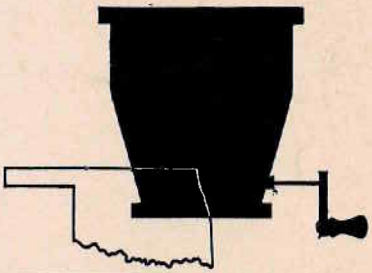
The HOPPER



DEDICATED TO OKLAHOMA'S DEVELOPMENT

OKLAHOMA GEOLOGICAL SURVEY NORMAN, OKLAHOMA

Vol. 15, Nos. 10-11 October- November, 1955

Regional Convention Number
American Association of Petroleum Geologists
Mid-Continent Regional Meeting
November 2, 3, 4, 1955

The Oklahoma Geological Survey dedicates this number of The Hopper to the Oklahoma City Geological Society and its co-hosts, Shawnee Geological Society, Ardmore Geological Society, Panhandle Geological Society, on the occasion of the regional meeting in Oklahoma City. The officers and committees of the societies have planned well and labored long in preparing a meeting which is the outstanding regional meeting ever held.

In addition to the many timely and important papers scheduled for the technical program, the meeting will feature the following:

1. A full program of entertainment for the ladies.
2. A volume containing the technical articles of the Shale Shaker published in the first five volumes.
3. A volume titled "Highway Geology of Oklahoma."
4. A field trip to the Arbuckle Mountains.
5. Exhibits by exploration and development service companies.

The Survey congratulates the Oklahoma City Geological Society and its co-hosts. We consider the meeting as an important scientific event, and our entire staff will be in attendance.

Oklahoma Geological Survey Exhibit

The Oklahoma City Geological Society has generously provided space for our exhibit of the work of the survey. Visit us in Booth No. 19, Room D, to the right from the elevators and the Persian Room.

We have prepared and published a new and revised list of our publications for the occasion for free distribution. On display are:

Geologic map of Oklahoma
Geologic map of Arbuckle Mountains
Minerals map of Oklahoma
Ground water map of Oklahoma
Geologic map of Hughes County
Geologic map of Okfuskee County
Geologic map of Grady and northern Stephens Counties
Geologic map of the core of the Ouachita Mountains
Geologic map of Ottawa County
Geologic map of the Baum-Ravia area

Drop in to see us and our exhibit. Pick up a copy of the new list of publications at that time.

Occurrence of Buff-Burning Ceramic Clay in Kay County

by A. L. Burwell and Carl C. Branson

In December 1954 Mr. Roscoe H. Dowd of Braman sent in a small sample of claystone for testing by the Survey. A. L. Burwell found that the material gave promise of yielding a brick of good buff color. Branson visited Braman and in company with Mr. Dowd examined and sampled the occurrence (February 23, 1955). The samples have been analyzed by T. E. Hamm and tested for ceramic properties by Burwell. Reserves seem inexhaustible on the basis of reconnaissance surveys (see Map).

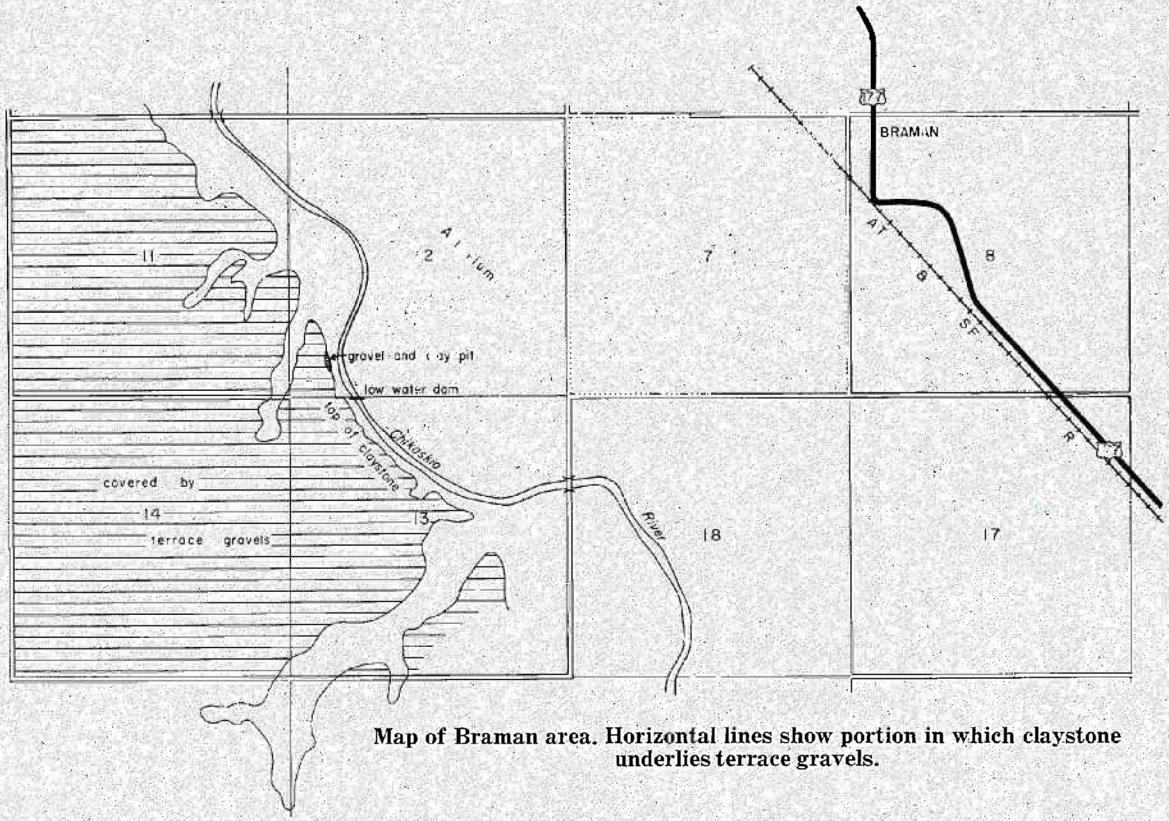
The area has not been mapped geologically in detail and is known only to be underlain by strata belonging to the middle part of the Wellington formation. Farther south, sediments deposited in a saline lake occur at this level, and it is possible that the clay deposits in Kay County are lake sediments. The exposures examined are on a farm owned by Mr. Dowd, the W½ SW¼ sec. 12, T. 26 N., R. 10 E., Kay County, Oklahoma. The occurrence is on the west side of the Chikaskia River about 2 miles southwest of Braman. The Atchison, Topeka, and Santa Fe Railway goes through the town. The site is reached by going west from Braman on the section line road, turn south 1 mile along the west edge of section 11, then east one mile to the Dowd farm.

The upland area is floored by terrace gravel and sand to a depth of at least 14 feet. The gravel has been excavated in a pit on the Dowd farm and some of the underlying clay was dug for road surfacing. The clay is well exposed along the small valleys on the farm and on adjacent farms. The clay extends westward under the cover of terrace gravel and can be expected to underlie a broad belt west of the line of outcrop.

The exposure examined has the following section:

	Feet
terrace sand, clay, gravel	0 to 14
claystone, gray, bedded, sandy layers, thin dolomite bed	6
clay, dark, carbonaceous	1.1
clay, light gray, silty	0.5
claystone, blue-gray	2.5
claystone, gray, ferruginous	0.5
clay, blue-gray	2.5
unexposed, may be like above	18.0

At least 5.5 feet of usable clay is exposed, and the entire section of



Map of Braman area. Horizontal lines show portion in which claystone underlies terrace gravels.

31.1 feet may well be suitable for processing. The sampled section consists of the 13.1 feet from the base of the exposure to the terrace cover. The composite sample has virtually the same analysis and firing properties as those of selected beds.

An interested operator should dig pits in or core drill a sufficient area to determine thickness and area of usable clay before establishing a plant. The clay makes a ceramic product with unusually pleasing color. The calcium carbonate content of the clay requires that the processing be controlled to prevent harmful effects.

A clay similar in properties to the Kay County occurrence was sampled in a road cut on U. S. Highway 60 near the center of sec. 2, T. 26 N., R. 10 E. This clay underlies the Labadie limestone and is 7 feet thick. This clay has practically the same chemical characteristics as that from Kay County, but burns to a less satisfactory color.

Chemical analyses have been made in the Oklahoma Geological Survey laboratory on four samples of shale from section 12, T. 28 N., R. 2 W., Kay County and, for comparison, one sample of shale from section 2, T. 26 N., R. 2 W., Osage County. All are drab gray in color. All are dolomitic, ranging from a calculated carbonate content of 9.6% in the Osage sample to 20.1% in one from Kay County.

A series of ceramic tests were made on one sample from Kay County, the results are shown in Table I and indicate a satisfactory buff colored product in the firing range from 950° to 1050°C. The Osage County sample burned to salmon shades and the physical properties were not determined.

Based upon the chemical analyses, calculations were made of approximate and probable composition, assuming the material other than calcium and magnesium carbonates is "clay".

TABLE II

Sample No. County	10164* Osage	10165 Kay	10166 Kay	10167 Kay	10168* Kay
Calcium carbonate	7.05%	8.83%	15.80%	11.83%	9.28%
Magnesium carbonate	2.55%	1.28%	9.33%	5.46%	4.58%
Combined H_2O in "clay"	5.9%	5.7%	5.5%	6.2%	5.9%
Excess MgO, combined in "clay". % of "clay"	2.7%	5.8%	4.6%	5.5%	5.2%

* samples that were "fired".

TABLE I
CERAMIC TESTS

Braman Shale, Lab. No. 10168

Casting Mixture: pulverized dry shale plus 30% water

Firing temp.	dried only	830°C	890°C	950°C	1010°C	1050°C	1090°C	1150°C
Color of product	drab gray	* Capucine buff avellaneous	* Capucine buff	* Capucine buff	* Capucine buff	* Capucine buff	* Capucine buff brown tinge	* Natal Brown glassy
Drying shrinkage linear— volume—	3.4% 6.5%	— —	— —	— —	— —	— —	— —	— —
Firing shrinkage linear—	—	6%					7%	9%
Hardness	< steel	< steel	< steel	steel	> steel	> steel	> steel	> steel
Bulk density	1.93	1.76	1.76	1.80	1.80	1.81	1.84	1.90
Porosity (volume)	—	34.4%	32.7%	31.2%	31.2%	30.5%	28.0%	4.4%
Absorption (weight)	—	19.5%	18.0%	17.4%	17.4%	16.9%	15.2%	2.3%

* Color Standards and Nomenclature, Robert Ridgeway (1912)

Distribution of Prairie Mounds in Oklahoma

In The Hopper, vol. 14, No. 7, Dr. F. A. Melton gave his views on the origin of the low, circular mounds commonly found on Quaternary deposits. His article is a revision of an article originally printed in the Proceedings of the Oklahoma Academy of Science in 1928. These mounds are variously termed "pimple mounds", "mima mounds", "flower mounds", and "prairie mounds."

There has been considerable curiosity about the distribution of the mounds in Oklahoma. The accompanying map, prepared by Carl C. Branson, shows by diagonal lines the areas where prairie mounds are known in abundance. The cross-hatched area is the site of chert mounds developed on the outcrop of the Cool Creek limestone.

It will be noted that the largest area of prairie mounds is in Sequoyah, Haskell, and LeFlore Counties, a region of broad terraces. The western border of occurrence is probably the eastern limit of deep dissection of terraces and of destruction of terrace flats by stream action.

Notes on some Oklahoma Formation Names

Carl C. Branson

The Survey is compiling a lexicon of Oklahoma formation names and descriptions. The work has been interrupted several times by changes in Survey personnel. The Hopper will carry items pertaining to the lexicon as it is being prepared. A preliminary list was issued in mimeographed form in 1954. The following names were omitted.

Rock Creek limestone member of Vamoosa formation

Named by F. C. Greene in 1918 (Amer. Assoc. Petroleum Geologists, Bull., vol. 2, p. 122). "At about 220 feet above the Wild Horse limestone is the Rock Creek limestone, well developed in T. 26 N., R. 10 E., but very thin in the southwest corner of the next township south. The Rock Creek limestone is probably about 325 feet below the top of the Elgin sandstone."

Rock Creek is a small tributary of Sand Creek and flows through sections 3, 4, 9, 10, and 15. The limestone is obviously the Labadie limestone, the type locality of which is Labadie Point in sec. 2, T. 26 N., R. 10 E.

The name Rock Creek is a synonym and is not in good standing. The name is preoccupied by Rock Creek limestone of Worthen (1873) in the McLeansboro of Illinois, by Rock Creek beds of Gidley (1903) in the Texas Pleistocene, by Rock Creek gabbro


KAY
OSAGE
WASHINGTON
NOWATA
CRAIG
OTTAWA
ROGERS
MAYES
DELAWARE
NOBLE
PAWNEE
TULSA
PAYNE
CREEK
WAGONER
CHEROKEE
ADAIR
LINCOLN
OKMULGEE
MUSKOGEE
SEQUOYAH
OKFUSKEE
POTTAWATOMIE
SEMINOLE
MC INTOSH
HASKELL
HUGHES
PITTSBURG
LATIMER
LE FLORE
GARVIN
PONTOTOC
COAL
MURRAY
PUSHMATAHA
CARTER
JOHNSTON
ATOKA
MARSHALL
MC CURTAIN
LOVE
BRYAN
CHOCTAW

CHEMICAL ANALYSES

SHALES

Lab. No.	SiO_2	Al_2O_3	Fe_2O_3	MnO_2	TiO_2	P_2O_5	CaO	MgO	K_2O	Na_2O	CO_2	S	H_2O	LOI	R_2O_3	Oxide Total
10164	50.69	18.51	6.55	0.11	0.62	0.16	3.95	3.53	3.21	1.62	4.43	0.22	1.59	9.83	25.84	100.59
10165	50.11	16.49	5.65	0.07	0.57	0.01	4.95	5.46	3.15	1.88	4.55	0.26	2.18	9.73	22.81	100.60
10166	42.34	12.66	5.20	0.17	0.54	0.08	8.85	8.10	2.53	1.38	11.82	0.21	1.97	16.21	18.48	100.23
10167	46.18	14.23	5.53	0.13	0.57	0.11	6.63	7.56	2.77	1.20	8.05	0.27	1.91	13.20	20.44	100.29
10168	49.42	14.95	6.03	0.10	0.57	0.11	5.20	6.92	2.82	1.22	6.47	0.17	1.78	11.61	21.66	100.90

and diorite of Daly (1913), Jurassic of British Columbia and Washington.

Bull Creek limestone member of Barnsdall formation

Named by F. C. Greene in 1918 (Amer. Assoc. Petroleum Geologists, Bull., vol. 2, p. 121). "The Bull Creek limestone, which is well exposed on Bull Creek, in the northwestern part of T. 23 N., R. 11 E., is the next succeeding persistent bed. It is 5 to 15 feet in thickness and lies about 100 feet above the Peoples sand and 150 feet above the Stanton limestone." The limestone is 80 to 125 feet below the Wildhorse dolomite.

The name is preoccupied by Bull Creek sandstone of Drake (1893) in the Strawn of Texas. Bull Creek is a small tributary of Bird Creek. The bed is the Birch Creek limestone of Bowen (1918), the valid name for the member.

Quapaw sandstone of Wann formation

Named by F. C. Greene in 1918 (Amer. Assoc. Petroleum Geologists, Bull., vol. 2, p. 122). "North of T. 23 N., the Wild Horse limestone is either very thin or absent, although its position is indicated by a massive sandstone which is believed to be that exposed at Quapaw. In many places the base of this sand is extremely coarse, containing pebbles up to one-fourth inch in diameter. The section above the Quapaw sandstone contains no well marked beds for about 200 feet."

Quapaw was a small village in sec. 35, T. 25 N., R. 10 E. The sandstone cropping out there is the Revard sandstone of Winchester et al. (1918), and the name Revard is the valid name of the member.

Hollis limestone member of Deese formation

Shown on manuscript map by Guthrey and Milner (1933). Type locality on Hollis farm in SW¼ SW¼ sec. 8, T. 5 S., R. 2 E. Name preoccupied by Hollis quartzite of Adams (1926) in the pre-Cambrian of Alabama. Renamed Natsy by Tomlinson (1937).

Williams limestone member of Deese formation

Shown on manuscript map of Guthrey and Milner (1933). Named by Tomlinson in 1937 (Ardmore Geol. Soc., field trip guide March 13, p. 3).

"**Williams Member.** The lowest stratigraphic unit which has been included in the Hoxbar formation of the Ardmore district on any published map is the one to which the name Williams was given by Guthrey and Milner on their detailed map of the Lake Murray area prepared in 1933. Although this map has not been published through regular channels, copies of it have been made available to all geologists who wished to make use of it, and are

SHALE

Lab. No.	Field Sheet	County	Section	Tow	Rang	Description
101 4	0968	Osage	2	26	10E	dark, gray shal , rare fossils, tabular concreti ns
10165	0969	Kay	12	28N	2	composite sect on of 12.1 foo exposure
166	0 9	Kay	2	28N	2W	dd d claystone with sandy ayers, thin o re l yer
1016	0969	Kay	12	28N	2W	chan l sample of selected beds acro s lower 10 feet of expos re
10168	0969	Kay	2	28N	2W	blue-gray clayst ne at base of exposure. Six feet expos d

on file with the State Geological Survey and the University of Oklahoma. The type locality is on the former Williams farm, now part of Lake Murray State Park, 100 yards north of CSL SE¼ Section 17, T. 5 S., R. 2 E. It there includes about 2 feet of impure silty limestone capping some 30 feet of more or less calcareous sandstones. The limestone carries a moderately abundant megascopic fauna including brachiopods, pelecypods, and gastropods. The party will see this bed at the type locality and also in the SW¼ of Section 27-5s-2e, where both megafauna and microfauna are weathered out in a few feet of calcareous shale overlying the limestone.

The meager and impure limestone content of the Williams member differentiates it much less sharply from a number of similar beds lower in the upper half of the Deese formation, than from the purer limestones of the Confederate, Crinerville, Anadarche and Daube members in the restricted Hoxbar formation above."

Natsy member of Deese formation

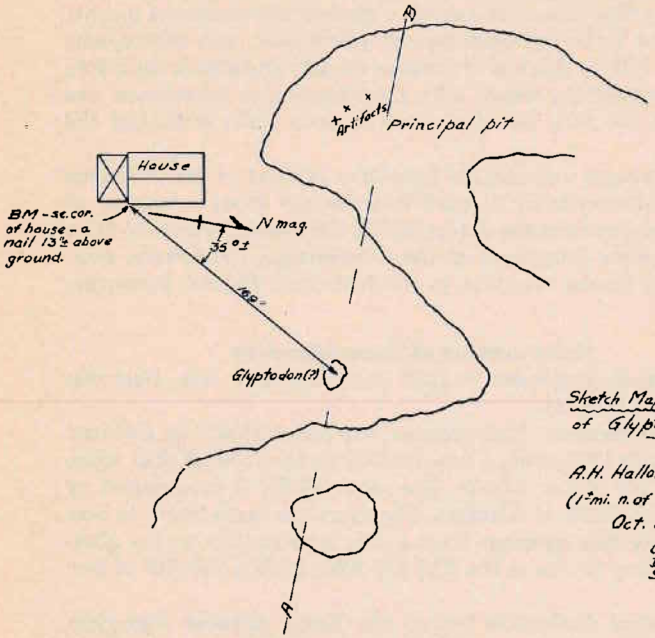
Named by Tomlinson in 1937 (Ardmore Geol. Soc., field trip guide March 13, p. 3).

"**Natsy Member.** This member was called 'Hollis' by Guthrey and Milner in 1933, from a type locality on the farm of that name in the SW SW of Sec. 8-5s-2e. The name 'Hollis' is preoccupied by the Hollis quartzite of Alabama. Therefore the name Natsy is here proposed for this member, from a new type locality on the allotment of Natsy Noella in the N½ SW SW and S½ NW SW of Sec. 27-5s-2e.

The most distinctive bed of the Natsy member comprises from 4 to 6 feet of impure silty ferruginous brown massive limestone with fairly abundant large fossils, including gastropods, brachiopods, and bryozoa. From 40 to 50 feet above that bed is a thinner-bedded calcareous sandstone of similar thickness, but usually of less prominent outcrops. At the new type locality in Section 27 both units are partially conglomeratic, containing many small variegated pebbles, chiefly of limestone, mostly ¼" or less in diameter. The conglomeratic phase disappears northwestward along the outcrop, as in the overlying Confederate member. Nowhere in T. 5 S., R. 1 or 2 E., is the limestone of the Natsy member as free from impurities as the limestones of the next four named members above it, which always have been placed in the Hoxbar formation. However, it was included by Goldston in 1922, in the type Hoxbar area southeast of Ardmore, in his Hoxbar member of the Glenn formation,—the first use of the name 'Hoxbar'."

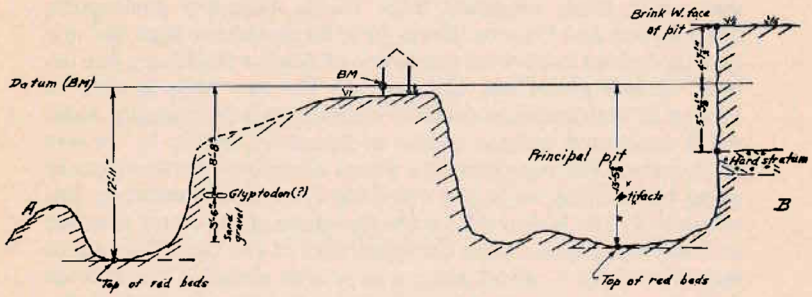
C. N. Gould's Map of Frederick Gravel Pit

In the files of the Survey is a manuscript map made by Dr. Gould at the time of the discovery of the Glyptodon specimen. This map is here reproduced as important evidence bearing on the question of the age of the bones and artifacts (see The Hopper, vol. 15, no. 8, pp. 96-105).



Sketch Map showing location of Glyptodon (?) find

A.H. Halloman Gravel Pit
(1½ mi. n. of Frederick, Okla.)
Oct. 8, 1927
Gould
Decker
Spier, del.



Section A-B

Survey Publications for Early Release

BULLETIN 74	Geology of Seminole County. Text in press, map ready for press. Probably on sale in February.
CIRCULAR 32	Spores of the Croweburg coal. Ready for the press.
CIRCULAR 35	Post-Boone outliers of northeastern Oklahoma. In press. Galley has been read and color separation proof of maps examined. To be released in October.
CIRCULAR 36	Spores of the McAlester-Stigler coal. In press. Plates printed. To be released in November.
CIRCULAR 37	New Pleistocene fauna of western Oklahoma. In press. Galley has been read. To be released in September.
MINERAL REPORT 28	Economic possibilities of Henryhouse marlstone. In press. For release in October.
MINERAL REPORT 29	Gypsum resources of Oklahoma. In press. For release in October.
MAP 72-1	Mineral map of Oklahoma. In press. Color proof examined. For release in September.
MAP 72-2	Map of ground-water reservoirs of Oklahoma. In press. Color separation proof examined. To be released in October.