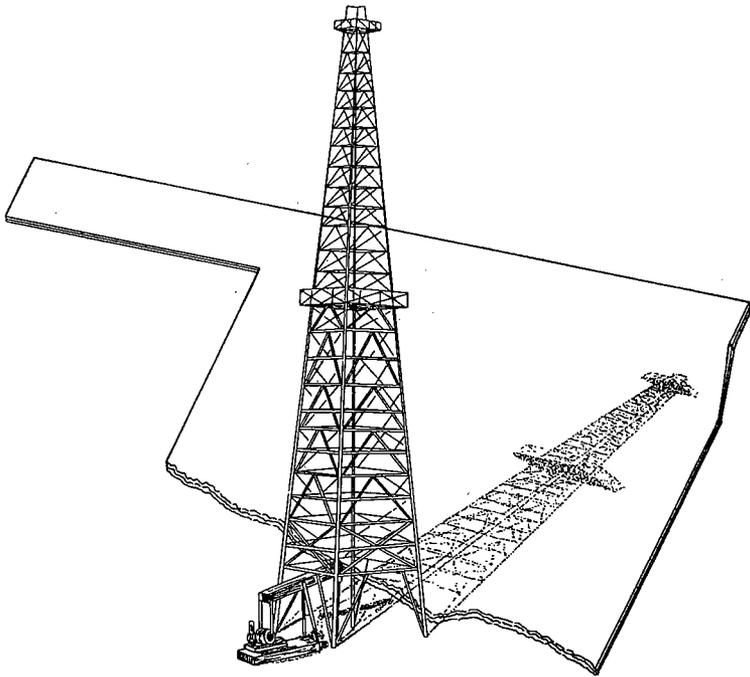


# Oklahoma Geology Notes



OKLAHOMA GEOLOGICAL SURVEY  
NORMAN, OKLAHOMA

## NEW PUBLICATIONS ANNOUNCED

- Mineral Report 28. The Henryhouse marlstone in the Lawrence uplift, Pontotoc County, Oklahoma, and its commercial possibilities. By A. L. Burwell, with a note on general geology, by William E. Ham. 21 pages, including 5 tables, map, columnar section. Printed by offset. Released November 11, 1955. Price \$0.25 postpaid.
- Mineral Report 29. An investigation of industrial possibilities of Oklahoma gypsum and anhydrite. By A. L. Burwell. 21 pages. Printed by offset. Released November 12, 1955. Price \$0.25 postpaid.
- Circular 35. Post-Boone outliers of northeastern Oklahoma. By R. C. Slocum. 44 pages, 8 colored maps, 3 figures. Released October 30, 1955. Price \$1.50 postpaid (bound in blue cloth, \$2.00).
- Circular 36. Spores of McAlester coal. By James Leland Morgan. 54 pages, 3 colotype plates, 1 table, 3 figures. Released November, 1955. Price \$1.50 postpaid (bound in blue cloth, \$2.00).
- Circular 37. A new Pleistocene fauna from Harper County, Oklahoma, by Dwight W. Taylor and Claude W. Hibbard. 23 pages, index map, figure. Released September 30, 1955. Price \$0.50.
- Map 72-1. Mineral map of Oklahoma, by John H. Warren. Scale 1 inch equal 720,000 inches (about 11 miles to one inch), in color. Price \$0.75. Released in September, 1955.
- Map 72-2. Map of ground-water reservoirs of Oklahoma, by S. L. Schoff. Scale 1 inch equals 720,000 inches (about 11 miles to one inch), in blue and black on gray base. Released November 11, 1955. Price \$0.50, postpaid.

# OKLAHOMA GEOLOGY NOTES

## LAVERNE FORMATION<sup>1</sup>

By

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U. S. Geological Survey

LAVERNE formation: early Pliocene, possibly late Miocene in lower part. The formation crops out in western Harper, eastern Beaver, and southeastern Texas Counties, Oklahoma, and in Meade and Seward Counties; Kansas (Schoff, 1947). It is believed to occur under cover of younger rocks in much of Seward, Haskell, Stevens, and Grant Counties, Kansas, and doubtless also the western part of Beaver County, Oklahoma. Rocks tentatively assigned to the Laverne formation have been penetrated in test holes in Finney and Gray Counties, Kansas. The formation was named by V. V. Waite in an unpublished manuscript, which was quoted by Gould and Lonsdale (1926 p. 33). Gould (1927) declared the name obsolete because it had not come into popular use, but later workers brought it back. Waite's manuscript has been lost, and his description of the type locality, if he gave one, has gone with it. The type locality, therefore, is presumed to be in the vicinity of Laverne, Harper County, Oklahoma. The rocks of the Laverne formation were studied by Cragin (1891), who correlated them with the "Loup-Fork beds," and by Case (1894), who made a collection of the flora from a locality in Beaver County, Oklahoma. Adams (1902) described similar rocks found in the Cimarron valley in southeastern Seward County, Kansas, and suggested that they were of Tertiary age and equivalent to the beds in Oklahoma described by Cragin. The flora and fauna of the Laverne formation in Beaver County, Oklahoma, were described by Chaney and Elias and by Hesse (Chaney and Elias, 1936). Outcrops of the formation in Meade and Seward Counties, Kansas, have been described by Smith (1940), Frye and Hibbard (1941), Frye (1942) and Byrne and McLaughlin (1948). The subsurface extent of the formation has been discussed by McLaughlin (1946) and Latta (1944). The formation is composed of sand, gravel, caliche, limestone, silt, and clay, most of which are not readily distinguishable lithologically from other Tertiary beds. Beds are gray, blue-gray, tan, yellow, pink, maroon, light green, and white. The distinctive beds in the formation are soft, massive, sandy chalk (or chalky sandstone), hard fossiliferous gray to white limestone, hard carbonaceous limestone, and coaly shale, but all exposures do not include such distinctive beds. No bed or group of beds is sufficiently persistent laterally to serve as a stratigraphic marker within the formation, and no subdivisions of the formation have been proposed. In most exposures the observable thickness is only a few tens of feet and neither top nor bottom is to be seen. In a few exposures, more than 100 feet has been found. Test holes drilled in Meade and Seward counties, Kansas, beginning on the outcrop,

<sup>1</sup> Publication authorized by the Director, U. S. Geological Survey

penetrated 301 to 464 feet of strata before entering the underlying Permian red beds. All these strata were regarded as belonging to the Laverne, and at the site of the deeper test hole enough Laverne strata crop out above the drill site to make a total exceeding 500 feet (Byrne and McLaughlin, 1948). This is to be considered a maximum. It is probable that the thickness differs greatly from place to place because the formation was deposited on an eroded surface having considerable relief. At the few places where the upper limit of the formation can be seen, the next younger formation is the Rexroad, of late Pliocene age, the relationship is one of angular unconformity, and the Ogallala formation is missing (Byrne and McLaughlin, 1948). The Laverne formation correlates approximately with the Valentine formation of the Ogallala group as these terms are used in Nebraska. The U. S. Geological Survey, however, has not accepted the Valentine formation. Geologic maps accompanying Kansas Geological Survey Bulletins 45 and 69 show outcrops in Kansas. The map accompanying Oklahoma Geological Survey Bulletin 38 shows locations of some of the exposures of the Laverne formation in Beaver County, Oklahoma, but no map showing the whole outcrop has been published. The principal problems in connection with the Laverne are: (1) how was it deposited; (2) why does it dip at moderate-to-steep angles in nearly every exposure and why are the dips so different from exposure to exposure; and (3) are any Miocene strata included in the lower parts?

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## NEW OKLAHOMA METEORITE

Some 20 years ago Mr. Van Long found a stone on his farm 7 miles north of Chickasha. He thought it might be a meteorite and carefully preserved it in his home. Recently Mr. Long brought the specimen to the Survey and permitted the cutting of slices. These reveal that it is a stony iron meteorite in good condition. The specimen weighs 4,532 grams (about 8 pounds). Mr. Long realizes the scientific value of the specimen and will care for it until he places it in a collection. He is to be commended for his discovery, for his careful preservation of the specimen, and for his generosity in making several trips to Norman in order to establish the facts of its characteristics. The locality is SW $\frac{1}{4}$  of section 31, Township 8 N., Range 6 W.

## Report on Harper County Fossils Released

Arthur J. Myers of the Oklahoma University geology teaching staff is preparing a report and map on the geology of Harper County. This is to be his doctoral dissertation at the University of Michigan and will be published by the Oklahoma Geological Survey. In the summer of 1954 Myers, Prof. Hibbard of the University of Michigan, and Carl C. Branson visited some of Myers' localities and found and collected fossil bones and shells. The shells are mainly of fresh-water and land snails, and these have been identified and discussed by Dr. Dwight W. Taylor of the University of California. Thirty-seven species of snail and two kinds of clams are listed. The fauna indicates a late Pleistocene age and shows that the climate was cooler and moister at that time than it is now.

Some of the bones were immediately recognized by Hibbard as armadillo band scutes. The species proves to be the Florida armadillo, known from the Pleistocene of that state. It is otherwise known only from clay deposits in a cave in St. Louis, Missouri. The cave had been opened and excavated to make room to store beer for aging. Four of the Harper County armadillo scutes are shown in a black and white figure.

The paper is "A new Pleistocene fauna from Harper County, Oklahoma", by Dwight W. Taylor and Claude W. Hibbard. It is Oklahoma Geological Survey, Circular 37. The publication contains 23 pages, an index map, and a figure. It sells for \$0.50 post paid.

## HIGHWAY GEOLOGY OF OKLAHOMA

An exceptionally attractive book of 172 pages has been issued by the Oklahoma City Geological Society. The title is "Highway Geology of Oklahoma". Eugene F. Culp was chairman of the committee and editor; Eugene B. Brewster, associate editor. The introduction consists of short chapters on Oklahoma geology, rivers of Oklahoma, and historic sites.

Each of the major highways has a geologic road log and accompanying strip maps. Points of historical interest are logged in italics. Oil fields are described and pay zones identified. The book is designed to be useful not only to geologists, but to anyone using the highways of the state.

More than fifty individuals contributed to the writing, drafting, and editing of the book. Jack Armbrust of Riley Reproduction, Inc. was in charge of the printing. The price is kept low in order to encourage wide use. Mail orders should be sent to Don Brown, Pure Oil Co., Box 1363, Oklahoma City. The price is \$3.25 postpaid. Checks should be written to Highway Geology of Oklahoma. The book is also available over the counter in the Survey office.

### ARBUCKLE MOUNTAIN FIELD TRIP

Eighty-two geologists stayed after the Midcontinent Regional Meeting of the American Association of Petroleum Geologists to participate in a field conference. The group was led by Dr. William E. Ham of the Survey staff. A road log from Oklahoma City to Davis was prepared by Eugene F. Culp and Gerald Don Brown and was distributed to all registrants. Stops were made at Seven Sisters Lookout, Turner's Falls, Chapman Ranch, and in the upper part of the Arbuckle group. The Hotel Ardmore served a steak dinner at noon. In the afternoon the party saw the Hutton group on the Tishomingo anticline, the Vanoss conglomerate in Platt National Park, the Deese formation in the Mill Creek syncline, and Tishomingo granite. The road guide of 5 pages and route map is available from Don Brown, Pure Oil Co., Box 1363, Oklahoma City, for \$0.25 postpaid.

### Map of Oklahoma Ground Water Reservoirs

Perhaps our State's most serious need is water. Water can be taken from streams and lakes or can be obtained from porous layers underground. The map just issued by the Oklahoma Geological Survey shows by blue overprint the areas underlain by ground water. Black contours and figures show the depth of the reservoir below the land surface. Patterns show the yield of wells in gallons per minute.

The text, printed below the panhandle and on the back of the map describes the reservoirs and reservoir rocks and explains simply some of the characteristics of ground water.

The map and text were prepared under the cooperative agreement of the Oklahoma Geological Survey and the U. S. Geological Survey, Ground Water Branch, by Dr. S. L. Schoff. Dr. Schoff was District Geologist (Ground Water) in Norman until January of this year. He is now in Peru helping that country in its ground water development.

The map has a gray base, blue water overprint, and black text, contours, and depth figures. It is on a scale of 1 to 720,000 or about 11 miles to one inch. It is available at a price of \$0.50 post paid. Please ask for Map 72-2.

### Mineral Map of Oklahoma Released

The new mineral map of Oklahoma was received from the printers on October 5, 1955. The map is 26 by 45 inches outside dimension, scale is 1 to 720,000, or about 11.4 miles to one inch. The map has a gray base and shows mineral raw materials (exclusive of coal, natural gas, and petroleum) in blue, red, violet, green, and yellow. Producing and processing facilities are shown by numbered symbols keyed to an explanation. Energy sources such as hydroelectric plants, natural gas lines, and power plants are given. The explanation carries a text descriptive of deposits and commercial uses, and further lists all commercial producing companies.

The map supersedes the out-of-print map of 1944. The earlier map showed ground water resources, but ground water will be shown by a separate map scheduled for release in November. Coal occurrences and reserves will also be shown on a separate map.

The new map is the first of the 1 to 720,000 series and is designated Map 72-1. Copies are now available at \$0.75 post paid folded in an envelope, \$0.85 rolled.

### New Viola Fossils Described

Last year Harry B. Whittington described a new genus of graptolites from the Viola limestone. The specimens were obtained by acid etching. Etching of a greater quantity of material has now provided specimens of additional forms, raising the total of known graptolite species to nine. Two new genera, **Pipiograptus** and **Phormograptus**, are described, and remains of a chitinozoan are noted and figured. All are from a road cut on U.S. Highway 77 on the south flank of the Arbuckle Mountains.

The article is "Additional new Ordovician graptolites and a chitinozoan from Oklahoma", *Journal of Paleontology*, vol. 29, no. 5, pages 837-851, September, 1955.

The author does not give the meaning of his new generic names, but phormos is a Greek word meaning basket, hence **Phormograptus**, basket written matter. The sole species of **Phormograptus** is named **Phormograptus sooneri** in reference to its occurrence in Oklahoma. The other new generic name, **Pipiograptus**, is of uncertain meaning.