RAGGEDY MOUNTAIN GABBRO GROUP
WICHITA MOUNTAINS

The Cambrian (?) Raggedy Mountain Gabbro Group, as formally
designated by Ham, Denison, and Merritt (1964, OGS Bulletin 95), includes two
distinctly different units. The older of these is called the Glen Mountains layered
complex and consists of several zones of cumulate rocks, which are mostly gabbroic anorthosites. The younger is represented by several types of biotite-bearing
gabbro as explained by Hunter (1967, in OGS Guidebook, with Stone, editor)
and by Powell and Fischer (1976, in OGS Guidebook). Quarrying for road
material in the NE 1/4 sec. 14, T. 4 N., R. 17 W., Kiowa County, has yielded
beautiful exposures that document relative ages of these two mafic units.

The photograph shows a scarp face with biotite-gabbro intruding a lighter
anorthositic member of the layered complex, which is seen as a V-shaped mass at
top. The contact is knife sharp throughout the exposure. Near the contact in
several places (but not in the photograph) are small inclusions of anorthosite in
biotite-gabbro confirming the intrusive relations.

At the bottom of the scarp, the hammer (length 14 inches) is resting on a
darker, subhorizontal dike in the biotite-gabbro of what is called “intrusion
breccia” or “mixed rock.” This dike, related to the Cold Springs “granite,” con-
­sists of mafic and silicic phases each reflecting later separate intrusive events.

—M. Charles Gilbert
BIBLIOGRAPHY AND INDEX OF OKLAHOMA GEOLOGY, 1977

Compiled by Elizabeth A. Ham

Bibliography—pages 119-149
Index—pages 149-168

BIBLIOGRAPHY


---

1 Includes some earlier listings.
2 Associate editor, Oklahoma Geological Survey.


Bartolina, D. G., see Cole, E. L., Bartolina, D. G., and Swafford, B. G.


Bellis, W. H., see Fryberger, J. S., and Bellis, W. H.

Bergström, S. M., see Sweet, W. C., and Bergström, S. M.


locality, Lower Permian of Oklahoma: Fieldiana, v. 37, no. 3, p. 61–73, 5 figs.


Boneau, D. F., see Kleinschmidt, R. F., Trantham, J. C., Boneau, D. F., and Patterson, H. L.


Boy, J. A., see Reiter, Leon, and Bray, D. E.


Brown, C. J., see Strimple, H. L., and Brown, C. J.


Burke, W. H., see Denison, R. E., Burke, W. H., Otto, J. B., and Hetherington, E. A.

Burutch, F. W., see Johnson, J. P., and Burutch, F. W.

Burutch, F. W., see also Thomas, R. D., Walker, C. J., and Burutch, F. W.


42. Chandler, C. E., 1977, Subsurface stratigraphic analysis of selected sand-
stones of the “Cherokee” Group, southern Noble County, Oklahoma [part 1]: Shale Shaker, v. 28, p. 56–59, figs. 1–3.


Chaudhuri, S., see Cullers, R. L., and Chaudhuri, S.

Clampitt, R. L., see Boneau, D. F., and Clampitt, R. L.

Clampitt, R. L., see also Trantham, J. C., and Clampitt, R. L.


54. Conybeare, C. E. B., 1976, Geomorphology of oil and gas fields in sand-
stone bodies: Elsevier Scientific Publishing Co., Amsterdam, 341 p., illus. (Includes Oklahoma fields and sandstones.)


Corley, R. K., see Thomas, W. O., Jr., and Corley, R. K.

Cox, W. C., see Dickey, P. A., and Cox, W. C.

Cramer, F. H., see Diéz, M. d.C. R., and Cramer, F. H.

58. Cuffey, R. J., 1977, Ctenostone bryozoans and burrowing barnacles of the Wreford Megacyclothem (Lower Permian; Kansas-Oklahoma-Nebraska) [abstract]: Geological Society of America Abstracts with Programs, v. 9, p. 587-588. (Reprinted in Oklahoma Geology Notes, v. 37, p. 56.)

Cuffey, R. J., see Simonsen, A. H., and Cuffey, R. J.

Culbertson, J. N., see Simon, D. E., Kaul, F. W., and Culbertson, J. N.


Cunningham, J. W., see DuBois, B. M., Johnson, J. P., and Cunningham, J. W.


Davis, R. E., see Playton, S. J., and Davis, R. E.

63. De Filippo, R. J., 1977, Cadmium, in Metals, minerals, and fuels, v. 1 of

De Filippo, R. J., see Cammarota, V. A., Jr., and De Filippo, R. J.


Dewey, J. F., see Burke, Kevin, Dewey, J. F., and Kidd, W. S. F.


DuBois, R. L., see Lawson, J. E., Jr., DuBois, R. L., and Foster, Paul Ebanks, W. J., see Wells, J. S., Ebanks, W. J., and Roberts, J. F.

Eddy, R. E., see Sneider, R. M., Richardson, F. H., Paynter, D. D., Eddy, R. E., and Wyant, I. A.


Ethington, R. L., see Repetski, J. E., and Ethington, R. L.
Fanelli, L. L., see Clarke, T. G., and Fanelli, L. L.
Fanelli, L. L., see also Koelling, G. W., and Fanelli, L. L.


74. Fisher, C. F., and Swafford, Bill, 1976, Soil survey of Canadian County, Oklahoma: U.S. Soil Conservation Service in cooperation with Oklahoma Agricultural Experiment Station, 64 p., 5 figs., 69 soil maps, 10 tables.


Forester, E. B., see Hazel, J. E., and Forester, E. B.
Forteyp, R. A., see Shaw, F. C., and Forteyp, R. A.
Foster, G. T., see Murphy, R. P., Foster, G. T., and Owens, W. W.
Foster, Paul, see Lawson, J. E., Jr., DuBois, R. L., and Foster, Paul


Friedman, S. A., see Manley, F. H., Friedman, S. A., and Mankin, C. J.
86. Fryberger, J. S., and Bellis, W. H., 1977, Quantifying the natural flushout
of alluvial aquifers: Ground Water, v. 15, p. 58-65, 6 figs. (Concerns
Red River and Arkansas River alluvial aquifers.)
exploration: Journal of Geochemical Exploration, v. 7, p. 155-188,
9 figs., 11 tables.
stratigraphic model of depositional platform margin, eastern Anadarko
basin, Oklahoma: American Association of Petroleum Geologists Bulle-
tin, v. 61, p. 1437-1447, 8 figs.
89. Gann, D. E., 1976, The geology and microscopy of the Prewitt copper
shale (Permian), Jackson County, Oklahoma: University of Missouri
at Rolla unpublished Ph.D. dissertation, 425 p. (Abstract in Disserta-
tion Abstracts International, sec. B, v. 37, no. 9, p. 4366-B, and in
Petroleum Abstracts, v. 17, p. 945.)
90. Gatewood, L. E., 1977, Stratigraphic trap possibilities in the Arbuckle
Group [abstract]: Shale Shaker, v. 28, p. 36.
of the Clinton National Topographic Map, NI 14-2, Oklahoma: U.S.
Energy Research and Development Administration Report GJBX-34
(76), v. 1, 52 p. plus 20 p. appendix, 18 figs., 4 tables.
of the Lawton National Topographic Map, NI 14-5, Texas and Okla-
homa: U.S. Energy Research and Development Administration Re-
port GJBX-34 (76), v. 1, 62 p. plus 33 p. appendix, 28 figs., 4 tables.
of the Oklahoma City National Topographic Map, NI 14-3, Okla-
homa: U.S. Energy Research and Development Administration Re-
port GJBX-34 (76), v. 1, 52 p. plus 37 p. appendix, 19 figs., 4 tables.
Glass, C. R., see Hyne, N. J., and Glass, C. R.
94. Goemaat, R. L., 1976, Ground-water levels in observation wells in Okla-
142 p., 1 fig., 1 table.
95. Goemaat, R. L., 1977, Ground-water levels in observation wells in Okla-
1 fig., 1 table. (Prepared in cooperation with Oklahoma Water Re-
sources Board.)
96. Goemaat, R. L., 1977, Selected water-level records for western Oklahoma,
1 fig., 1 table. (Prepared in cooperation with Oklahoma Water Re-
sources Board.)
97. Goemaat, R. L., 1977, Selected water-level records for western Oklahoma,
1 fig., 1 table. (Prepared in cooperation with Oklahoma Water Resources Board.)


Gordon, Mackenzie, Jr., see Saunders, W. B., Manger, W. L., and Gordon, Mackenzie, Jr.

101. Grayson, R. C., Jr., 1977, Correlation of late Morrowan and early Atokan (Early Pennsylvanian) conodont faunas from the frontal Ouachita Mountains and the Ardmore basin (Oklahoma) [abstract]: Geological Society of America Abstracts with Programs, v. 9, p. 600. (Reprinted in Oklahoma Geology Notes, v. 37, p. 57–58.)

102. Grayson, R. C., Jr., and Sutherland, P. K., 1977, Conodont evidence for unconformity within Trace Creek Shale Member of Bloyd Formation (Lower Pennsylvanian) in northwestern Arkansas and northeastern Oklahoma, in Sutherland, P. K., and Manger, W. L. (editors), Upper Chesterian–Morrowan stratigraphy and the Mississippian-Pennsylvanian boundary in northeastern Oklahoma and northwestern Arkansas: Oklahoma Geological Survey Guidebook 18, p. 181–185, 3 figs., 1 table.

Grayson, R. C., Jr., see Sutherland, P. K., and Grayson, R. C., Jr.


Grover, E. S., see Williams, G. E., and Grover, E. S.


Gutschick, R. C., see Rodriguez, Joaquim, and Gutschick, R. C.


Haley, B. R., see Stone, C. G., and Haley, B. R.


Hanson, R. E., see Al-Shaieb, Zuhair, and Hanson, R. E.

Hanson, R. E., see also Al-Shaieb, Zuhair, Olmsted, R. W., Shelton, J. W., May, R. T., Owens, R. T., and Hanson, R. E.


Hattin, D. E., see Kaufman, E. G., Hattin, D. E., and Powell, J. D.


119. Hazen, J. E., and Forester, E. B., 1977, Ostracode assemblage zones in the upper Austinian and Tayloran (Campanian) of Arkansas and Okla-


Henry, T. W., see Sutherland, P. K., and Henry, T. W.

Henson, B. L., see Lee, L. J., and Henson, B. L.

Hetherington, E. A., see Denison, R. E., Burke, W. H., Otto, J. B., and Hetherington, E. A.


Hicks, J. F., see Landman, G. B., Hicks, J. F., and Ihloff, T. W.


129. Horowitz, A. S., and Macurda, D. B., Jr., 1977, Late Mississippian and
Early Pennsylvanian blastoids from northeastern Oklahoma and northwestern Arkansas, in Sutherland, P. K., and Manger, W. L. (editors), Upper Chesterian–Morrowan stratigraphy and the Mississippian-Pennsylvanian boundary in northeastern Oklahoma and northwestern Arkansas: Oklahoma Geological Survey Guidebook 18, p. 169–170, 1 table.


Hulke, S. D., see Kehle, R. O., and Hulke, S. D.


Ihloff, T. W., see Landman, G. B., Hicks, J. F., and Ihloff, T. W.


Johnson, C. H., see Keller, W. D., Viele, G. W., and Johnson, C. H.
Johnson, F. S., see Heath, L. J., Miller, J. S., and Johnson, F. S.


144. Johnson, K. S., 1977, Faulted strata on south flank of Arbuckle Mountains: Oklahoma Geology Notes, v. 37, p. 150. (Cover-photo description.)


147. Johnson, K. S., 1977, Limestone and shales on the southwestern edge of the Arbuckle anticline: Oklahoma Geology Notes, v. 37, p. 66. (Cover-photo description.)


Johnson, K. S., see Arndt, R. H., Johnson, K. S., and Roberts, J. F.


Kaul, F. W., see Simon, D. E., Kaul, F. W., and Culbertson, J. N.


Koch, M. R., see Morris, R. C., Proctor, K. E., and Koch, M. R.

165. Koelling, G. W., and Fanelli, L. L., 1977, Natural gas, in Metals, minerals,


Lakey, C. J., see Roy, M. B., Tucker, C. W., and Lakey, C. J.
Lamb, G. C., see Steele, K. F., and Lamb, G. C.


Lansford, Bryan, see Kent, D. C., Watts, K. R., and Lansford, Bryan


Levorson, C. O., see Kolata, D. R., Strimple, H. L., and Levorson, C. O.

178. Lewis, R. D., 1977, Depositional environments and paleoecology of the Oil Creek Formation (Middle Ordovician), Arbuckle Mountains, Oklahoma [abstract]: Geological Society of America Abstracts with Programs, v. 9, p. 59. (Reprinted in Oklahoma Geology Notes, v. 37, p. 32-33.)


Longman, M. W., see Sprinkle, James, and Longman, M. W.


McBride, E. F., see Briggs, Garrett, McBride, E. F., and Moiola, R. J.

McBride, E. F., see also Sholes, Mark, and McBride, E. F.


McClaslin, R. G., see D'Lugosz, J. J., and McClaslin, R. G.


Manger, W. L., see Saunders, W. B., Manger, W. L., and Gordon, Mackenzie, Jr.

Manger, W. L., see also Sutherland, P. K., and Manger, W. L.


Mankin, C. J., see Manley, F. H., Friedman, S. A., and Mankin, C. J.


(Reprinted in Oklahoma Geology Notes, v. 37, p. 33.)

Mapes, R. H., see Strimple, H. L., and Mapes, R. H.

Marcher, M. V., see Carr, J. E., and Marcher, M. V.
Marshall, S. Y., see Galloway, W. E., Marshall, S. Y., and Whipple, A. P.
from the western United States: Review of Palaeobotany and Paleontology, v. 24, p. 195–208, 2 figs., 1 pl., 3 tables. (Describes specimens
from Ogallala Formation.)

200. Maxwell, J. C., 1977, Influence of depth, temperature, and geologic age on
porosity of quartzose sandstone, in Ali, S. A., and Friedman, G. M.
(editors), Diagenesis of sandstones: American Association of Petrole-
um Geologists Reprint Series 20, p. 83–95, 14 figs. (Reprinted from

May, R. T., see Al-Shaieb, Zuhair, Olmsted, R. W., Shelton, J. W., May,
R. T., Owens, R. T., and Hanson, R. E.

201. Mayhugh, R. E., 1977, Soil survey of Pottawatomie County, Oklahoma:
U.S. Soil Conservation Service in cooperation with Oklahoma Agri-
cultural Experiment Station, 118 p., 10 figs., 67 soil maps, 19 tables.

202. Meleen, N. H., 1977, Strip mines and fluvial systems; geomorphic effects
and environmental impact in northeastern Oklahoma: Clark Uni-
versity unpublished Ph.D. dissertation, 264 p. (Abstract in Disserta-
tion Abstracts International, v. 38, no. 5, p. 2100-B.)

figs., 1 table. (Refers to Ouachita tectonic belt and "Tulsa Mountains,"
Oklahoma.)

Meyer, E. L., see Guisti, E. V., and Meyer, E. L.
Michalski, B. C., see Harper, W. B., Michalski, B. C., and Parker, M. R.
Miller, J. S., see Heath, L. J., Miller, J. S., and Johnson, F. S.

204. Mining Informational Services, 1977, Oklahoma, in 1977 Keystone coal
937–939. (Lists producers and mines.)

quakes in the United States, October-December 1975: U.S. Geological
Survey Circular 749-D, 27 p., 10 figs., 2 tables.

Minsch, J. H., see Stover, C. W., Simon, R. B., Person, W. J., and Minsch,
J. H.

206. Moiola, R. J., and McBride, E. F., 1975, Sedimentology of Ouachita turbid-
dites, southeastern Oklahoma: a summary, in Dallas Geological Society,
A guidebook to the sedimentology of Paleozoic flysch and associated
deposits, Ouachita Mountains–Arkoma basin, Oklahoma: Fieldtrip

Moiola, R. J., see Briggs, Garrett, McBride, E. F., and Moiola, R. J.
Monaghan, P. H., see Young, Allen, Monaghan, P. H., and Schweisberger,
R. T.

207. Morris, J. W. (editor), 1977, Geography of Oklahoma: Oklahoma Histori-
cal Society, Oklahoma City, 182 p., 12 papers, illus.

208. Morris, R. C., 1977, Favorable hydrocarbon potential predicted for Ouachita
Mountains [abstract]: American Association of Petroleum Geologists


National Stripper Well Association, see Interstate Oil Compact Commission and National Stripper Well Association

Nestell, M., see Scott, R. W., Root, S. A., Tenery, J. H., and Nestell, M.
Newland, C. T., see Polone, D. J., Newland, C. T., and Swaafford, B. G.


Nuttli, O. W., see Gupta, I. N., and Nuttli, O. W.


219. Oil and Gas Journal staff, 1977, Anadarko basin, home of the deep holes: Oil and Gas Journal, v. 75, no. 21, p. 98.

220. Oil and Gas Journal staff, 1977, New Oklahoma play blossoms: Oil and Gas Journal, v. 75, no. 8, p. 103, 1 fig.

221. Oil and Gas Journal staff, 1977, Prolific wells revive old U.S. oil area: Oil and Gas Journal, v. 75, no. 28, p. 38–39, 1 fig. (Logan County wells.)

222. Oil and Gas Journal staff, 1977, Recovery projects net mixed results: Oil and Gas Journal, v. 75, no. 38, p. 72–73, 3 tables.


Olmsted, R. W., see Al-Shaieb, Zuhair, Olmsted, R. W., Shelton, J. W., May, R. T., Owens, R. T., and Hanson, R. E.


Otto, J. B., see Denison, R. E., Burke, W. H., Otto, J. B., and Hetherington, E. A.

Owens, R. T., see Al-Shaieb, Zuhair, Olmsted, R. W., Shelton, J. W., May, R. T., Owens, R. T., and Hanson, R. E.

Owens, W. W., see Murphy, R. P., Foster, G. T., and Owens, W. W.


Programs, v. 9, p. 638–639. (Reprinted in Oklahoma Geology Notes, v. 37, p. 60.)


Parker, M. R., see Harper, W. B., Michalski, B. C., and Parker, M. R.
Patterson, H. L., see Kleinschmidt, R. F., Trantham, J. C., Boneau, D. F., and Patterson, H. L.


Person, see Minsch, J. H., Stover, C. W., Person, W. J., and Simon, R. B.
Person, W. J., see also Stover, C. W., Simon, R. B., Person, W. J., and Minsch, J. H.
Phelps, D. W., see Powell, B. N., and Phelps, D. W.
Pittman, E. D., see Wilson, M. D., and Pittman, E. D.


234. Polone, D. J., 1976, Soil survey of Wagoner County, Oklahoma: U.S. Soil Conservation Service in cooperation with Oklahoma Agricultural Experiment Station, 66 p., 13 figs., 49 soil maps, 13 tables.


Powell, J. D., see Kauffman, E. G., Hattin, D. E., and Powell, J. D.


Proctor, K. E., see Morris, R. C., Proctor, K. E., and Koch, M. R.

239. Reasoner, R. C., 1974, Soil survey of McCurtain County, Oklahoma: U.S. Soil Conservation Service in cooperation with Oklahoma Agricultural Experiment Station, 99 p., 12 figs., 58 soil maps, 11 tables.


Richardson, F. H., see Sneider, R. M., Richardson, F. H., Paynter, D. D., Eddy, R. E., and Wyant, I. A.


Roberts, J. F., see Arndt, R. H., Johnson, K. S., and Roberts, J. F.

Roberts, J. F., see also Wells, J. S., Ebanks, W. J., and Roberts, J. F.

245. Rodríguez, Joaquin, and Gutschick, R. C., 1977, Barnacle borings in live and dead hosts from the Louisiana Limestone (Famennian) of Missouri: Journal of Paleontology, v. 51, p. 718–724, 1 text-fig., 1 pl., 2 tables. (List of Oklahoma occurrences.)


Roeder, Dietrich, see Briggs, Garrett, and Roeder, Dietrich


Root, S. A., see Scott, R. W., Root, S. A., Tenery, J. H., and Nestell, M.

[Number 248 omitted.]


141


Schultz, D. J., see Blatt, Harvey, and Schultz, D. J.


Schweisberger, R. T., see Young, Allen, Monaghan, P. H., and Schweisberger, R. T.


Shelton, J. W., see Al-Shaieb, Zuhair, and Shelton, J. W.

Shelton, J. W., see also Al-Shaieb, Zuhair, Olmsted, R. W., Shelton, J. W., May, R. T., Owens, R. T., and Hanson, R. E.

Sheskin, I. M., see Osslund, J. P., and Sheskin, I. M.


Simon, R. B., see Minsch, J. H., Stover, C. W., Person, W. J., and Simon, R. B.

Simon, R. B., see also Stover, C. W., Simon, R. B., Person, W. J., and Minsch, J. H.


268. Simonsen, A. H., and Cuffey, R. J., 1977, Fenestrate and pinnate bryozoans in the Wreford Megacyclothem (Lower Permian; Kansas, Oklahoma, and Nebraska) [abstract]: Geological Society of America Abstracts with Programs. v. 9, p. 652. (Reprinted in Oklahoma Geology Notes, v. 37, p. 61.)


Sleslavinskiy, K. B., see Ronov, A. B., Sleslavinskiy, K. B., and Khain, V. Ys.


272. Sneider, R. M., 1977, Application of reservoir geologic methods to improve ultimate recovery [abstract]: American Association of Petro-
leum Geologists Bulletin, v. 61, p. 831–832. (Information on Elk City field.)


Sniegocki, T. M., see Bedinger, M. S., and Sniegocki, R. T.


Sprinkle, James, see Katz, S. G., and Sprinkle, James


Stone, C. G., see Gordon, Mackenzie, Jr., and Stone, C. G.


Stover, C. W., see Minsch, J. H., Stover, C. W., Person, W. J., and Simon, R. B.


Strimple, H. L., see Frest, T. J., and Strimple, H. L.

Strimple, H. L., see also Kolata, D. R., Strimple, H. L., and Levorson, C. O.

Strimple, H. L., see also Pabian, R. K., and Strimple, H. L.

Strimple, H. L., see also Warn, J., and Strimple, H. L.

294. Suhm, Raymond, 1977, Joins–Oil Creek outcrops of the Simpson Group (Middle Ordovician), Beach and Baylor Mountains, Culberson County, Texas [abstract]: Geological Society of America Abstracts with
Programs, v. 9, p. 75–76.


Sutherland, P. K., see Grayson, R. C., Jr., and Sutherland, P. K.

Sutherland, P. K., see also Henry, T. W., and Sutherland P. K.

Swafford, B. G., see also Cole, E. L., Bartolina, D. G., and Swafford, B. G.

Swafford, B. G., see also Fisher, C. F., and Swafford, Bill

Swafford, B. G., see also Polone, D. J., Newland, C. T., and Swafford, B. G.


Tener, J. H., see Scott, R. W., Root, S. A., Tenery, J. H., and Nestell, M.


Tranham, J. C., see Kleinschmidt, R. F., Tranham, J. C., Boneau, D. F., and Patterson, H. L.
Tucker, C. W., see Roy, M. B., Tucker, C. W., and Lakey, C. J.


Viele, G. W., see Keller, W. D., Viele, G. W., and Johnson, C. H.
Wall, L. J., see Clark, N. E., and Wall, L. J.
Walker, C. J., see Thomas, R. D., Walker, C. J., and Burch, F. W.

313. Walper, J. L., Paleozoic tectonics of southern margin of North America [abstract]: American Association of Petroleum Geologists Bulletin,
v. 61, p. 1549. (Reprinted in Oklahoma Geology Notes, v. 38, p. 33–34.)
Warmath, A. T., see Tehan, R. E., and Warmath, A. T.
Watts, K. R., see Kent, D. C., Watts, K. R., and Lansford, Bryan
Whipple, A. P., see Galloway, W. E., Marshall, S. Y., and Whipple, A. P.
Williamson, E. A., see Davies, D. K., and Williamson, E. A.
323. Wilson, J. L., 1977, Carbonate facies in geologic history: Springer-Verlag, New York, 471 p., illus., 30 pls. (Includes numerous Oklahoma examples.)

Wright, W. B., see Cohoee, G. V., and Wright, W. B.
Wyant, I. A., see Sneider, R. M., Richardson, F. H., Paynter, D. D., Eddy, R. E., and Wyant, I. A.


Zick, Alan, see Waugh, Richard, and Zick, Alan


INDEX

(Numbers refer to entries in bibliography)

AGE DATING:
hydrocarbon assemblages, dating of, 326
isotopic, Ouachita foldbelt, 63
potassium/argon, Ouachita foldbelt, 64, 330
rubidium/strontium: Havensville Shale, 45; Ouachita alkaline subsurface rocks, 330; Ouachita tectonics, 64

ANADARKO BASIN
deep wells, 16, 141, 162, 195, 219, 238, 278
iodine, 55
petroleum and natural gas, 16, 34, 54, 65, 141, 162, 195, 219, 238, 266, 273, 278, 318
sedimentology, 8, 54, 88, 273, 283, 318, 328
seismic study, 88
stratigraphy 88, 327
structure and tectonics, 8, 37, 54, 88, 126, 187, 212, 276, 312, 313, 318, 327, 328
Washita River–Meers Valley–Mountain View fault, 126

ARBUCKLE MOUNTAINS:
algal mounds, 323
Blue River fault, 188
Bromide Formation, 30, 57, 118, 146, 166, 180, 181, 182, 259, 275, 299, 314
Clarita fault, 188
conodonts, 259
Dougherty anticline, 145
Eocambrian rocks, 251
Frank's fault zone, 188
ggeomorphology, 98
graptolites, 19
Mill Creek fault and syncline, 187, 188, 189
mineral production, 143
Oil Creek Formation, 57, 146, 178, 259, 294, 299
Precambrian geology, 161
Reagan fault, 188, 189
sedimentology, 37, 178, 180, 259, 294, 318, 323
Simpson outcrops, Texas, 294
source of Permian San Angelo deposits, Texas, 270
stratigraphy, 188
structure and tectonics, 2, 37, 143, 144, 145, 146, 147, 149, 161, 180, 181, 187, 188, 189,
251, 276, 313, 318
Sulphur fault and syncline, 188
trilobites, 36, 259
Washita Valley fault and syncline, 188

ARDMORE BASIN:
Golf Course Formation, conodonts, 101
Lake Murray Formation, conodonts, 101
petroleum, 318
seismic activity, 190
structure, 187, 190, 276, 318

ARKOMA BASIN:
Arbuckle facies, 28, 29
Atocha Formation, 9, 28, 29
Boocho sand, 54
gas fields, 65
sedimentology, 8, 28, 29, 40, 54, 60
seismic activity, 190
structure and tectonics, 8, 9, 28, 29, 37, 60, 160, 190
trace fossils, 40
bibliographies: Oklahoma geology, 1976, 114; Paleozoic crinoids, 317; remote sensing, 168;
sandstone reservoirs, 173

CAMBRIAN:
Arbuckle Group, 37, 38, 90, 118, 188, 193, 280, 284, 326: Butterly Formation, 37, 280;
Fort Sill Formation, 37, 118, 280; Honey Creek Formation, 37, 118, 280; Reagan
Formation, 37, 118, 251, 280; Royer Formation, 37, 118, 280; Signal Mountain
Formation, 37, 118, 280
Cambrian-Ordovician boundary, 280
Carlton Rhyolite Group, 118, 236, 251
Mount Sheridan Gabbro, 236
Navajo Mountain Group, 251
Ouachita eugeosyncline, 247
Quanah Granite, 1, 3
Raggedy Mountain Gabbro Group, 118, 236
Saratoga zone, 280
Saukia zone, 280
Taenicephalus zone, 280
Tillman Group, 251
Timbered Hills Group, 118, 188, 280; Honey Creek Formation, 118, 280; Reagan Sandstone, 118, 280
Wichita Complex, Wichita Granite Group, 118, 236, 251

Carboniferous, see also Mississippian and Pennsylvanian:
  correlation chart for Oklahoma and Kansas, 99
  Ouachita Mountains, ammonoid-zone correlation, 100
  stratigraphy: general, 297, 298; Tri-State district, 108
  Tri-State district, lead-zinc ores, 108

clays: role in formation of micropar, Bromide Formation, 182; see also Mineral Industries: commodities

Clinton quadrangle, radiometric and magnetic survey, 91

Coal:
  coal beds: Baldwin coal, 171, 329; Bluejacket coal, 103; Boggy Formation coal beds, 83, 103; Booch coal, 9; Cavanal coal, 85, 198; Croweburg coal, 4, 81, 85, 198; Dawson coal, 85; Drywood coal, 103, 198; Fleming coal, 81; general, 84, 230; Hartshorne coals 5, 9, 83, 85, 198, 215, 218; Iron Post coal, 4, 81, 85; Leigh coal, 9; Lower Witteville coal, 85; McAlester Formation coal beds, 83, 85, 103; Mineral coal, 81, 85; Neutral coal, 103; Rowe coal, 85, 103, 198, 218; Savanna Formation coal beds, 83, 103; Secor coal, 85, 198, 218; Seminole coals, 4; Senora Formation coals, 81, 83; Stigler coal, 85, 198; Tebo coal, 4; Weir-Pittsburg coal, 81, 85
  coking coal, 56, 82
  gasification, 83
  kerogen analysis, 117
  mine disasters, 230
  mined-land reclamation, 148, 230
  mining operations, 11, 84, 204
  Mokogee County, general, 218
  Oklahoma Geological Survey programs, 197
  origin, alteration of organic matter, 5
  producers, 12, 84, 204, 230
  reserves and resources, 81, 82, 83, 84, 85, 103, 148, 198, 215, 320
  statistics, 10, 11, 12, 56, 82, 84, 85, 148, 230, 308, 309, 320
  sulfur content, 84
  technology, 84, 85, 230, 320
  transportation, 12, 320
  underclays, 198

Copper:
  Creta deposit, 91, 92, 93, 270
  Mangum deposit, 91, 92, 93
  Meadows copper shale, 89, 92
  mineralization, 89, 91, 92, 93, 122, 123, 270
  Prewitt copper shale, 89, 92
  statistics, 11, 12, 148, 230, 309

Counties:
  all counties: hydrologic units, 311; mineral production, 12, 230; Oklahoma earthquakes, 172; petroleum and natural gas statistics, 13, 136, 244, 300; surface-water-quality data, 285
  all western counties, ground-water levels, 96, 97
  Adair: Atoka Formation, 152; crinoids, 288; microfauna, 217; Trace Creek Shale, 102
Alfalfa: Mississippian trend, enhanced recovery, 115; soil survey, 322; Wakita trend, 54
Atoka: Arkansas Novaculite, 156; Boswell Reservoir, 133; coal, 85
Beaver: fossil wood, 199
Beckham: copper, 122; deep wells, 195, 219, 300; Elk City field, 272, 273; Hunton production, 141; Morrow sands, 34; petroleum and natural gas, general, 300; South Erick gas area, 2; stratigraphy, 327, 328; structure, 327, 328
Blaine: copper, 122; gypsum plant, 240; Mississippian trend, enhanced recovery, 115
Bryan: Bokchito Formation, 134; Boswell Reservoir, 133
Calvert: deep wells, 195; East Binger field, 124; East Cement field, 2
Canadian: seismic stratigraphic study, 88; soil survey, 74
Carter: Arbuckle Mountains, 144; Sholom Alechem field, 46
 Cherokee: Atoka Formation, 152; blastoids, 129; crinoids, 288, 289; Morrowan-Atokan unconformity, 102
Choctaw: Bokchito Formation, 134; Boswell and Hugo Reservoirs, 133
Cimarron: Cretaceous chalk analyses, 255; Upper Cretaceous rocks, 154, 255
Cleveland: fossil amphibian, 107; geomorphology, 110; road-bank erosion, 110
Coal: Atoka Formation, 9; coal, 85
Comanche: amphibian, 21; copper, 122; uranium in sandstone lenses, 2; Wichita Complex, 236
Cotton: copper, 122; radioactive deposits, 2
Craig: Atoka Formation, 152; coal, 81, 84, 85, 320; crinoids, 287, 288
Creek: coal, 85; Shoestring field, 54; Tuskegee field, 54; Vamoosa aquifer, 67
Custer: deep wells, 195; structure and stratigraphy, 327, 328
Garfield: copper, 122; Mississippian trend, enhanced recovery, 115
Garvin: copper, 122
Grady: Cox City, radioactive anomalies, 2
Grant: copper, 122; Wakita trend, 54
Greer: copper, 122; South Erick gas area, 2
Haskell: coal, 56, 84, 85, 320; coking coal, 56
Jackson: copper, 122
Jefferson: copper, 122; radioactive sandstones, 2
Johnston: soil survey, 31
Kay: Burbank field, 54
Kingfisher: Mississippian trend, enhanced recovery, 115; vertebrate fossils, 26
Kiowa: Wichita Complex, 236
Latimer: coal, 84, 85
LeFlore: coal, 56, 83, 84, 85, 320; coking coal, 56; waste-treatment program, 192; Wildhorse Mountain Formation, 183
Lincoln: petroleum exploration, 220; Vamoosa aquifer, 67
Logan: East Guthrie field extension, 221; Garber-Wellington aquifer, 39
Love: Bokchito Formation, 134
McCurtain: coper, 122
McClain: Arbuckle Mountains, 145, 146, 147, 149
McIntosh: coal, 85; palynology, 324
Major: Cheyenne Valley field, 54; Mississippian trend, enhanced recovery, 115
Marshall: Bokchito Formation, 134
Mayes: Atoka Formation, 152; coal, 81, 84, 85; crinoids, 288; soil survey, 235
Murray: Arbuckle Mountains, 145, 146, 147, 149
Muskogee: Atoka Formation, 152; blastoids, 129; coal, 84, 85, 320; crinoids, 287, 288, 291, 292; geology, general, 218; microfauna, 217; mineral resources, 218; Morrowan-Atokan unconformity, 102; Morrowan bioherms, 24
Noble: “Cherokee” Group, subsurface, 42, 43; copper, 122, 123; Northeast Lucien field, 155
Nowata: coal, 81, 84, 85, 320; Delaware Extension field, 54
Okfuskee: coal, 85; Olympic field, 54; Vamoosa aquifer, 67
Oklahoma: Garber-Wellington aquifer, 39; Oklahoma City field, 283, 316, 318
Okmulgee: coal, 84, 85, 320
Osage: Birch Creek valley, 112; Burbank fields, 23, 54; North Stanley field, 70, 142, 158, 159; Vamoosa aquifer, 67
Ottawa: lead-zinc ores, Picher field, 108; zinc-mine-water study, 233
Pawnee: copper, 122, 123; Havensville Shale, Rb/Sr study, 45; Shoestring field, 54; uranium in sandstone lenses, 2; Vamoosa aquifer, 67
Payne: "Cherokee" Group, subsurface, 42, 43, 262, 263; copper, 122, 123; Vamoosa aquifer, 67
Pittsburg: coal, 56, 84, 85, 320; coking coal, 56; South Pine Hollow field, 54
Pontotoc: Atoka Formation, 9; crinoid, 290
Pottawatomie: soil survey, 201; Vamoosa aquifer, 67
Roger Mills: Morrow sands, 34; natural gas development, 25; structure and stratigraphy, 327, 328
Rogers: coal, 56, 81, 83, 84, 85, 103, 320; coking coal, 56; kerogen sample analysis, 117
Seminole: Vamoosa aquifer, 67
Sequoyah: Atoka Formation, 153; coal, 85; Morrow-Atokan unconformity, 102; waste-treatment program, 192
Stephens: Sholom Alchem field, 46
Tillman: fossil amphibian, 107; radioactive anomalies, 2
Tulsa: coal, 85; fossil fish, 331; Shoestring field, 54; soil survey, 53
Wagoner: Atoka Formation, 152; coal, 84, 85; soil survey, 234
Washington: coal, 85; Copan Reservoir, 113; Little Caney River, 113
Washita: Cordell area, geology, 212; deep wells, 16, 195, 219, 238, 300; Morrow sands, 34; structure and stratigraphy, 327, 328

CRETACEOUS:
Bennington Formation, 134
Bokchito Formation, 134; Denton Clay Member, 134; McNutt Limestone Member, 134
Casita Sandstone Member, 134; Soper Limestone Member, 134; Weno Clay Member, 134
Caddo Formation, 134
crinoids, 257
Dakota Group, 154, 327
Grander Shale, 154; Thatcher Limestone Member, 154
Grayson Formation, 134
Greenhorn Formation, 154, 255; Bridge Creek Limestone Member, 154, 255; Hartland Member, 154, 255; Lincoln Member, 154
Kiowa Formation, 327
Marlbrook Formation, ostracodes, 119
outliers, Anadarko basin, 328
Ozan Formation, ostracodes, 119
Upper Cretaceous, Cimarron County, 154, 255
data system, petroleum data, 306

DEVONIAN:
Arkansas Novaculite, 28, 29, 78, 156, 160, 185, 194, 264, 265, 303
brachiopods, 176, 177
Chattanooga Formation, 218: black shale member, 218; Sylamore Sandstone Member, 218
Hunton Group, 36, 141, 162, 188, 225, 290; Bois d'Arc Formation, 36; Frisco Formation, 36, 225; Haragan Formation, 36, 290; Turkey Creek Formation, 225
Hunton production, 141, 162
paleoecology, paleogeography, Early Devonian, 36
Woodford Formation, 29, 155, 188

EARTHQUAKES:
El Reno 1952 earthquake, 105, 190, 191
July—September, 1975, 286
map and catalog of, through 1976, 172
October–December, 1975, 205
relation to Nemaha uplift, 190, 191
spatial attenuation, 105

Environmental Geology:
effect of strip mining on fluvial systems, 202
energy-facilities siting, 15
flood-disaster protection, 15, 170
flood-discharge estimates, 305
general, 15, 207
land use: Alfalfa County, 322; Canadian County, 74; effect of water development, 69;
general, 15; Johnston County, 31; McCurtain County, 239; Mayes County, 235;
Pottawatomie County, 201; regulations, 15, 170, 192; Tulsa County, 53; Wagoner County, 234
mine disasters, 230
mined-land reclamation, 148, 202, 230
Oklahoma Geological Survey programs, 197
road-bank erosion, Cleveland County, 110
soil pollution by oil wastes, 53
soils, see Soils
surface-water management, 15
waste disposal, 192
water laws, 17
water pollution, 86, 138, 192, 202
water quality, see under Hydrology
water-resource planning, 17, 39

Geochemistry:
catagenesis of kerogen, 117
Clay-copper mineral relationship, 123
copper mineralization, 89, 91, 92, 93, 122, 123, 270
crude-oil analyses, Oklahoma City field, 283
Fayetteville Shale, 277
geochemical maps, red-bed copper, 123
isotopic Rb/Sr investigations, 45
lead-zinc ores, Tri-State district, 108
microspar formation, Bromide Formation, 182
Permian red beds, sample analyses, 122
petroleum generation, organic-matter alteration, 5
petroleum hydrocarbons: age dating of, 326; carbon-isotope study, 87; pyrolysis analyses,
Arbuckle rocks, 37, 38; pyrolysis of kerogen, 117
Quanah Granite, pegmatite dikes, 1
uranium, 1
Vamoosa aquifer water, 67
zinc-mine-water analyses, 233

geography: general, 207; Muskogee County, 218

Geomorphology:
Arbuckle Mountains, 98
bar morphology, Red River, 256
Cleveland County, 110
eastern lowlands, 98
fluvial channel patterns, Red River, 256
general, 98, 207
Great Plains, 98
Muskogee County, 218
Osage Plains, 98
Ouachita Mountains, 98
Ozark Mountains, 98
Wichita Mountains, 98

**Geophysics:**

- gravity data, Nemaha uplift, 191
- magnetic survey: Clinton quadrangle, 91; Lawton quadrangle, 92; Nemaha uplift, 191; Oklahoma City quadrangle, 93
- paleomagnetism in petroleum exploration, 124
- radiometric survey: Clinton quadrangle, 91; Lawton quadrangle, 92; Oklahoma City quadrangle, 93
- seismology: Anadarko-basin seismic-stratigraphic model, 88; Ardmore basin, 190; Arkoma basin, 190; earthquakes, general, 172; earthquakes, recordings, 205, 286; earth- quakes, spatial attenuation, 105; electric logs, 88; Fall Line trend, 139; frontal Ouachita belt, 139; gamma-ray logs, Permian and Pennsylvanian, 2; gravity anomalies, southern Oklahoma aulacogen, 276; Morrow-Springer geoseismic model, 50; Nemaha uplift, 139, 190, 191; radioactive anomalies, Permian and Pennsylvanian, 2; recording of train derailment, 242; seismic-exploration statistics, 72; seismic profiles, Mill Creek syncline, 188; shear waves, Arkansas Novaculite, 78; Wichita-Amarillo block, 139

**Hydrogeology/ Hydrology:**

- consumption: Black Fox nuclear plant, 104; general, 1970, 214
- flood control, 170
- hydrologic units, 311
- Lawton quadrangle, general, 118
- Oklahoma Geological Survey programs, 197
- resources: Arkansas-White-Red region, 17; Boswell Reservoir, 133; development of resources, 321; Garber-Wellington aquifer, 39; general, 138, 207; ground water, general, 94, 95, 138; ground water, Lawton quadrangle, 118; ground water, Muskogee County, 218; ground water, western counties, 96, 97; Hugo Reservoir, 133; Lawton quadrangle, general, 118; Vamoosa aquifer, 67
- subsurface waters: Arbuckle-Timbered Hills aquifers, 118; Arkansas River aquifers, 86; Arkansas-White-Red region, 17; Boone Chert aquifer, 157, 233; development of resources, 321; Dog Creek–Blaine–Flowerpot aquifers, 118; Garber-Wellington aquifer, 39; general, 138, 285; ground-water levels, general, 94, 95; ground-water levels, western counties, 96, 97; Lawton quadrangle, 118; legislation, 321; Red River aquifers, 86, 118; Rush Springs–Chickasha–Duncan aquifers, 118; Vamoosa aquifer, 67; zinc-mine water, 233
- surface waters: Arkansas River, 17, 44, 86, 135, 218; Arkansas-White-Red region, 17; Birch Creek, 112; Boswell Reservoir, 133; Canadian River, 44, 110; Cimarron River, 44; Copan Reservoir, 113; Fall Creek, 44; flood discharge, 305; general, 138, 207; Greenleaf Lake, 218; Hilliby Creek basin, 67; Hugo Reservoir, 133; Keystone Reservoir, 69; Kiamichi River, 44; Lake Altus, 118; Lake Ellsworth, 118; Lake Lawtonka, 118; Lawton quadrangle, 118; Little Caney River, 113; Little River, 110; Muskogee County, 218; Neosho River, 44, 218; Pine Creek Reservoir, 69; Polecat Creek basin, 67; Red River, 17, 86, 118, 175, 256; Rock Creek, 44; Spencer Creek basin, 202; surface-water management, 15; use of surface water by nuclear plants, 104; Verdigris River, 44, 104, 218; Washita River, 44
- technology: flood-discharge estimating techniques, 305
- water quality: Arkansas River, 17, 86; Arkansas-White-Red region, 17; Boone Chert aquifer, 157; effect of strip mining, 202; Garber-Wellington aquifer, 39; general, 138, 285; index of data, 285; Lawton quadrangle, 118; LeFlore and Sequoyah Counties, waste treatment, 192; pollution, 86, 138, 192, 202; Red River, 17, 86; Vamoosa aquifer, 67; zinc-mine water, 233

**Indexes:**

- Lower Paleozoic acritarchs, 66
- Oklahoma geology, 1976, 114
- *Oklahoma Geology Notes*, v. 37, 224
Paleozoic crinoids, 317
remote sensing, 168
surface-water-quality data, 285
Lawton quadrangle: hydrology, general, 118; radiometric and magnetic survey, 92; surface geology map, 118
McAlester basin: gas-producing sands, 54
mapping; status of geologic mapping, 310
Maps:
coal mines, eastern Oklahoma, 84
earthquakes through 1976, 172
hydrologic-unit map of Oklahoma, 311
Lawton quadrangle, aquifer map, geologic map, water-quality map, 118
stratigraphic atlas, 260
Marietta basin: petroleum, 318; sedimentation, 318; structure, 318
memorials: Hugh D. Miser, 282, 304; John A. E. F. Norden, 131, 132
Mineral Industries:
commodities: ammonia, 76; bentonite, 148, 230; cadmium, 63; carbon black, 12, 79;
cement, 10, 11, 12, 148, 237, 309; clay and shale, 6, 10, 11, 12, 148, 218, 230, 308;
coal, see Coal; copper, 11, 12, 89, 91, 92, 93, 122, 123, 148, 230, 270, 309; crushed stone and aggregate, 11, 143; general, 148, 207; germanium, 109; granite, 11, 148,
230; gypsum, 10, 11, 12, 148, 230, 240, 308, 309; helium, 10, 11, 12, 48, 308;
iodine, 12, 55; lead and zinc, 11, 35, 108, 148, 230, 253, 305; lime, 309; nitrogen, ammonia plant, 76; petroleum and natural gas, see Petroleum and Natural Gas; pumice, 308, 309; salt, 11, 12, 77, 308, 309; sand and gravel, 10, 11, 12, 201, 218,
230, 231, 308; silica sand, 11, 148; silver, 148, 309; stone, 10, 11, 12, 143, 148, 218,
230, 241, 308; sulfur, 12, 261; thorium, 271; tripoli, 12, 47, 148, 230, 309; underclays, 198; uranium, 1, 2, 3, 91, 92, 93, 151, 310; vermiculite, 269; volcanic ash, 10, 12, 148
producers, 12, 48, 63, 109, 230, 240
regulations, 230
statistics, 6, 10, 12, 47, 48, 56, 77, 79, 148, 151, 230, 231, 237, 240, 241, 261, 308,
309, 320
technology: ammonia plants, 76; brick manufacture, 11; cadmium processing, 63; electrolytic zinc plant, Bartlesville, 35; helium plant, 48; thorium processing plant, 271;
vermiculite exfoliating plant, 269
transportation, 12
Mississippian:
ammonoid zones, 99, 100
Arkansas Novaculite, 28, 29, 78, 156, 160, 185, 194, 264, 265, 303
Batesville Sandstone, 127, 254
Beavers Bend tuff, 216
Boone Formation 108, 233, 323
bryozoans, 128
Caney Formation, Caney Shale, 29, 188, 303
channel fan sequence, reservoirs, 173
Chickasaw Creek Formation, Chickasaw Creek tuff, 64, 194, 216
correlation chart for Oklahoma and Kansas, 99
Fayetteville Shale, 27, 129, 218, 254, 274, 277, 287, 288, 297; Wedington Sandstone Member, 254
Hatton tuff, 64, 216
Hindsville Limestone, 127, 218, 288, 289
Imo Formation, 27, 254, 274, 288
Jackfork Group, 28, 29, 40, 173, 194, 206, 209, 210, 211, 303; Wildhorse Mountain Formation, 28
Johns Valley Formation, 28, 29, 40, 194, 303
lead-zinc ores, 108

156
Miscener Sandstone, 54
Mississippian-Pennsylvanian boundary, 254, 297, 298
Mooresfield Formation, 41, 103, 127, 218, 254; Bayou Menard Member, 218; Ordnance
Plant Member, 218; Ruddel Shale Member, 254; Spring Creek Member, 41, 254
Moyers Formation, 29, 194
Mud Creek tuffs, 64, 216
oil recovery, 115
Pitkin Limestone, 27, 125, 129, 217, 218, 254, 287, 288, 289, 292, 296, 297, 301
Springer Formation, 188
Stanley Group, Stanley Shale, 28, 29, 40, 64, 194, 206, 210, 211, 216, 303
Tennille Creek Formation, 28, 29, 194, 216
tuffs, 28, 64, 194, 216
Woodford Formation, 29

NEMAHA RIDGE, NEMAHA UPLIFT:
relation to earthquakes, 190, 191
relation to major lineaments, 126
seismology, 139, 190, 191
structure, 126, 139, 190, 191, 283, 323
U.S. Nuclear Regulatory Commission study, 190, 191
nuclear energy: Black Fox plant, water consumption, 104
Oklahoma City quadrangle, radiometric and magnetic survey, 93

OKLAHOMA GEOLOGICAL SURVEY:
annual report, July 1, 1976–June 30, 1977, 197
coal programs, 83, 197
environmental geology programs, 197
hydrology programs, 197
petroleum and natural gas programs, 197

ORDOVICIAN
Arbuckle Group, 37, 38, 90, 118, 146, 149, 188, 193, 249, 280, 284, 299, 326: Butterfly
Formation, 37, 280; Cool Creek Formation, 37, 118; Kindblade Formation, 37, 118,
146, 149; McKenzie Hill Formation, 37, 118; Signal Mountain Formation, 37, 280;
West Spring Creek Formation, 37, 118, 146, 149, 299
Bigfork Chert, Bigfork Formation, 29, 64, 157, 160, 194, 243, 303
Blakely Formation, 29, 62, 64, 160, 194, 243, 281, 303
Blaylock Formation, 29, 64, 194
Bromide Formation, 30, 57, 118, 146, 166, 180, 181, 182, 259, 275, 299, 314: Corbin
Ranch Member, 57, 299; Pooleville Member, 57, 275, 299; Mountain Lake Member,
57, 275, 299
cephalopods, 75
Chinneyhill Formation, 232, 299; Keel Limestone Member, 232, 299
Collier Formation, 29, 64, 160, 194, 243, 303
conodont zonation, 169, 179, 294, 299
Crystal Mountain Formation, 29, 62, 64, 160, 194, 243, 303
eyearly Middle Ordovician stratigraphy, 57
echinoderm zonation, 275
Fernvale Limestone, 218, 299
graptolites, 19, 71, 243
Lukiata Formation, 64, 194, 243
McLish Formation, 57, 75, 146, 259, 299
Mazarn Formation, 29, 64, 160, 194, 243, 303
Mississiphoia zone, 280
Missouri Mountain Formation, 29, 160, 194
Ouachita facies, 249
paleogeography, 19, 178, 179, 180, 181, 259
Polk Creek Formation, 29, 160, 194, 303
Simpson Group, 19, 57, 146, 155, 178, 179, 188, 200, 249, 259, 294, 299, 326: Joins
Formation, 19, 57, 146, 179, 259, 294, 299; Marshall Sandstone, 155; Oil Creek Formation, 57, 146, 178, 259, 294, 299
Sylvan Shale 188, 218, 299, 323
*Symphysurina* zone, 280
Tulip Creek Formation, 57, 146, 259, 299
Viola Limestone, 57, 71, 75, 118, 130, 188, 299, 323
Wobble Formation, 29, 160, 194, 243, 303

**Ouachita Mountains (includes Ouachita basin, Ouachita foldbelt, Ouachita geosyncline, Ouachita orogenic belt, Ouachita trend):**
alkalic subsurface rocks, age of, 330
ammonoid zones, 100
Arbuckle facies, 29, 249
arkose erratics, Blakely Sandstone, 281
Benton-Broken Bow uplift, 64, 243, 246, 315
Black Knob Ridge, 157
Cambrian rocks, associations, 247
Choctaw fault, 29, 160, 218
codoncots, 101, 243
flysch facies, 28, 29, 40, 60, 62, 100, 209, 210, 211, 249, 303, 304
gomorphism, 98
hydrocarbon potential, 208, 258
igneous intrusions, chronology, 64
metamorphism: chronology, 64; thermal metamorphism, Arkansas Novaculite, 156
Mississippian tuffs, 28, 64, 216
Ouachita-Marathon thrust belt, 73
Pine Mountain fault, 160
Potato Hills, 157
relation to Appalachians, 304
relation to Black Warrior basin, 203
relation to continental margin and craton, 303
relation to Marathon region, 160, 194
sedimentology, 28, 29, 40, 60, 62, 100, 160, 183, 184, 185, 186, 194, 206, 208, 209, 210, 211, 216, 218, 249, 258, 264, 265, 282, 295, 303, 304, 318
source of lead-zinc mineralization fluids, 258
stratigraphy, 28, 29, 40, 100, 101, 194, 216, 243, 249, 264, 282, 303, 304
structure and tectonics, 28, 29, 32, 33, 37, 60, 64, 73, 100, 126, 139, 160, 189, 194, 203, 208, 218, 243, 246, 249, 251, 282, 303, 304, 312, 313, 315, 318, 330
Ti Valley fault, 160
trace fossils, 40, 60
volcanism, 194
Windingstair fault, 29, 160

**Ozark Mountains: Fayetteville Shale, geochemistry, 277; geomorphology, 98; Precambrian geology, 161; structure, 161, 218**

**PALEOBOTANY:**
algae, 27, 167
algal mounds, 323
cyoads, 196
Hartshorne Formation, 28
*Robinia* wood, 199
Stanley Shale, 100

**PALEOECOLOGY, PALEOENVIRONMENTS, PALEGEOGRAPHY:**
Atoka Formation, 9, 152
Bromide Formation, 180, 181, 275
Cambrian, 280
Carboniferous, Ouachita Mountains, 100
Chesterian, 274

158
Desmoinesian and Missourian, Tulsa area, 4
Early Devonian, 36
Jackfork Group, 208, 209, 210
lower Paleozoic, 62
Morrowan, 154, 274, 296
Oil Creek Formation, 178
Ordovician, 19, 71, 178, 179, 180, 181, 249, 259, 280
Permian: brackish waters, 279; Post Oak Formation, 284
pre-Desmoinesian: Noble County, 43; Payne County, 262
Sauksee Formation, bioherms, 24
Silurian and Devonian, coral biogeography, 225
Upper Cretaceous, Cimarron County, 154
Upper Pennsylvanian, 228, 323
Wichita Mountains, 284
Wreford Megacyclothem, 58, 267, 268

**PALEOZOIC:**
acritarchs, index, 66
barnacle borings, 245
continental margins, 73
crinoids, bibliography and index, 317
cycads, 196
folded strata, Arbuckle Mountains, 145
lower Paleozoic environments, 62
stratigraphy, southern Oklahoma, 187, 188
tectonics, 73, 313

**PALEOZOOLOGY:**
ammonoids, 99, 100, 254, 292
arthropods, 127
barnacles, 58, 245
blastoids, 129, 153, 293
brachiopods, 57, 125, 127, 130, 176, 177
bryozoans, 58, 127, 128, 267, 268
burrows, 127
carpoïds, 166
cephalopods, 75, 292
conodonts, 100, 101, 102, 127, 152, 169, 171, 179, 243, 259, 294, 295, 299
corals, 127, 225, 252
crinoids, 14, 30, 80, 228, 229, 257, 287, 288, 289, 290, 291, 292, 314, 317
dimorphism, trilobites, 36
eyear Late Silurian biofacies, 7
ehinoderms, 127, 275
foraminifers, 9, 27, 100, 127
fusulinids, 9
general: Ardmore area, 140; Chesterian, 127; Oil Creek Formation, 178; Ordovician, 19, 57, 249; Upper Cretaceous, Cimarron County, 154
graptolites, 19, 71, 243
microfauna, general, Chesterian and Morrowan, 217
molluscs, 127, 232
ostracods, 119, 164, 274
Pterocephalid biomere, 280
Psychaspid biomere, 280
radiolarians, 127
sponges, 295
trace fossils, 40, 60, 152
trilobites, 36, 41, 259, 280
vertebrates, 18, 21, 22, 26, 107, 127, 154, 226, 331
worns, 127

**Palynology:**
- basal Permian, Texas, 106
- color alteration of spores, 5
- Holocene, 112, 113, 324
- Paleozoic acritarchs, index, 66
- Pennsylvanian, Texas, 106
- Pennsylvanian-Permian boundary, 51
- pollen: Birch Creek valley, 112; Little Caney River valley, 113

**Pennsylvanian:**
- ammonoid zones, 99, 100
- Atokan Series: Atoka Formation, 9, 28, 29, 40, 54, 61, 101, 102, 152, 164, 186, 188, 194, 218, 295, 296, 297, 303; blastoid, 293
- channel sands, reservoirs, 173
- correlation chart for Pennsylvanian and Mississippian, 99
- coal beds, see Coal

**Desmoinesian:**
- Altamont Limestone, 4
- Atoka Formation, see Atoka Series
- Bandera Shale, 4
- Boggy Formation, 2, 54, 83, 103, 120, 194, 218, 221, 262, 263, 302: Bluejacket-Battlesville Sandstone Member, 2, 54, 103, 120, 218, 221, 262, 302; Crekola Sandstone Member, 218; Inola Limestone Member, 218, 262, 263
- Brown limestone, 262
- Booch coal, 9
- Cabaniss Group, 4, 20, 42, 43, 81, 83, 85, 198, 218, 262, 263: Chelsea coal, 4; Croweburg coal, 4, 81, 85, 198; Excello Shale, 4, 121; Iron Post coal, 4, 81, 85; Prue sands, 4, 42, 43, 262; Senora Formation, Senora coals, 4, 20, 81, 83, 218; Skinner sands, 4, 42, 43, 262, 263; Tebo coal, 4; Verdigris Limestone, 4, 262
- Calvin Formation, 20, 218
- Cavanal coal, 85, 198
- "Cherokee" Group, "Cherokee" sands, 2, 42, 43, 54, 262, 263, 283
- Deese Formation, 326
- Drywood coal, 103, 198
- Fleming coal, 81
- Fort Scott Limestone, 4
- Hartshorne Formation, 5, 9, 20, 28, 83, 85, 194, 198, 215, 218: Cameron-Lequire Member, 218; Keota Sandstone Member, 218; McCurtain Shale Member, 218; Tahapa Sandstone Member, 218; Warner Sandstone Member, 218
- Holdenville Formation, 4
- Krebs Group, 9, 29
- Labette Shale, 4
- Leigh coal, 9
- Lower Witteville coal, 85
- McAlester Formation, 9, 83, 85, 103, 194, 218
- Marmaton Group, 4, 42, 43, 218
- Mineral coal, 81, 85
- Neutral coal, 103
- Nowata Shale, 4
- Oologah Formation, 331
- Oswego Limestone, 42, 43, 262
- Peru sands, 4
- Pink limestone, 262, 263
- Red Fork Sandstone, 42, 43, 54, 262, 263
- Rowe coal, 85, 103, 198, 218
- Savanna Formation, 83, 103, 194, 218: Doneley Limestone Member, 218; Sam
Creek Limestone Member, 218; Spaniard Limestone Member, 218; Spiro Sandstone Member, 40, 54, 218, 325
Secor coal, 85, 198, 218
Stigler coal, 85, 198, 218
Stuart Shale, 218
Weir-Pittsburg coal, 81, 85
Wewoka Formation, 4
Gerran Series: Harrington Formation, 226; Oscar Formation, Oscar Group, 118, 226; pynology, 51, 106
Missourian Series: Belle City Limestone, 88; black shale deposition, 121; Checkerboard Limestone, 4; Cleveland sand, 4; Coffeyville Formation, 4, 331; Dawson coal, 85; Haskell Limestone, 88; Hogshooter Limestone, 4; Hoxbar Group, 88, 326; Layton sand, 4; Lost City Limestone, 4; Marchand sand, 124; Nellie Bly Formation, 4; Seminole Formation, 4; Shell Creek Sandstone, 4; Skiatook Group, 4, 85, 331; Stark Shale, 4; Tonkawa Limestone, 88; Wann Formation, 227; Winterset Limestone, 4
Morrowan Series:
algae, 167
Atoka Formation, see Atakan Series
bioherms, 24
Bloyd Formation, 102, 125, 129, 153, 164, 171, 217, 218, 228, 254, 274, 288, 291, 295, 296, 297, 329: Baldwin coal, 171, 329; Brentwood Limestone Member, 125, 129, 153, 164, 171, 217, 228, 274, 296, 297, 329; Dye Shale Member, 102, 125, 153, 164, 171, 217, 254, 296, 297, 329; Kessler Limestone Member, 102, 125, 153, 164, 171, 217, 254, 296, 297, 329; Trace Creek Shale Member, 102, 125, 164, 171, 217, 254, 296, 297, 329; Woolsey Member, 153, 171, 217, 254, 296, 297, 329
bryozoans, 128
conodont faunas, 101
corals, 252
Golf Course Formation, 101
Hale Formation, 27, 125, 129, 153, 164, 171, 217, 218, 254, 274, 296, 297: Cane Hill Member, 125, 153, 164, 171, 217, 254, 274, 296, 297; Prairie Grove Member, 125, 153, 164, 171, 217, 254, 296, 297
Jackfork Formation, Jackfork Group, 28, 29, 183, 184, 186, 194, 209, 210, 211, 303: Chickasaw Creek Formation, 29, 194; Game Refuge Formation, 29, 194; Markham Mill Formation, 29, 194; Prairie Mountain Formation, 29, 194; Wesley Formation, 29, 194; Wildhorse Mountain Formation, 28, 29, 183, 194
Johns Valley Formation, 28, 29, 194, 295, 303
Lake Murray Formation, 101
McCully Formation, 102, 125, 153, 171, 217, 296, 297: Chisum Quarry Member, 102, 125, 153, 171, 217, 296, 297; Greenleaf Lake Member, 102, 125, 153, 171, 217, 296, 297; Slate “A” Member, 102, 125, 153, 171, 217, 296, 297; Slate “B” Member, 102, 125, 153, 171, 217, 296, 297
Mayes Formation, 303
Morrow sands, 25, 34, 50, 64, 266
Morrowan-Atakan: arkose, 2; boundary, 101, 102, 152, 153
Sausbee Formation, 24, 125, 153, 171, 217, 296, 297: Brewer Bend Limestone Member, 125, 153, 171, 217, 296, 297; Bragg’s Member, 24, 125, 153, 171, 217, 296, 297
Springer Formation, 29, 50, 180, 194, 206, 303
Stanley Shale, 64, 303
Wapanucka Formation, 9, 29, 40, 54, 101, 153, 164, 188, 194, 295, 303
Witt Springs Formation, 27
Pennsylvanian-Mississippian boundary, 254, 297, 298
Pennsylvanian-Permian boundary, 51, 226
rare laths, 59
reservoirs, Elk City field, 273
sandstones, porosity, 200
uranium in sandstones, 2
Virgilian Series: blastoid, 293; Pontotoc Formation, 61; Vamoosa Formation, 67; Vanoss Formation, 2

PERMIAN:
Admire Group, 122, 196
arkose, 2
Blaine Formation, 118, 323
Chickasha Formation, 2, 20, 270
Cloud Chief Formation, 2, 118, 212, 327, 328; Moccasin Creek Gypsum Member, 2, 118
copper, 89, 91, 92, 93, 122, 123, 270
Cretaceous deposit, 91, 92, 93, 270
cycads, 196
Dog Creek Shale, 118, 212, 226
Doyle Shale, 122
Doxey Formation, 2, 212, 327, 328
Duncan Sandstone, 2
Elk City Sandstone, 327, 328
El Reno Group, 2, 20, 26, 89, 91, 118, 226, 270, 323
Enterprise Shale, 122
Eskridge Shale, 122
Fawn Creek Formation, 26, 89, 91, 118, 270
Fort Sill fissure fills, 21
Garber Sandstone, 2, 118
Garrison Shale, 122
Gearyan Series, palynology, 51, 106
Havensville Shale, 45
Hennessey Group, Hennessey Shale, 2, 39, 107, 118
Hughes Creek Shale, 122
Johnson Shale, 122
Mangum copper deposit, 91
Marlow Formation, 20, 118, 212, 226; Verden Sandstone Member, 20
Meadow Shale, 122
Meadows copper shale, 89
Pennsylvanian-Permian boundary, 51, 226
Pontotoc Formation, 61
Post Oak Conglomerate, 2, 118, 284
Prewitt copper shale, 89
rare earths, 59
Rush Creek Formation, 226
Rush Springs Formation, 2, 20, 118, 212
salt deposits, 280
San Angelo Sandstone, 118
sandstones, porosity, 200
Summer Group, 2, 106, 118, 122, 226
uranium, 2, 91, 92, 310
vertebrates, 18, 21, 22, 26, 107
Weatherford Dolomite, 212
Wellsington Formation, 2, 106, 118, 122, 226
Whitehorse Group, 2, 20, 118, 212, 226
Wichita Group, uranium potential, 310
Wreford Megacyclothem, 58, 267, 268

PETROGRAPHY AND PETROLOGY:
authigenic clays, 325
crystalline silica in mudrocks, 20
Post Oak Formation, 284
river-bank muds and sands, Recent, 44
Stanley-Jackfork sandstones, 210

Petroleum and Natural Gas:
abnormal pressures, 16, 25, 34, 65, 238
accumulation, entrapment, migration, and reservoirs: Anadarko basin, 65, 141, 318; aqueous solubility, 16; Arbuckle Group rocks, 37, 38, 90, 193, 195; association with uranium occurrences, 2; Bromide Formation, 180, 181; "Cherokee" sands, Noble County, 43; Cimarron County chalks, 255; effect of authigenic clays, 325; Hunton zone, 141; Northeast Lucien field, 155; Oklahoma City field, 283, 316, 318; Ouachita geosyncline, 258; Payne County, 262, 263; Pennsylvanian reservoirs, 273; sandstone reservoirs, general, 173, 174; southern Oklahoma aulacogen, 318; Stanley and Jackfork sands, 211
ages of hydrocarbons, 326
Anadarko Basin, see Anadarko Basin
Arbuckle Group oils, 37, 38
composition of petroleum, 37
deep wells, 11, 16, 141, 150, 162, 195, 219, 238, 278, 300
enhanced recovery: carbon dioxide flooding, 222; Elk City field, 272; fluid injections, 222; fracturing, 115, 222; Morrow-Springer sandstone stimulation, 266; polymer waterflood, Delaware-Childers field, 302; polymer waterflood, North Stanley field, 70, 142, 158, 159; production from stripper wells, 137; surfactant flooding, North Burbank field, 23, 163; waterflood, 213, 250, 307
exploration and development: Anadarko basin, 141, 162, 195, 219; Arbuckle development, 141, 162, 195; Bartlesville sand development, 221; Beckham County, 195; East Binger field, paleomagnetism, 124; general, 10, 12, 13, 117, 244, 300; Hunton production, 141, 162; Lincoln County, 220; Morrow sands, general, 34; Morrow-Springer sands, 50, 162; natural gas, general, 165; Ouachita area, 208; relation of chalk diagenesis, 255; Reydon field, Morrow sands, 25; Sholom Alechem field, 46; use of carbon isotopes, 87
fields, pools, and districts: Agra field, 220; Aledo field, 141, 195; all fields, 10, 12, 136; all new fields, 13; Burbank fields, 23, 54, 163, 307; Butcher field, 263; Cheyenne Valley field, 54; Cox City field, 2; Delaware-Childers field, 302; Delaware extension, 54; East Cement field, 2, 87; East Guthrie field, 221; East Tuskegee field, 54; Elk City field, 195, 272, 273, 318; Enid field, 115; Fitts pool, 318; Golden Trend, 318; Hawkins field, 54; Healdton field, 37, 318, 326; Hewitt pool, 326; Hoover field, 37; Hugoton field, 48, 318; Keys field, 48; Kiota field, 54; Loco field, 318; Lone Elm field, 42; Mills Ranch field, 90, 142, 162, 195, 219; Noble County fields, 43; North Cement field, 87; North Stanley field, 70, 142, 158, 159; Northeast Lucien field, 155; Oklahoma City field, 283, 316, 318; Olympic field, 54; Perry field, 42; Postle field, 250; Red Oak field, 54; Reydon field, 25; Seminole district, 54; Shoestring field, 54; Sholom Alechem field, 46; Sho-Vel-Tump area, 116, 318; Sooner trend, 116; South Ceres field, 54; South Drummond field, 115; South Erick field, 2; South Pine Hollow gas field, 54; Southwest Davis field, 143; Southwest Enville field, 326; Southwest Lone Grove field, 37; Stillwater Airport field, Stillwater field, 42, 262; Wakita trend, 54; Watonga-Chickasha trend, 50; West Cement field, 87; West Edmond field, 318; West Mayfield field, 90, 141, 195, 219, 300; West Sentinel field, 195; Wilburton field, 54
general operations, 11, 117
geochemistry, 37, 38, 87, 326
giant oil fields, 148, 244
heavy oil, 120, 222, 319
helium, Hugoton and Keys fields, 48
Oklahoma Geological Survey programs, 197
origin and generation, source: alteration of organic matter, 5; aqueous solubility, 16, 238; Arbuckle oils, 37; laboratory generation, 117; Oklahoma City oil field, 283, 316;
Ouachita area, 218, 258
Ouachita area: petroleum potential, 208, 258; well, 64
Petroleum Data System, 306
pipelines, 10
producing formations, general, 13, 136
projections: heavy oil, 319; natural gas, 227
statistics: consumption, 116, 165; deep wells, 278; drilling activity, 150, 300; economics, 68, 116, 148, 165, 244; exploration and development, 13, 68, 116, 136, 150, 165, 244, 300; general, 10, 12, 13, 68, 116, 136, 300, 309; liquid natural gas, 49, 165; natural gas, general, 165, 215; production, 116, 136, 137, 148, 165, 223, 244, 300, 308; refinery production, 116; reserves and resources, 137, 148, 165, 215, 223, 244; seismic exploration, 72; stripper wells, 137; supplies, 116; waterflooding, 68
stripper wells, 137
technology: application of paleomagnetism, 124; carbon isotope study, use in exploration, 87; enhanced recovery methods, see enhanced recovery; heavy oil recovery methods, 120; injection logs, 213, 307; liquid natural gas recovery, 47
Pliocene: Anadarko basin, 327; Ogallala Formation, fossil wood, 199
Precambrian:
general, 161
Mount Sheridan Gabbro, 236
Raggedy Mountain Gabbro Group, 236; Layered Series, 236
Spavinaw Granite, 161
Tishomingo Granite, 161, 188
Troy Granite, 161
“Tulsa Mountains,” 203
Quaternary alluvium and soils: Anadarko basin, 327; Birch Creek valley, 112; Little Caney River valley, 113; Washita County, 212
rare earths, Pennsylvanian and Permian sediments, 59
Recent, Holocene: geomorphology, see Geomorphology; palynology, 112, 113, 324; river-bank muds and sands, petrology, 44
remote sensing: aerial photography, Arbuckle Mountains, 143, 144, 145, 146, 147, 149; aerial photography, Beckham County, 327; ERTS imagery, Beckham County, 327; LANDSAT imagery, fracture discrimination, Boone Formation, 157
Sedimentology:
algal mounds, 323
alluvial fan deposition: Arbuckle and Wichita areas, 2; Post Oak Formation, 284
Anadarko basin, 8, 54, 88, 273, 283, 318, 328
Arbuckle Mountains, 37, 178, 180, 259, 318, 323
Arbuckle facies: Arkoma basin, 29; Ouachita Mountains, 29, 249
Arkansas Novaculite facies, 186, 264, 265
Arkoma basin, 8, 9, 28, 29, 40, 60
authigenic days, 325
bar and channel sands: Elk City field, 273; Red River, 256
bioherms: Mississippian, Tri-State district, 108; Pitkin Formation, 301; Sausbee Formation, 24
black shale facies, origin, 121
Bloyd Formation, 329
boulder beds, Johns Valley Formation, 28
Bouma cycles: Atoka Formation, Jackfork Group, 28; Stanley Group, 206
carbonate deposition: general, 323; platform facies, 296, 303, 304; role of algae, 167
channel sandstones: “Cherokee” Group, 43, 262, 263; Jackfork sands, 173; Pennsylvanian, 173; Permian, 2, 284
clastics deposition: Anadarko basin, Missourian, 88; Ouachita Mountains, 303, 304
crystalline silica in mudrocks, 20
cyclothems, 58, 121, 267, 268, 323
deltaic deposition: Atoka Formation, 152; “Cherokee” Group, 43, 262, 263; Crystal Moun-
tain and Blakely Formations, 62; lacustrine delta orifice, Great Salt Plains, 135; Pennsylvania and Mississippian reservoirs, 173, 273; Permian, 122; Stanley-Jackfork Sandstones, 210, 211

depositional environments, see Paleocology, Paleoenvironments, Paleogeography
diagenesis: Arkansas Novaculite, 265; Bromide Formation, 180, 181; cementation and
lithification of sandstones, 61; chalks, Upper Cretaceous, 255; Jackfork Group,
consolidation, 183; pressure solution, 208; sandstone porosity study, 200; shales,
Ouachita area, 208
dish and pillar structures, Jackfork Group, 28, 184, 186, 206
energy-transport processes in sedimentary basins, Ouachita geosyncline, 258
evaporites, Permian dolomites and gypsum, 212, 323
fluviatile-marine deposition, Atoka Formation, 152
flysch deposition: Arkoma basin, 60; Ouachita area, 28, 29, 40, 60, 62, 100, 183, 186,
209, 210, 211, 303, 304
granite-wash deposits, Arbuckle and Wichita areas, 2
karst development, Boone Formation, 108
lead-zinc deposition in carbonates, 253
limestone mounds, Pitkin Formation, 301
liquefied-flow deposition, Atoka Formation, 186
micritic mounds, Boone Formation, 323
Morrowan deposition, 295, 296, 297
Oklahoma City field, 283
Ouachita Mountains, 28, 29, 40, 60, 62, 64, 100, 183, 184, 185, 186, 194, 206, 208, 209,
210, 211, 216, 249, 264, 265, 281, 282, 295, 303, 304
paragenesis of lead-zinc ores, 108
Post Oak Formation, 284
preflysch deposition, 29
river-bank deposition, 44, 110, 112
sabkha facies, Permian copper deposits, 270
shallow-marine deposition, Joins and Oil Creek Formations, 294
shelf deposition, 9, 24, 62, 259, 274, 301, 323
southern Oklahoma aulacogen, southern Oklahoma geosyncline, 280, 318
submarine fans, Jackfork Group, 183, 210, 211
tidal deposition, 2, 28, 37, 259, 270
transgressive deposition, transgressive-regressive sequences: Atoka Formation, 9, 152;
"Cherokee" sands, 42, 262, 263; Chesterian and Morrowan, 274; Oil Creek Forma-
tion, 178
tuff deposits, 28, 64, 194, 216
turbidites, 28, 29, 40, 173, 184, 206, 208, 209, 210, 211
Seismology, see Geophysics
Silurian:
Bigfork Formation, 29, 64
Blakely Formation, 29, 164
Blaylock Formation, 28, 29, 64, 160, 194, 303
brachiopods, 176, 177
Collier Formation, 29
crinoid, Henryhouse Formation, 14
Crystal Mountain Formation, 29
Hunton Group, 14, 80, 141, 162, 188, 225: Frisco Formation, 36, 225; Henryhouse
Formation, 14, 36, 80, 225
Hunton production, 141
Late Silurian biofacies, 7
Mazarrn Formation, 29
Missouri Mountain Formation, 28, 29, 160, 194, 264, 265, 303
Polk Creek Formation, 29
Womble Formation, 29
SOILS:
Alfalfa County, general, 322
Birch Creek valley, Osage County, 112
Canadian County, general, 74
Johnston County, general, 31
Little Caney River valley, Washington County, 113
McCurtain County, general, 239
Mayes County, general, 235
pollution by oil wastes, 53
Pottawatomie County, general, 201
Tulsa County, general, 53
Wagoner County, general, 234
southern Oklahoma aulacogen, 28, 29, 32, 33, 73, 180, 181, 187, 236, 249, 275, 276, 280, 312, 318, 327, 328

STRATIGRAPHY:
Anadarko basin, 88, 327
Arkansas Novaculite, 264, 265
Atoka Formation, Atokan Series, 9, 19, 152, 217
biostratigraphy:
Atoka Formation, Atoka Series: conodonts, 101, 102, 152; fusulinids, 9, 19; microfauna, 217
basal Permian, mioflora, 106
Cambrian-Ordovician, trilobite zonation, 280
Carboniferous, ammonoid zonation, 99, 100, 254
Chesterian: brachiopods, 125; bryozoans, 128; conodonts, 171; general biota, 127, 297, 298; microfossils, 27, 217; Pitkin Limestone, crinoids, 292
Cretaceous: Cimarron County, 154; Upper Cretaceous, ostracode zonation, 119
Early Devonian, trilobites, 36
Morrowan: bioherms, Sausbee Formation, 24; blastoids, 153; brachiopods, 125; bryozoans, 128; conodonts, 101, 102, 152, 171, 288, 295; coral zonation, 252; general, 298; microfauna, 217; ostracodes, 164; Wapanucka Formation, conodonts, 295
Ordovician: cephalopods, 75; conodont zonation, 169, 179, 294, 299; early Middle Ordovician correlations, 57; echinoderm zonation, 275; general, 249; graptolite zonation, 19, 71; trilobites, 259, 280
Pennsylvanian: Pennsylvanian and Mississippian, Ouachita area, trace fossil zonation, 40, 60; Pennsylvanian-Permian boundary, palynology, 51; Permian-Carboniferous boundary, vertebrates, 226; Upper Pennsylvanian, crinoid zonation, 228
Bloyd Formation, 329
Bokchito Formation, 134
Cambrian-Ordovician boundary, 280
Carboniferous, 40, 60, 99, 100, 108, 226, 294, 295, 296, 297, 298
Chesterian, 292, 296, 297, 298, 301; Fayetteville Shale, 277; Pitkin Formation, 292, 301; Stanley Group, 210, 216; Stanley-Jackfork correlations, 210
general, stratigraphic maps and sections, 260
Mill Creek syncline, 188
Mississippian-Pennsylvanian boundary, 254, 297, 298
nomenclatural changes, 52
Ouachita Mountains, 28, 29, 40, 100, 101, 160, 194, 243, 249, 264, 282
Paleozoic, southern Oklahoma, 187, 188
Pennsylvanian: Bloyd Formation, 328, 329; Desmoinesian coals, 103; Mississippian-Pennsylvanian boundary, 254, 297, 298; Morrowan, 295, 296, 297, 298, 328; Morrowan-Atokan contact, 101, 102, 152, 153; Pennsylvanian-Permian boundary, 51; Permian-Carboniferous boundary, 226; pre-Desmoinesian unconformity, 262
Simpson Group, correlation with Texas, 294
southern Oklahoma aulacogen, general, 318
STRUCTURAL GEOLGY (includes tectonics):

Anadarko basin, 8, 37, 54, 126, 187, 212, 276, 312, 313, 318, 327, 328
Arbuckle Mountains and Criner Hills, 2, 9, 37, 143, 144, 145, 146, 147, 149, 187, 188, 189, 276, 313, 318, 327
Ardmore basin, 187, 276, 318
Arkoma basin, 8, 9, 28, 29, 37, 60, 160
Beckham County, 327
Bendelari monocline, 108
Blue Creek fault and horst, 327
Blue River fault, 188
block faulting, Ouachita Mountains, 29
Benton-Broken Bow uplift, 64, 243, 246, 315
Carter-Knox anticline, 2
Cement anticline, Cement fault, 2, 327
“Cherokee” Group, 43, 262, 263
Choctaw fault, 29, 160, 218
Clarita anticline, Clarita fault, 9, 166
Clarita-Phillips fault, 9
clastic dikes, Anadarko basin, 328
Cordell fault and graben, 327, 328
Cox City area, 2
Criner arch, 276
Custer County, 327
Dougherty anticline, 146
Fall Line trend, 139
Franks graben, Franks fault zone, 9, 188
Hollis basin, 276
Lawtonka fault and graben, 327
lineaments: Anadarko basin, 328; central United States, 126
Marietta basin, 276, 318
Meers Valley fault, 126, 327
Miami trough, 108, 233
Mill Creek fault, Mill Creek syncline, 187, 188, 189
Mountain View fault, 126, 327
Muskogee County, 218
Nemaha ridge, Nemaha uplift, 126, 139, 190, 191, 283
Northeast Lucien field, 155
Oklahoma City field, subsurface, 283, 316
Oswego Limestone, 42
Ouachita-Marathon thrust belt, 73, 313
Ouachita Mountains, 28, 29, 32, 33, 37, 60, 64, 73, 100, 126, 139, 160, 189, 194, 203, 208, 218, 243, 246, 251, 282, 303, 304, 312, 313, 315, 318, 330
Ozark uplift, 161, 218
Perry anticline, 42
Pine Mountain fault, 160
Reagan fault, 188
Roger Mills County, 327
Sayre graben, 327, 328
Seneca trough, 108
slickensides, Mill Creek fault, 188
southern Oklahoma aulacogen, 28, 29, 32, 33, 73, 187, 236, 249, 251, 276, 280, 312, 313, 318, 327, 328
Stony Point fault, 327
stress faulting, Arbuckle Mountain, 189
strike-slip faulting, southern Oklahoma aulacogen, 32
subduction, Ouachita Mountains, 29
Midcontinent Section of SEPM Being Formed

A Midcontinent Section of the Society of Economic Paleontologists and Mineralogists is being formed. The section will encompass Oklahoma, the Texas Panhandle, Kansas, Nebraska, Iowa, Missouri, Arkansas, Kentucky, and Tennessee. This is the only region in the continental United States that currently has no SEPM section.
The purpose of the section will be to promote the science of geology in the Midcontinent region through research in paleontology, sedimentary petrology, stratigraphy, and sedimentology. The Midcontinent Section will provide opportunities to hear technical papers, have field trips, and allow dissemination of new ideas and research being conducted in stratigraphy and paleontology. The section will be affiliated with The American Association of Petroleum Geologists and other geological organizations in the area. Section representatives will coordinate meetings and programs of the local state groups with the SEPM section council.

Anyone interested in helping form the SEPM Midcontinent Section or willing to participate once the section is formed should contact Dr. Mary E. Hileman, Anadarko Production Co., 100 Park Avenue Building, Suite 300, Oklahoma City, Oklahoma 73102.

OGS Takes Charge of Geophysical Observatory

The Oklahoma Geophysical Observatory, formerly The University of Oklahoma Earth Sciences Observatory, was transferred by The University of Oklahoma to the Oklahoma Geological Survey on July 1 of this year. The Observatory was built in 1961 by Jersey Production Research Co. near Leonard, Oklahoma, south of Tulsa. In 1964 Jersey Research was consolidated into a Humble Oil and Refining Co. (now Exxon) research affiliate in Houston, Texas. In April 1965 Humble donated the Observatory to The University of Oklahoma.

The Observatory is situated on 160 acres of land that was acquired in 1973–74 through the efforts of several members of The University of Oklahoma School of Geology and Geophysics Alumni Advisory Council and aided by a Sarkeys Foundation grant. Robert L. DuBois was director of the Observatory from 1967 to 1978.

The Oklahoma Geophysical Observatory operates seven seismometers, three long period and four short period, which have been installed in a vault detached from the main building. Seismic responses are recorded on 11 paper-drum recorders; 16 seismograms are recorded on film. The seismological data are routinely sent to the National Earthquake Information Center at Boulder, Colorado, for inclusion in its earthquake reports and to the International Seismological Center at Newbury, England, for listing in its monthly bulletin. The Observatory maintains a statewide volunteer-operated semipermanent network of seven seismograph stations located throughout Oklahoma. In addition to the seismological studies, the Observatory records a number of other geophysical parameters, such as gravity, earth currents, the earth’s magnetic field, and the atmosphere’s vertical electric field, along with meteorological observations.

The Oklahoma Geophysical Observatory’s activities will be directed by James L. Lawson, Jr., a geophysicist with the Observatory since 1970, and by Paul H. Foster, supervisor and electrical engineer with the Observatory since 1961. Kristie Binney and Shirley Jackson will continue to assist in the record labeling and cataloging.
Boron-10 Plant Begins Production

A $14 million plant and laboratory were constructed at Quapaw and Miami in northeastern Oklahoma by Eagle-Picher Industries. The plant at Quapaw was built primarily to supply boron-10 to the U.S. Department of Energy for use in defense-related purposes. Miami is the location of Eagle-Picher’s Quality Control Laboratory, where the final product is milled, graded, tested, and packaged for shipment.

Boron-10 is a nonradioactive isotope that occurs naturally in boron and is an effective neutron absorber. The process at Quapaw extracts the boron-10 from a gaseous compound of boron and reduces it to a metallic powder.

The combined operation is one of only four such facilities in the world and the only one located in the United States. When full production is reached, employment is expected to exceed 300.

Uranium Program Announced for Oklahoma

The involvement of the Oklahoma Geological Survey in the effort to assess the nation’s domestic supply of uranium was announced in a previous issue of Oklahoma Geology Notes (v. 38, no. 2, April 1978, p. 65–66). The program, referred to as the National Uranium Resource Evaluation (NURE) program, is funded by a grant from Bendix Field Engineering Corp. and the U.S. Department of Energy (DOE). Bendix and DOE have recently announced other subcontractors that will assess uranium potential on $1^\circ \times 2^\circ$ (scale, 1:250,000) quadrangles of Oklahoma or lands adjacent to Oklahoma.

A total of seven quadrangles to be assessed are wholly or partly in Oklahoma, and another seven quadrangles are adjacent to the State (fig. 1.) The subcontractors working on these 14 quadrangles are:

<table>
<thead>
<tr>
<th>Subcontractor</th>
<th>Quadrangles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bendix Field Engineering Corp.</td>
<td>Ardmore, La Junta, Plainview</td>
</tr>
<tr>
<td>Consulting Professionals, Inc.</td>
<td>Dalhart</td>
</tr>
<tr>
<td>Santa Fe, New Mexico</td>
<td></td>
</tr>
<tr>
<td>Geological Services of Tulsa, Inc.</td>
<td>Joplin, Oklahoma City</td>
</tr>
<tr>
<td>Tulsa, Oklahoma</td>
<td></td>
</tr>
<tr>
<td>Oklahoma Geological Survey</td>
<td>Clinton, Enid</td>
</tr>
<tr>
<td>Norman, Oklahoma</td>
<td></td>
</tr>
<tr>
<td>Oklahoma State University</td>
<td>Lawton</td>
</tr>
<tr>
<td>Stillwater, Oklahoma</td>
<td></td>
</tr>
<tr>
<td>Texas Bureau of Economic Geology</td>
<td>Amarillo, Sherman, Wichita Falls</td>
</tr>
<tr>
<td>Austin, Texas</td>
<td></td>
</tr>
<tr>
<td>Wichita State University</td>
<td>Pratt, Wichita</td>
</tr>
<tr>
<td>Wichita, Kansas</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1. Locations and names of $1^\circ \times 2^\circ$ quadrangles in and adjacent to Oklahoma that are being studied under the NURE program.

Recent Theses Released by OSU

The following M.S. theses have been released by the Department of Geology of Oklahoma State University and are on file at the OSU Library:

Geology and Geochemistry of Uranium in Morrison Formation, Oklahoma Panhandle and Northeastern New Mexico, by Marvin Milton Abbott.

Geochemical and Petrologic Characteristics of Selected Freshwater Limestones, by Jim Richard Armstrong.

Geology of the Hartshorne Coal, McCurtain and Lafayette Quadrangles, Haskell and Le Flore Counties, Oklahoma, by Lee Edward Catalano.


The Physical Stratigraphy of the Avant Limestone Member, Iola Formation, Osage County, Oklahoma, by Joey Dwayne Davidson.

Genesis and Trend of the Lowermost Unit of the Vamoosa Formation (Gypsy Sandstone), by Gary Wayne Ford.


Petroleum Geology of the Misener Sandstone in Parts of Payne and Lincoln Counties, Oklahoma, by James Paul Kochick.

Petrography and Geochemistry of the Buttery Dolomite and Associated Sphalerite Mineralization of the Turner Prospect, in the Arbuckle Mountains, Oklahoma, by Peter Val Kranak.
Petrography and Geochemistry of Lower Permian Cornstones in Southwestern Oklahoma, by John Akio Kwang.

Distribution, Depositional Environment, and Reservoir Properties of the Pennsylvanian Cottage Grove Sandstone, South Gage Field, Oklahoma, by Danny Joe Towns.

Lithostratigraphy of Missourian Shelf-Basinal Strata, Beaver County, Oklahoma, by Steven Dale Lane.

Some Aspects of the Petrology and Geochemistry of Selected Freshwater Carbonates, by William Richard Trent.


New AAPG Executive Committee Begins Term

Robert D. Gunn, independent oil operator from Wichita Falls, Texas, assumed the presidency of The American Association of Petroleum Geologists on July 1. Joining the executive committee as president-elect is John D. Haun, professor of geology at the Colorado School of Mines in Golden and president of Barlow and Haun, Inc.

Other new officers are Thomas D. Barber, with Michel T. Halbouty in Houston, vice-president, and George B. Pichel, with Union Oil Co. of California in Los Angeles, treasurer. John J. Amoruso, an independent geologist from Houston, began his second year as secretary, and John W. Shelton, professor of geology at Oklahoma State University in Stillwater, is winding up his final year as editor.

The Tulsa-based association, for many years the largest scientific body of geologists in the world, recently attained a new record of 20,000 members.