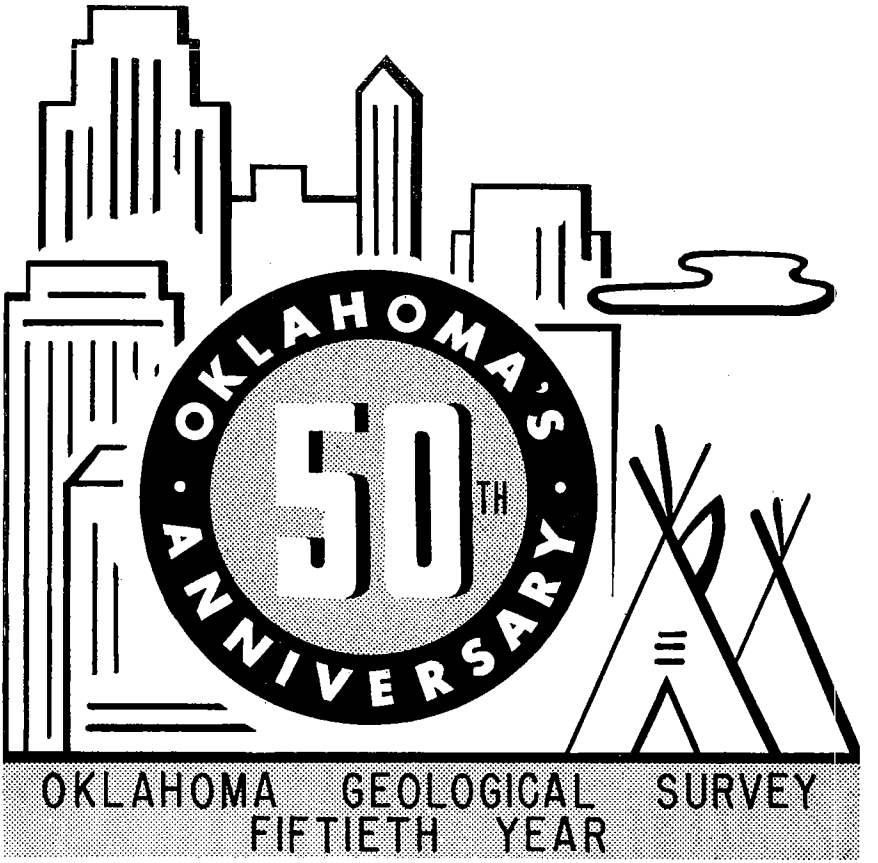
Oklahoma Geology Notes



Vol. 17, No. 1 January, 1957

CHANGES IN LIST OF AVAILABLE PUBLICATIONS

Circular 32. Microfossils of the Croweburg coal in Oklahoma, by L. R. Wilson and W. S. Hoffmeister. Report has 87 pages, 5 collotype plates. Spores of the Croweburg coal are described and figured, spore distribution histograms compare Croweburg to Iron Post and Bluejacket coals. Cutical types are figured. Bound in blue cloth, $1.75; in paper, $1.25. Issued April 13, 1956.

Circular 38. Catalog of fossils from the Hunton group, Oklahoma, by Thomas W. Amsden. Catalog has 63 pages. Species listed 229, of which 52 are from Chimneyhill, 72 from Henryhouse, 105 from Haragan. Bound in blue cloth, $1.25; in paper, $0.75. Issued June 22, 1956.

Circular 39. Chester Foraminifera and Ostracoda from the Ringwood pool of Oklahoma, by R. W. Harris and Thomas C. Jobe. Paper has 41 pages, 4 collotype plates. Specimens are from a core in the Manning zone. Age is Chesterian. Bound in blue cloth, $1.50; in paper, $1.00. Issued June 23, 1956.

Circular 40. Geology of Northeastern Osage County, Oklahoma, by W. F. Tanner. Report consists of 76 pages, colored geologic map. Barnsdall and Tallant formations of Missourian age and Vamoosa formation of Virgilian age are described. Bound in blue cloth, $2.25; in paper, $1.50. Issued October 31, 1956. Map separately available as Map A-3, $0.50.

Circular 41. Two measured sections of Jackfork group in southeastern Oklahoma, by L. M. Cline and Frank Moretti. Report contains 20 pages. Two complete sections, one 5,600 feet thick and one 6,000 feet thick, are described in detail. Paper bound only, $0.35. Issued October 1, 1956.

Map GM-3. Tectonic Map of Oklahoma, by J. Kaspar Arbenz. Colored map, scale 1/750,000, inserts of tectonic provinces and tectonic history. $0.50 folded, $0.65 rolled in map tube. Issued November 19, 1956.

Chart. General geologic section of Oklahoma oil-producing areas, by Carl C. Branson. Reprinted from National Oil Scouts and Landmen's Association Yearbook, 1956. $0.10.

Publications which have gone out-of-print since last list: Bulletin 46, Bulletin 63.

DEWEY AND WOODWARD ADDED TO PRODUCING COUNTIES

In December, 1956, the discoveries of Sinclair Oil and Gas in No. 1 Kunc, sec. 11, T. 17 N., R. 18 W. in Dewey County, and Union Oil of California in No. 1 McCormick, sec. 14, T. 22 N., 20 W., Woodward County, increased the number of producing counties to seventy. This latter discovery is the most significant of the year in northwestern Oklahoma. Custer and Major Counties are the only areas in the entire Anadarko basin not scheduled to receive wildcat drilling in the coming weeks.

L.J.

Oil and Gas Discoveries in Woods and Alfalfa Counties

by

Louise Jordan

Only two oil fields had been discovered in the two-county area of Woods and Alfalfa at the time that Albert E. Allen was writing his thesis for the Master of Science degree in 1953 (later published in the **Shale Shaker**, vol. 4, no. 8, April, 1954 under the title of "The Subsurface Geology of Woods and Alfalfa Counties, Northwestern Oklahoma"). These fields consisted of one well each, North McWillie in Alfalfa and Yellowstone in Woods County.

The North McWillie field was discovered December 27, 1950 with the completion of Davis et al No. 1 Glidewell, (SW¼ SW¼ NE¼ sec. 14, T. 24 N., R. 11 W.), which flowed 6 barrels of oil per day from the "Oswego" at 5792 feet. This remained a one-well pool with a cumulative production of 15,493 barrels at the end of 1955 until March 1956, when Trigg Drilling Company, Inc. completed No. 1 Nelson (C NW¼ SE¼ sec. 14, T. 24 N., R. 11 W.) with oil production from a "basal Pennsylvanian" limestone at 6229 to 6250 feet, a lower horizon than the discovery well.

The Yellowstone field was discovered by Champlin Refining Company in its No. 1 Harry Diamond (NE¼ NE¼ SW¼ sec. 17, T. 29 N., R. 17 W.) in Woods County. This well was completed on October 15, 1953, flowing 50 barrels of 43° gravity oil per day from Arbuckle dolomite at 6134-52 feet. A year later in October 1954, the Tegarden field in Woods County was opened by J. R. McDermott No. 1 Murrow (C SW¼ NE¼ sec. 19, T. 27 N., R. 16 W.) with gas and distillate from Mississippian limestone at the depth of 5750 to 5780 feet.

On September 30, 1954, Phillips Petroleum Company, No. 1 Sandra "A" (C NW¼ NW¼ sec. 8, T. 26 N., R. 15 W.) was completed for oil production at 5910-28 and 5954-76 feet in Mississippian limestone in Northwest Avard field. Gas has since been found in Phillips No. 1 Avard (SE¼ NE¼ NE¼ sec. 9, T. 26 N., R. 15 W.) in the Neva limestone at 3054 feet.

On November 17, 1955 Amerada Petroleum opened the Northwest Oakdale field with its No. 1 Farris (C SW¼ NW¼ sec. 21, T. 24 N., R. 13 W.) from sand in the Simpson group. Gas has also been found in a sand in the Cherokee group and in the Cottage Grove sandstone in this field. The Northeast Waynoka field was opened by the Texas Company's No. 1 McAntire (NW¼ NW¼ NE¼ sec. 20, T. 25 N., R. 15 W.), completed March 1, 1956 with oil and gas again from the Cottage Grove sandstone.

It appears at the present time that Gulf Oil Corporation has opened another field with its No. 1 Shade (SE¼ SE¼ sec. 31, T. 25 N., R. 14 W.) which flowed 20 barrels of oil in one hour on a drill-stem test from 7,117-46 feet, reported to be Misener or Hunton.

These six field areas in Woods County have production of oil and/or gas distillate from seven stratigraphic horizons: Neva limestone, Cottage Grove sandstone (also called "Lower Tonkawa," Layton, Peoples-Layton, Osage-Layton), a sandstone in

the Cherokee group, porosity in Mississippian limestone older than Chester, Misener or Hunton, sandstone in the Simpson group and porosity in the Arbuckle group.

After the discovery of the North McWillie field, no more oil was found in Alfalfa County until drilling in the Southeast Eureka district was extended into the county in the middle of 1955.

In rapid sucession several fields were discovered in Alfalfa County: Southeast Flower Dale was opened when Continental Oil Co. worked over No. 1 Maltbie (SW¼ NW¼ SE¼ sec. 8 T., 28 N., R. 9 W.) and completed it August 8, 1955 for a gas distillate well in a basal Pennsylvanian sand; Amorita (discovery well: Jones-Shelbourne et al. No. 1 Ohio-Parr, SE¼ SE¼ NW¼ sec. 9, T. 28 N., R. 10 W.), completed November 17, 1955 with production from Cottage Grove sandstone and "Mississippian chat"; Mendon (discovery well: Woods Petroleum Corp. No. 1 Christensen C NW¼ NW¼ sec. 21, T. 28 N., R. 9 W.), completed December 29, 1955 with production from basal Pennsylvanian sand; West Mendon (discovery well: Woods Petroleum Corp. No. 1 Tucker, (C SE¼ SE¼ sec. 13, T. 28 N., R. 10 W.), completed February 29, 1956 with basal Pennsylvanian sand production; and southwest Eureka (discovery well: N. T. Smith No. 1 Bodle "A", C NW¼ SW¼ sec. 15, T. 28 N., R. 9 W.), completed May 8, 1956, also from basal Pennsylvanian sand.

About 8 years ago a well drilled in C SW¼ SE¼ sec. 19, T. 25 N., R. 12 W., was abandoned. Now named Calvert No. 1 Newlin it was reworked and completed in July 1956 flowing 10,600,000 cubic feet of gas and approximately 84 barrels per day of distillate from 5838-48 feet in a sand in the Cherokee. This well opened the Southeast Dacoma field. Other fields are being opened currently in this very active area with multiple pay possibilities.

INGENIOUS USES OF MINERAL MATERIALS

A. L. Burwell

A lightweight structural material is being manufactured in Sweden that has been given the unusual name of ytong. Ytong is produced by mixing hard-burned high-calcium lime, powdered metallic aluminum, a suitable aggregate, and water and by casting the mixture or dough in molds. A reaction takes place, resulting in a gas which causes the dough to rise like bread, and in a short time the mass sets and is firm enough to handle. The product is autoclaved to complete the "cure," and then sawed to desired shapes.

A news item states that Denver, Colorado, business men plan to build a plant at Salida to pulverize "an ore containing 37 percent sulfate, 26 percent calcium, and smaller percentages of magnesium, potassium, phosphorus, sulfur, and nitrogen" and to offer the pulverized material as "a soluble plant supplement," or fertilizer. The composition indicates that the ore is something closely akin to gypsite, a mineral material found abundantly in Oklahoma.

A process has been devised for making building blocks from lightweight aggregate without the use of cement or lime. The

aggregate is mixed with a clay or shale mud that acts as a binder. The block is formed in the conventional vibrating machine and then dried, after which it is fired in the same way as brick and tile. Definite advantages are claimed over the cement block, especially as regards volume stability.

NEW AGE DETERMINATION OF PRECAMBRIAN GRANITE IN THE ARBUCKLE MOUNTAINS

The second absolute age determination by means of radioactive zircon in granite from Oklahoma is given in an article entitled "Precambrian Rocks of Wichita and Arbuckle Mountains, Oklahoma," Geol. Soc. Amer., Bull., vol. 67, 1956, p. 1319-1330, by W. B. Hamilton.

Determined by alpha counts and spectroscope estimates of lead in zircon from the Tishomingo granite near Troy, in the central part of the Arbuckle Mountain region, the age was calculated by David Gottfried and C. L. Waring to be 900-980 million years. The Tishomingo granite is thus the oldest rock in Oklahoma for which an absolute age has been determined.

In an earlier paper by E. S. Larsen, Jr., C. L. Waring, and J. Berman (Amer. Mineralogist, vol. 38, 1953, p. 1118-1125) zircon in a pegmatite from the Wichita Mountains was shown to have an absolute age of 635 million years.

Both determinations were made from single localities in the widely distributed igneous rocks of the Wichita Mountains and Arbuckle Mountains that have been classified for many years as Precambrian. These new data show the range in age of the igneous rocks to be about 300 million years, equal to more than half the time that has elapsed since the beginning of the Cambrian period. In Oklahoma more than 95 percent of the surface rocks are of Cambrian or younger age, and these younger rocks contain all the oil, gas, coal, zinc, lead, limestone, gypsum, salt, silica sand, and other resources upon which the mineral economy of Oklahoma is built.

The Precambrian rocks nevertheless play an important role in geologic interpretation. When age determinations have been made from numerous localities in the many igneous rock types that are known in the Wichitas and Arbuckles, it appears probable that the range in age will be extended even more than is now known; and it seems equally probable that the generalizations about relative age drawn by Hamilton will be shown invalid.

W.E.H.

Cherokee Rocks of Southeastern Kansas

The State Geological Survey of Kansas has released as its Bulletin 123 a fine report by Wallace B. Howe. The paper was Howe's doctoral dissertation at the University of Kansas. Howe describes the stratigraphy of the important coal-bearing sequence of Kansas. Each unit from the top of a coal bed to the top of the next succeeding coal is termed a formation. Seventeen such formations are described in addition to the Excello shale at the top.

The Cherokee is called a group, with Krebs and Cabaniss subgroups. The base of the Cabaniss is placed at the top of the Seville limestone. The Seville limestone probably is the lower, fusulinid-bearing member of the Inola limestone of Oklahoma.

The Robinson Branch coal is briefly discussed, but the one Kansas exposure is no longer accessible.

The Bevier coal of this report is the Wheeler coal of Searight et al. (1953), the lower bench of the Bevier. Howe considers that this coal is much higher in the section in Oklahoma than it is in Kansas and is close to the Iron Post coal. Underlimestones were recognized locally below the Mulky coal, the Croweburg coal, the Mineral coal, and the Tebo coal.

An unnamed coal horizon is mentioned between the Tebo and Scammon beds. Howe suggests that the Doneley limestone of Oklahoma caps the Neutral coal rather than the Rowe. He equates the Columbus coal with Rowe. The report was written before Alexander's fusulinid study and Wilson and Hoffmeister's spore study were published.

Howe was the first to recognize (1951) that the Mulky coal is absent in Oklahoma and that the so-called Lower Fort Scott limestone is Breezy Hill. He also identified Mineral, Fleming, and Weir-Pittsburg coals in Oklahoma and redefined the type Bluejacket sandstone. This useful and long-awaited report will be of great value in the continued studies of Desmoinesian rocks being carried forward in Oklahoma and in Missouri.

C. C. B.

Can a Commercial Use be found for Oklahoma Grahamite and Impsonite?

A. L. Burwell

Natural occurrences of solid bitumens and pyrobitumens are quite numerous in Oklahoma. There are occurrences also of liquid and semi-solid bitumens usually associated with sandstones or limestones, but for this article the discussion will be restricted to the solid and pyrobitumens. The solid bitumens in the observed occurrences differ somewhat in chemical and physical properties but all fall in the class known as grahamite. The pyrobitumens are in the class known as impsonite.

Grahamite has a relatively high specific gravity, black streak, high fusion point, high percentage of fixed carbon (25 to 50 percent), and non-mineral matter is soluble in carbon disulfide, whereas impsonite with approximately the same specific gravity and black streak is infusible and is insoluble in carbon disulfide, and fixed carbon will range from 50 to 85 percent. According to Abraham,[1] outcrops of grahamite are prone to metamorphose to impsonite, which may lead observers to be mistaken in identification. Oklahoma occurrences of both grahamite and impsonite are shown in Oklahoma Geological Survey Mineral Report 30, by William E. Ham.

In years past, grahamite was mined and used in the prepara-

[1] Abraham, Herbert. (1944) Asphalts and Allied Substances. D. Van Nostrand Co. p. 298.

tion of asphaltic roofing and other products. Impsonite was mined and burned to obtain the vanadium compound found in the ash. At the present time, there is no commercial demand for either grahamite or impsonite from Oklahoma.

A solid bitumen known as gilsonite is known to occur in this country only in Utah. It differs from grahamite in several respects, the most important ones being its solubility in solvents other than carbon disulfide, its fusibility, and its low sulfur content. It has been used mainly in the paint and varnish industry, but quite recently a new and novel use has been developed.

In Chemical Week, issue of June 11, 1955, appeared an article entitled "Outlet for a Natural Asphalt" (gilsonite). More detailed information appeared in the July 4, 1955 issue of Chemical & Engineering News and the July 11, 1955 issue of the Oil & Gas Journal. In short, the process is proposed to convert the gilsonite by thermal decomposition under controlled conditions into a marketable gasoline and a residual coke having physical and chemical properties that make it especially desirable for electrodes for the aluminum industry.

Naturally, the question arises as to whether or not grahamite or impsonite may be utilized in place of gilsonite. Offhand, it would seem that grahamite might be so used if the raw material is low in ash. However, analyses indicate that the main objection would be that the coke might contain too much sulfur if the sulfur present in the grahamite is retained in the coke. Therefore, experiments were conducted in the Oklahoma Geological Survey laboratory to determine the possibility of volatilization of the sulfur during thermal decomposition. The work was done by Thomas E. Hamm, yielding the following results:

Grahamite from the Wade deposit in sec. 1, T. 2 N., R. 17 E., Pushmataha County, was coked by heating in covered porcelain crucibles in an electric furnace. Coking was complete, as indicated by insolubility in carbon disulfide, after 3 hours at 1000°F, but the coke continued to lose weight on further heating. Percent sulfur was determined for the original grahamite and for two samples of coke.

Temperature (°F)	Time hrs.	Cumulative loss in wt. %	Sulfur content referred to the Wt. of orig. grahamite. %
Orig. grahamite	—	0.00	1.59
620	3	0.48	
640	8	2.96	
1,000	3	65.35	0.60
1,000	15	79.40	0.40

Obviously, a considerable portion of the sulfur is removed in the distillate, but the percentage of sulfur remaining in the coke is still too high for the coke to be acceptable as electrode material for the aluminum industry. However, these results should not be regarded as evidence that grahamite cannot be processed successfully for electrode carbon. They mean only that under one set of conditions, the sulfur content was not reduced sufficiently. Perhaps someone will be interested enough to investigate further.

OKLAHOMA MINE PRODUCTION AND MINE SAFETY IN 1955-56

Issued in November by the State Department of Chief Mine Inspector was the Forty-Eighth Annual Report of Mines and Mining in Oklahoma. Prepared under the direction of John M. Malloy, Chief Mine Inspector, the report gives production data and safety records for the mining of coal, zinc, lead, rock asphalt, and gypsum in Oklahoma for the fiscal year ending June 30, 1956.

During this period 2,052,000 tons of coal was produced from 47 mines in 14 counties. Greatest tonnage was reported from LeFlore County (424,000 tons), followed by Rogers County (401,000), Haskell County (291,000), and Pittsburg County (247,000). Total production was an increase of 46,000 tons over the previous year. Two men were killed in strip mines as the result of accidents.

Zinc and lead ores were produced from 31 mines in Ottawa County without a single fatality. Production was 1,760,000 rock tons from 1,150,000 man-hours worked.

Rock asphalt production from Murray County was 77,000 tons.

A record production of 468,000 tons of gypsum was reported from mines in Blaine County, without a fatal accident.

The report, available from the Department of Chief Mine Inspector, Oklahoma City 5, Oklahoma, also contains a summary of production in Oklahoma for the calendar year 1955. Similar mineral statistics for 1955, giving production and value for all mineral resources of the State, including petroleum, natural gas, and liquified petroleum gases, will be published jointly by the Oklahoma Geological Survey and the United States Bureau of Mines early in 1957.

W.E.H.

GEOLOGY SECTION—OKLAHOMA ACADEMY OF SCIENCE

The 1956 meeting was held on Friday afternoon, November 30th, at Stillwater, John D. Naff, presiding. Papers presented were:

Tertiary Vertebrate Faunas of Western Oklahoma, by David B. Kitts.

Cavitation in a Rapidly Flowing Stream, by Gladys E. Braden (read by Alex R. Ross).

Lower and Middle Silurian of the Eastern United States, by Thomas W. Amsden.

Rapid Ca-Mg Determination in Sedimentation Studies, by Joseph F. Shreiber.

Mineral Resources of Western Oklahoma, by Philip P. Chandler.

Geology in the Boston Mountains, by William Bonney Brent.

The 1957 meeting will be in Norman under the Chairmanship of William E. Ham. Hugh E. Hunter was elected vice-chairman of Section B.