurred at Site No. 1. The backhoe also was used for digging test holes at various places in Big Bone Creek valley to determine the extent of bone accumulations and stratigraphic layers.*

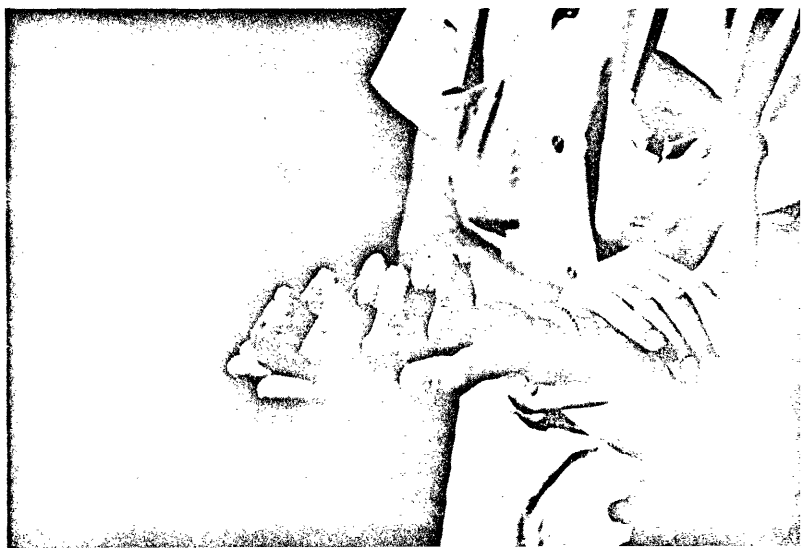
*Test hole dug with backhoe at Site No. 1 in 1966. The sides of the test hole were later smoothed down with shovels and trowels in order to study the different colors and textures of the fine grained sediments.*

University of Nebraska Research Council, and the Benjamin and Rachael Maiben Paleontological Fund of the University of Nebraska Foundation. During the following four years the work was financed primarily by the National Science Foundation. Small grants for special associated investigations also were made by the University of Nebraska Foundation (Maiben Fund) and the University of Nebraska Research Council. The United States Geological Survey furnished funds to Frank C. Whitmore and Louis L. Ray for their research work. The Kentucky State Department of Parks furnished bulldozers, backhoes, and test-hole drilling equipment and some manpower

*A bulldozer was used to remove the overburden at Site No. 2 (KEN-2), south of Gum Spring and Site No. 1 (KEN-1). One or more of the members of the paleontological expedition constantly followed the bulldozer to see if any historical, archaeological, or paleontological objects were encountered.*

*A mastodon tooth* (Mammut americanus) *was found during the bulldozing operations near the surface in the historic layer. Apparently someone had found the mastodon tooth along Big Bone Creek early in the 19th Century and had left it on the high 22-foot terrace south of the creek, perhaps at the old fort which stood there. See the 1831 map for locations of the Fort and Site No. 2.*





*Three of the 10-foot squares which were excavated in 1966 at Site No. 2. A tusk and a partial lower jaw of a mastodon* (Mammut americanus) *are shown to the left of the nearest square just below and in front of the photographer.*

*A tooth of a mammoth* (Mammuthus primigenius) *and various fossil bones exposed in an iron-stained, calcareous, gravelly, sandy silt some 15 feet below the top of the terrace in Site No. 1. The tooth and the bones are more than 10,000 years old at this site.*

*Site No. 3 (KEN-3) was first extensively excavated in 1966. The bulldozer in the foreground was used to remove the major portion of the overburden. The main part of the site was the same age as that of* Site No. 2, *but more recent sediments were encountered just below the surface. An early pioneer salt works and associated historical objects were found. These were preserved for the Big Bone Lick State Historical Museum which will be constructed at the State Park in the near future. A fence was constructed behind the site to allow visitors to watch the excavation process without interfering with it.*

during the five years of the excavations. Roger Arnold, Superintendent of Big Bone Lick State Park, and William Fitzgerald and Bruce Ferguson of the Big Bone Lick Historical Association, Woods Miller and J. D. Moore of Big Bone, Daniel Roberts of Walton, Wallace Lucas of Florence, George Lyon of Frankfort, and numerous other persons provided help in many ways.

The various assistants which aided in the Big Bone Lick project include the following: Edward C. Black (1964-65), John W. Carson (1963), R. A. Cochran, II (1962-63), Donald Cox (1962-63), David Dahms (1965), Gary W. Dickerson (1966), Joseph W. Emmons (1965-66), Jack W. Flynn (1965-66), Ronald E. Gall (1963), Ronald Graziano (1964), Nathaniel B. Haynes (1962-64), Wayne M. Isaacs (1964), Arthur W. Johnson, graduate assistant (1965), Robert D. Luken (1964), Jonathan C. MacDowell (1966), Ronald Marquart, graduate assistant (1966), Jimmie J. Miller (1963-66), Robert E. Moore (1966), Lee J. Otte (1966), Gerald Petsche (1962), Thomas L. Piercefield (1962-63), W. H. Pile, Jr. (1962), Charles F. Piner (1965-66), Michael Ricketts (1965), Barry D. Rider (1966), Virgil Rowe (1964), Gerald Schaber, graduate assistant (1962-64), Donna Schultz (1966), Lewis R. Setters (1965), Gayle Smith (1966), Charles Tongret (1964), Susan Whitmore (1965), and Darrol C. Worstell (1962-63).

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Lloyd G. Tanner
*University of Nebraska State Museum*

Frank C. Whitmore, Jr.
Louis L. Ray
*U. S. Geological Survey*

Ellis C. Crawford
*William P. Behringer Memorial Museum*

*A mastodon lower jaw found in an upside down position at locality KEN-3 prior to the 1962 excavations. Collections made during this time were limited to fossils which were exposed eroding out of the banks along Big Bone Creek.*

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*The photographs of the Big Bone Lick area used in this article were taken by the following persons: Ran Cochran (Cincinnati Inquirer), p. 11; Jerry Petsche (University of Nebraska), p. 6 (lower left), p. 7 (upper left); and C. Bertrand Schultz, p. 1. 3, 4, 5, 6 (upper left and lower right), 7 (upper right and lower left and right), 8, 9, 10.*

## ECK FRANK SCHRAMM

The staffs of the Museum and Department of Geology have just lost an outstanding friend and colleague. Professor Eck Frank Schramm passed away in Lincoln on February 28, 1967, at the age of 83. He was born at DeWitt, Nebraska, on September 7, 1883. On March 2 memorial services were conducted in Lincoln, Nebraska, and on the following day graveside rites were held at Newkirk, Oklahoma, where Professor Schramm had spent part of his early life. He had been associated with the Museum and Department of Geology for sixty years (1907-1967). In the fall of 1906 he came from the University of Oklahoma (A.B. 1906) to the University of Nebraska as a graduate student. Two years later he received his M.A. degree in geology, having studied chiefly under Professors Erwin H. Barbour and George E. Condra.

Professor Schramm remained in Nebraska after he had finished his graduate work. He became associated with the University of Nebraska State Museum (1908-1967), the Department of Geology (1906-1951), and the Nebraska State Geological Survey (1908-1915). He aided much in curating the various geological collections which were housed at the University. He became Professor of Geology in 1918 and Chairman of the Department in 1934. He remained in this position until his retirement in 1951.

The Museum was always of interest to Professor Schramm. He participated regularly in the geologic and vertebrate paleontology expeditions from 1908 to 1913 and in later years—until 1927—occasionally led successful field parties for the Museum. During this time he discovered vertebrate fossils which later were used as types of new species and genera. In 1941, when the Museum was reorganized, he became Curator of the newly formed Division of Geology. He continued as Curator of the Division until his retirement in 1951, when he was named Honorary Curator. His keen interest in the Museum continued until the time of his death.

During Professor Schramm's long career at the University he was always interested in students and took an active interest in various student organizations. He was a member of Kappa Sigma social fraternity, and he served for more than a quarter of a century as an advisor to the University's Interfraternity Council. Sigma Gamma Epsilon, national honorary geology fraternity, owes much to Professor Schramm for its growth. From 1932 to 1938 he served as its national Grand President. For a considerable number of years he was Editor of the "Compass," the official publication of Sigma Gamma Epsilon. He was active in Sigma Xi and the Nebraska Academy of Sciences while at the University.

One of Professor Schramm's former students, now a very successful petroleum geologist and administrator, paid the following tribute to the memory of his illustrious teacher "who did so much to train so many that they might lead a more useful life." The tribute continues, "I feel very deeply the loss of this man who had such a tremendous impact upon the formulation of my career and who implanted in me an optimistic philosophy of life. As students we all developed a life-long admiration of Professor Schramm as a man, as a teacher, as a friend and as a leader who instilled a deep sense of duty, integrity and loyalty in the mind and life of each and everyone of us. The world is truly better that he lived."

This conveys the feeling that the majority of his former students, colleagues, and other friends had of him. These admirers of Professor Schramm have established a memorial fund in his honor with the University of Nebraska Foundation. Some of the fund will be used to secure outstanding rocks and minerals for exhibit in one of the Museum's galleries, which will be named after him. The remaining portion will be used for the purchase of some special piece of equipment or some books for the Department of Geology.

*Harvey L. Gunderson, Editor*