AREA OF MINERAL PRODUCTION ON NORTH FLANK OF ARBUCkLE ANTICLINE

The cover photograph for this issue shows folded limestones and shales on the north flank of the Arbuckle anticline, 3 miles southwest of Davis. Two north-plunging anticlines are outlined by the prominent, tree-bare ridge of Viola Limestone (Ordovician) visible in the south half of the photograph. The anticlines cover most of secs. 10, 11, 14, and 15, T. 1 S., R. 1 E., in Murray County. The width of the area shown in the photograph is 2 miles.

This area has yielded significant quantities of mineral resources (limestone and petroleum) since the photograph was taken in the 1930's. Sooner Rock and Sand, Inc., opened its Davis quarry on the nose of the east anticline (SE¼ sec. 11) in 1959 and is mining the Viola Limestone for road material, aggregate, and other concrete products, most of which is being sent to Oklahoma City markets. The Davis quarry is closer to Oklahoma City than any other quarries in the Arbuckle Mountains, and its annual production in recent years has been a little over half a million tons.

An important petroleum discovery was made on the east anticline in January 1975. Mapco, Inc., completed the No. 1 Howell in sec. 14 for an initial potential flow (IPF) of 1,392 barrels of oil per day (BOPD) from sands of the Oil Creek Formation (Middle Ordovician) at a depth of 4,172–4,199 feet beneath a series of complex thrust faults. Since then 12 more wells have been completed in the Southwest Davis field (secs. 11 and 14), with IPF's of 130 to 400 BOPD, from upper and lower Oil Creek sands at depths ranging from 3,800 to 4,900 feet; two additional wells have been dry.

The photograph was taken by the U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service.

—Kenneth S. Johnson

Editorial staff: William D. Rose, Rosemary L. Hardage, Elizabeth A. Ham

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Short articles on aspects of Oklahoma geology are welcome from contributors. A set of guidelines will be forwarded on request.

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BIBLIOGRAPHY

Adams, G. F., see Fairbridge, R. W., and Adams, G. F.
Adams, S. R., see Al-Shaieb, F. Z., Hanson, R. E., and Adams, S. R.
Ade-Hall, J. M., see Vincenz, S. A., Yaskawa, K., and Ade-Hall, J. M.
Agatson, R. S., see Rouse, J. T., Agatson, R. S., Bright, Jerlene, and Proctor, R. M.


Al-Shaieb, Zuhair, see Olmsted, R. W., and Al-Shaieb, Zuhair
Al-Shaieb, Zuhair, see also Shelton, J. W., and Al-Shaieb, Zuhair

American Petroleum Institute, see American Gas Association, American Petroleum Institute, and Canadian Petroleum Association


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

   Antelo, Belarmino, see Isaacson, P. E., Antelo, Belarmino, and Boucot, A. J.


   Babitzke, H. R., see Cammarota, V. A., Jr., and Babitzke, H. R.


   Barringer, A. R., see Donovan, T. J., Barringer, A. R., Foote, R. S., and Watson, R. D.

   Beikman, H. M., see King, P. B., and Beikman, H. M.


18. Bellis, W. H., and Rowland, T. L., 1976, Shale and carbonate-rock re-
sources of Osage County, Oklahoma: Oklahoma Geological Survey Circular 76, 50 p., 18 figs., 1 panel, 4 tables.


Bergman, D. L., see Carr, J. E., and Bergman, D. L.
Bergman, D. L., see also Havens, J. S., and Bergman, D. L.


Bergström, S. M., see Boger, J. L., and Bergström, S. M.


Black, Bernard, see Decker, R. E., and Black, Bernard


Bock, W. D., see Otvos, E. G., Jr., and Bock, W. D.
Bogard, D. D., see Cressy, P. J., Jr., and Bogard, D. D.

28. Bojer, J. L., and Bergström, S. M., 1976, Conodont biostratigraphy of the upper Beekmantown Group and the St. Paul Group (Early and Middle Ordovician of Maryland and West Virginia) [abstract]: Geological Society of America Abstracts with Programs, v. 8, p. 465. (Refers to Lower-Middle Ordovician boundary in Oklahoma.)


Boucot, A. J., see Isaacscon, P. E., Antelo, Belarmino, and Boucot, A. J.
Bower, R. R., see Kidwell, A. L., and Bower, R. R.
Bowles, L. G., see Zweiacker, P. L., and Bowles, L. G.
Briggs, Garrett, see Wickham, John, Roeder, Dietrich, and Briggs, Garrett


Bright, Jerlene, see Rouse, J. T., Agatson, R. S., Bright, Jerlene, and Proctor, R. M.


Browning, J. M., see Walper, J. L., and Browning, J. M.


Burtch, F. W., see Walker, C. J., Burtch, F. W., Thomas, R. D., and Lorenz, P. B.


Canadian Petroleum Association, see American Gas Association, American Petroleum Institute, and Canadian Petroleum Association

45. Cannon, P. J., 1976, Generation of explicit parameters for a quantitative geomorphic study of the Mill Creek drainage basin: Oklahoma Geology Notes, v. 36, p. 3-17, 3 figs., 4 tables.


48. Carr, J. E., and Havens, J. S., 1976, Records of wells and water quality for


Case, G. R., see Zangerl, Rainer, and Case, G. R.


Cebull, S. E., see Shurbet, D. H., and Cebull, S. E.

Century, J. R., see Bright, J. A., and Century, J. R.


Chaudhuri, S., see Lee, M. J., and Chaudhuri, S.


Chilingarian, G. V., see Bissell, H. J., and Chilingarian, G. V.


60. Cooper, Paul, 1976, The cyanophyte Wetheredella in Ordovician reefs and off-reef sediments: Lethaia, v. 9, p. 273-281, 3 figs. (Refers to an Oklahoma algal species.)


Derby, J. A., see Simon, D. E., and Derby, J. A.

Derby, J. R., see Stitt, J. H., Miller, J. F., and Derby, J. R.


Dickinson, W. R., see Graham, S. A., Ingersoll, R. V., and Dickinson, W. R.


Dixon, G. H., see Frezon, S. E., and Dixon, G. H.


78. Donovan, T. J., 1976, Landsat study of alteration aureoles in surface rocks overlying petroleum deposits: Government Reports Announcements, v. 76, no. 8, p. 104. (Flights over Cement and Davenport oil fields, Oklahoma; abstract in Petroleum Abstracts, v. 16, p. 1158.)

Donovan, T. J., Barringer, A. R., Foote, R. S., and Watson, R. D., 1976, Low-altitude remote sensing experiments at Cement and Davenport oil
Drummond, H. E., see Vandeveer, L. R., and Drummond, H. E.
DuBois, B. M., see Johnson, J. P., Cunningham, J. W., and DuBois, B. M.
DuBois, R. L., see Lawson, Jim, and DuBois, R. L.
Epstein, Samuel, see Knauth, L. P., and Epstein, Samuel
Fanelli, L. L., see Koelling, G. W., and Fanelli, L. L.
Fanelli, L. L., see also Prehoda, Ronald, and Fanelli, L. L.
92. Feenstra, Roger, and Wickham, J. S., 1976, Computer models of simple shear deformation superposed on symmetric folds applied to deforma-
tion in the Ouachita Mountains [abstract]: Geological Society of America Abstracts with Programs, v. 8, p. 20. (Reprinted in Oklahoma Geology Notes, v. 36, p. 68.)
Felix, C. J., see Burbridge, P. P., and Felix, C. J.
Fernandez, L. A., see Twyman, J. D., and Fernandez, L. A.
Fischer, A. G., see Roggenthen, William, Fischer, A. G., Napoleone, Giovanni, and Fischer, J. F.
Fischer, J. F., see Giddens, J. D., III, Gregory, C. W., Smith, C. K. B., and Fischer, J. F.
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Foote, R. S., see Donovan, T. J., Barringer, A. R., Foote, R. S., and Watson, R. D.
95. Forney, G. G., and Nitecki, M. H., 1976, Type fossil Mollusca (Hyolitha, Polyplacophora, Scaphopoda, Monoplacophora, and Gastropoda) in Field Museum: Fieldiana Geology, v. 36 [misnumbered on publication as v. 35].
French, R. B., see Van der Voo, R., French, R. B., and Williams, D. W.
97. Friedman, S. A., 1976, Effect on recoverable coal reserves by surface mining under adverse geological and engineering conditions [abstract]: Geological Society of America Abstracts with Programs, v. 8, p. 876. (Concerns Oklahoma reserves; reprinted in Oklahoma Geology Notes, v. 36, p. 245.)
Friz, T. O., see Imhoff, E. A., Friz, T. O., and LaFevers, J. R.
100. Fry, H. C., and Cuffey, R. J., 1976, Filiramaporina kretaphilia—a new
genus and species of bifoliate tubulobryozoan (Ectoprocta) from the Lower Permian Wreford Megacyclothem of Kansas: University of Kansas Paleontological Contributions, Paper 84, 9 p., 3 figs., 2 pls.


Ghermazien, T., see Crow, F. R., Paine, M. D., and Ghermazien, T.


Goemaat, R. L., see Hart, D. L., Jr., Hoffman, G. L., and Goemaat, R. L.


Goodwin, R. H., see Brocoum, S. J., and Goodwin, R. H.


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

Gregory, C. W., see Giddens, J. D., III, Gregory, C. W., Smith, C. K. B., and Fischer, J. F.


Hague, J. M., see Ryan, J. P., and Hague, J. M.


Halseth, M. A., see Ossian, C. R., and Halseth, M. A.


Hanson, R. E., see Al-Shaieb, F. Z., Hanson, R. E., and Adams, S. R.


Harris, R. E., see Westerstrom, L. W., and Harris, R. E.


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Heine, R. R., see Al-Shaieb, Zuhair, and Heine, R. R.


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Holdoway, K., see Zeller, E. J., Dreschhoff, G., Angino, E., Holdoway, K.,
Hakes, W., Jayaprakash, G., Crisler, K., and Saunders, D. F.
Hudson, J. O., see Raymond, R. L., Hudson, J. O., and Jamison, V. W.


Ingersoll, R. V., see Graham, S. A., Ingersoll, R. V., and Dickinson, W. R.


130. Irving, E., and Pulliah, G., 1976, Reversals of the geomagnetic field, magnetostratigraphy, and relative magnitude of paleosecular variation in the Phanerozoic: Earth-Science Reviews, v. 12, p. 35-64, 17 figs., 3 tables. (Includes Garber Formation quiet interval.)
Irwin, J. H., see Cameron, A. N., Irwin, J. H., Sniegocki, R. T., and Yost, I. D.

131. Isaacson, P. E., Antelo, Belarmino, and Boucot, A. J., 1976, Implications of a Llandovery (Early Silurian) brachiopod fauna from Salta Province, Argentina: Journal of Paleontology, v. 50, p. 1103-1112, 4 figs., 1 pl., 1 table. (Refers to Oklahoma species.)


Johnson, K. S., see Southard, L. G., Johnson, K. S., and Roberts, J. F.


Jones, L. L., see Lacewell, R. D., Jones, L. L., and Osborn, J.


4 figs., 4 tables. (Report on McClain County disposal site.)


Kaufman, Sidney, see Oliver, Jack, Dobrin, Milton, Kaufman, Sidney, Meyer, Robert, and Phinney, Robert

Keller, G. R., see Cebull, S. E., and Keller, G. R.


144. Kennedy, J. R., 1976, A look at dry-hole contributions: Oil and Gas Journal, v. 74, p. 88-91, 3 figs., 2 tables. (Includes Morrow-Springer example.)

Kent, D. C., see Naney, J. W., Kent, D. C., and Seely, E. H.


Keyes, W. F., see Merwin, R. W., and Keyes, W. F.


152. King, P. B., 1976, Reply [to comment by R. H. Belderson on King, P. B.,


Kisvarsanyi, E. B., see Kisvarsanyi, G., and Kisvarsanyi, E. B.


Klapper, Gilbert, see Barrick, J. E., and Klapper, Gilbert


Koinm, D. N., see Kessler, L. G., II, Koinm, D. N., and Lundy, W. L.


162. Lacellew, R. D., Jones, L. L., and Osborn, J., 1976, Adjustments due to a declining groundwater supply: high plains of northern Texas and western Oklahoma: Texas A and M University, College Station, Water Resources Institute, 42 p., 1 fig., 10 tables. (Available as National Technical Information Service PB-255 792; abstract in Selected Water Resources Abstracts, v. 9, no. 20, p. 25.)

LaFevers, J. R., see Imhoff, E. A., Friz, T. O., and LaFevers, J. R.

LaFountain, L. J., see Jacobs, A. M., and LaFountain, L. J.

163. Landing, Ed, 1976, Early Ordovician ( Arenigian) conodont and graptolite biostratigraphy of the Taconic allochthon, eastern New York: Journal
LeBlanc, R. J., see Thompson, Alan, and LeBlanc, R. J.


168. Linville, Bill (editor), 1976, Contracts and grants for cooperative research on enhancement of recovery of oil and gas: Energy Research and Development Administration Technical Information Center Progress Review 7, 82 p., illus. (Includes Oklahoma grant projects.)


Loomis, E. C., see Sargent, K. A., and Loomis, E. C.
Lorenz, P. B., see Walker, C. J., Burotch, F. W., Thomas, R. D., and Lorenz, P. B.

Ludvigsen, R., see Chatterton, B. D. E., and Ludvigsen, R.

Lundy, W. L., see Kessler, L. G., II, Koinam, D. N., and Lundy, W. L.

176. Lutz-Garihah, A. B., 1976, Composita subttila (Brachiopoda) in the Wreford Megacyclothem (Lower Permian) in Nebraska, Kansas, and Oklahoma: University of Kansas Paleontological Contributions, Paper 81, 19 p., 2 pl., 9 tables, 8 text-figs.


Lyons, Paul, see Wickham, John, Lyons, Paul, and Morris, R. C.


180. McCaslin, J. C., 1976, Drilling programs link Oklahoma gas fields: Oil and Gas Journal, v. 74, no. 8, p. 151, 1 fig.

MacDonald, K. G., see Bright, J. A., and MacDonald, K. G.


McKinney, F. K., see Boardman, R. S., and McKinney, F. K.
Meyer, Robert, see Oliver, Jack, Dobrin, Milton, Kaufman, Sidney, Meyer, Robert, and Phinney, Robert
Michalski, Bernadette, see Harper, W. B., Michalski, Bernadette, and Moore, B. M.

Miller, J. F., see Stitt, J. H., Miller, J. F., and Derby, J. R.


Moore, B. M., see Harper, W. B., Michalski, Bernadette, and Moore, B. M.


Morris, R. C., see Wickham, John, Lyons, Paul, and Morris, R. C.


Mose, D. G., see Bickford, M. E., and Mose, D. G.


County; abstract in Selected Water Resources Abstracts, v. 10, no. 2, p. 5."

Napoleone, Giovanni, see Roggenthen, William, Fischer, A. G., Napoleone, Giovanni, and Fischer, J. F.


Nicksic, C. P., see Bostick, N. H., and Nicksic, C. P.


Nitecki, M. H., see Forney, G. G., and Nitecki, M. H.

210. Noran, Dave, 1976, Reservoir data base expands content: Oil and Gas Journal, v. 74, no. 34, p. 137, 1 photo, 1 table.

211. Ohle, E. L., 1976, Precipitation mechanisms for Mississippi Valley-type ore deposits [discussion]: Economic Geology, v. 71, p. 1060-1061. (Refers to Tri-State district, Anadarko basin, Ouachita basin.)


221. Ormiston, A. R., and Lane, H. R., 1976, A unique radiolarian fauna from
the Sycamore Limestone (Mississippian) and its biostratigraphic significance: Palaeontographica, Abt. A., p. 158-180, 6 pls., 4 text-figs., 2 tables.

Osborn, J., see Lacewell, R. D., Jones, L. L., and Osborn, J.


Overbey, W. K., Jr., see Shumaker, R. C., Pierce, C. I., and Overbey, W. K., Jr.


Paine, M. D., see Crow, F. R., Paine, M. D., and Ghermazien, J.


Bulletin, v. 8, no. 6, p. 31-33. (Lists Oklahoma earthquakes.)
Phares, R. S., see Vischer, G. S., Saitta B., Sandro, and Phares, R. S.
Phinney, Robert, see Oliver, Jack, Dobrin, Milton, Kaufman, Sidney, Meyer, Robert, and Phinney, Robert
Pierce, C. I., see Shumaker, R. C., Pierce, C. I., and Overbey, W. K., Jr.
236. Pirson, S. J., 1976, Track record in ME exploration: Oil and Gas Journal, v. 74, no. 38, p. 241-244, 246, 249, 3 figs., 3 tables. (Caddo County survey.)
237. Potter, C. W., 1975, Lower Ordovician conodonts of the upper West Spring Creek Formation, Arbuckle Mountains, Oklahoma: University of Missouri at Columbia unpublished M.S. thesis.
239. Powell, B. N., and Fischer, J. F., 1976, Plutonic igneous geology of the Wichita magmatic province, Oklahoma: Geological Society of America South-Central Section, Guidebook for Field Trip no. 2, February 28-29, 1976, 35 p., 52 figs., 7 tables. (Published by Oklahoma Geological Survey.)
Proctor, R. M., see Rouse, J. T., Agatson, R. S., Bright, Jerlene, and Proctor, R. M.
Pruatt, Martin, see Wickham, John, Pruatt, Martin, and Reiter, Leon
Pulliah, G., see Irving, E., and Pulliah, G.

246. Rankin, D. W., 1976, Appalachian salients and recesses: Late Precambrian continental break-up and the opening of the Iapetus Ocean: Journal of Geophysical Research, v. 81, p. 5605-5619, 5 figs., 2 tables. (Refers to Anadarko basin and Ouachita orogenetic belt.)


Reed, P. R., see Claypool, G. E., and Reed, P. R.
Reiter, Leon, see Pruatt, M. A., and Reiter, Leon
Reiter, Leon, see also Wickham, John, Pruatt, Martin, and Reiter, Leon
Rhoades, E. D., see Coleman, G., Gander, G. A., and Rhoades, E. D.


252. Roberts, John, 1976, Carboniferous chonetacean and productacean brachiopods from eastern Australia: Palaeontology, v. 19, p. 17-77, 18 figs., pls. 3-13. (Refers to Oklahoma species.)

Roberts, J. F., see Southard, L. G., Johnson, K. S., and Roberts, J. F.

Roeder, Dietrich, see Wickham, John, Roeder, Dietrich, and Briggs, Garrett


256. Roles, J. S., 1976, Ground water resources of the Rush Springs Sandstone...
of southwestern Oklahoma: Oklahoma Water Resources Board Publication 72, 3 sheets.


Rose, W. D., see Ham, E. A., and Rose, W. D.


Rowland, T. L., see Bellis, W. H., and Rowland, T. L.


Saitta B., Sandro, see Visher, G. S., Saitta B., Sandro, and Phares, R. S.


accumulation rates: Geology, v. 4, p. 723-727. (Includes Oklahoma Carboniferous flysch deposits and southern Oklahoma aulacogen.)


269. Sheehan, P. M., 1976, Late Silurian brachiopods from northwestern Utah: Journal of Paleontology, v. 50, p. 710-733, 1 fig., 5 pls., 1 table. (Refers to Oklahoma species.)


274. Shurbet, D. H., and Cebull, S. E., 1975, The age of the crust beneath the Gulf of Mexico: Tectonophyscis, v. 28, p. T25-T30, 1 fig. (Relates history of Gulf to that of Paleozoic Ouachita orogenic system.)


276. Simpson, L. C., 1976, Paleontology of the Garber Formation (Lower Permian), Tillman County, Oklahoma: University of Oklahoma un-
published M.S. thesis, 29 figs., 7 charts, 7 tables. (Abstract in Oklahoma Geology Notes, v. 36, p. 131.)


Smith, C. K. B., see Giddens, J. D., III, Gregory, C. W., Smith, C. K. B., and Fischer, J. F.


Snegocki, R. T., see Cameron, A. N., Irwin, J. H., Snegocki, R. T., and Yost, I. D.


Speed, R. C., see Sloss, L. L., and Speed, R. C.

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


287. Strimple, H. L., 1976, The inadunate crinoid genus Mooreocrinus in
Oklahoma: Oklahoma Geology Notes, v. 36, p. 161-165, 1 fig.
Strimple, H. L., see Pabian, R. K., and Strimple, H. J.
Summerfelt, R. C., see Hill, L. G., and Summerfelt, R. C.

Taylor, Constance, see Taylor, R. J., and Taylor, Constance


290. Taylor, M. E., 1976, Indigenous and redeposited trilobites from Late Cambrian basinal environments of central Nevada: Journal of Paleontology, v. 50, p. 668-700, 9 figs., 3 pls. (Refers to Oklahoma genera.)

Thomas, R. D., see Walker, C. J., Burtsch, F. W., Thomas, R. D., and Lorenz, P. B.


311. Valderrama, Rafael, 1976, The Skinner sandstone zone in central Okla-


313. Van der Voo, R., French, R. B., and Williams, D. W., 1976, Paleomagnetism of the Wilberns Formation (Texas) and the Late Cambrian paleomagnetic field for North America: Journal of Geophysical Research, v. 81, p. 5633-5638, 5 figs., 2 tables. (Includes comparison with Wichita Mountain granites.)


Viele, G. W., see Keller, W. D., Viele, G. W., and Johnson, C. H.

Vine, J. D., see Tourtelot, E. B., and Vine, J. D.


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Wicander, E. R., see Loeblich, A. R., Jr., and Wicander, E. R.


Wickham, J. S., see Feenstra, Roger, and Wickham, J. S.

Wilhm, Jerry, see Namminga, H. E., and Wilhm, Jerry


Williams, D. W., see Van der Voo, R., French, R. B., and Williams, D. W. Williamson, E. A., see Davies, D. K., and Williamson, E. A.


Wise, F. A., see Doscher, T. M., and Wise, F. A.


Yaskawa, K., see Vicenz, S. A., Yaskawa, K., and Ade-Hall, J. M.

Yost, I. D., see Cameron, A. N., Irwin, J. H., Sniegocki, R. T., and Yost, I. D.


351. Zidek, Jiri, 1976, Kansas Hamilton Quarry (Upper Pennsylvanian) Acanthodes, with remarks on the previously reported North American occurrences of the genus: University of Kansas Paleontological Contributions, Paper 83, 41 p., 15 figs., 7 pls., 2 tables. (Refers to Oklahoma Permian species.)


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AAPG Distributes Speaker’s Kit

The American Association of Petroleum Geologists’ Public Information Committee has assembled a speaker’s kit for use by geologists addressing various types of audiences on the subject of energy. The kit contains 49 slides, in addition to comprehensive reference materials, and is intended to provide speakers with factual information on which to base their presentations.

Claude E. McMichael, a geologist with Shell Oil Company in New Orleans, was chiefly responsible for putting the kit together. He explained that the material in the kit covers the energy situation in the United States, including use, current sources, known supplies, outlook for new sources, necessity for conservation, and environmental effects. “It is not a ‘canned talk,’” he emphasized. “Each person using the kit is to assemble his presentation according to his own idea of how it should be given.”

All the geological societies affiliated with AAPG in this country were recently sent one kit each from the association, free of charge, for loan to their members. Additional kits are available on a loan basis from headquarters or for purchase at $25.00 apiece. For further information, write AAPG Headquarters, P.O. Box 979, Tulsa, Oklahoma 74101.
Greater Seminole Oil Field Commemorated

An 8-foot granite marker was unveiled in a ceremony July 14, 1977, in recognition of the significant petroleum discoveries in 1926 that led to the development of the multipay Greater Seminole oil field. The marker is the 13th to be dedicated in a joint project of the Oklahoma Historical Society and the Oklahoma Petroleum Council. It was placed adjacent to the site of a proposed oil museum near the entrance to Seminole Municipal Park, on State Highway 99 at the north edge of Seminole.

The granite monument was unveiled by Governor David L. Boren and by representatives of the sponsoring organizations, the Seminole Historical Society, and the city of Seminole. Also assisting was D. A. McGee, chairman of the board of Kerr-McGee Corp., Oklahoma City, who spoke at a forum luncheon preceding the dedication.

Production from the greater Seminole field reached its peak of 527,400 barrels on July 30, 1927. By 1977 cumulative production had reached an impressive 201,246,000 barrels.

Taking part in the dedication of the granite marker commemorating the Greater Seminole oil field were, left to right, D. A. McGee, board chairman of Kerr-McGee Corp., Oklahoma City; Governor David L. Boren; and Warren L. Jensen, vice-president of the Oklahoma Petroleum Council and vice-president of Continental Oil Co., Ponca City.
New AAPG Executive Committee Takes Charge

Edd R. Turner, a geologist with Getty Oil Co. in Houston, took the helm of The American Association of Petroleum Geologists as president on July 1. Joining the executive committee as president-elect was Robert D. Gunn, independent oil operator from Wichita Falls, Texas.

Oklahoma is well represented on this year's executive committee by Edwin P. Kerr, vice-president, and John W. Shelton, editor. Ed, who lives in Oklahoma City, is a graduate of The University of Oklahoma and has been an independent exploration geologist since 1973. John, a professor of geology at Oklahoma State University, Stillwater, has just begun his second 2-year term as editor.

Other officers are John J. Amoruso, consulting geologist and independent, Houston, the new secretary, and George S. Galbraith, independent geologist, Abilene, Texas, who is serving his second and final term as treasurer of the 18,500-member organization.

New Theses Added to OU Geology Library

The following M.S. theses have been added to The University of Oklahoma Geology and Geophysics Library:


Relative Mechanical Durabilities of Quartz and Feldspar, by James Harrell.

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OGS Releases New Coal-Mine Map of Oklahoma

An updated version of a map showing coal-mining operations in Oklahoma has just been published by the Oklahoma Geological Survey. Compiled by S. A. Friedman, the Survey’s coal geologist, the map depicts all coal mines, preparation plants, and loading facilities in the eastern Oklahoma coal field as of January 1 of this year.

The 32- by 28-inch map sheet, printed at a scale of 1:500,000 (1 inch = 8 miles), shows 69 mining operations in all, a substantial increase over the 42 shown in last year’s version. All active mines are at the surface. The region’s one underground mine, Kerr-McGee’s deep Choctaw Mine southeast of Stigler, is idle.

A comprehensive table lists the individual mines and plants, the seams mined and their thickness, thickness of overburden, sulfur content, and annual production range. The principal seams are the Croweburg, Iron Post, Stigler, and upper and lower Hartshorne. Production during 1976 amounted to approximately 3.6 million short tons.

A green overprint on the map shows the regional extent of the coal field. Also shown are railroads, highways, and waterways, including the Arkansas River Navigation System.

Map of Eastern Oklahoma Showing Active Coal Mines (January 1, 1977) is available from the Survey for $2.00 by writing to the address on the front cover.

Two Colorado Coal Publications Issued

The Colorado Geological Survey has recently published two volumes on coal. Both can be ordered by writing to the survey at the following address: Room 715, 1313 Sherman Street, Denver, Colorado 80203. Prepayment is requested.

Resource Series 1, Geology of Rocky Mountain Coal, Proceedings of the 1976 Symposium, contains 14 papers plus abstracts of 5 papers that were presented at a symposium held in April 1976 at the Colorado School of Mines. In addition to Rocky Mountain coal deposits in Colorado, Montana, New Mexico, Utah, and Wyoming, the publication covers basic coal geology and geochemistry, coal-exploration techniques, and geologic aspects of coal mining and utilization. Edited by D. Keith Murray, the 175-page volume is available for $4.00.

The second study is entitled Colorado Coal Analyses, 1975 (Analyses of 64 Samples Collected in 1975) and was prepared by Donna L. Boreck, David C. Jones, D. Keith Murray, Janet E. Schultz, and Denise C. Suek. Issued as Information Series 7, the 112-page report contains the most detailed chemical analyses ever published on Colorado coals. The beds sampled range in age from Late Cretaceous to early Tertiary. The report sells for $3.00.
Coal-Geology Course Offered at OU

The fourth annual short course in Coal Geology Fundamentals will be given October 24-26 at the Oklahoma Center for Continuing Education on The University of Oklahoma campus in Norman. Sponsored by the Oklahoma Geological Survey and OU’s Management Development Programs, the 3-day course will focus on applied coal geology and will offer an optional 1-day field trip to the eastern Oklahoma coal field.

The course has been organized by the Survey’s coal geologist, S. A. Friedman, and follows the general format of those given in the past. In addition to Friedman, the faculty consists of P. A. Hacquebard, coal geologist with the Geological Survey of Canada, Dartmouth, Nova Scotia; C. G. Groat, chairman of the Department of Geology, The University of Texas at El Paso; M. Deul, research geologist with the U.S. Bureau of Mines, Pittsburgh, Pennsylvania; E. C. Beaumont, consultant, Albuquerque, New Mexico; and R. L. Fuchs, president of Geosystems, Inc., Westport, Connecticut.

The course is directed toward scientists, engineers, and administrators who are not formally trained in the principles or practice of coal geology. General topics to be covered are the origin, occurrence, and geographic distribution of coal; principal coal regions of the United States and their remaining coal resources; types of coal mining; and trends in coal production. Selected aspects of these topics will include coal economics, coal exploration, sulfur in coal, current and future uses of coal, applied coal petrology, and methane in coal.

Tuition for the course is $150.00, plus an additional $75.00 for the field trip. For further details, contact John Boardman, Director, Management Development Programs, The University of Oklahoma, 1700 Asp Avenue, Norman, Oklahoma 73037 (phone 405—325-1931).

Mining Engineers to Meet in St. Louis

The fall meeting and exhibit of the Society of Mining Engineers (SME) of the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME) is scheduled for October 19-21 in St. Louis’ convention center.

Among the session topics are underground coal mining, coal utilization, mineral resources and the environment, open-pit mining, chemical processing, and rock mechanics. Besides coal, mineral commodities dealt with specifically are lithium, bauxite-alumina, limestone, clay, lead, and zinc.

Two pre-meeting short courses are planned (on longwall and shortwall mining and on economic principles for coal-property valuation), as are several 1-day field trips.

For further information on the meeting, contact Ruth M. Orologio, SME Meetings Manager, P.O. Box 8800, Salt Lake City, Utah 84108 (phone, 801—582-2744).
Gem and Mineral Show Scheduled for Oklahoma City

The General Exhibits Building at the State Fairgrounds in Oklahoma City will be the locale October 15 and 16 for the Oklahoma Mineral and Gem Society's biennial show. Billed as an October Festival of Gems and Minerals, the show promises to be an extravaganza of specimens, working displays, and other exhibits. A swap area also will be provided.

For further information on the show, contact the chairman, Les Wagner, 3400 Preston Drive, Oklahoma City, Oklahoma 73122.

Oklahoma APGS Members to Meet in October

The annual meeting of the Oklahoma Section of the Association of Professional Geological Scientists has been scheduled for October 14 and 15 at the new Sheraton-Century Center Hotel in downtown Oklahoma City. Section president Henry Trattner, Oklahoma City independent, will preside.

For details on the meeting, contact John W. Erickson, Michigan Wisconsin Pipe Line Co., Fidelity Plaza, Suite 1400, Oklahoma City, Oklahoma 73102 (phone 405—239-7031).

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