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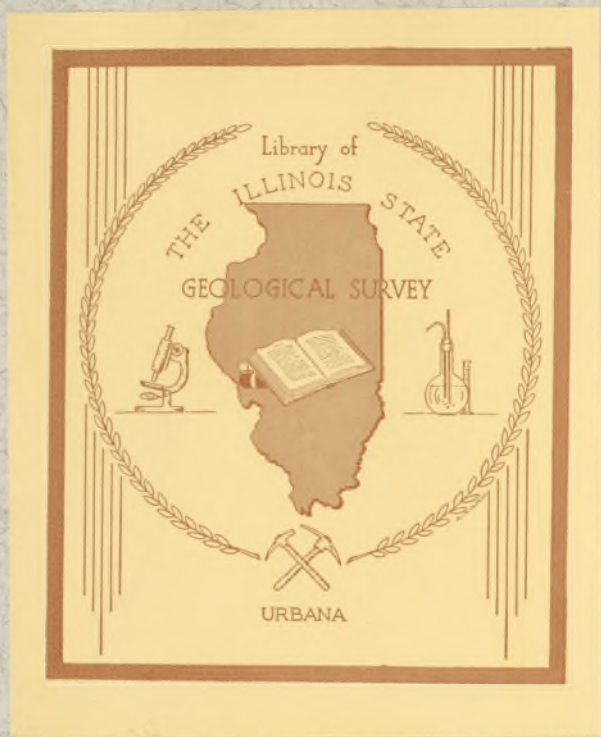
H. B. Willman
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Betty M. Lynch
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BULLETIN 92

ILLINOIS STATE GEOLOGICAL SURVEY

URBANA, ILLINOIS 61801



**Bibliography and Index
Of Illinois Geology
Through 1965**

H. B. Willman
Jack A. Simon
Betty M. Lynch
Virginia A. Langenheim

A Contribution to the Illinois Sesquicentennial Year

Illinois State Geological Survey
Urbana, Illinois 61801

Bulletin 92
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Topographic mapping in cooperation with the United States Geological Survey

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BIBLIOGRAPHY AND INDEX OF ILLINOIS GEOLOGY THROUGH 1965

H. B. Willman, Jack A. Simon, Betty M. Lynch,
and Virginia A. Langenheim

INTRODUCTION

Bibliography

This bibliography of Illinois geology incorporates all the fields of research of the Illinois State Geological Survey, including economic geology, educational geology, engineering geology, general geology, geochemistry, geophysics, and mineral economics. It does not include the literature on related subjects, such as archeology, climatology, modern soils, and surface waters, that are the primary interests of other Illinois state organizations.

All publications of the Illinois State Geological Survey are included. Articles by members of the Survey staff published in professional journals that describe the geology of other regions, or problems not related to Illinois, are not included.

Textbooks, abstracts, reviews, glossaries, catalogues, bibliographies, or lexicons, except for a few that contain original data, are excluded, as are, in general, quotations from, references to, and summaries of Illinois geology that do not contain original contributions.

In the field of economic geology, the bibliography includes mining, milling, quarrying, and construction methods and operations only where these are specifically related to Illinois mineral resources. It does not include articles dealing exclusively with management, safety, plant design, equipment, beneficiation, smelting ores, crushing rocks, burning clay and shale, refining oil, the use of coal, oil, or gas for fuel, or the use of rocks for construction purposes, except those articles in publications of the Illinois State Geological Survey or in publications prepared by the Survey in cooperation with other agencies.

Publications describing the geology of areas bordering Illinois, but with no descriptions of Illinois geology, are not included. Most of them can be found in reference lists in Survey publications or in bibliographies published by the adjacent states.

The bibliography is restricted to publications and does not include manuscripts and maps classified as on open file. Much of the open-file material at the Illinois State Geological Survey in Urbana is listed in Circulars 201, 209, 210, and 220.

In classifying material as publications, the principal criteria have been distribution and availability rather than format. There have been many border-line cases, and, consequently, arbitrary decisions, particularly in the case of field trip guidebooks and maps. Guidebooks that contain significant articles and described sections are included. Guidebooks that are little more than road logs and were distributed only to participants on a field trip are, as a rule, not included. Printed maps given general distribution are included. Some Illinois Geological Survey blue-line maps are included, in particular those that have had wide distribution, are listed in the Survey's List of Publications, and are available from the Survey.

The date of the reference is the actual date of publication shown by the printer's insignia, where given. If this differs from the date on the title page, which is commonly the date of a meeting, the latter date appears in parentheses following the name of the serial.

Theses on Illinois geology, available only from departments or libraries at colleges and universities, or from reproducing services, are not considered publications. However, they are listed in a separate section with a brief index based only on the titles.

Index

The index combines, in one alphabetical unit, references arranged by location, subject, and key words and phrases from titles.

Locations are indexed comprehensively under counties, and less fully under regions, quadrangles, valleys, and cities.

Subjects indexed cover the fields of geology, mineral resources, geochemistry, and geophysics. The volume of literature is so large that no subject can be completely indexed, and the degree of indexing is necessarily uneven. Although indexing ranges from two or three subjects to more than 100 per reference, the average is about ten. Consequently, specific references can generally be located by examining several related subjects.

Stratigraphic names in the index include both formal and informal names, names currently accepted, names formerly used, and names applied to units in Illinois but not adopted. Currently accepted formal names are listed under each system. As the index is not a lexicon of stratigraphic names, it does not include original references to out-of-state names used in Illinois, nor necessarily to their first use in Illinois.

As far as practical, the references to a stratigraphic unit are combined under one heading, even though various modifications of the name have been used. Variations in usage follow the accepted name, set off by commas. If a formation is commonly referred to by a rock term, the word "formation" is omitted. The system to which the unit is assigned is shown in parentheses following the name. If the same term has been applied to different units, separate listing is necessary.

Under "Oil and gas," only the pools for which geologic descriptions were found are indexed. Many pools listed only in tables or on charts are not included but are shown on maps listed under "Oil and gas development maps" under county names, and on lists of pools in Illinois Geological Survey annual petroleum industry reports.

The indexing of key words and phrases from titles is particularly useful to those familiar with the literature. However, in effect, this introduces hundreds of minor subject headings for which there is no attempt at complete indexing. Most of such headings have only one or two references, and commonly do not include the most up-to-date, or even the best, references on the subject. However, examination of related or more general subjects will direct attention to additional references.

Acknowledgments

The U. S. Geological Survey bibliographies of North American geology from 1785 through 1964 provided the starting point for compilation of this bibliography. The Survey kindly provided an advance copy of the portion of the bibliography for 1963 that related to Illinois.

Many members of the Illinois Geological Survey staff have assisted in preparation of the bibliography and index. Elwood Atherton, Jane E. Busey, and Kenneth E. Clegg, in particular, made major contributions. Bruce A. Masters and John T. Kummer assisted in the literature search. For the tedious task of compiling, indexing, and checking, the assistance of John L. Barker, Richard B. Button, Gerald L. Gherardini, Carol E. Kristen, Larry G. Pauley, Linda D. Rentfrow, Dorothy H. Scoggin, and Janet S. Thompson merits special recognition.

LISTS OF ABBREVIATIONS

Abbreviations of Serial and Organization Names

- AAAS—American Association for the Advancement of Science
 AAPG—American Association of Petroleum Geologists
 AIME—American Institute of Mining and Metallurgical Engineers
 Albany Inst.—Albany Institute
 Am. Acad. Arts & Sci.—American Academy of Arts and Sciences
 Am. Antiquity—American Antiquity
 Am. Ceramic Soc.—American Ceramic Society
 Am. Chem. Soc.—American Chemical Society
 Am. Foundrymen's Assoc.—American Foundrymen's Association
 Am. Geog. Soc. N. Y.—American Geographical Society of New York
 Am. Geol.—American Geologist
 Am. Geophys. Union—American Geophysical Union
 Am. Inst. Chem. Eng.—American Institute of Chemical Engineers
 Am. Iron & Steel Inst.—American Iron and Steel Institute
 Am. J. Bot.—American Journal of Botany
 Am. J. Sci.—American Journal of Science
 Am. Midland Nat.—American Midland Naturalist
 Am. Mineralogist—American Mineralogist
 Am. Mus. NH—American Museum of Natural History
 Am. Nat.—American Naturalist
 Am. Paleo.—American Paleontology
 Am. Petrol. Inst.—American Petroleum Institute
 Am. Philos. Soc.—American Philosophical Society
 Am. Soc. Civil Eng., J Hydraulics Div.—American Society of Civil Engineers, Journal of the Hydraulics Division
 Am. Soc. Mech. Eng.—American Society of Mechanical Engineers
 Am. Water Works Assoc.—American Water Works Association
 Anal. Chem.—Analytical Chemistry
 Annals & Mag. NH—Annals and Magazine of Natural History
 Assoc. Am. Geol. & Nat.—Association of American Geologists and Naturalists
 Assoc. Am. State Geologists—Association of American State Geologists
 Assoc. Mo. Geologists—Association of Missouri Geologists
 Assoc. State Eng. Soc.—Associated State Engineering Societies
 Augustana Lib. Pub.—Augustana Library Publications
 Biol. Soc. Wash.—Biological Society of Washington, D. C.
 Boston Soc. NH—Boston Society of Natural History
 Bot. Gaz.—Botanical Gazette
 Buffalo Soc. Nat. Sci.—Buffalo Society of Natural Sciences
 Butler Univ. Bot. Studies—Butler University Botanical Studies
 Canada GS—Geological Survey of Canada
 Canadian Nat. & Geol.—Canadian Naturalist and Geologist and Proceedings of Natural History of Montreal
 Carnegie Inst. Wash.—Carnegie Institution of Washington
 Chem. Communications—Chemical Communications
 Chem. Indus.—Chemical Industries
 Chem. & Met. Eng.—Chemical and Metallurgical Engineering
 Chicago Acad. Sci.—Chicago Academy of Sciences
 Chicago Geog. Soc.—Chicago Geographical Society
 Chicago Nat.—Chicago Naturalist
 Chicago Univ. Walker Mus.—Chicago University Walker Museum
 Cincinnati Soc. NH—Cincinnati Society of Natural History
 Coal Indus.—Coal Industry
 Conn. Acad. Arts & Sci.—Connecticut Academy of Arts and Sciences
 Davenport Acad. Nat. Sci.—Davenport Academy of Natural Sciences
 Denison Univ. B, J Sci. Lab.—Denison University Bulletin, Journal of the Scientific Laboratories
 Earth Sci.—Earth Science
 Earth Sci. Digest—Earth Science Digest

- Econ. Geog.—Economic Geography
 Econ. Geol.—Economic Geology
 Eng. Exp. Sta. News Eng., Ohio State Univ.—Engineering Experiment Station News in Engineering, Ohio State University
 Eng. & Mining—Engineering and Mining
 Eng. News-Record—Engineering News-Record
 Eng. Soc. West. Pa.—Engineers' Society of Western Pennsylvania
 Esconi Assoc.—Esconi Association
 European Assoc. Explor. Geophysicists—European Association of Exploratory Geophysicists
 Field Columbian Mus.—Field Columbian Museum
 Field Mus. NH—Field Museum of Natural History
 Fuel in Sci. & Practice—Fuel in Science and Practice
 Geog. Review—Geographical Review
 Geol. Mag.—Geological Magazine
 Geol. Minn.—Geology of Minnesota
 Geologists' Assoc.—Geologists' Association
 Geophys. Case Histories—Geophysical Case Histories
 GSA—Geological Society of America
 Harper's Mag.—Harper's New Monthly Magazine
 Harvard College Mus. Comparative Zool.—Harvard College Museum of Comparative Zoology
 Harvard Univ. Bot. Mus.—Harvard University Botanical Museum
 Ill. Acad. Sci.—Illinois State Academy of Science
 Ill. Biol. Monograph—Illinois Biological Monograph
 Ill. Coal Strippers Assoc.—Illinois Coal Strippers Association
 Ill. Dept. Agr.—Illinois Department of Agriculture
 Ill. Dept. Reg. & Ed.—Illinois Department of Registration and Education
 Ill. Emergency Relief Comm.—Illinois Emergency Relief Commission
 Ill. Eng.—The Illinois Engineer
 Ill. Geol. Soc.—Illinois Geological Society
 Ill. GS—Illinois State Geological Survey
 Ill.-Ind. Petrol. Assoc. & Ill. GS Ann. Pet. Conf.—Illinois-Indiana Petroleum Association and Illinois Geological Survey Annual Petroleum Conference
 Ill. Indus. Univ.—Illinois Industrial University
 Ill. J Commerce—Illinois Journal of Commerce
 Ill. Mining Inst.—Illinois Mining Institute
 Ill. NH Soc.—Illinois Natural History Society
 Ill. Soc. Architects—Illinois Society of Architects
 Ill. Soc. Eng.—Illinois Society of Engineers
 Ill. Soc. Eng. & Surveyors—Illinois Society of Engineers and Surveyors
 Ill. State Div. Indus. Planning & Dev.—Illinois State Division of Industrial Planning and Development
 Ill. State Mus.—Illinois State Museum
 Ill. State Water Sur.—Illinois State Water Survey
 Ind. Acad. Sci.—Indiana Academy of Science
 Ind. Dept. Geol. & Nat. Res.—Indiana Department of Geology and Natural Resources
 Ind. Dept. Geol. & NH—Indiana Department of Geology and Natural History
 Ind. GS—Indiana Geological Survey
 Independent Petrol. Assoc. Am. Monthly—Independent Petroleum Association of America Monthly
 Indus. & Eng. Chem.—Industrial and Engineering Chemistry
 Inst. Mining Eng.—Institution of Mining Engineers
 Internat. Assoc. Quaternary Research—International Association for Quaternary Research
 Internat. Assoc. Sci. Hydrology—International Association of Scientific Hydrology
 Internat. Comm. Coal Petrology—International Committee for Coal Petrology
 Internat. Conf. Bit. Coal—International Conference on Bituminous Coal
 Internat. Cong. Soil Sci.—International Congress of Soil Science
 Internat. Geod. & Geophys. Union, Assoc. Sci. Hydrology—International Geodetic and Geophysical Union, Association of Scientific Hydrology
 Internat. Geol. Cong.—International Geological Congress
 Internat. Oil Scouts Assoc.—International Oil Scouts Association
 Internat. Sedimentological Cong.—International Sedimentological Congress
 Internat. Ser. Mons. Earth Sci.—International Series of Monographs on Earth Science

- Interstate Oil Compact Comm.—Interstate Oil Compact Commission
 Interstate Oil Compact Quart.—Interstate Oil Compact Quarterly
 Iowa Acad. Sci.—Iowa Academy of Science
 Iowa GS—Iowa Geological Survey
 Iowa State Hist. Soc.—Iowa State Historical Society
 Iowa State Univ., Lab. NH—Iowa State University, Laboratories of Natural History
 Isotopic & Cosmic Chem.—Isotopic and Cosmic Chemistry
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 Mo. Bot. Garden Annals—Missouri Botanical Garden Annals
 Mo. Bur. Geol. & Mines—Missouri Bureau of Geology and Mines
 Mo. GS & Water Resources—Missouri Division of Geological Survey and Water Resources
 Mo. School Mines & Metall.—Missouri School of Mines and Metallurgy
- Natl. Acad. Sci.—Natl. Research Council—National Academy of Sciences—National Research Council
 Natl. Conf. on Clays & Clay Minerals—National Conference on Clays and Clay Minerals
 Natl. Conserv. Commission—National Conservation Commission
 Natl. Oil Scouts & Landmen's Assoc.—National Oil Scouts and Landmen's Association
 Natl. Research Council—National Research Council

- Neb. Acad. Sci.—Nebraska Academy of Science
 Nev. Bur. Mines—Nevada Bureau of Mines
 N. M. Bur. Mines & Minerals Res.—New Mexico Bureau of Mines and Minerals Resources
 N. Y. Acad. Sci.—New York Academy of Sciences
 N. Y. GS—New York Geological Survey
 N. Y. State Cabinet NH—New York State Cabinet of Natural History
 N. Y. State Geologist—New York State Geologist
 N. Y. State Mus.—New York State Museum
 Nova Scotia Dept. Mines—Nova Scotia Department of Mines
 Ohio GS—Ohio Geological Survey
 Ohio J Sci.—Ohio Journal of Science
 Okla. Geol. Notes—Oklahoma Geology Notes
 Outdoor Ill.—Outdoor Illinois
 Pa. Acad. Sci.—Pennsylvania Academy of Science
 Pa. State Univ. Minerals Industries Exp. Sta.—Pennsylvania State University Minerals Industries Experiment Station
 Paleo. B—Paleontological Bulletin
 Pan-Am. Geol.—Pan-American Geologist
 Peoria Sci. Assoc.—Peoria Science Association
 Petrol. Eng.—Petroleum Engineer
 Phila. Acad. Nat. Sci.—Philadelphia Academy of Natural Sciences
 Phila. Acad. Sci.—Philadelphia Academy of Science
 Phila. Geog. Soc.—Philadelphia Geographical Society
 Phys. & Colloid Chem.—Physical and Colloid Chemistry
 Popular Astron.—Popular Astronomy
 Popular Sci. Monthly—Popular Science Monthly
 Robert A. Taft Sanitary Eng. Center—Robert A. Taft Sanitary Engineering Center
 Royal Soc. Canada—Royal Society of Canada
 Royal Soc. Edinburgh—Royal Society of Edinburgh
 St. Louis Acad. Sci.—St. Louis Academy of Science
 Sci. Monthly—Scientific Monthly
 Sedalia NH Soc.—Sedalia Natural History Society
 Seismol. Soc. Am.—Seismological Society of America
 SEPM—Society of Economic Paleontologists and Mineralogists
 Smithsonian Inst.—Smithsonian Institution
 Soc. Mining Eng.—Society of Mining Engineers
 Soil Sci. Soc. Am.—Soil Science Society of America
 Solid Fuel Eng.—Solid Fuel Engineering
 Southeast Mo. State College Earth Sci. Dept.—Southeast Missouri State College Earth Science Department
 Torrey Bot. Club—Torrey Botanical Club
 Tulane Geol. Studies—Tulane Studies in Geology
 Tulsa Geol. Soc. Digest—Tulsa Geological Society Digest
 U. S. Army Topog. Eng.—United States Army, Corps of Topographical Engineers
 U. S. Bur. Labor Statistics—United States Bureau of Labor Statistics
 USBM—United States Bureau of Mines
 U. S. Bur. Standards—United States Bureau of Standards
 U. S. Cong.—United States Congress
 USDA Bur. Soils—United States Department of Agriculture, Bureau of Soils
 U. S. Dept. Commerce, Bur. Census—United States Department of Commerce, Bureau of the Census
 U. S. Dept. Commerce and Labor, Bur. Census—United States Department of Commerce and Labor, Bureau of the Census
 U. S. Dept. Interior—United States Department of the Interior
 USGS—United States Geological Survey
 USGS Geophys. Inv. Maps—United States Geological Survey Investigations Maps
 USGS Water Supply & Irr. Paper—United States Geological Survey Water Supply and Irrigation Paper
 U. S. Natl. Mus.—United States National Museum
 U. S. Soil Conserv. Serv. Sed. Survey—United States Soil Conservation Service Sedimentation Survey
 Univ. Chicago Press, Univ. Record—University of Chicago Press, University Record

Univ. Ill. Agr. Exp. Sta. B.—University of Illinois Agricultural Experiment Station Bulletin
 Univ. Ill. Bur. Econ. & Bus. Res.—University of Illinois Bureau of Economic and Business Research
 Univ. Ill. Eng. Exp. Sta.—University of Illinois Engineering Experiment Station
 Univ. Ill. Mus. NH Contrib.—University of Illinois Museum of Natural History Contributions
 Univ. Ill. Social Sci. Studies—University of Illinois Social Science Studies
 Univ. Iowa Studies NH—University of Iowa Studies in Natural History
 Univ. Kans. Mus. NH Pub.—University of Kansas, Museum of Natural History Publications
 Univ. Mich. Mus. Paleo.—University of Michigan Museum of Paleontology
 Univ. Wis. Geophysical & Polar Research Center, Dept. Geol.—University of Wisconsin Geophysical and Polar Research Center, Department of Geology

Va. J Sci.—Virginia Journal of Science

Wash. Acad. Sci.—Washington Academy of Sciences
 Wash. Univ. Studies—Washington University Studies
 Water Works Eng.—Water Works Engineering
 Western Soc. Eng.—Western Society of Engineers
 Wilson B—Wilson Bulletin
 Wis. Acad. Sci.—Wisconsin Academy of Sciences
 Wis. GS—Wisconsin Geological Survey
 Wis. J Geol.—Wisconsin Journal of Geology
 World Petrol.—World Petroleum

Other Abbreviations

Am.	American	Fm.	Formation	Pop.	Popular
Ann.	Annual	Geol.	Geologic	Prelim.	Preliminary
Anon.	Anonymous	Gen.	General	Proc.	Proceedings
B	Bulletin	IC	Information circular	Prof.	Professional
C	Circular	Inv.	Investigations	Pt.	Part
Camb.	Cambrian	J	Journal	Prog.	Progress
Chap.	Chapter	LS.	Limestone	Pub.	Publication
Circ.	Circular	M.	Member	Rept.	Report
Collect.	Collection	Mem.	Memoir	RI	Report of investigations
Conf.	Conference	Misc.	Miscellaneous	Sci.	Science
Contrib.	Contribution	Miss.	Mississippian	ser.	Series
Coop.	Cooperative	Mon.	Monograph	Sh.	Shale
Cre.	Cretaceous	Mus.	Museum	Sil.	Silurian
Cyc.	Cyclothem	NH	Natural History	Spec.	Special
Dev.	Devonian	no.	Number	Ss.	Sandstone
Disc.	Discussion	n. s.	New series	Sur.	Survey
Doc.	Document	Ord.	Ordovician	Tech.	Technical
Dol.	Dolomite	p.	Page, pages	Ter.	Tertiary
Ec.	Economics	Pa.	Pennsylvanian	Trans.	Transactions
Ed.	Educational	Pet.	Petroleum	Univ.	University
Eng.	Engineering	Pleis.	Pleistocene	v.	Volume
Exec.	Executive			Zool.	Zoology

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- Atokan Series, Atoka Group (Pa.): C. L. Cooper 1946, W. V. Searight 1961, M. L. Thompson 1964.
- Attapulgitic, structural scheme: W. F. Bradley 1940.
- Atterberg limits (see Clay and shale)
- Atwood Fault: Heyl 1965.
- Augusta Limestone (Miss.): Keyes 1898.
- Augusta Member (Ord.): Templeton 1963.
- Aurora, mastodon: W. E. Powers 1936, C. R. Smith 1936.
- Aurora Syncline: Willman 1942b.
- Aux Vases Sandstone (Miss.): H. H. Arnold Jr. 1939, J. W. Baxter 1963a, J. C. Bradbury 1963, Butts 1929, P. L. Dana 1941, English 1948, Folk 1946, Keyes 1892b, 1922c, 1938a, L. K. Lee 1939b, Leighton 1939, Piersol 1940, P. E. Potter 1958a, 1963a, 1963c, E. W. Shaw 1923, Smoot 1960b, 1960c, Swann 1963, Tippie 1942, E. O. Ulrich 1917, J. M. Weller 1940b, Stuart Weller 1920a, 1939b, Workman 1940.
 Isopach map: P. E. Potter 1963a.
 Petrography: Mast 1963, Swann 1959.
- Aux Vases Sandstone—cont.
 Structure map: Folk 1946, Morrisey 1957.
- Ava area: St. Clair 1917b.
- Ava Shale (Pa.): Kosanke 1960, Wanless 1939.
 Structure map: Root 1928.
- Ava-Campbell Hill Anticline: Root 1928.
- Ava-Campbell Hill gas field: A. H. Bell 1935a, 1940b.
- Aviston Anticline: A. H. Bell 1941b.
- Avon Quadrangle: Savage 1916b, 1921a.
- Ayers Anticline: A. H. Bell 1926c, 1928b, 1928c, 1941b, R. S. Blatchley 1914a, F. H. Kay 1915a.
- Ayers Oil Field: A. H. Bell 1935a, Peterson 1942a.
- Aylesworth Limestone Member (Pa.): Savage 1930a.

B

- Babylon Anticline: Moulton 1925d.
- Babylon Coal (Pa.) (see Manley Coal): Kosanke 1950, 1960, Wanless 1939, 1957a, Winslow 1959.
- Babylon Cyclothem (Pa.): Kosanke 1960, Krumbain 1933a, Wanless 1931a, 1957a.
- Babylon Sandstone Member (Pa.): Kosanke 1960, P. E. Potter 1956a, Siever 1956b, 1959, Wanless 1939, 1955b, 1957a.
- Back Bone: Worthen 1868(2).
- Backbone Limestone (Dev.) (see Little Saline Ls.): Bassett 1925, J. E. Lamar 1953a, 1959, Ross 1964b, Savage 1920, J. M. Weller 1939c, 1940a, 1940c, 1944a, 1944b, 1952, Willman 1949, Workman 1944.
 Paleogeographic map: Schuchert 1955.
- Bacteria, sulphate-reducing: E. S. Bastin 1926a, 1930.
- Bacteriostatic substance from vitrain: Kosanke 1954a.
- Bailey Limestone (Dev.): Caylor 1944, J. E. Lamar 1934, 1948, 1953a, 1959, Meek 1868a, Pryor 1962a, Ross 1964b, Savage 1920, 1925a, J. M. Weller 1939c, 1940a, 1940c, 1944a, 1944b, 1952, Workman 1944.
 Paleogeographic map: Schuchert 1955.
- Bainbridge Group, Limestone (Sil.): J. R. Ball 1939, 1940b, 1941, 1942b, J. E. Lamar 1948, Lowenstam 1942, 1946, 1949b, J. M. Weller 1940a, 1940c.
- Baker (Frank Collins) fossil collection: A. B. Leonard 1957b.
- Bald Hill Anticline: Butts 1917b, Stuart Weller 1920b.
- Bald Hill Coal (Pa.) (see Mt. Rorah Coal): G. H. Cady 1926, 1952b, Kosanke 1950, 1960, Winslow 1959.
- Bald Hill Sandstone (Pa.): G. H. Cady 1926.
- Bald Hill Uplift: J. N. Gardner 1915, Lockett 1947.
- Baldwin Formation (Miss.): Leighton 1939, Swann 1963, J. M. Weller 1940b, Stuart Weller 1939b.
- Baldwin Quadrangle: Stuart Weller 1939b.
- Baldwinsville Limestone (Pa.): J. E. Lamar 1934.
- Baltimore and Ohio Railroad, geology along: Grimsley 1933.
- Bankston Coal (Pa.) (see Allenby Coal): Kosanke 1950, 1960, Wanless 1939.

- Bankston Cyclothem (Pa.): Kosanke 1960, J. M. Weller 1942c.
- Bankston Fork Limestone Member (Pa.): J. R. Ball 1931, A. H. Bell 1931a, G. H. Cady 1926, 1932c, 1955, Kosanke 1960, Lowenstam 1951, Pullen 1951, Rolley 1951, Siever 1957a, Wanless 1955b, J. M. Weller 1942c.
- Bardolph Anticline: Wanless 1957a.
- Barite: E. S. Bastin 1931b, J. C. Bradbury 1959a, Brecke 1964a, J. E. Lamar 1965, S. M. McClure 1947b, Owen 1846, Shipton 1915, Shrode 1952.
- Chemical analyses: J. C. Bradbury 1959a.
- Barlow Limestone (Miss.) (see Beech Creek Ls.): Brownfield 1954, Folk 1946, Swann 1948, 1963.
- Structure map: Brownfield 1954, P. E. Potter 1956c.
- Bartleso Dome: A. H. Bell 1941b, E. W. Shaw 1912a, 1923.
- Bartleso Pool: Piersol 1940.
- Bassetts Coal (Pa.): Worthen 1868(2).
- Batchtown Channel: Rubey 1952.
- Bath Terrace: W. H. Walker 1965, Wanless 1957a.
- Battery Rock Coal (Pa.) (see Gentry Coal): E. T. Cox 1875, Kosanke 1950, 1960, Wallace Lee 1916, Wanless 1939, 1955b, Stuart Weller 1920b, Winslow 1959, Worthen 1866a(5).
- Paleobotany: Jongmans 1937a.
- Battery Rock Cyclothem (Pa.): Kosanke 1960, J. M. Weller 1940a.
- Battery Rock Sandstone Member (Pa.): J. W. Baxter 1963a, 1965a, E. T. Cox 1875, Desborough 1961b, 1961d, S. E. Harris 1961, Kosanke 1960, P. E. Potter 1956a, 1962c, 1963a, 1965, Siever 1956b, 1959, Wanless 1955b, J. M. Weller 1940a, 1952.
- Bay Creek: Leverett 1899a.
- Baylis Formation (Cre.): Frye 1964a.
- Beach erosion: U. S. Army Corps of Engineers 1953.
- Beach-pebble abrasion: Landon 1930.
- Beach sands: Krumbein 1954, Pettijohn 1931.
- Bear Creek Valley: Leverett 1899a.
- Beardstown Quadrangle: Wanless 1957a, 1958.
- Beardstown Quadrangle Pleistocene: Leighton 1935d.
- Beardstown Terrace: W. H. Walker 1965, Wanless 1957a.
- Beaver Bend Limestone Member (Miss.): Swann 1963.
- Beaver Creek, glacial origin: G. E. Ekblaw 1929.
- Beckemeyer Dome: A. H. Bell 1941a.
- Bedrock Topography (see also under county)
- General: Bretz 1955, Caldwell 1938, M. R. Campbell 1900, Clem 1911, Fidar 1943, Horberg 1945, 1946, 1950a, 1953, 1956a, Leverett 1895, Pullen 1953, Selkregg 1958, E. H. Walker 1957, Wanless 1957a, G. K. Warren 1878, Willman 1942b, Workman 1932.
- Maps (see under county)
- Map of state: Horberg 1950a.
- Geologic history: Frye 1963d.
- Beech Creek Limestone (Miss.) (see Barlow Ls.): J. W. Baxter 1963a, 1965a, A. H. Bell 1961c, J. C. Bradbury 1963, McFarlan 1955, Malott 1952, P. E. Potter 1958a, Swann 1948, 1963, Whiting 1959.
- Structure map: A. H. Bell 1961c, Meents 1959, Whiting 1959.
- Beecher Member (Ord.): Doyle 1965, Templeton 1952, 1963.
- Bell Coal (Pa.): G. H. Cady 1919a.
- Bellair-Champaign Uplift: Clegg 1959, Mylius 1923, 1927.
- Bellair Dome: Mylius 1927.
- Bellair Pool: Mylius 1923, 1927, Squires 1950b, 1950d.
- Bellevue, mammoth: Willman 1941b.
- Belleville Anticline: A. H. Bell 1941b, DeWolf 1909.
- Belleville Coal (Pa.): Worthen 1866a(5), 1882c.
- Belleville (No. 6) Coal (Pa.) (see Herrin (No. 6) Coal): Culver 1925b, Johan A. Udden 1908c.
- Belleville-Breese area: Johan A. Udden 1915.
- Belleville-O'Fallon Anticline: Johan A. Udden 1915.
- Belleville Quadrangle: Johan A. Udden 1908c, 1915.
- Beloit region: Swezey 1882.
- Beltrees-Melville Anticline: Collingwood 1933.
- Belvidere Lobe: Leighton 1923a.
- Bench Coal (Pa.): G. H. Cady 1919a.
- Bench marks (see Spirit leveling)
- Bend meteorite: Nichols 1939, Roy 1951, B. H. Wilson 1938.
- Benoist Sand, Pay Zone: H. H. Arnold 1939, A. H. Bell 1927b, W. F. Cloud 1941, Folk 1946, Squires 1943e, 1950d, Swann 1948, Witherspoon 1955a.
- Isopach map: Barger 1950.
- Structure map: H. H. Arnold 1939, A. H. Bell 1927b, 1934a, H. L. Koch 1939, L. K. Lee 1939b, Squires 1943e.
- Paleogeographic map: Schuchert 1955.
- Bentley Terrace: Fisk 1949.
- Benton Pool: Cameron 1951, Howell 1948, Kornfeld 1952, Parkison 1957, Squires 1951.
- Bentonite, green compression strength: W. F. Bradley 1956a.
- Bentonite, Ordovician: Templeton 1963.
- Bernadotte Cyclothem (Pa.): Wanless 1931a.
- Bernadotte Sandstone Member (Pa.): Kosanke 1960, Savage 1927, Wanless 1939, 1955a, 1957a.
- Berwyn Quadrangle: Bretz 1943, 1955.
- Bethel Sandstone (Miss.): Atherton 1947, J. W. Baxter 1963a, 1965a, Brecke 1962, Butts 1925, Coryell 1939a, Currier 1944, P. L. Dana 1941, English 1948, J. E. Lamar 1925a, Piersol 1940, P. E. Potter 1958a, Pye 1943, 1944, Ross 1964b, Smoot 1960c, A. H. Sutton 1952, Swann 1948, 1956, 1963, J. M. Weller 1939e, 1940a, 1940b, 1952, Stuart Weller 1920a, 1920b, 1939a, Workman 1940.
- Paleogeographic map: Pye 1944.
- Structure map: A. H. Bell 1940a, Pye 1944, J. M. Weller 1952.
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- Chicago area: Isfort 1949, Turley 1961.
- Coal mining: Andros 1915a.
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- Ostracodes: Agnew 1942.
- Bidwell Coal Member (Pa.): Kosanke 1960.

- Biehl Sand, Pay Zone: Moulton 1925b, 1927a, 1927b, Piersol 1940, Rich 1915, 1916b, Squires 1938b, 1943c.
 Structure map: Moulton 1925b, 1927a.
 Big Clifty Sandstone Member (Miss.): P. E. Potter 1958a, Swann 1948, 1963.
 Big Creek Fault: J. W. Baxter 1965a, J. M. Weller 1952, Stuart Weller 1920b.
 Big Creek Shale Member (Pa.): Kosanke 1960, Savage 1927, Wanless 1957a.
 Big Meadow Channel: Leverett 1899a.
 Big Muddy Basin reservoir site: Leighton 1935a.
 Big Muddy River Valley: Horberg 1950a.
 Big Muddy River watershed: Pickels 1929.
 Big Vermilion River watershed: Pickels 1929.
 Billett Hills: Fidler 1948.
 Billett Pool: Rich 1916b.
 Binding materials for briquets: Yohe 1964.

Biostratigraphy

Biostratigraphic Zones

- Agassizocrinus* cf. *leavis* Peak Zone: McFarlan 1955, Swann 1963.
Apatognathus geminus - *Cavusgnathus* Assemblage Zone: Collinson 1962.
Aphelaspis Zone: Lochman 1956.
Bactrognathus-*Polygnathus communis* Assemblage Zone: Collinson 1962.
Bactrognathus-*Taphrognathus* Assemblage Zone: Collinson 1962.
Batostomella nitidula Peak Zone: Swann 1963.
Brachythyris subcardiiformis Zone: Stuart Weller 1926a.
 "Camarophoria" *explanata* Zone: Swann 1963, Stuart Weller 1926a.
Campophyllum gasperense Zone: McFarlan 1955, Swann 1963.
Cladognathodus-*Cavusgnathus navicula* Assemblage Zone: Collinson 1962.
Cladognathodus prima Assemblage Zone: Collinson 1962.
Cornulites Zone: Templeton 1963.
Cystodictya labiosa Zone: Swann 1963, Stuart Weller 1926a.
Dalmanella Zone: Templeton 1963.
Dalmanites Zone: Lowenstam 1948a.
Diaphragmus Zone: Swann 1963.
Elvinia Zone: Lochman 1956.
Fusulina Zone: C. L. Cooper 1947a, Culver 1922b, M. L. Thompson 1959, J. M. Weller 1942c.
Fusulina eximia Subzone: J. M. Weller 1942c.
Fusulina girtyi Subzone: J. M. Weller 1942c.
Fusulina leei Subzone: J. M. Weller 1942c.
Fusulinella Zone: C. L. Cooper 1947a, M. L. Thompson 1959, J. M. Weller 1942c.
Fusulinella iowensis Subzone: J. M. Weller 1942c.
Gnathodus bilineatus - *Cavusgnathus characta* Assemblage Zone: Collinson 1962.
Gnathodus bilineatus - *Cavusgnathus cristata* Assemblage Zone: Collinson 1962.
Gnathodus bilineatus - *Cladognathodus mehli* Assemblage Zone: Collinson 1962.
Gnathodus n. sp. A Assemblage Zone: Collinson 1962.

Biostratigraphy—cont.

Biostratigraphic zones—cont.

- Gnathodus semiglaber* - *Pseudopolygnathus multistriata* Assemblage Zone: Collinson 1962.
Gnathodus sp. B - *G. kocheli* Assemblage Zone: Collinson 1962.
Gnathodus texanus - *Taphrognathus* Assemblage Zone: Collinson 1962.
Leptaena analoga Zone: Stuart Weller 1926a.
Lithostrotionella castelnaui = "*Lithostrotion canadensis*" Assemblage Zone: Swann 1963, Stuart Weller 1926a.
Millerella Assemblage(?) Zone: Swann 1963.
Mysticocrinus Zone: Lowenstam 1948a.
Palmatolepis provera - *P. triangularis* Assemblage Zone: Collinson 1962.
Palmatolepis quadrantinodosa - *P. glabra* Assemblage Zone: Collinson 1962.
Pentamerus Zone: Savage 1926, Willman 1943b, 1963.
Pentremites foehsi Zone: Swann 1963, Stuart Weller 1926a.
Pionodema Zone: Templeton 1963.
Platycrinites "*Platycrinus*" *penicillus* Zone: Swann 1963, Stuart Weller 1926a.
Platyerella manniensis Zone: Athy 1928, D. J. Fisher 1925a, Savage 1913c, 1926, A. H. Sutton 1935, Willman 1962.
Polygnathus irregularis - "*Ancyrognathus*" *quadrata* Assemblage Zone: Collinson 1962.
Prasopora Zone: Templeton 1952, 1963.
Prismopora serrulata Zone: Swann 1963.
Productus crawfordsvillensis Zone: Stuart Weller 1926a.
Productus inflatus Zone: McFarlan 1955, Swann 1963.
Productus magnus Zone: Stuart Weller 1926a.
Profusulinella Zone: M. L. Thompson 1959.
Pseudolingula Zone: Templeton 1963.
Pterotocrinus acutus and *Pterotocrinus bifurcatus* Assemblage Zone: Swann 1963, Stuart Weller 1926a.
Pterotocrinus capitalis Range Zone: Swann 1963, Stuart Weller 1926a.
Pterotocrinus Zone: Gutschick 1965.
Receptaculites oweni Zone: Templeton 1952, 1963, Trowbridge 1916, Willman 1943b.
Saukia Zone: Lochman 1956.
Siphonodella duplicata Assemblage Zone: Collinson 1962.
Siphonodella quadruplicata - *S. crenulata* Assemblage Zone: Collinson 1962.
Siphonodella sp. A - *S. cooperi* Assemblage Zone: Collinson 1962.
Siphonodella sulcata Assemblage Zone: Collinson 1962.
Sowerbyella Zone: Templeton 1963.
Spathognathodus aculeatus Assemblage Zone: Collinson 1962.
Spirifer grimesi - *logani* Zone: Stuart Weller 1926a.
Stenocisma explanata Range Zone: Swann 1963.
Streptognathodus unicornis Assemblage Zone: Collinson 1962.

Biostratigraphy—cont.

Biostratigraphic zones—cont.

Stricklandia pyriformis Zone: Athy 1928,
D. J. Fisher 1925a, Savage 1913c, 1926,
A. H. Sutton 1935, Willman 1962.

Sulcatopinna missouriensis Zone: Swann
1963, Stuart Weller 1926a.

Talarocrinus Range Zone: Swann 1963,
Stuart Weller 1926a.

Taphrognathus varians - Apatognathus Assem-
blage Zone: Collinson 1962.

Triticites Zone: C. L. Cooper 1947a, J. M.
Weller 1942c.

Triticites ohioensis Subzone: J. M. Weller
1942c.

Wedekindellina Zone: J. M. Weller 1942c.

Wedekindellina euthisepta Subzone: J. M.
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Classification: Willman 1958.

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Mississippi Valley: Collinson 1962.

Faunal Zones

Bankston Fork Zone: C. L. Cooper 1946.

Blue Island Zone: Lowenstam 1948a.

Brereton (Herrin) Zone: C. L. Cooper
1946.

"Centralia" Zone: C. L. Cooper 1946.

Cohn Zone: C. L. Cooper 1946.

Crab Orchard Zone: C. L. Cooper 1946.

Depauperate Zone: Templeton 1963.

Exline Zone: C. L. Cooper 1946.

Greenup Zone: C. L. Cooper 1946.

Jamestown Zone: C. L. Cooper 1946.

Lamellibranch Zone: Trowbridge 1916.

LaSalle-Livingston-Millersville Zone: C. L.
Cooper 1946.

Little Vermilion Zone: C. L. Cooper 1946.
Liverpool (Oak Grove) Zone: C. L.
Cooper 1946.

Lonsdale (Gimlet) Zone: C. L. Cooper
1946.

Macoupin Zone: C. L. Cooper 1946.

Newton-Shumway Zone: C. L. Cooper
1946.

Piasa-Sparland Zone: C. L. Cooper 1946.

St. David Zone: C. L. Cooper 1946.

Seahorne Zone: C. L. Cooper 1946.

Seville Zone: C. L. Cooper 1946.

Shoal Creek Zone: C. L. Cooper 1946.

Summum (Hanover) Zone: C. L. Cooper
1946.

Trivoli Zone: C. L. Cooper 1946.

Wiley Zone: C. L. Cooper 1946.

Woodbury Zone: C. L. Cooper 1946.

General

Paleozoic: C. L. Cooper 1942b.

Cambrian: Lochman 1956.

Ordovician: Gutstadt 1958b, Perry 1962,
Savage 1924b, Templeton 1963.

Silurian: Collinson 1955b, Lowenstam
1948a, 1948c, Ross 1962b.

Devonian: Collinson 1955b, 1958d, 1959,
1962, Orr 1964.

Devonian and Mississippian conodont zones:
Rexroad 1965a, A. J. Scott 1961a.

Mississippian: R. H. Benson 1958, Collin-
son 1954, 1958b, 1959, 1962, 1964b, J. E.
Conkin 1965, C. L. Cooper 1941, Easton
1951, R. C. Moore 1937, Rexroad 1957,
1958b, 1961b, 1963, Swann 1963, J. M.
Weller 1940b, Stuart Weller 1920b, 1926a,
Winslow 1959.

Biostratigraphy—cont.

General—cont.

Chesterian: Horowitz 1961, Rexroad
1961c, A. H. Sutton 1932, 1934b, Swann
1963.

Pennsylvanian: C. L. Cooper 1946, 1947a,
Dunbar 1942, Kosanke 1947, 1950, Les-
quereux 1870, R. C. Moore 1937, Peppers
1964, Savage 1924a, M. L. Thompson 1959,
Wanless 1958, 1963b, J. M. Weller 1942c,
Winslow 1959.

Pleistocene: A. B. Leonard 1955, 1960.

Birds Pool: Rich 1916a.

Birds Quadrangle: Rich 1916a.

Birdsville Formation, Group (Miss.): Bain 1905a,
R. S. Blatchley 1913a, Bleining 1912, E.
W. Shaw 1912b, E. O. Ulrich 1917, Stuart
Weller 1906b, 1907a.

Birkbeck Syncline: Willman 1947.

Bituminous shale (see Oil shale)

Black Jack Syncline: Willman 1947.

Black River Limestone, Group (Ord.): Gutstadt
1958a, Thwaites 1923.

Black Slate (Dev.): Worthen 1868(2).

Blackland Pool: Whiting 1956.

Blackriveran Stage (Ord.): Templeton 1963.

Blair Coal: Bement 1929, Wanless 1939.

Blairsville Pool: Squires 1950b.

Blocher Shale (Dev.): Meents 1965b, Workman
1956.

Blodgett Member (Ord.): Buschbach 1964.

Blodgett Moraine: Bretz 1939, 1955, Suter 1959.

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M. R. Campbell 1900, Culver 1922a, Ewel-
land 1952, D. J. Fisher 1925a, R. F. Flint
1949, John Webster Foster 1956, Frye
1965b, Leighton 1923a, 1925a, 1953, 1958a,
Leverett 1899a, MacClintock 1959, C. O.
Sauer 1916, Wanless 1957a, Willman
1942b.

Bloomington Ridged Plain: Leighton 1948b.

Blue Band, in No. 6 Coal (Pa.): G. H. Cady
1916, 1917, 1919a, 1952b, F. H. Kay 1915a,
MacClintock 1959, Deette Rolfe 1929, E.
W. Shaw 1921, Johan A. Udden 1915,
Wanless 1939, 1952, 1957a, Woltman 1956.

Blue Diggings dikes: J. W. Baxter 1965a.

Blue Diggings Fault: E. S. Bastin 1931b, J. W.
Baxter 1965a, Hubbert 1944, J. M. Weller
1952, Stuart Weller 1920b.

Blue Fly Coal (Pa.): Johan A. Udden 1912b.

Blue Island Quadrangle: Bretz 1943, 1955.

Blue Limestone (Platteville) (Ord.): James Shaw
1873, Whitney 1866.

Boarman Member (Ord.): Templeton 1952.

Bog deposit: Artist 1936, Athy 1928, E. S. Riggs
1937, Tehon 1938, Voss 1937, Waterman
1923.

Bogota Cyclothem (Pa.) (see Upper and Lower Bo-
gota Cyclothem): Kosanke 1960, J. M.
Weller 1958b.

Bogota Limestone Member (Pa.): Kosanke 1960,
Newton 1937b, Pryor 1956b.

Isopach map: Pryor 1956b.

Structure map: Pryor 1956b.

Bogota-Rinard Syncline: F. E. Williams 1955.

Boles Member (Ord.): Templeton 1963.

Bond County

- Bedrock topography: Horberg 1950a, Wallace Lee 1926.
- Brines: Meents 1952.
- Clay and shale: Wallace Lee 1926.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: Grim 1957, Smoot 1960a, W. A. White 1960b.
- Resources: W. A. White 1964a.
- Coal**
- General: F. H. Kay 1915a, Wallace Lee 1917, 1926, J. N. Payne 1941.
- Analyses: G. H. Cady 1935b, 1948a, Fieldner 1942b, Hawley 1923, Parr 1916.
- Mined-out areas: Ill. GS 1959b map 22.
- Mining: Annual coal reports, Andros 1914e, H. M. Cooper 1942b, E. W. Shaw 1923.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1952b, Siever 1950.
- Subsidence: L. E. Young 1916b.
- Cone-in-cone: Broadhead 1907.
- Drill records: R. F. Blatchley 1911, Ross Hanson 1950, 1958, F. H. Kay 1915a, Leverett 1899a, Saxby 1957, Warthin 1944, Worthen 1890(2).
- Earthquakes: Heinrich 1950.
- Feldspar: Willman 1942a.
- Fossil horse: O. P. Hay 1909.
- Geologic sections (described outcrops)
- Dry Fork (Pa.): Kosanke 1960.
- Flat Creek (Pa.): Kosanke 1960.
- Geophysical studies: Pryor 1956c.
- Greenville area guide leaflet: Ill. GS 1962-F.
- Ground water**
- General: Horberg 1950a, Wallace Lee 1926, Leverett 1899a, Pryor 1956c, Selkregg 1957.
- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
- Gypsum and anhydrite: Saxby 1957.
- Limestone and dolomite: Krey 1925.
- Building stone: Wallace Lee 1926.
- Trace elements: Ostrom 1957c.
- Maps (see also type of map, stratigraphic units)**
- Bedrock topography: Horberg 1950a, Wallace Lee 1926, Johan A. Udden 1915.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Wallace Lee 1926, E. W. Shaw 1923, Johan A. Udden 1915.
- Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Workman 1956.
- Structure: A. H. Bell 1926c, 1926e, 1928b, 1928c, 1943c, R. S. Blatchley 1914a, F. H. Kay 1915a, Wallace Lee 1915, 1917, 1926, Moulton 1925d, J. N. Payne 1941, Pye 1944, E. W. Shaw 1912a, 1923, Siever 1950, Johan A. Udden 1915.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas**
- General: R. S. Blatchley 1910a, 1914a, Wallace Lee 1926.
- Development maps: Ill. GS 1959 maps 49, 50, 62.
- Developments: A. H. Bell 1928c, Moulton 1926j.

Bond County—cont.

- Oil and gas—cont.
- Physical properties: Armon 1964.
- Pools**
- Ayers: S. F. Peterson 1942a.
- Greenville: R. S. Blatchley 1914a.
- Possibilities: A. H. Bell 1926c, 1926e, 1941b, R. S. Blatchley 1910a, Wallace Lee 1915, Moulton 1925d, 1926b.
- Prospecting: Mylius 1920b.
- Secondary recovery: Pryor 1957.
- Physiography: Wallace Lee 1926, Leighton 1948b, MacClintock 1929, E. W. Shaw 1923, Johan A. Udden 1915.
- Quadrangle studies**
- Brees: Johan A. Udden 1915.
- Carlyle: E. W. Shaw 1923.
- Mt. Olive: Wallace Lee 1926.
- Sand and gravel**
- Mineralogy: Willman 1942a.
- Molding sand: Littlefield 1925a, 1925b.
- Sandstones: Andresen 1961, P. E. Potter 1961a, 1962c, Pye 1944.
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- Stratigraphy**
- General: A. H. Bell 1928c, R. S. Blatchley 1914a, Wallace Lee 1915, 1926, Selkregg 1957, E. W. Shaw 1923, Swann 1958, Johan A. Udden 1915.
- Ordovician: A. H. Bell 1964, Gutstadt 1958b, Workman 1948.
- Silurian: Lowenstam 1950, Whiting 1958.
- Devonian: Meents 1965b, Schwalb 1955, Warthin 1944, Whiting 1958, Workman 1944.
- Mississippian: Pye 1944, Swann 1958, 1963, 1965, Workman 1956.
- Pennsylvanian: Andresen 1961, L. G. Henbest 1928b, F. H. Kay 1915a, Kosanke 1960, Wallace Lee 1915, 1917, 1926, P. E. Potter 1961a, Jon A. Udden 1908.
- Pleistocene: Frye 1965c, Leighton 1959, 1961, McGee 1890, Willman 1963.
- Structural materials: Jon A. Udden 1910b.
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- Uranium: Ostrom 1955.
- Worthen Survey report (v. 6): Broadhead 1875.

- Bond Formation (Pa.): Kosanke 1960, Wier 1961.
- Bonding clay (see Clay and shale)
- Bone bed in Eastern Illinois: Cope 1878.
- Bonneterre Dolomite (Camb.): Workman 1948.
- Isopach map: Workman 1948.
- Bonpas Limestone Member (Pa.) (see Calhoun Ls.): Kosanke 1960.

Boone County

- Bedrock topography: Horberg 1950a, McGinnis 1963b.
- Belvidere area guide leaflet: Ill. GS 1963-C.
- Building stone: Conover 1884.
- Drill records: C. B. Anderson 1919, M. L. Fuller 1905, Ross Hanson 1950, 1961, Kempton 1963.
- Geologic sections (described outcrops)
- Belvidere (Sil.): Savage 1926.

one County—cont.

Geologic sections—cont.

Cherry Valley (Pleis.): Frye 1965a.

Irene (Pleis.): Horberg 1953, Leighton 1923a, Leverett 1899a, Shaffer 1956.

Geophysical studies: Beck 1965, McGinnis 1963b.

Ground water

General: C. B. Anderson 1919, Hackett 1956a, Horberg 1950a, Leverett 1899a, Thwaites 1927, Walton 1960a.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961.

Artesian waters: C. B. Anderson 1919.

Igneous rocks: Grogan 1949a.

Limestone and dolomite: J. C. Bradbury 1965a, Krey 1925, J. E. Lamar 1934, Willman 1943b.

Loess: Frye 1962e, Leighton 1950b, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Horberg 1953, McGinnis 1963b.

Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Structure: Beck 1965, Horberg 1950a, McGinnis 1963b, Thwaites 1927.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Physiography: Leighton 1948b, Salisbury 1918.

Sand and gravel

Molding sand: Littlefield 1925a, 1925b.

Soil report 65

Springs: Peale 1886.

Stratigraphy

General: C. B. Anderson 1919, J. C. Bradbury 1965a, McGinnis 1963b.

Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c, Grogan 1949a.

Cambrian: A. H. Bell 1964, Templeton 1950.

Ordovician: A. H. Bell 1964, J. C. Bradbury 1965a, Willman 1943b.

Silurian: Savage 1926.

Pleistocene: W. C. Alden 1909, F. C. Baker 1922a, 1931b, G. E. Ekblaw 1929, Frye 1965c, Horberg 1953, Kempton 1963, Leighton 1923a, Leverett 1899a, Salisbury 1918, Shaffer 1954b, 1956, Wascher 1938, Willman 1963.

Structural materials: Jon A. Udden 1910b.

Structure: State geol. map, Horberg 1950a, Thwaites 1927.

Woodstock area guide leaflet: Ill. GS 1960-C. Worthen Survey report (v. 5): James Shaw 1873.

Jordan Siltstone: Oil & Gas Journal 1964, D. L. Stevenson 1964, G. M. Wilson 1959.

Distribution map: D. L. Stevenson 1964, Swann 1965.

Isopach map: Swann 1965.

Structure map: Meents 1965a.

Borings (see Drill records under county)

Boskydell Sandstone, Marine Horizon (Pa.): Desborough 1959a, 1961a, Kosanke 1960, Wanless 1939, J. M. Weller 1942c, Siever 1959.

Bourbon Anticline: Clegg 1959.

Bourbon North Pool: Whiting 1959.

Bourbon Pool: A. H. Bell 1958b, Whiting 1959.

Bowling Green Limestone Member (Sil.): Keys 1898, 1915, Krey 1924, Rubey 1952, Savage 1913a, 1914b.

Bowmanville Stage (Lake Chicago): F. C. Baker 1926, Bretz 1951, 1955, R. F. Flint 1956, Hough 1958.

Braceville Coal (Pa.): Worthen 1868(2).

Braidwood fossil flora (see Mazon Creek fossils)

Brainard Shale (Ord.): Buschbach 1964.

Brassfield Limestone (Sil.): J. R. Ball 1941, Rubey 1952, Savage 1913a, 1926.

Breccia (fault): P. E. Potter 1957.

Breese Quadrangle: Johan A. Udden 1908c, 1915.

Bremen Anticline: F. H. Kay 1916a, Stuart Weller 1915, 1939b.

Breton Anticline: Wanless 1957a.

Breton Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, Krumbein 1956b, MacClintock 1959, Wanless 1931a, 1947b, 1950, 1957a, 1958, J. M. Weller 1936c, Willman 1942b.

Fauna: Wanless 1958.

Isopach and facies maps: Wanless 1963a.

Breton Limestone Member (Pa.) (see Herrin Ls.): J. R. Ball 1952, J. W. Baxter 1965b, G. H. Cady 1916, 1917, 1919a, D. J. Fisher 1925b, F. H. Kay 1915a, Kosanke 1960, J. E. Lamar 1934, Wallace Lee 1926, MacClintock 1959, Reinertsen 1964, Savage 1927, Wanless 1931b, 1939, 1955a, 1955b, 1957a, J. M. Weller 1931c, 1942c, Willman 1942b.

Isopach map: J. E. Lamar 1934.

Breton Shale (Pa.): Krumbein 1956b.

Isopach map: Krumbein 1956b.

Brewerville Sandstone (Miss.): Stuart Weller 1913, 1914.

Briar Hill (No. 5A) Coal Member (Pa.): Butts 1925, G. H. Cady 1952b, Kosanke 1950, 1960, Pullen 1951, Siever 1951a, H. L. Smith 1951, Wanless 1939, 1965, Winslow 1959.

Isopach map: G. H. Cady 1935a.

Briar Hill Cyclothem (Pa.) (see Crab Orchard Cyc.): Kosanke 1960.

Brickeys Member (Ord.): Templeton 1952, 1963.

Bridgeport Pool: Bain 1908h.

Bridgeport Sand, Pay Zone: R. S. Blatchley 1909, 1913a, Moulton 1925b, 1927a, Mylius 1927, Rich 1916b, Squires 1950d.

Brines

General: L. C. Case 1945, Ill. State Div. Ind. Planning and Dev. 1959, J. E. Lamar 1965, Meents 1952, Moulton 1925b, Owen 1846, Parizek 1958, Peterson 1945b, Rich 1916a, Willman 1942b.

Analyses: Albright 1938, A. H. Bell 1932b, W. S. Blatchley 1906, E. T. Cox 1875, W. E. Hall 1963, J. E. Lamar 1928a, 1938d, Meents 1952, Moulton 1926f, Mylius 1927, Pye 1944, Tough 1919.

Chlorine in coal: Gluskoter 1964, 1965a.

Disposal: A. H. Bell 1957a, Gibbon 1945, Moulton 1926f.

Eastern Illinois: F. H. Walker 1959.

Isotopic fractionation: Graf 1965.

Origin: Bredehoeft 1963, Graf 1965.

Sulphate-reducing bacteria: E. S. Bastin 1926b, 1930.

Waterflooding: Pryor 1957.

- Brisbane Quadrangle: Bretz 1943, 1955.
 Briton Member (Ord.): Templeton 1952, 1963.
 Brocton Dome: Clegg 1965a.
 Bronson Group (Pa.): C. L. Cooper 1946.
 Brookville Dome: Hershey 1894, Templeton 1952.
 Brouillet Coal (Pa.): C. L. Cooper 1946, Wanless 1939.
 Brouillet Cyclothem (Pa.): J. M. Weller 1942c.
- Brown County**
- Beardstown area guide leaflet: Ill. GS 1965-B.
 Bedrock topography: Horberg 1950a.
 Clay and shale
 General: Bleining 1912, J. E. Lamar 1934, Parmelee 1921.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: W. A. White 1960b.
 Refractory clay: Lines 1917.
 Resources: W. A. White 1963.
- Coal
 General: Culver 1925a, J. M. Weller 1939b.
 Analyses: Parr 1916, Reinertsen 1964.
 Chlorine in: Gluskoter 1964.
 Mined-out areas: Ill. GS 1959b map 13.
 Mining: Annual coal reports, Andros 1915b.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b.
 Strippable reserves: Culver 1925b, Reinertsen 1964.
 Subsidence: L. E. Young 1916b.
 Drill records: M. L. Fuller 1906, Ross Hanson 1958, Nebel 1919.
 Geologic sections (described outcrops)
 Cooperstown (Miss.): Bleining 1912.
 Dry Ford Creek (Miss.): Bleining 1912.
 LaGrange (Miss., Pa.): Nebel 1919.
 Logan Creek (Miss., Pa.): Bleining 1912.
 Mount Sterling (Miss.): Bleining 1912.
 Versailles (Miss.): Bleining 1912.
 Versailles West (Miss.): Rexroad 1965a.
- Ground water
 General: Bergstrom 1957, Horberg 1950a, Leverett 1899a.
 Analyses: Bartow 1909b, Ross Hanson 1958, A. W. Palmer 1897.
- Limestone and dolomite: Krey 1925, J. E. Lamar 1934.
 Cement materials: Bleining 1912, J. E. Lamar 1956b.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, J. M. Weller 1940b.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Wanless 1957a, Workman 1944.
 Structure: R. H. Howard 1961, Morse 1915, Nebel 1919, Reinertsen 1964, Wanless 1957a, Whiting 1965b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
 Development maps: Ill. GS 1965 maps I, J, F.
 Possibilities: Morse 1915, Nebel 1919.
- Brown County—cont.
 Oil and gas—cont.
 Siloam Pool: R. H. Howard 1961.
 Physiography: Leighton 1948b, Nebel 1919.
 Sandstone: J. C. Bradbury 1962a, Siev 1956b.
 Springs: Peale 1886.
 Stratigraphy
 General: Bergstrom 1957, Bleining 1912, R. H. Howard 1961, Morse 1915, Nebel 1919, Wanless 1957a.
 Silurian: Whiting 1965b.
 Devonian: Whiting 1965b.
 Mississippian: Calvin 1890, Morse 1912, J. M. Weller 1940b, J. S. Williams 1957, Workman 1956.
 Pennsylvanian: J. C. Bradbury 1962, Culver 1925a, Nebel 1919, Reinertsen 1964, Wanless 1931a, 1931b, 1947b, W. A. White 1963.
 Pleistocene: Frye 1965c, Leighton 1964.
 Structure: A. H. Bell 1964, Wanless 1957a.
 Worthen Survey report (v. 4): Worthen 1877.
- Brownfield Quadrangle: Stuart Weller 1939a.
 Browning Sandstone Member (Pa.): Kosanke 1960, Wanless 1939, 1957a.
 Distribution map: Wanless 1957a.
 Brownsport Formation (Sil.): Lowenstam 1942.
 Brush Coal Member (Pa.): (See Middle DeLong Coal) Kosanke 1960.
 Brush Cyclothem (Pa.) (see Middle DeLong Cyc.) Kosanke 1960.
 Brushy Anticline: A. H. Bell 1939c.
 Brushy Creek Sandstone (Pa.): G. H. Cady 1926.
 Brussels Quadrangle: Rubey 1952.
 Brussels Syncline: Collinson 1958e.
 Brussels Terrace: Leighton 1961, Rubey 1952.
 Bryant Limestone (Ord.): Keyes 1898.
 Bryant Syncline: Wanless 1957a.
 Bryantsville Breccia Bed (Miss.): Swann 1963.
 Buchanan Sand, Pay Zone: R. S. Blatchley 1909, 1913a, Moulton 1925b, Rich 1916b, Squires 1943e.
 Structure map: R. S. Blatchley 1913a, Squires 1943e.
 Buchanan Stage (Pleis.): Leverett 1898b.
 Buckhorn Member (Ord.): Doyle 1965, Templeton 1952, 1963.
 Buda Bedrock Valley: Horberg 1950a.
 Buda Moraine: MacClintock 1959.
 Buda Quadrangle: G. E. Ekblaw 1932b, MacClintock 1959.
 Buelter Member (Camb.): Buschbach 1964.
 Buff Limestone (Galena) (Ord.): James Shaw 1873, Templeton 1963, Whitney 1866.
 Buffalo Hart Substage, Moraine (Pleis.): Frye 1965b, W. H. Johnson 1964, Leighton 1961, Leverett 1899a, E. W. Shaw 1913, Wanless 1957a, Willman 1963.
 Buffalo Rock Terrace: Willman 1942b.
 Buffalo Shale (Ord.): Keyes 1898.
 Building stone (see also under rock types): Conover 1884, Ill. GS 1934a, J. E. Lamar 1942b, 1955a, Leighton 1949b, Wanless 1957a, Worthen 1883(1).
 Limestone rubble and ashlar: Sanborn 1938.
 Statistics: Anon. 1884b.
 Weather resistance: J. E. Lamar 1945.
 Bunje Cyclothem (Pa.): Kosanke 1960.
 Bunje Limestone Member (Pa.): Kosanke 1960.

Bureau County

- Bedrock topography: Horberg 1950a, MacClintock 1959.
- Clay and shale
 General: Bleininger 1912, G. H. Cady 1912b, 1919b, J. E. Lamar 1934.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 In coal mines: Stull 1917.
 Mineralogy: Grim 1957, W. A. White 1960b.
 Resources: MacClintock 1959.
- Coal
 General: G. H. Cady 1915a, Culver 1925a, Ede 1900, Ill. GS 1913.
 Analyses: G. H. Cady 1912b, 1919b, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Parr 1906b, 1915a, 1916.
 Chlorine in: Gluskoter 1964.
 Mined-out areas: Ill. GS 1959b maps 2, 3.
 Mining: Annual coal reports, Andros 1914a, H. M. Cooper 1942b, C. O. Sauer 1916.
 Paleobotany: Noe' 1925c.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, DeWolf 1908b, MacClintock 1959.
 Shaft sinking at Ladd: G. S. Rice 1894.
 Strippable reserves: G. H. Cady 1937c, W. H. Smith 1963.
 Subsidence: C. A. Herbert 1927, L. E. Young 1916b.
- Drill records: G. H. Cady 1912a, 1915a, Culver 1925a, Ross Hanson 1950, 1958, 1961, Horberg 1953, Thwaites 1927, Johan A. Udden 1914, Willman 1942b.
- Feldspar: R. E. Hunter 1965, Willman 1942a.
- Fossil plant localities: Collinson 1960a.
- Geologic sections (described outcrops)
 Brush Creek (Pleis.): Horberg 1953.
 Buda (Pleis.): F. C. Baker 1928b.
 Buda East (Pleis.) Frye 1965a.
 Bureau (Pleis.): G. H. Cady 1919b.
 Bureau Creek (Pleis.): Horberg 1953.
 Bureau South (Pleis.): Frye 1965a, Horberg 1953.
 Coal Creek (Pa.): MacClintock 1959.
 Depue (Pleis.): F. C. Baker 1928b, Frye 1962e, Horberg 1953.
 East Bureau Creek (Pleis.): Horberg 1953.
 Marquette (Pa.): Bleininger 1912.
 Plow Hollow (Pleis.): Horberg 1953.
 Ridge School (Pleis.): C. O. Sauer 1916.
 Rocky Run (Pa.): MacClintock 1959.
 Spring Valley (Pa., Pleis.): Bleininger 1912, G. H. Cady 1919b, J. E. Lamar 1934, Leighton 1953.
 Spring Valley West (Pa.): J. E. Lamar 1934.
 Wyanet (Pleis.): F. C. Baker 1928b.
- Geophysical studies: P. S. McClure 1935.
- Ground water
 General: G. H. Cady 1919b, Hackett 1956a, Horberg 1950a, Leverett 1899a, R. C. Scott 1962, Thwaites 1927.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Artesian waters: G. H. Cady 1912b.

Bureau County—cont.

- Limestone and dolomite: J. E. Lamar 1934.
 Cement materials: Bleininger 1912, G. H. Cady 1912b, 1919b.
- Loess: Frye 1962e, MacClintock 1959, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Barrows 1910, G. H. Cady 1919b, Horberg 1950a, MacClintock 1959, Meents 1958b.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Barrows 1910, G. H. Cady 1919b, Horberg 1953, MacClintock 1959, C. O. Sauer 1916.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Willman 1942b.
 Structure: G. H. Cady 1915a, 1919b, Horberg 1950a, Thwaites 1927, Willman 1942b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
 General: G. H. Cady 1919b.
 Gas in drift: Meents 1958b, 1960.
- Physiography: Barrows 1910, G. H. Cady 1912b, 1919b, Leighton 1948b, MacClintock 1959, C. O. Sauer 1916.
- Quadrangle studies
 Buda: MacClintock 1959.
 Hennepin: G. H. Cady 1912b, 1919b.
 LaSalle: G. H. Cady 1912b, 1919b.
- Radiocarbon date: Rubin 1958, 1960.
- Sand and gravel
 General: G. H. Cady 1912b, 1919b, G. E. Ekblaw 1932b, J. E. Lamar 1934.
 Mineralogy: R. E. Hunter 1965, Willman 1942a.
 Molding sand: Berkelhamer 1944, Littlefield 1925a, 1925b.
 Resources: MacClintock 1959.
- Sandstone: G. H. Cady 1919b.
- Soil report 20.
- Springs: G. H. Cady 1919b.
- Stratigraphy
 General: Barrows 1910, Bleininger 1912, G. H. Cady 1912b, 1919b, MacClintock 1959, C. O. Sauer 1916.
 Ordovician: G. H. Cady 1919b.
 Pennsylvanian: G. H. Cady 1915a, 1919b, Culver 1924, 1925a, Ede 1900, MacClintock 1959, W. H. Smith 1963, Wanless 1931b.
 Pleistocene: F. C. Baker 1928b, 1936, Barrows 1910, G. H. Cady 1915a, 1919b, Frye 1965a, Horberg 1949, 1953, Leighton 1923a, 1931b, 1961, Leverett 1898a, 1899a, MacClintock 1959, McGee 1890, Meents 1958b, C. O. Sauer 1916, Staplin 1963b, Willman 1963.
 Recent: Barrows 1910.
 Structure: G. H. Cady 1912b, 1919b, Horberg 1950a, Thwaites 1927.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 5): James Shaw 1873.
- Buried Valleys (see Bedrock topography, named valleys)
 Exploration for: Buhle 1955.
- Burlington Limestone (Miss.): J. R. Ball 1952, A. H. Bell 1928a, 1932e, Bleininger 1912,

Burlington Limestone—cont.

- Collingwood 1933, Collinson 1954, 1957, 1958a, 1964b, Coryell 1919, B. B. Cox 1927, Frye 1938, Graf 1950a, H. A. Green 1870, James Hall 1857b, 1858, Keyes 1892b, Kissling 1961, J. E. Lamar 1934, 1937a, 1950a, 1955a, 1959, Meek 1861c, R. C. Moore 1935, Morse 1915, Nebel 1919, Rubey 1952, Savage 1921a, 1921c, Spreng 1961, A. H. Sutton 1939, Johan A. Udden 1908a, Wanless 1929a, 1957a, J. M. Weller 1940a, 1940b, Stuart Weller 1906b, 1907b, 1914, 1939a, 1939b, J. S. Williams 1957, Willman 1949, Workman 1926, Worthen 1866a(3), 1868(2), 1870, 1873(1).
- Fauna: Meek 1868a, 1873, A. H. Sutton 1939.
- Paleogeographic map: Schuchert 1955.
- Structure map: A. H. Bell 1928a, Howell 1935a, Krey 1924, Moulton 1925d, Nebel 1919.
- Burlington-Keokuk Limestone (Miss.): Barton 1918, A. H. Bell 1927a, Harris 1961, Harvey 1964, R. H. Howard 1961, Krey 1924, Leighton 1939, J. M. Weller 1940c.
- Burroughs Dolomite (Sil.): E. O. Ulrich 1924.
- Burroughs Limestone Member, Beds (Pa.): J. R. Ball 1952, Kosanke 1960.
- Burton Anticline: J. R. Ball 1952.
- Burtschi Sand, Pay Zone: A. H. Bell 1946b.
- Bushnell Syncline: Wanless 1957a.
- Butler Anticline: Wallace Lee 1915, 1926.
- Buzzards Point Plain: Stuart Weller 1920b.

C

- Cache Creek watershed: Pickels 1929.
- Cache Valley: Fisk 1944, Horberg 1950a, Leighton 1950b, Pryor 1960, L. L. Ray 1963a, Ross 1963, E. H. Walker 1957, J. M. Weller 1940a.
- Cache Valley Terrace: L. L. Ray 1964.
- Cahokia Creek Bedrock Valley: Horberg 1950a.
- Cahokia Mounds, geology of: Leighton 1923b, 1930a.
- Cairo ground water: Roos 1942.
- Cairo Lowland: Fisk 1944.
- Cairo Quadrangle: Pryor 1962a.
- Cairo Till: Keyes 1932.
- Calhoun Coal Member (Pa.): M. C. Fisher 1939, Kosanke 1960, Mamay 1962.

Calhoun County

- Bedrock topography: Horberg 1946, 1950a.
- Building stone: Conover 1884.
- Caves: Bretz 1961.
- Clay and shale
- General: J. E. Lamar 1926a, 1934, Parmelee 1921, Rubey 1952.
- Bonding clay: Grogan 1945.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: Grim 1957, W. A. White 1960b.
- Refractory clay: J. E. Lamar 1931d, 1956b, Lines 1917, Stuart Weller 1907b.
- Resources: Parham 1963a.

Calhoun County—cont.

- Coal
- General: Culver 1925a, Rubey 1952, Stuart Weller 1907b.
- Analyses: Culver 1925a, Hawley 1923, J. E. Lamar 1926a, Parr 1916, Reinertsen 1964, Rubey 1952.
- Mined-out areas: Ill. GS 1959b map 21.
- Mining: Annual coal reports, Andros 1915b.
- Production: Annual coal reports.
- Reserves: Culver 1925a.
- Strippable reserves: Reinertsen 1964.
- Subsidence: L. E. Young 1916b.
- Driftless Area: Salisbury 1891b.
- Drill records: Ross Hanson 1961, Krey 1924, J. E. Lamar 1931d.
- Geologic sections (described outcrops)
- Brussels (Pleis.): Rubey 1952.
- Degerlia Hollow (Pa.): J. E. Lamar 1931d.
- Dixon Hollow (Ord.): Templeton 1963.
- Dogtown Landing (Ord.): Rubey 1952.
- Golden Eagle (Pa.): J. E. Lamar 1931d, Rubey 1952.
- Hamburg (Sil., Dev.): Collinson 1954, Savage 1913c, 1926, Stuart Weller 1906c, J. S. Williams 1943.
- Hamburg North (Miss.): Collinson 1961.
- Hamburg South (Sil., Dev., Miss.): Collinson 1961.
- Howell Hollow (Miss., Pa.): J. E. Lamar 1931d.
- Meppen North (Miss.): Collinson 1954, 1957.
- Monterey School (Sil., Dev.): Collinson 1954, 1957, Savage 1926.
- West Point Landing (Ord.): Collinson 1954, 1957, Templeton 1963.
- Wildcat Hollow North (Dev., Miss.): Collinson 1961.
- Ground water
- General: Bergstrom 1957, Horberg 1950a, Leverett 1899a.
- Analyses: Bartow 1909b, Ross Hanson 1961, A. W. Palmer 1897.
- Limestone and dolomite
- General: Krey 1925, J. E. Lamar 1926a, 1934, Rubey 1952, Stuart Weller 1907b, Willman 1943b.
- Cement materials: J. E. Lamar 1956b.
- Mineralogy: Goldsmith 1958b.
- Loess: Frye 1962e, Rubey 1952, G. D. Smith 1942, Stuart Weller 1907b.
- Mammoth at Belleview: Willman 1941a.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Rubey 1952, J. M. Weller 1940b.
- Glacial: State geol. map, Frye 1965c, Leighton 1961, Leverett 1899a, Rubey 1952.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Workman 1956.
- Structure: Krey 1924, J. E. Lamar 1928b, Reinertsen 1964, Rubey 1952.
- Mastodon: N. C. Anderson 1905.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Mississippi River regimen: Rubey 1932, 1952.
- Oil and gas
- Oil shale: J. E. Lamar 1956a.

- oun County—cont.
 Oil and gas—cont.
 Possibilities: Krey 1924.
 Phosphates: Rubey 1952, Stuart Weller 1907b.
 Physiography: Leighton 1948b, Rubey 1952.
 Quadrangle Studies
 Brussels: Rubey 1952.
 Hardin: Rubey 1952.
 Sand and gravel: J. E. Lamar 1926a, Rubey 1952.
 Orange sands: Salisbury 1891a.
 Silica sand: J. E. Lamar 1928b.
 Sandstone: J. E. Lamar 1927d, 1928b, Stuart Weller 1907b.
 Sink holes: Rubey 1952.
 Soil report 53
 Springs: Peale 1886, Rubey 1952.
 Stratigraphy
 General: Bergstrom 1957, Collinson 1954, 1957, Keyes 1898, Krey 1924, J. E. Lamar 1926a, Rubey 1952, Stuart Weller 1907b.
 Ordovician: J. H. Bradley 1925, Broadhead 1904, C. L. Fenton 1922, J. E. Lamar 1928b, Templeton 1963, Stuart Weller 1907d, Workman 1941.
 Silurian: Lowenstam 1949b, Savage 1913a, 1913c, 1914b, 1926, Willman 1943b.
 Devonian: Collinson 1961, G. A. Cooper 1938, A. J. Scott 1961a, 1961b, Stainbrook 1944, Warthin 1944, C. A. White 1865.
 Mississippian: P. E. Cloud 1948, Collinson 1961, J. E. Conkin 1965, R. C. Moore 1929, A. J. Scott 1961a, J. M. Weller 1940b, 1941b, Stuart Weller 1906c, 1908, J. S. Williams 1957, Workman 1956.
 Pennsylvanian: Culver 1925a, Parham 1963a, Reinertsen 1964, W. V. Searight 1961, Wanless 1931b, 1947b.
 Tertiary: Salisbury 1892.
 Pleistocene: F. C. Baker 1931b, Frye 1965c, Rubey 1933, Staplin 1963b.
 Structure: Broadhead 1904, V. B. Cole 1961, Koenig 1961, Krey 1924, McQueen 1941, Rubey 1952.
 Tufa: Rubey 1952.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 4): Worthen 1870.
 oun Limestone (Pa.) (see Bonpas Ls.): Kosanke 1960, J. M. Weller 1942c.
 oun Peneplain: Horberg 1946, 1950a, Rubey 1952.
 ilico Shale" (Springville Shale) (Miss.): J. E. Lamar 1953a, Worthen 1868(2).
 umet City Quadrangle: Bretz 1943, 1955.
 umet Lake Quadrangle: Bretz 1943, 1955.
 umet Quadrangle: W. C. Alden 1902.
 umet Stage, Beach (Lake Chicago): W. C. Alden 1902, 1904, 1918, Atwood 1908, F. C. Baker 1912, Bretz 1939, 1951, 1955, 1959, 1964, D. J. Fisher 1925a, J. W. Goldthwait 1909, Hough 1953, 1958, Leverett 1899a, 1915, G. F. Wright 1918.
 Paleogeographic map: J. W. Goldthwait 1909.
 mbrian inlier: Bevan 1935.
mbrian System
 Accepted nomenclature (see named units)
- Cambrian System—cont.
 Croixan Series
 Tempealeauan Stage
 Knox Megagroup (cont.)
 Jordan Ss.
 Eminence Dol.
 Momenca Ss. M.
 Potosi Dol.
 Franconian Stage
 Potsdam Megagroup (top North)
 Franconia Fm.
 Derby-Doerun Dol. M.
 Davis Ss. M.
 Ironton Ss.
 Mooseheart M.
 Marywood M.
 Fox Valley M.
 Buelter M.
 Dresbachian Stage
 Galesville Ss.
 Eau Claire Dol.
 Proviso Siltstone M.
 Lombard Dol. M.
 Elmhurst Ss. M.
 Potsdam Megagroup (top South)
 Mt. Simon Ss.
 Charter M.
 Gunn M.
 Lacey M.
 Mayfield M.
 Lovell M.
 Kenyon M.
 Crane M.
 General: State geol. map, Bevan 1935, 1939, Buschbach 1964, Cohee 1945b, 1948a, John Webster Foster 1956, Lochman 1956, Thurston 1923, Thwaites 1927, Trowbridge 1935a, Stuart Weller 1906b, 1907a, Willman 1951, Workman 1935b, 1948, 1950b.
 Isopach map: Sloss 1960.
 Lithofacies map: Sloss 1960.
 Paleogeographic map: Schuchert 1923.
 Cambrian-Keweenawan boundary: Raasch 1950.
 Camp Grant: Salisbury 1918.
 Campbell Hill Anticline: Root 1928, St. Clair 1917b, Wanless 1955b, J. M. Weller 1939e, Stuart Weller 1939b.
 Campbell Hill Coal (Pa.): G. H. Cady 1952b.
 Campbell Hill—Cottage Grove Anticlinal Fault Zone: G. H. Cady 1952b.
 Campbell Hill Quadrangle: Stuart Weller 1939b.
 Canaan Gas Pool: Rich 1916a.
 Canadian Series (Ord.): State geol. map, Buschbach 1964, Cohee 1945b, Grabau 1940, Templeton 1963.
 Paleogeographic map: Schuchert 1955.
 Cannel Coal (see Coal)
 Canton Anticline: Moulton 1925d.
 Canton Quadrangle: Savage 1916b, 1916c, 1917a, 1921a.
 Canton Shale Member (Pa.): Kosanke 1960, Reinertsen 1964, Savage 1921a, Wanless 1939, 1955a, 1957a, Willman 1942b.
 Canton Syncline: Wanless 1957a.
 Cap au Grès Faulted Flexure, Fault, Monocline: W. S. Blatchley 1906, Broadhead 1889, V. B. Cole 1961, Collinson 1954, 1957, 1958e, James Hall 1858, Keyes 1898, 1916a, 1917a, Krey 1924, McGinnis 1961b, Rubey 1952, Wanless 1955b, Worthen 1866a(4), 1870.

- Cap au Grès Sandstone (St. Peter) (Ord.): Keyes 1898.
- Cape Girardeau Limestone (Ord.) (see Girardeau Ls.): Foerste 1909, Savage 1908.
- Cape Limestone (Ord.): Gutstadt 1958b, Pryor 1962a, Templeton 1963.
- Facies map: Gutstadt 1958b.
- Isopach map: Gutstadt 1958b, Sloss 1960.
- Lithofacies map: Sloss 1960.
- Carbon ratios: A. H. Bell 1936b, Moulton 1925a.
- Carbonate mineralogy: Graf 1963.
- Carbonates, crystallographic tables: Graf 1961.
- Carbonates, lattice constants: Goldsmith 1958a, 1961.
- Carbondale Formation, Group (Pa.): R. S. Blatchley 1913a, 1914a, Brokaw 1916, Butts 1925, G. H. Cady 1915a, 1916, 1917, 1919a, 1919b, 1921, 1942a, 1952b, Clegg 1959, 1965a, 1965b, Coryell 1919, Culver 1922a, 1925a, Currier 1922, English 1948, Hinds 1914, 1917, 1919, Ill. GS 1913, F. H. Kay 1915a, 1915b, Kosanke 1947, 1950, 1960, J. E. Lamar 1925a, Wallace Lee 1915, 1926, Lowenstam 1951, MacClintock 1959, Morse 1915, Mylius 1927, Nebel 1919, P. E. Potter 1956c, Reinertsen 1964, Rich 1916a, 1916b, Rolley 1951, Rubey 1952, St. Clair 1917b, 1917d, Savage 1915, 1921a, 1921b, 1921c, 1927, E. W. Shaw 1912b, 1913, 1921, 1923, H. L. Smith 1951, W. H. Smith 1957, 1958, 1961, 1963, Tough 1919, Johan A. Udden 1915, Wanless 1929a, 1931b, 1939, 1955b, J. M. Weller 1940a, Willman 1942b, Winslow 1959, L. E. Young 1916b.
- Fauna: Hinds 1919, Savage 1924a, Wanless 1958.
- Isopach map: Clegg 1965b, Wanless 1955b.
- Isopach-lithofacies map: Sloss 1960.
- Isopach, total coal: Sloss 1960.
- Number of coal beds: Sloss 1960.
- Paleogeographic map: Schuchert 1955.
- Carbondale, glacial phenomena at: J. E. Lamar 1925b.
- Carbondale Quadrangle: J. E. Lamar 1925a, 1925b.
- Carbonic (Carboniferous) succession: Keyes 1933d.
- Carboniferous System: Henry Engelmann 1863, R. C. Moore 1936, Stuart Weller 1906b, 1907a.
- Quadrupeds: Moodie 1909a.
- Sponges: E. O. Ulrich 1890e.
- Carcinogenicity, enhancement of 4-dimethylaminoazobenzene by fluorosubstitution: J. A. Miller 1953.
- Carcinogenicity of dyes: J. A. Miller 1957.
- Cardiff Coal (Pa.): G. H. Cady 1915a.
- Carlinville Coal (Pa.): Kosanke 1950, 1960.
- Carlinville Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, Wanless 1931b.
- Carlinville Dome (Anticline): J. R. Ball 1952, R. S. Blatchley 1914a, Easton 1942, F. H. Kay 1915a, Wallace Lee 1926.
- Carlinville-Centralia Anticlinal Belt: Folk 1946.
- Carlinville Limestone Member (Pa.): J. R. Ball 1952, J. W. Baxter 1965b, Broadhead 1875, G. H. Cady 1916, 1919a, 1921, 1939c, DuBois 1951, S. E. Ekblaw 1934, F. H. Kay 1912, 1915a, Kosanke 1960, Wallace Lee 1915, 1926, J. N. Payne 1942, 1944, E. W. Shaw 1923, Wanless 1955b, Worthen 1873(1), 1882c.
- Carlinville North Dome: Easton 1942.
- Carlinville Pool: R. S. Blatchley 1910a, F. H. Kay 1912, Wallace Lee 1915.
- Carlinville Quadrangle: J. R. Ball 1938a, 1949.
- Carlyle Anticline (Dome): A. H. Bell 1941b, E. W. Shaw 1912a, H. A. Wheeler 1911a.
- Carlyle Pool: A. H. Bell 1934a, Piersol 1940, E. W. Shaw 1912a, Squires 1938a, 1943e, H. A. Wheeler 1911b.
- Carlyle Sand, Pay Zone: Squires 1943e.
- Structure map: A. H. Bell 1934a, Squires 1943e.
- Carlyle Quadrangle: E. W. Shaw 1923.
- Carper Sand, Pay Zone: Moulton 1926a, Mylius 1923, 1927, J. N. Payne 1940, D. L. Stevenson 1964.
- Isopach map: Oil & Gas Journal 1964, D. L. Stevenson 1964.
- Structure map: D. L. Stevenson 1964.
- Carr fossil plant collection: Stewart 1950.
- ### Carroll County
- Bedrock topography: Carman 1910, Horberg 1946, 1950a.
- Caves: Bretz 1938, 1961.
- Clay and shale: J. E. Lamar 1934.
- Chemical analyses: W. A. White 1959.
- Mineralogy: C. W. Rolfe 1908.
- Driftless Area: Shipton 1917.
- Drill records: DuBois 1945, Ross Hanson 1950, 1961, Leverett 1899a, Worthen 1890(2).
- Feldspar: R. E. Hunter 1965, Willman 1942.
- Geologic sections (described outcrops)
- Brookville Northwest (Ord.): Templeton 1963.
- Johnson Creek (Sil.): Savage 1926.
- Mississippi Palisades State Park (Ord., Sil.): J. M. Weller 1935c.
- Mt. Carroll (Pleis.): Shaffer 1956.
- Savanna (Ord., Sil.): Savage 1926, J. M. Weller 1935c.
- Savanna (Pleis.): A. B. Leonard 1960.
- Ground water
- General: Hackett 1956a, Horberg 1950, Leverett 1899a, Thwaites 1927.
- Analyses: Ross Hanson 1950, 1961, A. V. Palmer 1897.
- Lead and zinc: G. H. Cox 1914, Willman 1946.
- Limestone and dolomite: Krey 1925, Willman 1943b.
- Loess: Carman 1910, Chamberlin 1885, Frye 1962e, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Carman 1910, Shaffer 1954a.
- Glacial: State geol. map, R. F. Flint 1955, Frye 1965c, Leighton 1961, Leverett 1899a, Shaffer 1954a, 1954b.
- Mineral industries: Ill. GS 1961.
- Structure: State geol. map, Horberg 1950a, Thwaites 1927.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Mississippi River sediments: Swensen 1942.
- Physiography: Carman 1910, G. H. Cox 1914, Leighton 1948b.
- Rock falls: G. E. Ekblaw 1930a.
- Sand and gravel
- Dune sand: Carman 1910.

Carroll County—cont.

Sand and gravel—cont.

Mineralogy: R. E. Hunter 1965, Willman 1942a.

Molding sand: Berkelhamer 1944, Littlefield 1925a.

Savanna area guide leaflet: Ill. GS 1963-D.

Stratigraphy

General: Carman 1910, G. H. Cox 1914, A. H. Sutton 1935, J. M. Weller 1935c.

Ordovician: Agnew 1955b, Gutstadt 1958b, Templeton 1963, Willman 1943b.

Silurian: Savage 1914b, 1926, E. O. Ulrich 1924, Willman 1943b.

Pleistocene: W. C. Alden 1909, F. C. Baker 1922a, Chamberlin 1885, R. F. Flint 1931, Frye 1965c, Leighton 1923a, 1961, A. B. Leonard 1957a, Leverett 1898b, 1942b, B. W. Ray 1962, Shaffer 1954a, 1954b, 1956, Willman 1963.

Structure: Horberg 1950a, Thwaites 1927, Willman 1943b.

Worthen Survey report (v. 5): James Shaw 1873.

Carrollton Anticline: Collingwood 1933.

Carter Pool: Root 1928.

Carthage Bedrock Valley: Horberg 1950a.

Carthage Limestone (Pa.): E. T. Cox 1875, DeWolf 1907a, 1908a.

Clay drift, bogs on: Voss 1937.

Clay-Mankato-Valders problem: Leighton 1957a.

Clay Substage (Pleis.): Frye 1960b, Keyes 1933a, 1938d, Leighton 1933a, 1953, 1960, Leverett 1933, MacClintock 1959, Wanless 1957a, Willman 1942b.

Clayey Limestone (Pa.): J. E. Lamar 1934, J. M. Weller 1940a.

Clayey Pool: Bain 1908h, W. S. Blatchley 1906, Mylius 1923, 1927.

Clayey Sand, Pay Zone: Mylius 1927.

Structure map: Mylius 1927.

Clayville Formation, Sandstone, Group (Pa.): Atherton 1960, J. R. Ball 1952, J. W. Baxter 1963a, 1965a, Butts 1925, G. H. Cady 1926, 1952b, 1955, Desborough 1961b, 1961d, English 1948, Kosanke 1947, 1950, 1960, Wallace Lee 1916, Leighton 1939, Lowenstam 1951, Owen 1856, Pettijohn 1964, P. E. Potter 1956a, 1956c, 1958b, 1963c, 1965, Pullen 1951, W. H. Smith 1957, 1958, Wanless 1939, 1955b, J. M. Weller 1940a, Stuart Weller 1920b, Willman 1949, Winslow 1959.

Cross bedding: J. S. Olson 1954, P. E. Potter 1954.

Isopach map: Wanless 1955b.

Paleogeographic maps: Schuchert 1955.

Petrology: Siever 1956b, 1959.

Structure map: Moulton 1925b, J. M. Weller 1952.

Cass County

Beardstown area guide leaflet: Ill. GS 1965-B.

Bedrock topography: Horberg 1945, 1950a, E. W. Shaw 1913, W. H. Walker 1965, Wanless 1957a.

Clay and shale

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Resources: Parham 1963a.

Cass County—cont.

Coal

General: G. H. Cady 1921, Culver 1925a, E. W. Shaw 1913.

Mined-out areas: Ill. GS 1959b map 14.

Mining: Annual coal reports, Andros 1915b, 1915c.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Culver 1925a.

Strippable reserves: W. H. Smith 1961.

Subsidence: L. E. Young 1916b.

Drill records: R. S. Blatchley 1910a, G. H. Cady 1921, Culver 1925a, Ross Hanson 1950, 1961, Wanless 1957a, Worthen 1883(1), 1890(2).

Feldspar: Willman 1942a.

Geologic sections (described outcrops)

Beardstown (Pleis.): DeHeinzelin 1958.

Cottonwood School (Pleis.): Frye 1963c, 1965a, R. L. Jones 1964, A. B. Leonard 1960.

Geophysical studies: McGinnis 1961a.

Ground water

General: Bergstrom 1957, Horberg 1950a, Leverett 1899a, E. W. Shaw 1913, W. H. Walker 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

Limestone and dolomite: Krey 1925.

Loess: Frye 1962e, 1963c, Leighton 1950b, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1945, 1950a, E. W. Shaw 1913, W. H. Walker 1965, Wanless 1957a.

Drift thickness: State geol. map.

Geologic: State geol. map, E. W. Shaw 1913, W. H. Walker 1965, Wanless 1957a.

Glacial: R. F. Flint 1959, Frye 1965c, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Wanless 1957a, Workman 1956.

Structure: Meents 1954, E. W. Shaw 1913, W. H. Smith 1961, Wanless 1957a, Whiting 1965b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Physiography: MacClintock 1929, E. W. Shaw 1913, W. H. Walker 1965, Wanless 1957a.

Quadrangle studies

Beardstown: Wanless 1957a, 1958.

Tallula: E. W. Shaw 1913.

Radiocarbon dates: Rubin 1960.

Sand and gravel

Mineralogy: Willman 1942a.

Molding sand: Littlefield 1925a, 1925b.

Sandstone channels: S. E. Ekblaw 1931.

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Stratigraphy

General: E. W. Shaw 1913, W. H. Walker 1965.

Ordovician: A. H. Bell 1964, Wanless 1957a, Workman 1948.

Silurian: Wanless 1957a, Whiting 1965b.

Devonian: Whiting 1965b.

Mississippian: Wanless 1957a, J. S. Williams 1957, Workman 1956.

Pennsylvanian: G. H. Cady 1921, Culver 1925a, S. E. Ekblaw 1931, Parham 1963a,

Cass County—cont.

Stratigraphy—cont.

Pennsylvanian—cont.

W. H. Smith 1961, Wanless 1931b, 1957a, 1958, Worthen 1883(1).

Pleistocene: F. C. Baker 1936, Frye 1963c, 1965a, Leighton 1965, A. B. Leonard 1960, Leverett 1898b, Staplin 1963b, Wanless 1957a, Willman 1963.

Recent: Stall 1959.

Structure: G. H. Cady 1921, Meents 1954, W. H. Smith 1961, Wanless 1957a.

Uranium: Ostrom 1955.

Worthen Survey report (v. 4): Bannister 1870.

Castlewood Member (Ord.): Templeton 1963.

Catalog of formation names

Central and northeastern Mo. and adjacent parts of Ill.: Beebe 1941.

Southwestern Ill. and southeastern Mo.: J. M. Weller 1939a.

Catalog of fossil spores and pollen: Kremp 1957-1965.

Catalog of Pennsylvanian names: Wanless 1939.

Cattail Channel: Carman 1910, Horberg 1950a.

Cave Hill Member (Miss.): Gutschick 1965, Swann 1963.

Cave in Rock country: Dearinger 1962.

Cave in Rock Fluorspar District (see also Fluorspar District): Currier 1944, Grogan 1949b.

Earth resistivity: Hubbert 1944.

Mining: A. B. Needham 1949.

Cave in Rock Quadrangle: J. W. Baxter 1963a.

Caves (see also under county): Bretz 1938, 1942, 1961, Harris 1952, Trowbridge 1916.

Cedar Bluff Group (Miss.): J. W. Baxter 1963a, Swann 1963.

Cedar Creek Dome: St. Clair 1917d.

Cedar Point Anticline: Willman 1942b.

Cedar Valley Limestone (Dev.): J. R. Ball 1952, Buschbach 1965, Collinson 1957, 1958d, 1958e, C. L. Cooper 1944, G. A. Cooper 1957, R. H. Howard 1961, Lowenstam 1946, 1948b, Rubey 1952, Savage 1920, 1921b, 1921d, Stainbrook 1944, Wanless 1929a, 1957a, Warthin 1944, J. M. Weller 1944a, Whiting 1965b, Workman 1935d, 1944.

Fauna: Collinson 1954, 1961, G. A. Cooper 1938.

Isopach map: Lowenstam 1948b, Whiting 1965b.

Structure map: Buschbach 1963, Craig Ferris 1964, R. H. Howard 1964, Wanless 1927, 1929a.

Cement (see Limestone and dolomite)

Central Casey Township Pool (Dome): Mylius 1923, 1927.

Central Illinois Peneplain: Horberg 1950a.

Central Lowland Province: Horberg 1950a, Wallace Lee 1926, Leighton 1948b.

Centralia Anticline, Monocline: A. H. Bell 1927b, Brownfield 1954, Moulton 1929d.

Centralia area: A. H. Bell 1926a, 1926b, St. Clair 1917c.

Centralia Cyclothem (Pa.): J. R. Ball 1943, S. E. Ekblaw 1934.

Centralia Limestone (Pa.): J. R. Ball 1934.

Centralia Pool: A. H. Bell 1927b, 1939b, Cohee 1941a, 1941b, H. L. Koch 1939, Moulton 1929d, Piersol 1940, Ver Wiebe 1949.

Centralia Pool—cont.

Structural history: Brownfield 1954.

Subsurface stratigraphy: Prescott 1938.

Centralia Quadrangle: E. W. Shaw 1923.

Centralia-Salem area: Caylor 1944.

Cerro Gordo Moraine: John Webster Foster 1951, 1951b, R. B. Johnson 1954, Leverett 1899.

Cerussite: Hobbs 1892.

Chalfin Limestone Member (Miss.): J. W. Baxter 1960b.

Champ Clark Group (Miss): Collinson 196, Workman 1956.

Champaign County

Bedrock topography: John Webster Foster 1951a, Horberg 1945, 1950a, Savage 193, Selkregg 1958.

Brines: Meents 1952.

Coal

General: Savage 1931.

Reserves: G. H. Cady 1952b.

Drill records: Bain 1908g, R. S. Blatchley 1910a, Ross Hanson 1950, 1958, 1961, Horberg 1953, Leverett 1899a, H. F. Smith 1950a, Warthin 1944, Worthen 1890(2).

Geophysical studies: John Wells Foster 185, R. B. Johnson 1954.

Ground water

General: Amsbary 1955, John Webster Foster 1951a, 1954, Gerber 1937a, Horberg 1950a, Howson 1947, Leverett 1899, Lohr 1953, W. J. Roberts 1947, Selkregg 1958, H. F. Smith 1950a, Walton 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1963, A. W. Palmer 1897.

Loess: Fehrenbacher 1965b.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Eveland 1952, John Webster Foster 1951a, Heigold 1964, Horberg 1945, 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Eveland 195, Horberg 1953, Schwalb 1953, Wier 1961.

Glacial: State geol. map, R. C. Anderson 1960, G. E. Ekblaw 1941, R. F. Flint 195, Frye 1965c, Leighton 1961, Leverett 1899.

Mineral industries: Ill. GS 1961.

Paleogeologic: Workman 1956.

Structure: A. H. Bell 1961c, Heigold 196, R. H. Howard 1964, Meents 1954, Schwalb 1953.

Mastodon: Bagg 1909.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil & gas: I. O. Baker 1885.

Development maps: Ill. GS 1965 map 9.

Gas in drift: Bain 1908a, Knirk 191, Meents 1960.

Natural gas: Ashburner 1886, Week 1892a.

Possibilities: Mylius 1923, 1927.

Prospecting: Ill. GS 1919a, 1919b, Mylius 1920a.

Underground gas storage: A. H. Bell 1961c, 1962b.

Physiography: Eveland 1952, Leighton 1948.

Sand and gravel

General: R. C. Anderson 1960.

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Stratigraphy

General: G. H. Cady 1920b, Mylius 192, Savage 1931, Selkregg 1958.

hampaign County—cont.

Stratigraphy—cont.

- Precambrian: A. H. Bell 1964.
 Cambrian: A. H. Bell 1964, Workman 1950b.
 Ordovician: A. H. Bell 1964, Gutstadt 1958b, Workman 1950b.
 Silurian: Lowenstam 1949b.
 Devonian: Warthin 1944, Workman 1944.
 Mississippian: Mylius 1927, Swann 1958, Workman 1956.
 Pennsylvanian: Mylius 1927.
 Pleistocene: R. C. Anderson 1960, F. C. Baker 1931b, Eveland 1952, John Webster Foster 1951a, Frye 1965c, Horberg 1953, Hubbard 1911, R. B. Johnson 1954, Leverett 1899a, Wascher 1938, Wickham 1917, Willman 1963.
 Recent: F. C. Baker 1918.
 Structure: A. H. Bell 1964, G. H. Cady 1920b, Savage 1931.
 Worthen Survey report (v. 4): F. H. Bradley 1870.

hampaign Moraine: R. C. Anderson 1960, Eveland 1952, R. F. Flint 1949, John Webster Foster 1951a, Leverett 1899a.

hampaign-Urbana, aquifers in glacial drift: John Webster Foster 1951a.

hamplain Epoch (Ord.): Lesquereux 1866a.

hamplainian Series (Ord.): State geol. map, Buschbach 1964, Templeton 1952, 1963.

Distribution map: Templeton 1963.

hana Member (Ord.): Templeton 1952, 1963.
 hannah Limestone (Sil.): Savage 1912, 1913a, 1913c.

hapel (No. 8) Coal Member (Pa.) (Trivoli (No. 8) Coal): G. H. Cady 1916, 1919a, 1921, Clegg 1961, F. H. Kay 1915a, Kosanke 1960, Savage 1915, E. W. Shaw 1913, Wanless 1939, 1955b, 1956, 1957a, 1961.

Map of basin: Wanless 1961.

hapman Pool: Rich 1916a.

harette Limestone (Ord.): Keyes 1937a, 1941a.
 harter Member (Camb.): Buschbach 1964, Templeton 1950.

hatsworth Moraine: Leighton 1953, Willman 1942b, Zumberge 1960.

hattanooga Shale (Dev.): Butts 1917a, 1917b, 1925, Stuart Weller 1920b, Workman 1956.

Structure map: Butts 1917b, Stuart Weller 1920b.

hattanooga-New Albany structure map: Swann 1951a.

hazyan Series, Chazy Limestone (Ord.): Calvert 1963, Gutstadt 1958a, Templeton 1963, Workman 1950b.

helttenham Clay Member, Fireclay (Pa.): Kosanke 1960, J. E. Lamar 1931d, E. F. Lines 1917, W. V. Searight 1961, Wanless 1939, 1947, 1955b, C. D. White 1910.

hemical resources, southern Illinois: Neckers 1937.

hemistry (see Analytical, Fluorine, Organic, etc., and under various rocks and minerals)

hemistry teacher and geology: Cohee 1940a.

hepultepec Dolomite (Ord.): Calvert 1963.

herokee Group (Pa.): C. L. Cooper 1946.

hert: J. E. Lamar 1953a, Parmelee 1946.

Origin: Biggs 1957, J. R. Schultz 1934, J. M. Weller 1940a.

Petrography: Biggs 1957.

Chester Quadrangle: Stuart Weller 1939b.

Chesterian Series, Chester Group (Miss.): State geol. map, Atherton 1947, 1960, J. R. Ball 1952, R. S. Blatchley 1914a, Butts 1917a, 1929, Cohee 1942a, C. L. Cooper 1941, 1942a, Coryell 1939a, E. T. Cox 1875, Croneis 1939f, P. L. Dana 1941, Desborough 1961d, Henry Engelmann 1866, Folk 1946, Keyes 1892b, 1922b, 1931a, 1931b, J. E. Lamar 1925a, 1926b, Malott 1952, Mylius 1927, Nickles 1891, P. E. Potter 1965, Pryor 1961b, Rexroad 1957, Rich 1916a, 1916b, Root 1928, St. Clair 1917b, 1917d, E. W. Shaw 1923, Siever 1953, A. H. Sutton 1932, 1934b, 1952, Swallow 1858, Swann 1948, 1951b, 1956, 1963, 1964, Tippie 1942, Johan A. Udden 1915, E. O. Ulrich 1917, J. M. Weller 1940a, 1940b, Stuart Weller 1906b, 1907a, 1913, 1914, 1920a, 1920b, 1939a, Whiting 1959, Winslow 1959, Workman 1937a, 1940, 1950b, Worthen 1866a(3), 1873(1).

Correlations: Horowitz 1961, E. O. Ulrich 1922.

Cyclical sedimentation: Wanless 1947b.

Distribution map: Siever 1953, Workman 1940.

Facies: Smoot 1960c

Fauna: Collinson 1959, Easton 1945a, Geis 1936, McFarlan 1942, Meek 1873, Rexroad 1958b, 1961c, A. H. Sutton 1931, 1934a, 1939, 1940, Stuart Weller 1926a, Worthen 1883(2), Zeller 1953.

Glossary of named units: Swann 1963.

Isopach map: H. H. Arnold 1939, Brownfield 1954, Folk 1946, P. E. Potter 1958a, Siever 1951a, Swann 1958, 1964, J. M. Weller 1936b, Workman 1940.

Isopach and lithofacies map: Sloss 1960.

Mineralogy: Smoot 1960a.

Paleogeographic map: Siever 1953, Swann 1963.

Petrology: Siever 1953.

Sandstones: Bain 1908h, Mylius 1927, P. E. Potter 1962c, 1963a, Siever 1953, Swann 1959.

Shale color and isopach map: Sloss 1960.

Stratigraphic variability: P. E. Potter 1955a.

Structure: A. H. Bell 1928c, J. E. Lamar 1925a.

Chesterville Anticline: Clegg 1959.

Chesterville East Pool: Whiting 1959.

Chesterville Pool: Whiting 1959.

Chicago Formation: D. O. Taylor 1930.

Chicago Lake Plain: W. C. Alden 1902, Bretz 1955, Leighton 1948b.

Chicago Loop Quadrangle: Bretz 1943, 1955.

Chicago Museum of Science and Industry

Illinois type coal mine: G. F. Shepherd 1936.

Chicago Outlet (see Lake Chicago)

Chicago tunnel: Edmund Andrews 1867.

Chicago portage: J. W. Goldthwait 1909.

Chicago Quadrangle: W. C. Alden 1902.

Chicago region (see also Cook County): W. C. Alden 1902, Bretz 1939, 1955, Buschbach 1964, G. E. Ekblaw 1964, Fryxell 1927, Leverett 1897, Nichols 1925, Suter 1959, Willman 1950.

Bibliography: Isfort 1949, Turley 1961.

Building stone: W. C. Alden 1903.

Chicagoland, how made: Bretz 1933.

Concrete materials: Burchard 1907.

Geographic setting: W. E. Powers 1946.

Chicago region—cont.

- Ground water: C. B. Anderson 1919, Suter 1959, Zeisel 1962a.
 Limestone and dolomite: Krey 1925, Willman 1950.
 Oil well boring: Shufeldt 1865.
 Petroleum: Hunt 1871.
 Properties of subsols: Peck 1954.
 Weather resistance of dolomite: Willman 1944.
 Chloritic material, X-ray diffraction criteria: W. F. Bradley 1955b.
 Chouteau Limestone: J. R. Ball 1952, R. H. Benson 1958, Buschbach 1952, Collingwood 1933, Collinson 1954, 1957, 1958b, 1958e, 1961, Easton 1944a, Folk 1946, Keyes 1892b, 1902, 1916b, Krey 1924, Meek 1861c, R. C. Moore 1929, 1935, Rubey 1952, J. M. Weller 1940b, Stuart Weller 1907b, J. S. Williams 1957, Workman 1956.
 Isopach map: Buschbach 1952, Workman 1956.
 Structure map: Buschbach 1952, Collinson 1954, Lowenstam 1946, Rubey 1952.
 Chouteau Shale: Keyes 1892b.

Christian County

- Bedrock topography: Horberg 1950a, Selkregg 1958.
 Brines: Gluskoter 1965a, Meents 1952.
 Clay and shale
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: Grim 1957, W. A. White 1960b.
 Coal
 General: Ill. GS 1913, F. H. Kay 1915a, J. N. Payne 1944.
 Analyses: Abernethy 1961, Aresco 1953-1965, Ashley 1902, G. H. Cady 1921, 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, Lindgren 1908, L. C. McCabe 1935, Parr 1904, 1906b, 1915a, 1916, N. H. Snyder 1953, Zubovic 1964.
 Ash analyses: Rees 1964.
 Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.
 Beryllium in: Stadnichenko 1961.
 Chlorine in: Abernethy 1965, Gluskoter 1964.
 Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.
 Losses: C. A. Allen 1925.
 Mined-out areas: Ill. GS 1959b maps 18, 19.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e, H. M. Cooper 1942b, P, Cl, Na, and K in: Abernethy 1965.
 Preparation: Boley 1949, L. C. McCabe 1935, 1939a, Mitchell 1937.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1944, 1952b, Clegg 1961, DeWolf 1908b.
 Subsidence: L. E. Young 1916b.
 Drill records: Collingwood 1922, 1924b, Ross Hanson 1950, F. H. Kay 1915a, Leverett 1899a, W. H. Walker 1961, Worthen 1883(1), 1890(2).
 Edinburg area guide leaflet: Ill. GS 1964-E.

Christian County—cont.

- Geologic sections (described outcrops)
 Annie's Lake (Pleis.): W. H. Johnson 1964.
 Taylorville Dam (Pleis.): W. H. Johnson 1964.
 Taylorville Dam borrow pit (Pleis.): W. H. Johnson 1964.
 Geophysical studies: P. S. McClure 1935
 Pryor 1956c.
 Ground water
 General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1958, W. H. Walker 1961, Walton 1962a, Workman 1930.
 Analyses: Bartow 1909b, Gluskoter 1965a, Ross Hanson 1950, 1961, A. W. Palmer 1897.
 Limestone and dolomite
 General: Krey 1925.
 Mineralogy: Grim 1937a, Ostrom 1957a.
 Loess: Frye 1962e, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Whiting 1956.
 Structure: A. H. Bell 1929d, 1943c, R. S. Blatchley 1914a, Clegg 1961, Collingwood 1924b, F. H. Kay 1915a, J. N. Payne 1944, Whiting 1956, 1965b.
 Mastodon: N. C. Anderson 1905.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Development maps: Ill. GS 1965 maps 69, 70, 79, 80, 88.
 Physical properties: Armon 1964.
 Pools
 Assumption: A. H. Bell 1949d, Whiting 1956.
 Assumption Consolidated: Whiting 1956.
 Assumption North: A. H. Bell 1949d.
 Edinburg: Whiting 1956.
 Edinburg South: Whiting 1956.
 Edinburg West: Whiting 1956.
 Kincaid: Whiting 1956.
 Kincaid South: Whiting 1956.
 Mt. Auburn Consolidated: A. H. Bell 1959c, Whiting 1956.
 Pana: Whiting 1956.
 Tovey: Whiting 1956.
 Possibilities: Collingwood 1924b, J. N. Payne 1944.
 Production: Whiting 1956.
 Secondary recovery: Pryor 1957.
 Pana area guide leaflet: Ill. GS 1960-E.
 Physiography: Leighton 1948b, MacClintock 1929.
 Sandstone: J. C. Bradbury 1962a, P. E. Potter 1961a, 1962a, 1962c.
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 Stratigraphy
 General: Selkregg 1958, Whiting 1956.
 Silurian: Lowenstam 1949b, Whiting 1958, 1965b.

ristian County—cont.

Stratigraphy—cont.

Devonian: Schwalb 1955, Whiting 1958, 1965b.

Mississippian: J. N. Payne 1944, Swann 1958, Workman 1956.

Pennsylvanian: J. C. Bradbury 1962a, G. H. Cady 1944, Clegg 1961, F. H. Kay 1915a, Kosanke 1960, Ostrom 1957a, J. N. Payne 1944, P. E. Potter 1961a, J. M. Weller 1942c, Worthen 1883(1).

Pleistocene: Frye 1965c, W. H. Johnson 1964, Leighton 1959, 1961, Leverett 1898b, 1899a, Willman 1963.

Recent: Stall 1959.

Structure: A. H. Bell 1964, R. S. Blatchley 1914a, F. H. Kay 1915a, J. N. Payne 1944, Swann 1958.

Worthen Survey report (v. 6): Broadhead 1875.

Cincinnati Shale (Ord.): J. W. Goldthwait 1909.

Cincinnati Series, Cincinnati Group (Ord.):

State geol. map, W. C. Alden 1902, Bannister 1870, F. H. Bradley 1870, Buschbach 1964, Cohee 1948b, Gutstadt 1958a, F. H. Kay 1915b, Savage 1910a, James Shaw 1873, Templeton 1963, Stuart Weller 1906b, 1907a, Whitney 1866, Workman 1950b, Worthen 1866a(4), 1868(2), 1870.

Clastic color map: Sloss 1960.

Fauna: Meek 1868a.

Isopach map: Cohee 1948b, Sloss 1960.

Lithofacies map: Sloss 1960.

Line Pool: Theron Wasson 1938.

Leighton Moraine: Leighton 1953.

Clark County

Bedrock topography: Fidler 1943, Horberg 1950a.

Brines: E. S. Bastin 1926a, Meents 1952, Mylius 1927.

Clay and shale

General: Bleininger 1912, J. E. Lamar 1934.

Bonding clay: Grogan 1945.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: Smoot 1960a, W. A. White 1960b.

Petroleum mud fluids: J. E. Lamar 1931c.

Coal

Mining and production: Annual coal reports.

Reserves: G. H. Cady 1952b, Clegg 1965b.

Drill records: Bain 1908g, Ballard 1938, W. S. Blatchley 1906, Cohee 1941b, Ross Hanson 1950, 1961, Moulton 1928, Mylius 1927, Johan A. Udden 1914, Warthin 1944.

Geologic sections (described outcrops)

Big Creek (Pa.): Bleininger 1912.

Big Creek (Pleis.): F. C. Baker 1928b, Leighton 1930f, MacClintock 1929.

Casey (Pa.): Bleininger 1912.

Dennison (Pleis.): MacClintock 1929.

Marshall (Pa.): Bleininger 1912.

Marshall (Pleis.): F. C. Baker 1928b, MacClintock 1929.

Martinsville Dome (Pa.): Newton 1937b.

Mill Creek (Pleis.): MacClintock 1929.

Clark County—cont.

Ground water

General: Horberg 1950a, Leverett 1899a, Selkregg 1957.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961.

Limestone and dolomite

General: Krey 1925, J. E. Lamar 1934.

Cement materials: Bleininger 1912, J. E. Lamar 1956b.

Trace elements: Ostrom 1957c.

Loess: Fehrenbacher 1965b, J. E. Lamar 1931c, Sittler 1960.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Newton 1937b, Wier 1961.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Workman 1956.

Structure: State geol. map, A. H. Bell 1934a, 1943c, G. H. Cady 1920b, Clegg 1965b, Moulton 1928, 1929d, Mylius 1927, Shrock 1929, Squires 1943e.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Bain 1906a, 1906b, R. S. Blatchley 1909, F. H. Kay 1917a, Mylius 1923, 1927.

Analyses: Bain 1908g.

Corrosion: J. E. Lamar 1928a.

Development maps: Ill. GS 1965 maps 57, 58, 73, 74.

Mud-fluid materials: J. E. Lamar 1931c.

Natural gas: A. H. Bell 1935a.

Physical properties: Armon 1964.

Pools

Casey: W. S. Blatchley 1906, Mylius 1927.

Casey Township: J. E. Lamar 1928a.

Central Casey: Mylius 1923.

Johnson Township: J. E. Lamar 1928a, Mylius 1923, 1927.

Martinsville: Cohee 1941b, J. E. Lamar 1928a, Moulton 1926a, 1929d, Mylius 1927.

North Casey: Mylius 1927.

Orange Township: Mylius 1927.

Parker: Mylius 1927, Squires 1956, Walter 1957.

Partlow: Squires 1943e.

Siggins: Mylius 1927, Squires 1946.

South Johnson: Squires 1951.

Westfield: Cohee 1941b, J. E. Lamar 1928a, Mylius 1927.

Possibilities: Moulton 1926a, 1928.

Prospecting: Ill. GS 1919a, 1919b, 1920b, Mylius 1920a.

Repressuring operations: A. H. Bell 1932d.

Sand properties: Piersol 1940.

Secondary recovery: Pryor 1957, Squires 1943e.

Waterflooding: A. H. Bell 1934a, Cassin 1951, L. C. Powell 1954, Squires 1943b, 1944a, 1946, 1949b, 1950a, 1950d.

Physiography: Leighton 1948b, MacClintock 1929.

Sandstone: J. C. Bradbury 1962a.

Clark County—cont.

Stratigraphy

- General: W. S. Blatchley 1906, Bleining 1912, Moulton 1929d, Mylius 1923, 1927, Selkregg 1957.
 Cambrian: A. H. Bell 1964.
 Ordovician: A. H. Bell 1964, Gutstadt, 1958b, Mylius 1927.
 Silurian: Lowenstam 1949b.
 Devonian: Schwalb 1955, Warthin 1944, Workman 1944.
 Mississippian: Mylius 1927, Swann 1958, Workman 1956.
 Pennsylvanian: J. C. Bradbury 1962a, Clegg 1965a, 1965b, Kosanke 1960, Mylius 1927, Newton 1937b, K. A. Payne 1937, H. W. Scott 1944a, Shrock 1929.
 Pleistocene: F. C. Baker 1928b, 1931b, Fidar 1948, Krumbain 1933b, Leighton 1930f, MacClintock 1929, 1933, Sitler 1960.
 Structure: G. H. Cady 1920b, Clegg 1965a, 1965b, Moulton 1926a, 1928, Mylius 1927.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 6): Worthen 1875a(2).

Clay and shale

(See also under county)

- General: G. H. Cady 1919b, Ill. State Div. Ind. Planning and Dev. 1959, J. E. Lamar 1931a, 1965, Leighton 1934e, Ries 1903, 1927, Risser 1961, St. Clair 1917a.
 Accessory constituents: Bleining 1912.
 Allophanes: W. A. White 1953.
 Alumina extraction: Grim 1945a.
 Anna kaolin: Grim 1934c, J. E. Lamar 1948, O'Brien 1964a, Piersol 1933a.
 Associated with evaporites: Grim 1960.
 Attapulgite: W. F. Bradley 1940.
 Atterberg index and limits: Grim 1948a, Wascher 1960, W. A. White 1949, 1958b.
 Base exchange: Eschenburg 1956.
 Beneficiation: Bole 1938.
 Bentonite: W. F. Bradley 1956a.
 Bleaching agents and tests: Piersol 1933a.
 Bleaching clay: J. E. Lamar 1938b, Nutting 1935.
 Bonding clay: Bleining 1917, Grim 1936a, 1940b, 1940f, 1945b, 1945c, 1950c, Grogan 1945, J. E. Lamar 1938b.
 Brick expansion: W. A. White 1964c.
 Brick, firing reactions: Grim 1951b.
 Buff-burning clay: Parham 1963a, W. A. White 1963.
 Ceramic analyses: J. R. Ball 1952, Grim 1941, Hinds 1917, J. E. Lamar 1931d, 1948, Parham 1959b, 1960, 1961, 1963a, Parmelee 1921, Purdy 1908a, Ries 1922, C. W. Rolfe 1908, Rubey 1952, St. Clair 1917a, Stull 1917, Sweeney 1965, W. A. White 1960a, 1963, Willman 1942b.
 Ceramic products research: Parmelee 1934.
 Ceramics, composition in: Grim 1950a.
 Ceramic uses: Parmelee 1921.
 Chemical analyses: Bleining 1912, J. C. Bradbury 1963, Bray 1935, G. H. Cady 1908, 1919b, Chatard 1886, Clarke 1897, Eckel 1913, Grim 1933, 1934c, 1935b, 1936b, 1937b, 1938b, 1939a, 1939b, 1940c, 1942a, 1945a, 1957, Grogan 1945, Huddle 1961, J. E. Lamar 1928b, 1929a, 1931b, 1931d, 1934, 1948, 1956b, Mylius 1927,

Clay and shale—cont.

Chemical analyses—cont.

- Parham 1963a, Parr 1921, Piersol 193 P. E. Potter 1963d, Ries 1922, C. Rolfe 1908, Rubey 1952, Schroyer 19 Sweeney 1965, W. A. White 1959a, 19 1960b, Willman 1942b.
 Chemistry: W. F. Bradley 1945b, Grim 194 R. J. W. McLaughlin 1958, Purdy 19 1908a.
 Clay behavior: Grim 1940e.
 Clay minerals in carbonates: Ostrom 1961
 Clay pockets: G. E. Ekblaw 1925b, D. Fisher 1925a, Krey 1925, Willman 194 1943b.
 Clay-water properties: Grim 1945d.
 In coal mines: Stull 1917.
 Dehydration: Rowland 1956.
 Diagenesis: Grim 1955.
 Differential thermal analyses: Grim 194 1944a, 1945a, 1947a, 1951b, 1951c, 19
 Diffraction methods: Johns 1954a.
 Economics (see also Mineral economics): Newton 1936a, 1937a, Voskuil 1933b.
 Efflorescence control: Deadmore 1957, J. Jones 1906, Machin 1957.
 Expansion properties: Sweeney 1965.
 Exploration program: Otto 1965.
 Face brick: Parmelee 1940, Jon A. Ud 1910b.
 Facies map: Parham 1963c.
 Fire clay: Bleining 1912, J. E. Lamar 193
 Fissure fillings (crevice deposits, joint clay Bleining 1909, J. C. Bradbury 195 W. A. White 1964b.
 Fithian illite: W. A. White 1958a.
 Flint clay: J. E. Lamar 1931d, L. G. Sch 1958, W. H. Smith 1965.
 Fuller's earth: Grim 1933, 1950c, J. E. Lam 1928e, Nutting 1943.
 Geochemical partition: R. J. W. McLaugh 1958.
 Genesis of clay minerals: H. H. Murray 19
 Grain size analyses: Bergstrom 1956b, Ec 1913, Grogan 1945, Hursh 1940, 19 Larsen 1965b, Lund 1965a, 1965b, Pur 1907, Shrode 1953.
 Grundite: Grim 1939a.
 Gumbotil uses: J. E. Lamar 1938b.
 Halloysite: W. F. Bradley 1945a, Grim 194 1945b, 1945c, 1948b, J. E. Lamar 194 W. A. White 1958b.
 Halloysite, high-temperature phase: GI 1954a.
 High temperature effects: W. F. Brad 1951.
 History: Barrett 1922a.
 Illite: W. F. Bradley 1945a, Grim 193 1939a, 1939c, 1940c, 1942a, 1945b, 194 1947a, 1948b, W. A. White 1958b.
 In igneous intrusion: Parham 1963b.
 Industries: Lines 1908.
 Interstratified growths: W. F. Bradley 195
 Iron-ore pellet binder: Jackman 1965a.
 Isomorphism: Johns 1954b.
 Kaolinite (kaolin): W. F. Bradley 194 1948b, St. Clair 1917a, W. A. White 195
 Kaolinite, high-temperature phase: GI 1954a.
 LaSalle region: Buzzard 1923.
 Light burning: Parham 1959b.

Clay and shale—cont.

- Lightweight aggregate: Sweeney 1965, W. A. White 1959b, 1960b.
- Lightweight brick: J. E. Lamar 1955a.
- Lightweight ceramic block: W. A. White 1964a.
- Magnesium-treated: Johns 1953.
- Microscopic structure: Purdy 1908a, C. W. Rolfe 1908.
- Mineral analyses: Atherton 1960, Frye 1964a, Grim 1940f, Hursh 1940, 1944, L. G. Schultz 1958, Smoot 1960a, W. A. White 1960b.
- Mineral analyses methods: Bray 1935.
- Mineralogy: V. T. Allen 1932b, Atherton 1960, Belyankin 1942, W. F. Bradley 1937, 1938a, 1938b, 1940, 1945a, 1948, 1950b, 1951, 1953a, 1955a, 1955b, 1959a, 1959b, Bray 1935, G. L. Clark 1937, Frye 1960c, 1964a, Glass 1954a, 1956, 1958, Grim 1934a, 1935b, 1936b, 1938a, 1939b, 1939c, 1940a, 1940e, 1942b, 1947c, 1948a, 1948b, 1949, 1950a, 1950b, 1951a, 1960, Hursh 1940, Johns 1953, 1954a, 1954b, R. J. W. McLaughlin 1958, H. H. Murray 1954, O'Brien 1963a, 1963b, 1964a, Ostrom 1961a, Parham 1963c, P. E. Potter 1958b, Pryor 1961a, Rowland 1940, Smoot 1959, 1960a, 1960b, 1960c, Weaver 1958, W. A. White 1949, 1953, 1954, 1956, 1959c, Woltman 1956.
- Mineralogy of glacial till: J. A. Brophy 1959, W. H. Johnson 1964, Wascher 1960, Willman 1963.
- Mineralogy of loess: Beavers 1957, Frye 1962e, Glass 1964.
- Montmorillonite: W. F. Bradley 1945a, 1945b, Grim 1933, 1939c, 1940c, 1942a, 1945b, 1945c, 1945d, 1947a, 1948b, W. A. White 1958b.
- Behavior on wetting: W. F. Bradley 1937.
- Density of water sorbed: W. F. Bradley 1959b.
- Glycol complexes, temperature stabilities: W. F. Bradley 1958.
- Homoionic: W. A. White 1955.
- Monoionic: Rowland 1956.
- Mortar mix: Hursh 1940, 1944.
- Mud-fluid materials: J. E. Lamar 1931c.
- Mullitization of kaolinite: Comeforo 1948.
- Oil yield: V. E. Swanson 1960.
- Paving brick: Purdy 1908a, 1908b, C. W. Rolfe 1908, Talbot 1908.
- Peat and corncob bricks: J. E. Lamar 1955a.
- Pennsylvanian: Hinds 1919, Huddle 1961, O'Brien 1964b, L. G. Schultz 1958.
- Petrology and petrography: Grim 1933, 1934b, 1935a, 1937b, 1938b, 1939a, 1940b, 1940d, 1941, 1957, Krumbein 1933a, Parham 1963d.
- pH control: Grim 1944b.
- Physical tests: Athy 1928, Eschenburg 1956, Grim 1939c, 1945b, 1945c, 1945d, 1950c, Grogan 1945, C. G. Harman 1940, Hursh 1940, 1944, Jackman 1965a, J. E. Lamar 1928e, 1955a, Parham 1963a, Parmelee 1921, Purdy 1908b, Ries 1922, C. W. Rolfe 1908, St. Clair 1917a, W. A. White 1961b, 1963, 1964a.
- Pipette analyses: Rowland 1940.
- Portland cement: J. E. Lamar 1959.

Clay and shale—cont.

- Potash content: Krey 1921.
- Pottery clays: C. G. Harman 1940, Jonas 1957.
- Pozzolans: W. A. White 1961b.
- Processing clay products: Hursh 1938.
- Production statistics (see Mineral economics)
- Products producers directory: D. F. Stevens 1942a.
- Properties: Grim 1939b, W. A. White 1965.
- Properties in mining: W. A. White 1954.
- Radioactivity: Patterson 1954.
- Reaction with organic cations: Grim 1947b.
- Rectorite: W. F. Bradley 1950a.
- Refractory clays: A. I. Andrews 1944, J. E. Lamar 1931d, Lines 1917, Parmelee 1921, 1922, St. Clair 1917a, W. A. White 1962, Willman 1942b.
- Refractory insulation: Grim 1947b.
- Research trends: Ill. GS 1935a, 1935c, 1936a.
- Residual clay: Doyle 1965, Frye 1965a, Trowbridge 1916.
- Resources: Ill. State Div. Ind. Planning and Dev. 1959, J. E. Lamar 1934, 1948, 1959, Leighton 1944d, E. W. Shaw 1911a, Wanless 1929a, 1957a.
- Rotary drilling mud: J. E. Lamar 1938b.
- Sedimentary structures: W. A. White 1961a.
- Sepiolite: Nagy 1955.
- Southern Illinois: J. E. Lamar 1928d, Leighton 1949b.
- Spectrochemical analyses: W. A. White 1959a.
- Squeezes in mines: W. A. White 1956.
- Structural clay products: D. F. Stevens 1942b, Voskuil 1934f, W. A. White 1965.
- Surface clays: Grogan 1945.
- Temperature stabilities: W. F. Bradley 1958.
- Trace elements: J. C. Bradbury 1960a, P. E. Potter 1963d.
- Underclays, lateral variations: Parham 1963c.
- Uranium content: Huddle 1954, Ostrom 1955, V. E. Swanson 1960.
- Uses: Parmelee 1921.
- Vermiculite: W. F. Bradley 1956b, 1960.
- Water sorption properties: W. A. White 1955, 1958b, 1959c.
- X-ray diffraction method: G. L. Clark 1937.
- Clay City Anticlinal Belt: A. H. Bell 1943c, Cohee 1962, DuBois 1955, Siever 1951b.
- Clay City-Noble Anticline: S. K. Clark 1948, Cohee 1939.
- Clay City Pool: Cohee 1939, Hager 1937, Squires 1946, C. H. Riggs 1945b, Ver Wiebe 1949, Theron Wasson 1938.
- Clay County**
- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Building stone: Conover 1884.
- Clay and shale
- Bonding clay: Grogan 1945.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: Atherton 1960, Smoot 1960a, W. A. White 1960b.
- Refractory clay: J. E. Lamar 1956b.
- Coal
- Mining and production: Annual coal reports.
- Reserves: G. H. Cady 1944, 1952b, Lowenstein 1951, Siever 1950.

Clay County—cont.

Coal—cont.

Strippable reserves: Culver 1925b.

Drill records: R. S. Blatchley 1910a, Easton 1944b, J. M. Weller 1936c.

Geophysical studies: Pryor 1956c, Wyllie 1949.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957.

Analyses: A. W. Palmer 1897.

Limestone and dolomite

General: Krey 1925.

Agricultural limestone: Grogan 1940.

Mineralogy: Graf 1950b, Grim 1937a.

Trace elements: Ostrom 1957c.

Loess: Fehrenbacher 1965b.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map.

Glacial: State geol. map, G. E. Ekblaw 1941, R. R. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: L. K. Lee 1939b.

Structure: A. H. Bell 1943c, Easton 1944b, Lowenstam 1951, Meents 1954, Pye 1944, Siever 1950, J. M. Weller 1936c.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas: Theron Wasson 1938.

Development maps: Ill. GS 1965 maps 41, 42, 52, 53.

Geophysical logs: Wyllie 1949.

Physical properties: Armon 1964.

Pools

Clay City: C. H. Riggs 1945b, Squires 1950a.

Kenner: A. H. Bell 1959c.

Possibilities: W. S. Blatchley 1906, Easton 1944b, J. M. Weller 1936c.

Secondary recovery: Pryor 1957, Squires 1946, 1950a.

Physiography: Leighton 1948b, MacClintock 1929.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962c, 1963a, Pye 1944, Siever 1953, 1956b.

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Springs: Peale 1886.

Stratigraphy

General: A. H. Bell 1964, R. S. Blatchley 1910a, W. S. Blatchley 1906, Selkregg 1957, Workman 1950b.

Silurian: Workman 1950b.

Devonian: Meents 1965b.

Mississippian: Coryell 1939a, L. K. Lee 1939b, Pye 1944, Swann 1958, J. M. Weller 1936c.

Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, Kosanke 1960, Lowenstam 1951, J. M. Weller 1936c, 1942c.

Pleistocene: Frye 1965c, Leighton 1961.

Structure: Easton 1944b, L. K. Lee 1939b, Meents 1965b, J. M. Weller 1936c.

Uranium: Ostrom 1955.

Worthen Survey report (v. 6): Worthen 1875a(2).

Claypool Sand, Pay Zone: Mylius 1927.

Clayton Formation (Ter.): Pryor 1962a, Ross 1963, J. M. Weller 1940a.

Paleogeographic map: Schuchert 1955.

Structure map: Pryor 1962a.

Clear Creek Limestone Chert (Dev.): Bassett 1925, Bleining 1912, Caylor 1944, J. E. Lamar 1930a, 1953a, 1959, Meek 1868a, Ross 1964b, Savage 1908, 1920, 1925a, Schuchert 1900, J. M. Weller 1939e, 1940a, 1940c, 1944a, 1944b, 1952, Willman 1949, Workman 1944, Worthen 1866a(4), 1866b, 1868(2).

Paleogeographic map: Schuchert 1955.

Clement Member (Ord.): Templeton 1952, 1963.

Clermont Shale Member (Ord.): Buschbach 1965, Templeton 1963.

Clifford Anticline: G. H. Cady 1916.

Clinton County

Bedrock topography: Horberg 1950a.

Brines: Meents 1952, E. W. Shaw 1923.

Building stone: Conover 1884.

Clay and shale: W. H. Smith 1965.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: Grim 1957, Smoot 1960a, W. A. White 1960b.

Coal

General: Ill. GS 1913, F. H. Kay 1915a, J. N. Payne 1941, Johan A. Udden 1915.

Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1935b, 1948a, Fieldner 1942b, Hawley 1923, J. A. Holmes 1908, Parr 1904, 1906b, 1915a, 1916, E. W. Shaw 1923, N. H. Snyder 1953, Johan A. Udden 1908c, 1915.

Ash fusibility: Abernethy 1961.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Losses: C. A. Allen 1925.

Mined-out areas: Ill. GS 1959b maps 26, 27.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e, H. M. Cooper 1942b, E. W. Shaw 1923.

P, Cl, Na, and K in: Abernethy 1965.

Physical tests: J. A. Holmes 1908.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, DeWolf 1908b, Siever 1950.

Subsidence: L. E. Young 1916b.

Drill records: R. S. Blatchley 1910a, Cohee 1941b, Ross Hanson 1950, 1958, 1961, F. H. Kay 1915a, E. W. Shaw 1912a, 1923, Johan A. Udden 1914, 1915, Worthen 1883(1).

Earthquakes: Heinrich 1950.

Geophysical studies: Dobrovolny 1953, Pryor 1956c.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956c, R. C. Scott 1962, Selkregg 1957, E. W. Shaw 1921, 1923, Johan A. Udden 1915.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961.

Limestone and dolomite

General: Krey 1925.

Building stone: Johan A. Udden 1915.

Mineralogy: Graf 1950b.

inton County—cont.

Limestone and dolomite—cont.

Trace elements: Ostrom 1957c.

Loess: Frye 1962e, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a, Johan A. Udden 1915.

Drift thickness: State geol. map.

Geologic: State geol. map, E. W. Shaw 1921, 1923, Johan A. Udden 1915.

Glacial: State geol. map, Frye 1965c, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Siever 1951a, Workman 1956.

Structure: A. H. Bell 1926b, 1927b, 1934a, 1943c, R. S. Blatchley 1914a, Brownfield 1954, F. H. Kay 1915a, H. L. Koch 1939, J. N. Payne 1941, Pye 1944, St. Clair 1917c, E. W. Shaw 1912a, 1921, 1923, Siever 1950, 1951a, Smoot 1958, Squires 1943e, Johan A. Udden 1908c, 1915.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: A. H. Bell 1926b, F. H. Kay 1916b, 1917a, H. A. Wheeler 1911b.

Development maps: Ill. GS 1965 maps 31, 32, 43, 44, 45, 50, 51.

Physical properties: Armon 1964.

Pools

Carlyle: A. H. Bell 1934a, E. W. Shaw 1912a, Squires 1938a, 1943e.

Centralia: A. H. Bell 1927b, Cohee 1941b, H. L. Koch 1939, Moulton 1929d.

New Centralia: A. H. Bell 1939b.

Sandoval: A. H. Bell 1927b, Moulton 1929d.

Wamac: Moulton 1929d.

Possibilities: A. H. Bell 1941b, St. Clair 1917c.

Sand properties: Piersol 1940.

Secondary recovery: Pryor 1957, Squires 1938a, 1943e.

Physiography: R. F. Flint 1941, Leighton 1948b, MacClintock 1929, E. W. Shaw 1921, 1923, Johan A. Udden 1915.

Quadrangle studies

Breese: Johan A. Udden 1915.

Carlyle: E. W. Shaw 1923.

Centralia: E. W. Shaw 1923.

Okawville: E. W. Shaw 1921.

Sand and gravel

General: Dobrovolny 1953.

Molding sand: Littlefield 1925a, 1925b.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1961a, 1962a, 1962c, Pye 1944.

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Stratigraphy

General: A. H. Bell 1927b, R. S. Blatchley 1910a, Brownfield 1954, L. G. Henbest 1928b, Moulton 1929d, St. Clair 1917c, Selkregg 1957, E. W. Shaw 1921, 1923, Smoot 1958, Johan A. Udden 1915.

Ordovician: Smoot 1958, Workman 1941.

Silurian: Lowenstam 1949b, Smoot 1958.

Devonian: Caylor 1944, Schwalb 1955.

Mississippian: Pye 1944, Siever 1951a, Smoot 1958, Swann 1958, 1965, Workman 1956.

Clinton County—cont.

Stratigraphy—cont.

Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, L. G. Henbest 1928b, F. H. Kay 1915a, Lesquereux 1866a, P. E. Potter 1961a, Prescott 1938, E. W. Shaw 1912a, 1923, Siever 1951a, Smoot 1958, Johan A. Udden 1908c, 1915, Johan A. Udden 1908, Worthen 1883(1).

Pleistocene: Frye 1965c, Leighton 1959.

Structure: A. H. Bell 1927b, 1941b, R. S. Blatchley 1914a, Moulton 1929d, Smoot 1958, Johan A. Udden 1915.

Uranium: Ostrom 1955.

Worthen Survey report (v. 3): Henry Engelmann 1868.

Clinton Formation, Limestone (Sil.): Bleining 1912, Savage 1908.

Clinton Sand: Mylius 1927.

Clare Formation, Limestone (Miss.): Atherton 1947, J. W. Baxter 1963a, 1965a, Butts 1917a, 1925, C. L. Cooper 1941, Coryell 1939a, Croneis 1939a, Currier 1944, P. L. Dana 1941, Desborough 1961b, English 1948, Folk 1946, J. E. Lamar 1925a, 1959, Siever 1953, Smoot 1960c, Swann 1963, Tippie 1942, E. O. Ulrich 1917, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1913, 1914, 1920a, 1920b, 1939a, 1939b, Willman 1949, Workman 1940.

Fauna: Coryell 1939b, Leighton 1939, McFarlan 1942, A. H. Sutton 1931, Zeller 1953.

Coal

(See also under county)

General: Anon. 1906c, Bain 1907d, 1908c, 1908g, 1908h, 1910, Bement 1906, 1913, 1929, G. H. Cady 1935b, 1942a, 1949, 1960a, DeWolf 1909, Dinsmore 1889, Ill. GS 1913, 1935d, Ill. State Div. Ind. Planning and Dev. 1959, Leighton 1933c, 1934a, 1937f, Norwood 1857, Parr 1929, Risser 1961, Savage 1914a, Simon 1965, Stull 1917, Stutzer 1940, Reinhardt Thiessen 1920, Jon A. Udden 1909, Worthen 1883(1), 1890(2), C. M. Young 1918.

Analyses (chemical): Abernethy 1961, Andros 1915a, Aresco 1953-1965, Ashley 1902, Beagle 1925, Bement 1906, 1909, 1910a, 1929, E. T. Benson 1935, Blaney 1866, 1868, Boley 1949, G. H. Cady 1910, 1915a, 1916, 1917, 1919a, 1919b, 1919c, 1921, 1927, 1930d, 1934, 1935b, 1948a, M. R. Campbell 1913, 1914, 1926, 1929, Clegg 1955a, Clement 1916, H. M. Cooper 1942a, Culver 1922a, 1925a, DeWolf 1907a, 1908a, Ede 1900, Eissler 1962, Fieldner 1914, 1918, 1922, 1930, 1942a, 1942b, M. L. Fuller 1903, J. A. Harrison 1960, Hawley 1923, Helfinstine 1946, 1948, 1951, Hinds 1919, J. A. Holmes 1906, 1908, Ill. GS 1913, Jackman 1955b, 1957, 1959a, 1959b, F. H. Kay 1915a, Kratz 1930, Wallace Lee 1926, Lindgren 1908, Lord 1907, 1913, R. S. McBride 1919b, L. C. McCabe 1934a, 1935, 1938, 1942a, Maher 1959a, C. E. Marshall 1958, E. W. Parker 1906b, B. C. Parks 1956, Parr 1902a, 1902b, 1904, 1906a, 1906b, 1907a, 1908a, 1908b, 1908d, 1910a, 1914, 1915a, 1915b, 1916, Pierron 1959, 1960, Piersol 1935, 1948,

Coal—cont.

Analyses—cont.

- Place 1935, Pope 1916, F. H. Reed 1947b, 1955, Rees 1936, 1939c, 1941, 1943b, 1947, 1961, Reinertsen 1964, Rubey 1952, Savage 1910b, 1914a, 1915, 1921a, 1921b, Selvig 1956, E. W. Shaw 1910, 1913, 1921, 1923, N. H. Snyder 1923, 1953, G. B. Taylor 1916, Gilbert Thiessen 1934c, 1937b, Johan A. Udden 1915, Wanless 1929a, J. D. Weeks 1896, W. F. Wheeler 1908a, Willman 1942b, Worthen 1870, 1873(1), Yohe 1955, Zubovic 1964.
- Calculations: C. G. Ball 1935b, E. T. Benson 1935, G. H. Cady 1930d, 1934, 1935a, L. C. McCabe 1934a, Parr 1910a, 1914, Gilbert Thiessen 1934a, 1934b, 1934c.
- Methods: Machin 1956, Parr, 1906b, 1910a, 1916, Rees 1937b, 1957, W. F. Wheeler 1907.
- Use of: Lord 1910.
- Well cuttings: G. H. Cady 1951b.
- Anthracizing: Parr 1907a.
- Anthracology (see Coal petrology and petrography): G. H. Cady 1960b.
- Antioxidants tests: Yohe 1965.
- Artificial modification: Parr 1908b.
- Ash: Abernethy 1960, Selvig 1922.
- Analyses: C. G. Ball 1935a, Bement 1908a, G. H. Cady 1935b, 1948a, Gluskoter 1965b, Helfinstine 1946, 1948, 1951, Parr 1908b, 1909b, 1910a, F. H. Reed 1947b, Rees 1937a, 1942a, 1964, Selvig 1956, Gilbert Thiessen 1934a, 1934b, 1934c, 1936c, Willman 1942b, Zubovic 1964.
- Correction formulae (see unit coal)
- Determination: Rees 1957.
- Fusion: Abernethy 1960, 1961, Harrington 1941, L. C. McCabe 1939a, Selvig 1922.
- Bacteriostatic substance: Kosanke 1954a.
- Banded ingredients: Boley 1937, G. H. Cady 1933, 1939a, Fieldner 1932, J. A. Harrison 1955, 1963, Kosanke 1952, 1954a, Leighton 1933c, L. C. McCabe 1934a, 1934b, 1936a, 1936b, 1936c, 1937b, Machin 1963, C. E. Marshall 1958, 1961a, B. C. Parks 1942, 1949, Rees 1941, 1947, N. C. Schenck 1954, Gilbert Thiessen 1936d, 1937b.
- Bedded irregularities: Ill. GS 1935d.
- Bibliography: Andros 1915a.
- Bituminous Coal Act: Maloney 1938.
- Bituminous coal movement: Voskuil 1942b.
- Boghead: Kosanke 1951.
- Briquetting: Piersol 1933b, 1935, 1936, 1944, 1948.
- Briquetting binder: Yohe 1964.
- Broken coal studies: J. A. Harrison 1955, B. C. Parks 1949.
- Calcium carbonate in: C. G. Ball 1935a, Parr 1916.
- Calorific variations: E. T. Benson 1936.
- Cannel: Ashley 1918, Grout 1907.
- Carbon ratios: A. H. Bell 1941e, Moulton 1925a, Parr 1906b, Gilbert Thiessen 1937b.
- Carbonization (see Coke)
- Cardiff Coal: Anon. 1907a, G. H. Cady 1915a.
- Chemical uses: Gilbert Thiessen 1936b.

Coal—cont.

- Chemistry: Bain 1909b, Bement 1910a, J. D. Davis 1925, Fieldner 1951, L. C. McCabe 1936b, Maher 1959a, 1959b, B. C. Park 1942, Parr 1906a, 1906b, 1925a, 1925b, 1930a, F. H. Reed 1937, Rees 1937b, Ru 1878, Gilbert Thiessen 1937b, Yohe 1939, 1941, 1942, 1947, 1949, 1955, 1958, 1961a, 1965.
- Chlorine in: Abernethy 1965, Gluskoter 1964, 1965a.
- Classification: Breckenridge 1907, G. H. Cady 1930b, 1930c, 1935b, 1937a, 1942b, 1960a, Fieldner 1931, Ill. GS 1935d, L. C. McCabe 1937a, 1937c, Parr 1906b, Place 1935, Rees 1939c, Siever 1952, Gilbert Thiessen 1937b.
- Clay in: C. G. Ball 1935b, Savage 1909a, Johan A. Udden 1908b, Woltman 1956.
- Clay materials in mines: Stull 1917, W. A. White 1954.
- Clay partings: Wanless 1952.
- Clay veins (see Horsebacks)
- Cleaning by oil flotation: Piersol 1948.
- Cleating: Dapples 1934.
- Coal balls (see Paleobotany)
- Coal selection: G. H. Cady 1935a, K. C. Richmond 1937.
- Coalification: C. G. Ball 1936, D. J. Fisher 1936.
- Coalite: Parr 1908b.
- Coke (see Coke)
- Combustion: Barber 1917, Grotts 1938.
- Comparison of coals: W. F. Wheeler 1908a.
- Compression tests: Talbot 1907.
- Conservation: DeWolf 1912a.
- Control drill holes: G. H. Cady 1952b.
- Correlation: Culver 1927, DeWolf 1907b, Jilison 1928, Keyes 1917b, Kosanke 1947, 1960, Lesquereux 1858, Wanless 1939, J. M. Weller 1939b.
- By spores: Kosanke 1947, 1950, 1954b, Kremp 1955, Peppers 1964, Schopf 1938d, Winslow 1959.
- U.S. coal basins: Wanless 1961.
- With European coals: Noe' 1930.
- Data processing: G. H. Cady 1940a, M. A. Parker 1946.
- Diamond drilling: G. H. Cady 1946, 1952b, Simon 1962.
- Differential thermal analyses: Clegg 1955a, 1955b, Glass 1954b, 1955, Pierron 1959.
- Discovery: Bement 1929, Henry Engelmann 1878, Fleener 1954, Hutchins 1778, Perrin 1906, C. O. Sauer 1916.
- Districts: G. H. Cady 1942a.
- District I: Andros 1914a, 1915b, G. H. Cady 1915a.
- District II: Andros 1914b, 1915a, G. H. Cady 1917.
- District III: Andros 1915a, 1915b, Culver 1925a.
- District IV: Andros 1915a, 1915c, G. H. Cady 1921.
- District V: Andros 1914c, 1915a, G. H. Cady 1919a.
- District VI: Andros 1914d, 1915a, G. H. Cady 1916.
- District VII: Andros 1914e, 1915a, F. H. Kay 1915a.
- District VIII: Andros 1914f, 1915a, F. H. Kay 1915b.

Coal—cont.

- Domestic: Callen 1934, Snodgrass 1908, A. C. Willard 1917.
- Domestic stoker combustion: Boley 1946, Helfinstine 1946, 1948, 1949, 1951, L. C. McCabe 1942a, A. C. Willard 1930.
- Drilling: G. H. Cady 1944, Simon 1962.
- Dust: Ill. GS 1913.
- Dust analysis: Clement 1916, Gilbert Thiessen 1936d, 1937b.
- Economics: R. L. Anderson 1942, Andros 1915a, Anon. 1939b, Bain 1908g, C. G. Ball 1939, Bentley 1933, H. D. Graham 1948, Honnold 1930, Howe 1944, Lammers 1944, Leighton 1949b, C. J. Potter 1944, Putnam 1944, F. H. Reed 1947a, G. S. Rice 1908, Risser 1957, 1958, 1960, 1962a, 1964b, 1965a, 1965c, Roepke 1955, E. H. Taylor 1910, R. C. Taylor 1848, Gilbert Thiessen 1937b, Voskuil 1934e, 1936b, 1936c, 1938e, 1939d, 1939e, 1942b, 1942c, 1951a, 1954, 1956c, 1957b, A. C. Willard 1917.
- Coal gas: Dunkley 1918.
- Competitive position: Voskuil 1933c, 1934b, 1941b, Wildman 1937.
- Future: Parr 1929.
- Future energy market: Risser 1960.
- Illinois Waterway, benefit to: Utzig 1925.
- Inventories: Risser 1959a.
- Market for steel production: Voskuil 1959a.
- Marketing: Bement 1912, W. G. Lathrop 1922, Voskuil 1942d, Utzig 1925.
- Railroad marketing: Lammers 1944.
- Water transportation: Putnam 1944.
- Electric logging: E. F. Taylor 1944a.
- Engineering experiment station: Breckenridge 1910.
- Environments of accumulation: Wanless 1961, 1965.
- Etching: W. S. McCabe 1936.
- Exploitation: Anon. 1888, Comstock 1887, 1889a.
- Extraction percentage: C. M. Young 1917, 1919.
- Fault at Girard: Hiram Young 1892.
- Field relations: Wanless 1952.
- Fire in mines: Andros 1915a.
- Foreign mining explosion stations: G. S. Rice 1910.
- Fractures: Johan A. Udden 1908b.
- Free-swelling index: Abernethy 1961.
- Freight rates: Risser 1962a.
- Friability: C. M. Smith 1930.
- Fuel tests: Breckenridge 1908.
- Fungistatic substance: N. C. Schenck 1954.
- Fusain content: C. E. Marshall 1958, 1961a, B. C. Parks 1941, 1942, Parr 1931, Piersol 1948, Gilbert Thiessen 1936d, 1937b.
- Gas analyses: Parr 1908b.
- Gas and tar analyses: Fieldner 1932.
- Gas from coking: Gilbert Thiessen 1937b.
- Gas in mines: Jeffery 1894, G. B. Taylor 1916.
- Gas manufacture: Parr 1915b.
- Gas purification: Dunkley 1920a.
- Gaseous and liquid fuel: Gilbert Thiessen 1936a.
- Gases, occluded: Perry Barker 1908, Parr 1909a.
- Geology: G. H. Cady 1949, 1951a, 1958.
- Germanium in fly ash: Machin 1956.

Coal—cont.

- Giesler plastometer (see plasticity)
- Grindability: Abernethy 1961.
- Ground-water composition: Gluskoter 1965a.
- Guffey Bill: G. H. Cady 1937a.
- Heated properties: Grotts 1938.
- Herrin Quadrangle: Savage 1911a, 1911b.
- History of mining: Andros 1914f, 1915a, 1915c, Barrett 1922a, Bement 1914, 1929, John Bradbury 1817, G. H. Cady 1929, Cartledge 1931, Ill. Dept. Mines and Minerals 1931, 1955, Leighton 1942a, Macfarlane 1873, Parr 1929, J. D. Peters 1893, Spooner 1952, R. C. Taylor 1848, Rutledge 1944.
- Home-heating research: Kratz 1944, Snodgrass 1910.
- Horsebacks: G. H. Cady 1917, 1952b, Clegg 1961, W. B. Roe 1935, Savage 1909a, 1910b, 1915, E. W. Shaw 1913, Wanless 1952, 1957a.
- Hydrogenation: LeClaire 1941, B. C. Parks 1956.
- Industry: G. H. Cady 1958, C. M. Young 1918.
- Infrared spectroscopy: Maher 1959a, Pierron 1959.
- Interior Province: M. R. Campbell 1929.
- Kaolinite in: C. G. Ball 1934.
- Kingston Mines: C. S. Richardson 1855.
- LaSalle region: Buzzard 1923.
- Lithology: L. C. McCabe 1934b.
- Losses: C. A. Allen 1925.
- Low sulfur: G. H. Cady 1919c, 1919d, 1919e, 1919f, Jackman 1963a.
- Low-temperature ashing: Gluskoter 1965b.
- Low-temperature distillation: Francis 1908.
- Maceration products: O. J. Henbest 1934.
- Maps: (see also under county) G. H. Cady 1927, 1952b.
- Coal fields of U.S.: M. R. Campbell 1926, Hitchcock 1874.
- Coal thickness: Wanless 1965.
- Mechanization: Weir 1940.
- Megascopic description: G. H. Cady 1939a.
- Metamorphism: G. H. Cady 1952a, M. R. Campbell 1930, Clegg 1955a.
- Methane in: Darton 1915.
- Methylation: Yohe 1947.
- Microchemistry: Kosanke 1952.
- Mine disasters: Ill. Dept. Mines and Minerals 1931, 1955.
- Mine explosions: J. A. Holmes 1910, James Taylor 1910, Verner 1910.
- Mine dusting: Bowles 1925.
- Mine in Chicago Museum of Science and Industry: Shepherd 1936.
- Mine notes: H. M. Cooper 1942b.
- Mine refuse reclamation: Mitchell 1938.
- Mine rescue work: J. A. Holmes 1910, R. Y. Williams 1910.
- Mine roof: Andros 1915c, G. H. Cady 1915a, 1916, 1917, 1919a, F. H. Kay 1915a, 1915b, Roley 1947, L. E. Young 1916b.
- Mines directory: Anon. 1880.
- Mined-out area maps (see also county): Ill. GS 1959b.
- Mined-out areas recognized by radio waves: Pullen 1953.
- Mineral matter: Abernethy 1965, C. G. Ball 1935a, 1935b, 1936, G. H. Cady 1922,

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Mineral matter—cont.

1932, 1933, 1935a, Fieldner 1930, Gluskoter 1965b, J. A. Harrison 1956, Leighton 1933c, L. C. McCabe 1934a, 1939b, Parr 1910a, 1914, 1915a, Stadnichenko 1961, Gilbert Thiessen 1934a, 1934c, 1936c, Zubovic 1964.

Mining:

Annual coal reports, Andros 1914a, 1914b, 1914c, 1914d, 1914e, 1914f, 1915b, Anon. 1836, 1896a, 1897, 1907a, Bement 1912, 1913, 1929, Bulmer 1895, G. H. Cady 1916, 1917, 1918a, 1919a, 1921, Comstock 1887, 1889a, Culver 1922a, Darton 1915, Dinsmore 1889, Ede 1900, 1919, D. J. Fisher 1925b, Garcia 1930, Ill. GS 1913, 1935b, Inman 1960, McFadden 1962, Parsons 1907, R. W. Raymond 1896, G. S. Rice 1908, Rothwell 1891, Rutledge 1895, Savage 1911a, Sharpenberg 1963, Shields 1949, Johan A. Udden 1908a, Weimer 1948, Weir 1940, W. A. White 1954, 1956, C. M. Young 1917, 1919.

Engineering: Goss 1910.

Fatalities, geologic causes: Roley 1947.

Forecasting explosion conditions: McIntosh 1958.

Long-wall: Andros 1914a, 1915a, Anon. 1896b, Bement 1929, G. H. Cady 1915a, Peltier 1910, Toenges 1936.

Methods: Andros 1914a, 1914b, 1914c, 1914d, 1914e, 1914f, 1915a, 1915b, 1915c, Bement 1929, Ill. GS 1913.

Population problems: Voskuil 1936f.

Research: Callen 1933.

Statistics: (1917-1965) Ill. Dept. Mines & Minerals A, 1931, 1955, (1881-1910) Ill. Bur. Labor Statistics, (1911-1916) Ill. State Mining Board.

Statutes: J. W. Thompson 1918.

Minor elements (chemical): Abernethy 1965, Stadnichenko 1961, Zubovic 1964.

Moisture analyses: Ill. GS 1913, Parr 1915a, 1916, Rees 1942b.

Northern Illinois Coal Field: Jasper Johnson 1875.

Origin: G. H. Cady 1960a, D. J. Fisher 1925b, Fleener 1952a, 1952b, Kosanke 1952, Lesqueroux 1859, 1860, Savage 1914a, Stutzer 1940, Wanless 1952, 1965, Worthen 1882c.

Oxidation: Beagle 1925, J. D. Davis 1925, Maher 1959a, Parr 1925a, 1925b, 1925c, H. C. Porter 1914, Rees 1943b, 1955a, Yohe 1939, 1941, 1942, 1947, 1950a, 1953, 1955, 1958, 1961a, 1965.

Paleobotany (see Paleobotany)

Particle count method of analyses: B. C. Parks 1949.

Petrology and petrography: C. G. Ball 1932, 1935a, Boley 1937, G. H. Cady 1933, 1939a, 1942b, 1945, 1951a, 1952a, 1956, 1960a, 1960b, Fieldner 1932, J. A. Harrison 1955, 1960, 1961, 1963, 1964, 1965, Helfinstine 1946, 1949, Ill. GS 1935d, Kosanke 1952, 1957, L. C. McCabe 1934a, 1936b, 1937a, 1937b, 1937c, 1938, 1942b, C. E. Marshall 1958, 1961a, B. C. Parks 1941, 1942, 1949, 1956, Parr 1926, 1931, Pierron 1960, Quirke 1938, Rees 1941, 1943b, 1947, Siever 1957c, Stutzer 1940, Gilbert Thiessen 1935, 1937b, Reinhardt Thiessen 1920, 1930.

Phenol as solvent: Parr 1914.

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Phosphorous in: Abernethy 1965.

Physical tests: J. A. Harrison 1963, J. A. Holmes 1906, 1908, L. C. McCabe 1937a, E. W. Parker 1906a, 1906b, Siever 1952.

Plasticity: Jackman 1955b, 1956a, 1957, 1961, Pierron 1959, 1960, F. H. Reed 1947b, Rees 1954, 1955a, 1955b, 1961, Gilbert Thiessen 1937b, Yohe 1965.

Porosity: Machin 1963.

Potassium in: Abernethy 1965.

Power generation: Hoagland 1910.

Preparation: Andros 1914a, 1914b, 1914c, 1914d, 1914e, 1914f, 1915a, 1915b, 1915c, Bement 1929, Boley 1946, 1949, G. H. Cady 1919f, Callen 1930, 1933, Crentz 1949, Fraser 1925, 1942, J. A. Harrison 1956, 1963, Holbrook 1930, Ill. GS 1935d, Leighton 1941b, L. C. McCabe 1934a, 1934b, 1935, 1936a, 1936b, 1937b, 1939a, 1939b, 1942b, Mitchell 1932, 1937, Pierson 1948, Gilbert Thiessen 1936d, G. M. Wilson 1951, Yancey 1929.

Preparation dry: Holbrook 1916.

Production: Anon. 1884a, 1887a, 1906c, 1909, 1933a, Bement 1909, 1929, G. H. Cady 1918a, Eich 1931, Ill. GS 1935d, Ill. State Div. Indus. Planning and Dev. 1959, J. H. Jones 1891, 1892, E. W. Parker 1905, Roepke 1955, Rutledge 1895, Stoek 1910.

Production history: Roepke 1955.

Production map: Bement 1909.

Production potential: G. H. Cady 1943.

Production statistics: (1881-1910) Ill. Bur. Labor Statistics, (1917-1965) Ill. Dept. Mines & Minerals A, 1931, 1955, (1906-1965) Ill. GS annual Illinois Mineral Industry reports, (1911-1916) Ill. State Mining Board, R. C. Taylor 1848.

Productivity: Risser 1962a.

Prolific field in Knox County: Jelliff 1925.

Purchase and sale: Parr 1915a.

Pyrite (see also sulfur in): C. G. Ball 1935a, G. H. Cady 1919f, 1920a, 1922, 1935a, Fraser 1925, Holbrook 1917b, Parr 1925d, Yancey 1921, C. M. Young 1917.

Quality: G. H. Cady 1951a, Ill. GS 1935d.

Radioactivity: Patterson 1954.

Rank (see also unit coal): G. H. Cady 1935b, 1948a, Clegg 1955b, Glass 1954b, L. C. McCabe 1937a, 1937c, Siever 1952.

Reflectance: J. A. Harrison 1961, 1964, 1965, Siever 1957c.

Refractive indices: L. C. McCabe 1937a, Quirke 1938.

Research: Bevan 1951, G. H. Cady 1939b, 1941, 1947a, 1950, 1952c, Callen 1934, Ill. GS 1935d, 1936b, Leighton 1933c, 1934a, 1937f, 1944b, 1944e, Simon 1965.

Research in industry: Ketchum 1930.

Resources (reserves—see also strippable reserves): Anon. 1875, Athy 1928, Averitt 1953, 1961, Bement 1909, 1913, G. H. Cady 1915a, 1916, 1921, 1942a, 1944, 1948b, 1952b, M. R. Campbell 1926, 1929, Clegg 1961, 1965b, Comstock 1887, 1889a, DeWolf 1908b, J. A. Harrison 1951, Ill. State Div. Indus. Planning and Dev. 1959, W. G. Lathrop 1922, Leighton 1944d, 1949b, Norwood 1857, J. N. Payne 1944, Stoek 1910, Jon A. Udden 1909, Wanless 1929a, 1957a, Worthen 1880.

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- Retort coal gas: Dunkley 1918.
 Russell effect: Yohe 1950a.
 Sampling: Lindgren 1908, Parr 1915a, 1916, N. H. Snyder 1942.
 Sandstone cut-outs: G. H. Cady 1938, S. E. Ekblaw 1931, M. E. Hopkins 1958, J. N. Payne 1941, 1944, P. E. Potter 1961a, Siever 1950, Wanless 1957a.
 Sedimentation: Dapples 1949, J. M. Weller 1961.
 Sedimentary structures: Wanless 1952, 1965.
 Shaft sinking: G. S. Rice 1894.
 Shipping coal mines map: G. H. Cady 1947b, Simon 1961.
 Smoke indices: Piersol 1936, 1948.
 Smoke prevention: Bement 1903, 1910c, Curran 1937, W. A. Evans 1910, Fellows 1938, Monnett 1937.
 Smokeless fuel: Bement 1908b, G. H. Cady 1939d, Parr 1920, 1922, Piersol 1936, 1948.
 Sodium in: Abernethy 1965.
 Solvent extraction: Fieldner 1932, Pierron 1959, 1960.
 Specific gravity: Nebel 1916.
 Specific volatile index: Gilbert Thiessen 1937b.
 Splits: G. H. Cady 1938, D. J. Fisher 1925b, P. E. Potter 1961a, Wanless 1952, 1965.
 Spontaneous combustion: J. D. Davis 1925, Katz 1917, Parr 1910b, 1925b, Yohe 1958.
 Spores (see Paleobotany)
 Squeezes in mines: Freer 1892, W. A. White 1956.
 Statistics (see also mining statistics, production statistics): 1924-1965 USBM, 1882-1923 USGS.
 Steam boiler corrosion: Gluskoter 1964.
 Steam boiler tests: Breckenridge 1906.
 Steaming tests: Breckenridge 1907.
 Stoker coal: Helfinstine 1949.
 Stoker combustion (see domestic stoker combustion)
 Storage and spontaneous combustion: Parr 1925b, Yohe 1958.
 Stratigraphy (see Pennsylvanian System and under county)
 Strip mining: Anon. 1939b, G. H. Cady 1930a, Croxton 1928, Shorthouse 1942.
 History: Bottomley 1944.
 Prospecting: G. H. Cady 1930a.
 Reclamation: Anon. 1939b, 1942, Croxton 1928, H. D. Graham 1948, Grandt 1958, Limstrom 1951, Schavilje 1941.
 Strippable reserves: Anon. 1939b, G. H. Cady 1927, 1937c, 1952b, Culver 1925b, L. G. Henbest 1929, Reinertsen 1964, W. H. Smith 1957, 1958, 1961, 1963, Willman 1942b.
 Structure (see also under county): G. H. Cady 1915a, 1916, 1917, 1919a, 1921, 1938, 1939e, 1940b, Culver 1925a, F. H. Kay 1915a, 1915b, Newsam 1893a, 1894, J. N. Payne 1941, 1942, 1944, Reinertsen 1964, W. H. Smith 1961.
 Ultrafine: Machin 1963.
 Subsidence: C. A. Herbert 1927, L. E. Young 1916a, 1916b.
 Sulfate in: Parr 1916.
 Sulfur in (see also pyrite): Abernethy 1960, C. G. Ball 1935b, Bement 1929, G. H. Cady 1919c, 1919d, 1919e, 1919f, 1922, 1935a, 1935b, Holbrook 1917a, L. C. Mc-

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- Sulfur in—cont.
 Cabe 1939b, 1951, Parr 1906b, A. R. Powell 1919, Selvig 1922, Gilbert Thiessen 1934c, 1935, 1937b, Voskuil 1951c, Yancey 1921.
 Sulfur varieties: Gilbert Thiessen 1935.
 Swelling properties: Rees 1954.
 Synthetic liquid fuels: F. H. Reed 1948a.
 Tars, determination of acidic groups: Maher 1959b.
 Technologic trends: Ill. GS 1935b.
 Temperature during formation: Gilbert Thiessen 1936e.
 Testing laboratories: Rees 1937b.
 Thickness: Wanless 1961, W. H. Young 1947.
 Trace elements (see Minor elements)
 Underclay squeezes: W. A. White 1956.
 Underground gasification: Squires 1952.
 Unit coal: C. G. Ball 1935b, E. T. Benson 1935, G. H. Cady 1930d, 1932, 1934, L. C. McCabe 1934a, 1934c, 1935, Parr 1908d, 1909b, 1910a, 1915a, 1916, Gilbert Thiessen 1934a, 1934b, 1934c.
 United States resources: Averitt 1953, 1961, G. O. Smith 1910.
 Uranium in: Huddle 1954.
 Utilization: Bement 1910a, 1910b, Leighton 1941b, L. C. McCabe 1937b, 1938, D. T. Randall 1910, F. H. Reed 1937, Gilbert Thiessen 1936a, Voskuil 1933c.
 Chemical aspects: F. H. Reed 1938.
 Trends: F. H. Reed 1947a.
 Vitricin: Kosanke 1954a, N. C. Schenck 1954.
 Water gas: Dunkley 1919, 1920b, W. W. Odell 1918, 1924.
 Weathering: J. A. Harrison 1956, Jackman 1957, 1959b, 1961, Mitchell 1931, Parr 1907b, 1907c, 1908a, 1908c, 1908e, 1909c, 1925a, 1925b, 1925c, 1925d, 1930b, Rees 1939b, 1961, Gilbert Thiessen 1935, W. F. Wheeler 1908b, Yohe 1958.
 Weight per cubic foot: Flag 1918.
 Wettability: Eissler 1962.
 Wilmington Coal Field: Jasper Johnson 1875.
 X-ray diffraction: Pierron 1959, Siever 1952.
 Coal balls (see Paleobotany)
 Coal fields of Illinois: Lesquereux 1866a, Worthen 1882c.
 Coal fields of U. S.: Hitchcock 1874 (maps), E. W. Parker 1910.
 Coal Measures (see also Pennsylvanian): Bain 1907d, James Hall 1858, Meek 1873, R. P. Stevens 1858a, Stuart Weller 1906b.
 Coastal Plain Section (Physiography): Horberg 1950a, Leighton 1948b.
 Cobden Terrace: St. Clair 1917d.
 Coe Group (Sil.): Lowenstam 1949b.
 Coffeen Limestone Member (Pa.): Kosanke 1960.
 Cohn Coal Member (Pa.): Kosanke 1960, Newton 1937b.
 Cohn Cyclothem (Pa.): Kosanke 1960, Newton 1937b, 1941.
 Cohn Limestone (Pa.): Pryor 1956b.
 Isopach map: Pryor 1956b.
 Structure map: Pryor 1956b.
 Coke
 General: Fieldner 1931, 1932, Glass 1955, J. A. Harrison 1961, 1963, Helfinstine 1949, Isenberg 1945, Jackman 1963a, R. S. McCabe 1919a, 1919b, L. C. McCabe 1938, C. E. Marshall 1961a, 1961b, Ovitz 1917,

Coke—cont.

General—cont.

- Parr 1914, 1922, 1926, F. H. Reed 1944a, 1947b, 1948b, Rees 1943b, Risser 1958, Gilbert Thiessen 1935, 1937a, 1937b, Utzig 1925, Voskuil 1946b, W. B. Warren 1938, Weeks 1896.
- Analyses: Fieldner 1932, J. A. Harrison 1964, Jackman 1955b, 1956a, 1958, C. E. Marshall 1958, Ovitz 1918, F. H. Reed 1945, 1947b, 1955, Gilbert Thiessen 1937b.
- Analytical methods: F. H. Reed 1947b, Gilbert Thiessen 1937b, Yohe 1955.
- Belleville: Weeks 1884.
- Big Muddy: Weeks 1884.
- By-products: F. H. Reed 1947b, Gilbert Thiessen 1937b.
- Carbondale: Weeks 1884.
- Carbonite: Curran 1937.
- Char for metallurgical coke: F. H. Reed 1955.
- Coal blending: F. H. Reed 1952.
- Coals used in: J. A. Harrison 1960, Jackman 1955b, 1956a, 1959a, 1960, 1961, Ovitz 1918.
- Coal sizing effects: Jackman 1955b, 1961.
- Commercial tests: Jackman 1955c.
- Crushing characteristics: Jackman 1964.
- Economics: Jackman 1956a, Risser 1962a, Gilbert Thiessen 1937b, Voskuil 1956c.
- Expansion pressure: Jackman 1958.
- Fine coal use: Jackman 1961.
- High-carbon additives: J. A. Harrison 1960, Jackman 1956b, 1960, C. E. Marshall 1958, 1961a.
- History: Barrett 1922a, F. H. Reed 1947b, Gilbert Thiessen 1937b.
- Inclined gas retorts: Ovitz 1918.
- Laboratory tests: C. E. Marshall 1958, Gilbert Thiessen 1937b.
- Natural: Clegg 1955a.
- Northern Illinois coal: Weeks 1884.
- Oven design: Jackman 1955a, F. H. Reed 1944b, 1945.
- Ovens, comparison: Fieldner 1932.
- Petroleum coke blends: Jackman 1960.
- Pilot oven: Isenberg 1945, Jackman 1958, F. H. Reed 1944a, 1945, 1947b.
- Research: Jackman 1946, 1965b.
- Sizing tests: Jackman 1955c.
- Slot-type oven (experimental): F. H. Reed 1945.
- Sole-heated oven (experimental): F. H. Reed 1944b.
- Statistics: USGS 1882-1923, USBM 1924-1965.
- Sulfur in: Gilbert Thiessen 1935, 1937b.
- Tests: J. A. Harrison 1960, J. A. Holmes 1908, Jackman 1955b, 1955c, 1956a, 1956b, 1957, 1958, 1959a, 1959b, 1960, 1961, 1964, C. E. Marshall 1958, E. W. Parker 1906a, F. H. Reed 1944b, 1945, 1947b, Gilbert Thiessen 1937b.
- Thermal pretreatment: F. W. Smith 1958.
- Colbert Cyclothem (Pa.): Kosanke 1960, Wanless 1956.
- Colchester (No. 2) Coal Member (Pa.): Andros 1914a, 1915a, Athy 1928, Bement 1914, G. H. Cady 1915a, 1916, 1917, 1920b, 1921, 1937c, 1942a, 1955, Clegg 1959, 1961, 1965a, Coryell 1919, Culver 1925a, 1925b, Currier 1922, Ede 1900, S. E. Ekblaw 1931, J. A. Harrison 1951, Hinds 1914, 1917, Inman 1960, Jasper Johnson 1875, F. H. Kay 1915a, Kosanke 1950, 1960, Wallace Lee 1917, McFadden 1962, Mors 1915, Nebel 1919, Parham 1959a, B. C. Parks 1956, P. E. Potter 1956a, Reinertsen 1964, Savage 1921a, W. H. Smith 1961, 1963, Wanless 1929a, 1932b, 1939, 1952, 1955a, 1955b, 1957a, 1961, 1965, J. M. Weller 1939b, Wier 1961, Winslow 1959, Worthen 1868(2), 1882c, L. E. Young 1916b.
- Beryllium in: Stadnichenko 1961.
- Isopach map: Wanless 1955b.
- Map of basin: Wanless 1961.
- Paleobotany: Jongmans 1937a.
- Structure map: G. H. Cady 1915a, 1917, 1920b, 1921, Clegg 1959, 1965b, Coryell 1919, Currier 1922, Hinds 1914, 1917, Morse 1915, Moulton 1925a, 1925d, 1929d, Nebel 1919, Reinertsen 1964, Savage 1916b, 1921a, W. H. Smith 1961, Wanless 1929a, 1957a.
- Underclay, facies map: Parham 1963c.
- Colchester Quadrangle: Hinds 1914, 1917, 1919.
- Coles County**
- Bedrock topography: John Webster Foster 1951b, Horberg 1950a, Selkregg 1958.
- Brines: Meents 1952.
- Clay and shale: Smoot 1960a.
- Coal
- Mining and production: Annual coal reports.
- Reserves: G. H. Cady 1952b, Clegg 1959.
- Drill records: Ross Hanson 1950, 1961, Leverett 1899a, Mylius 1927, Warthin 1944, Worthen 1883(1), 1890(2).
- Geologic sections (described outcrops)
- Charleston City Farm (Pleis.): Horberg 1953.
- Hurricane Creek (Pleis.): J. R. Ball 1952, MacClintock 1929.
- Geophysical studies: R. B. Johnson 1954, P. S. McClure 1935.
- Giant beaver: F. C. Baker 1930b, Leidy 1867.
- Ground water
- General: John Webster Foster 1951b, 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958, Walton 1960b, Workman 1930.
- Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.
- Limestone and dolomite
- General: Krey 1925, J. E. Lamar 1934.
- Agricultural limestone: Van Horn 1907.
- Cement materials: Bleininger 1912.
- Trace elements: Ostrom 1957c.
- Loess: Fehrenbacher 1965b.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: John Webster Foster 1951b, Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Horberg 1953, Newton 1937b, Wier 1961.
- Glacial: State geol. map, Frye 1965c, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Workman 1956.
- Structure: A. H. Bell 1943c, 1961c, Clegg 1959, Meents 1965a, Mylius 1927, E. F. Taylor 1944b, Whiting 1959.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Coles County—cont.

Oil and gas

General: Bain 1906a, F. H. Kay 1917a.
Development maps: Ill. GS 1965 maps 72,
73, 76, 77.

Gas in drift: Meents 1960.

Physical properties: Armon 1964.

Pools

Ashmore: Meents 1965a.

Cooks Mills: A. H. Bell 1958b,
1962b, Whiting 1959.

Mattoon: Anon. 1946, Kniseley 1946,
Simmons 1957.

Parker: Mylius 1927.

Westfield: Mylius 1927.

Possibilities: W. S. Blatchley 1906, De-
Wolf 1920e, Mylius 1923.

Prospecting: Ill. GS 1919a, 1919b, 1920b,
Mylius 1920a.

Secondary recovery: Pryor 1957, Simmons
1957.

Underground gas storage: A. H. Bell
1961c, 1962b.

Ridge Lake sediment: Stall 1951b.

Sandstone: J. C. Bradbury 1962a, P. E. Pot-
ter 1962a, 1962c.

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Stratigraphy

General: W. S. Blatchley 1906, Bleininger
1912, Meents 1965a, Mylius 1927, Sel-
kregg 1958.

Precambrian: A. H. Bell 1964.

Cambrian: A. H. Bell 1964, Workman
1950b.

Ordovician: A. H. Bell 1964, Mylius 1927,
Workman 1950b.

Silurian: Lowenstam 1949b.

Devonian: Schwalb 1955, Warthin 1944,
Workman 1944.

Mississippian: Mylius 1927, Swann, 1958,
1963, Whiting 1959, Workman 1956.

Pennsylvanian: J. C. Bradbury 1962a,
Clegg 1959, 1965a, Mylius 1927, Newton
1937b, E. F. Taylor 1944b, Worthen
1883(1).

Pleistocene: John Webster Foster 1951b,
Frye 1965c, Galbreath 1947, Horberg 1953,
R. B. Johnson 1954, Leighton 1961, Lever-
ett 1898b, 1899a, MacClintock 1929.

Recent: Stall 1951b.

Structural materials: Jon A. Udden 1910b.

Structure: Clegg 1965a, Mylius 1927.

Uranium: Ostrom 1955.

Worthen Survey report (v. 6): Worthen
1875a(2).

Collinsville Cyclothem (Pa.): Newton 1937b.

Collinsville Limestone (Pa.): Siever 1957a, Wan-
less 1939, Worthen 1873(1).

Collinsville Pool: A. H. Bell 1939f.

Colmar Anticline: Hinds 1919.

Colmar Pool: R. H. Howard 1961, F. H. Kay
1917a, Morse 1915.

Colmar-Plymouth Pool: A. H. Bell 1939f, Flood
1934, 1938, Hinds 1919, Piersol 1940.

Columbia Formation (Pleis.): Hershey 1895a.

Columbia Syncline: J. M. Weller 1939e, Stuart
Weller 1939b.

Columbian Exposition

Glacial drift: Anon. 1894c.

Paleontology: Anon. 1894a.

Soils exhibition: Anon. 1894b.

Combs Pool: Root 1928.

Conant Dome: A. H. Bell 1940b.

Conant Limestone Member (Pa.) (see Jamestown
Ls.): Kosanke 1960.

Conasauga Shale (Camb.): Calvert 1963.

Concretions: J. B. Hayes 1964, Trowbridge 1916,
Wanless 1929a, 1957a, Willman 1942b.

Cone-in-cone: Broadhead 1907, Cady 1919b, Wan-
less 1929a, 1957a, Willman 1942b.

Conservation (see Mineral economics and Mineral
resources)

Continental glaciation and sea level: Frye 1961a.

Cook County

Bedrock topography: W. C. Alden 1902,
Bretz 1939, 1955, Goldthwait 1909, Hor-
berg 1950a, Peattie 1914, Suter 1959.

Bibliography: Turley 1961.

Building stone: Conover 1884.

Chicago Avenue tunnel: D. O. Taylor 1930.

Chicago drainage channel: Lewis 1898.

Clay and shale: J. E. Lamar 1934, Otto 1965.

Bonding clay: Grogan 1945.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

DesPlaines Disturbance: Emrich 1962.

Drainage: Goldthwait 1909.

Drill records: W. C. Alden 1902, C. B. An-
derson 1914, 1919, Bretz 1939, Buschbach
1964, M. L. Fuller 1906, Ross Hanson
1950, 1958, 1961, J. E. Lamar 1934, Lever-
ett 1899a, Prickett 1964, Leander Stone
1886, Suehrstedt 1929, Thwaites 1927,
Johan A. Udden 1914, Walton 1965, C. B.
Williams 1915.

Earthquakes: M. L. Fuller 1912, Shaler 1869.

Engineering geology: Peck 1954, Suehrstedt
1929.

Environmental geology: Larsen 1965a.

Faults: Emrich 1962, Goldthwait 1909.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Geologic sections (described outcrops)

Bellewood Quarry, Hillside (Sil.): Savage
1926, Willman 1950.

Chicago Avenue Tunnel (Sil.): D. O.
Taylor 1930.

Crawford Avenue Bridge (Sil.): J. E.
Lamar 1934.

Evanston (Pleis.): W. C. Alden 1902.

LaGrange Quarry (Sil.): Willman 1950.

Lemont (Sil.): J. E. Lamar 1934.

North Shore Channel (Pleis.): Bretz
1955.

Oak Park Spit (Pleis.): W. C. Alden
1902.

Superior Stone Co. Quarry (Sil.): Savage
1926, Willman 1950.

Thornton Quarry (Sil.): Ingels 1963, J. E.
Lamar 1934, Lowenstam 1956, Savage
1926, Willman 1950, 1962.

Geophysical studies: Beck 1965.

Glacial channels: Guthrie 1890.

Great Lakes history: Newberry 1870b, J. W.
Spencer 1887.

Ground water

General: W. C. Alden 1902, C. B. An-
derson 1914, 1915b, 1919, Atwood 1908,
Bergstrom 1955, 1962, Bretz 1955, Bruin
1964, Buswell 1943, Gerber 1937a, Ross
Hanson 1945, Horberg 1950a, T. E. Lar-
son 1964, Leverett 1899a, Lohr 1953, Pin-

Cook County—cont.

Ground water—cont.

General—cont.

cus 1962, Prickett 1964, Suter 1959, Thwaites 1927, Walton 1960a, 1964b, 1964c, 1965, H. J. Weiland 1916, C. B. Williams 1915, Workman 1930.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Artesian waters: C. B. Anderson 1919, Atwood 1908, Leander Stone 1886.

Future water-level declines: Walton 1964b.

Lake Michigan beach: Krumbein 1950, 1953b, 1959, D. E. Willard 1893.

Limestone and dolomite

General: W. C. Alden 1902, W. C. Day 1899, Krey 1925, J. E. Lamar 1934, Willman 1943b.

Building stone: W. C. Alden 1903.

Cement materials: Burchard 1907.

High-purity dolomite: Willman 1943b.

Mineralogy and petrology: Grim 1937a.

Resistance to weathering: Willman 1941b, 1944.

Resources: Ostrom 1956, Willman 1943b.

Loess: Frye 1962e, Wascher 1960.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Bretz 1955, Horberg 1943b, 1950a, Suter 1959.

Drift thickness: State geol. map.

Geologic: State geol. map, W. C. Alden 1902, Bannister 1868, Bretz 1939, 1943, 1955, Emrich 1962, D. J. Fisher 1925a, Horberg 1953, Suter 1959, Trowbridge 1912.

Glacial: State geol. map, Bretz 1943, G. E. Ekblaw 1941, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a, Suter 1959.

Mineral industries: Ill. GS 1961.

Paleogeologic: Buschbach 1964.

Structure: Athy 1928, Beck 1965, Buschbach 1964, Emrich 1962, Suter 1959, Thwaites 1927.

Mastodon: N. C. Anderson 1905, Penhallow 1891.

Mineral collecting: Turley 1959.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Mineralogy: Crook 1902, Turley 1960.

Oil and gas

Oil-bearing limestone: Bretz 1939, Hunt 1871, USBM 1965.

Oil well boring: Shufeldt 1865.

Underground gas storage: Schwalm 1961.

Peat: Bretz 1939, 1955, G. F. Wright 1918.

Physiography: Atwood 1908, Bretz 1955, Leighton 1948b, Rudd 1956, Salisbury 1899, C. U. Shepard 1838.

Quadrangle studies

Arlington Heights: Bretz 1943, 1955.

Berwyn: Bretz 1943, 1955.

Blue Island: Bretz 1943, 1955.

Brisbane: Bretz 1943, 1955.

Calumet: W. C. Alden 1902.

Calumet City: Bretz 1943, 1955.

Calumet Lake: Bretz 1943, 1955.

Chicago: W. C. Alden 1902.

Chicago Loop: Bretz 1943, 1955.

DesPlaines: W. C. Alden 1902.

Dyer: Bretz 1943, 1955.

Cook County—cont.

Quadrangle studies—cont.

Elmhurst: Bretz 1943, 1955.

Englewood: Bretz 1943, 1955.

Evanston: Bretz 1943, 1955.

Frankfort: Bretz 1943, 1955.

Harvey: Bretz 1943, 1955.

Highland Park: Bretz 1943, 1955.

Hinsdale: Bretz 1943, 1955.

Jackson Park: Bretz 1943, 1955.

Joliet: D. J. Fisher 1925a.

Mokena: Bretz 1943, 1955.

Palos Park: Bretz 1943, 1955.

Park Ridge: Bretz 1943, 1955.

River Forest: Bretz 1943, 1955.

Riverside: W. C. Alden 1902.

Sag Bridge: Bretz 1943, 1955.

Steger: Bretz 1943, 1955.

Tinley Park: Bretz 1943, 1955.

Wheaton: Trowbridge 1912.

Wheeling: Bretz 1943, 1955.

Radiocarbon dates: J. R. Arnold 1951, Horberg 1955a, Libby 1952a, 1952b, 1954a, 1954b, Rubin 1955, 1958, 1960.

Refuse disposal: Sheaffer 1963.

Sand and gravel

General: W. C. Alden 1902, J. E. Lamar 1934.

Mineralogy: R. E. Hunter 1965, Pettijohn 1931, Willman 1942a.

Molding sand: Littlefield 1925a, 1925b, Willman 1939b.

Resources: G. E. Ekblaw 1962b, 1964.

Sand dunes: Atwood 1908.

Sandstone and dolomite: W. C. Day 1895.

Sanitary and ship channel: Lewis 1898.

Spores in till: G. M. Dawson 1885, H. A. Johnson 1884.

Springs: Peale 1886.

Stony Island reef: Downing 1924.

Stratigraphy

General: W. C. Alden 1902, C. B. Anderson 1914, 1919, E. B. Bastin 1890, Bretz 1933, Downing 1924, Emrich 1962, J. W. Goldthwait 1909, Nichols 1925, W. E. Powers 1946, C. U. Shepard 1838, Leander Stone 1886, Suter 1959, Thwaites 1923, 1927.

Cambrian: Buschbach 1964, Cohee 1945b.

Ordovician: Buschbach 1964, Cohee 1945a, 1945b, Gutstadt 1958b, Workman 1950a.

Silurian: J. R. Ball 1929b, Bretz 1939, Dunn 1942, C. L. Fenton 1931, Foerste 1925, 1926, Ingels 1963, Krinsley 1960, Lowenstam 1942, 1948a, 1949b, 1956, Ostrom 1956, Roy 1931, Savage 1926, Slocum 1907, D. O. Taylor 1930, Terzaghi 1940, Stuart Weller 1900b, 1907c, Willman 1943b, 1950, A. N. Winchell 1866.

Devonian: W. C. Alden 1902, Stuart Weller 1899.

Mississippian: W. W. Davis 1917, Emrich 1962, Stuart Weller 1926b.

Pennsylvanian: Emrich 1962.

Pleistocene: Edmund Andrews 1870, Anon. 1894c, Atwood 1908, F. C. Baker 1910, 1930d, J. R. Ball 1929a, 1942a, Bretz 1939, 1955, Chamberlin 1878, 1882b, Downing 1924, G. E. Ekblaw 1931b, R. F. Flint 1956, Frye 1965b, 1965c, Fryxell 1927, J. W. Goldthwait 1906, 1908, 1909, Guthrie

Cook County—cont.

Stratigraphy—cont.

Pleistocene—cont.

1890, P. W. Harrison 1957, Horberg 1953, 1955b, Hough 1958, H. A. Johnson 1884, Krumbein 1933b, Leighton 1953, Leverett 1889a, 1897, 1899a, Lewis 1898, Staplin 1963b, Suter 1959, Wascher 1938, Willman 1963, Woodward 1895, Zumberge 1960.

Recent: Atwood 1908, Stall 1959.

Structural materials: Jon A. Udden 1910b.

Structure: Buschbach 1964, Cohee 1945a, Emrich 1962, Suter 1959, Thwaites 1927.

Topographic mapping: W. D. Jones 1941.

Worthen Survey report (v. 3): Bannister 1868.

Cooks Mills Anticline: Clegg 1959.

Cooks Mills Fault: S. K. Clark 1948.

Cooks Mills gas storage area: A. H. Bell 1961c, 1962b, Whiting 1959.

Cooks Mills Pool: A. H. Bell 1958b, Whiting 1959.

Cooper Limestone Member (Dev.): Meents 1965b.

Copper in drift (see also counties): F. H. Bradley 1870, Crook 1929, Knappen 1926, Salisbury 1886.

Copper Ridge Dolomite (Camb.): Calvert 1963.

Copperas Creek Sandstone Member (Pa.): Kosanke 1960, MacClintock 1959, Savage 1927, Wanless 1939, 1957a, Willman 1942b.

Cora Limestone Member (Miss.): Swann 1963.

Cordes Pool: A. H. Bell 1940b.

Core drilling (see Drill records under county)

Corniferous Group (Dev.): Meek 1868a.

Corrosion, oil field: J. E. Lamar 1928a.

Cottage Grove Fault Zone: A. H. Bell 1949d, G. H. Cady 1919a, 1938, 1939e, S. K. Clark 1948, L. G. Henbest 1929, Heyl 1961, 1965, Wanless 1955b.

Cotter Dolomite (Ord.): Rubey 1952.

Coulterville Dome: A. H. Bell 1940b.

Court Creek Dome: Poor 1927.

Covel Conglomerate Member (Pa.): Kosanke 1960, Siever 1957a, Wanless 1939, 1955b, 1956, 1957a, Willman 1939a, 1942b.

Covel Creek Esker: Leverett 1899a, Willman 1942b.

Coxville Sandstone Member (Pa.): P. E. Potter 1963a.

Crab Orchard Limestone (Pa.): C. L. Cooper 1946.

Crab Orchard Cyclothem (Pa.) (see Briar Hill Cyc.): Kosanke 1960, J. M. Weller 1942c.

Cramer Limestone Member (Pa.) (see Trivoli Ls.): Kosanke 1960.

Crane Member (Camb.): Templeton 1950.

Crawford County

Bedrock topography: Fidlal 1943, Horberg 1950a.

Brines: Meents 1952.

Clay and shale: J. E. Lamar 1934.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: W. A. White 1960b.

Petroleum mud fluids: J. E. Lamar 1931c.

Coal

Analyses: G. H. Cady 1944.

Mined-out areas: Ill. GS 1959b map 24.

Mining and production: Annual coal reports.

Crawford County—cont.

Coal—cont.

Reserves: G. H. Cady 1944, 1952b, P. E. Potter 1956c.

Drill records: R. S. Blatchley 1913a, W. S. Blatchley 1906, M. L. Fuller 1906, Ross Hanson 1950, 1958, 1961, Mylius 1927, Rich 1916a, Tough 1919, Johan A. Udden 1914.

Feldspar: Hunter 1965, Willman 1942a.

Geologic sections (described outcrops)

Flat Rock (Pleis.): Willman 1963.

Geophysical studies: Buhle 1953, J. R. Henderson 1951b, Pryor 1956c.

Ground water

General: Buhle 1953, Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961.

Limestone and dolomite: Krey 1925.

Loess: Fehrenbacher 1965b, Frye 1962e.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Newton 1937b, Wier 1961.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: P. E. Potter 1956c, Workman 1956.

Structure: A. H. Bell 1943c, G. H. Cady 1920b, Mylius 1927, P. E. Potter 1956c, Shrock 1929, Squires 1943e, Tough 1919.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Bain 1906a, 1909b, R. S. Blatchley 1909, 1912e, 1912f, 1913a, F. H. Kay 1916b, 1917a, Mylius 1923, 1927.

Analyses: Bain 1908g.

Corrosion: J. E. Lamar 1928a.

Development maps: Ill. GS 1965 maps 55, 56, 57.

Mud-fluid materials: J. E. Lamar 1931c.

Natural gas: A. H. Bell 1935a, Rich 1916a.

Occurrence in Pennsylvanian beds: Hance 1925.

Oil field farm map: Ill. GS 1929, 1934b.

Oil sand: Mylius 1923.

Physical properties: Armon 1964.

Pools

Allison: Rich 1916a.

Bellair: J. E. Lamar 1928a, Mylius 1923, 1927, Squires 1950b.

Birds: J. E. Lamar 1928a, Rich 1916a.

Canaan Gas: Rich 1916a.

Chapman: Rich 1916a.

Flat Rock: J. E. Lamar 1928a, Rich 1916a, Squires 1943e, Tough 1919.

Heathsville: Rich 1916a.

Kraft: Squires 1946.

Main: Squires 1950b.

New Hebron: Rich 1916a.

Parker: J. E. Lamar 1928a, Rich 1916a, Squires 1943e.

Robinson: Squires 1946.

Swearingen: Rich 1916a.

Weger: Rich 1916a.

Crawford County—cont.

Oil and gas—cont.

- Possibilities: W. S. Blatchley 1906.
 Repressuring operations: A. H. Bell 1932d.
 Sand properties: Piersol 1940.
 Secondary recovery: Pryor 1957, Squires 1943e, 1948b.
 Water control: Tough 1919.
 Waterflooding: L. C. Powell 1954, Squires 1935, 1943b, 1944a, 1946, 1949b, 1950a, 1950b, 1950d.
 Well data: R. S. Blatchley 1913a.
 Physiography: Leighton 1948b, MacClintock 1929, Rich 1916a.
 Quadrangle studies, Birds: Rich 1916a.
 Sand and gravel
 Mineralogy: R. E. Hunter 1965, Willman 1942a.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962c.

Stratigraphy

- General: R. S. Blatchley 1912e, 1913a, W. S. Blatchley 1906, Mylius 1923, 1927, Selkregg 1957.
 Ordovician: Mylius 1927.
 Silurian: Lowenstam 1949b.
 Devonian: Schwab 1955.
 Mississippian: Mylius 1927, Rich 1916a, Swann 1958, Workman 1956.
 Pennsylvanian: Andresen 1961, R. S. Blatchley 1913a, J. C. Bradbury 1962a, G. H. Cady 1944, Mylius 1927, Newton 1937b, K. A. Payne 1937, P. E. Potter 1956c, Rich 1916a, Shrock 1929, Tough 1919.
 Pleistocene: Fidlar 1948, Willman 1963.
 Structure: A. H. Bell 1964, R. S. Blatchley 1912e, 1913a, G. H. Cady 1920b, Mylius 1927, P. E. Potter 1956c.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 6): Worthen 1875a(2).

Crawford-Martin Syncline: Mullens 1964.

Crawford Pool: Piersol 1940.

Creal Springs Limestone Member (Pa.): Kosanke 1960.

Creek Sequence (Ord.): H. E. Wheeler 1963.

Crescent City Dome: A. H. Bell 1961c.

Crescent City gas storage area: A. H. Bell 1962b.

Cretaceous System

Accepted nomenclature (see named units)

Gulfian Series (South)

Embayment Megagroup

Owl Creek Fm.

McNairy Fm.

Levings M.

Tuscaloosa Gravel

Little Bear Soil

Gulfian Series (West)

Baylis Fm.

Kiser Creek M.

Hadley Gravel M.

- General: State geol. map, Boswell 1965, Cushing 1964, Frye 1964a, J. E. Lamar 1930b, 1948, 1959, Marcher 1962, Parmelee 1921, Pryor 1960, 1961a, 1962a, 1962b, Ross 1963, 1964b, Shrode 1954a, Stearns 1962, L. W. Stephenson 1914, 1942, J. M. Weller 1940a, Woodward 1895.

Cretaceous System—cont.

- Clays: O'Brien 1964a, Purdy 1907.
 Heavy minerals: J. E. Lamar 1937b.
 Isopach map: Boswell 1965, Ross 1963.
 Microfossils in till: Woodward 1895.
 Paleogeographic map: Schuchert 1923.
 Structure map: Cushing 1964, Ross 1963.

Croixan Series, St. Croixan (Camb.): Buschbach 1964, Doyle 1965, Knappen 1926, Wanless 1929a.

Isopach map: Sloss 1960.

Lithofacies map: Sloss 1960.

Crooked Creek Bedrock Valley: Horberg 1950a.

Crooked Creek Watershed: Pickels 1929.

Cropsey Moraine: John Webster Foster 1956, Frye 1965b, Leighton 1953, Willman 1942b.

Cross sections

(See also State geol. map; sections within one county generally not listed)

Alton to Mt. Carmel: J. M. Weller 1945a.

Around Michigan Basin: Cohee 1945b.

Boone Co. to Will Co.: Folk 1944.

Brown Co. to McDonough Co.: Reinertsen 1964.

Bureau Co. to Tazewell Co.: W. H. Smith 1963.

Bureau Co. to Union Co.: Frye 1962e.

Bureau Co. to Will Co.: J. N. Payne 1939a.

Cache River Valley at Ullin: Fisk 1944.

Cairo to DuQuoin: John Wells Foster 1856.

Calhoun Co. to Jasper Co.: Workman 1956.

Calhoun Co. to Warren Co.: Reinertsen 1964.

Central Illinois: Whiting 1958.

Clark Co. to Edgar Co.: Clegg 1965b.

Clark Co. to Lawrence Co.: Newton 1937b, Johan A. Udden 1914.

Clay Co. to Richland Co.: J. N. Payne 1940.

Cleveland, Ohio, to Mississippi River: James Hall 1843b.

Clinton Co. to Christian Co.: P. E. Potter 1961a.

Clinton Co. to Wayne Co.: Sims 1944.

Clinton, Ia., to Chicago: Thwaites 1927.

Coles Co. to Edgar Co.: Clegg 1965b.

Cook Co., Ill., to Wayne Co., Mich.: Cohee 1948b.

Cook Co. to Pulaski Co.: DuBois 1945.

Crawford Co. to Lawrence Co.: P. E. Potter 1956c.

Crawford Co. to Vermillion Co., Ind.: Mylius 1927.

Douglas Co. to Vermillion Co., Ind.: Mylius 1927.

Dunleith (E. Dubuque) to Cairo: Worthen 1866a(1).

East St. Louis to Thebes: J. M. Weller 1939e.

Eastern Interior Basin: Swann 1951b.

Effingham Co. to Johnson Co.: Siever 1953.

Fayette Co. to Franklin Co.: Andresen 1961.

Fayette Co., Ill., to Wood Co., W. Va.: Calvert 1963.

Fayette Co. to Williamson Co.: Siever 1957b.

Ford Co. to Shelby Co.: Horberg 1953.

Fulton Co. to Henry Co.: W. H. Smith 1963.

Hamilton Co. to White Co.: P. E. Potter 1962c.

Hancock Co. to Clark Co.: Workman 1956.

Hancock Co. to Pike Co.: Horberg 1956b.

Hardin Co. to Champaign Co.: Workman 1956.

Cross sections—cont.

- Henderson Co. to Jersey Co.: Whiting 1965b.
 Henry Co. to Kendall Co.: Horberg 1953.
 Illinois Basin: P. L. Dana 1941.
 Iroquois Co. to Clark Co.: Horberg 1953.
 Jackson Co. to Gallatin Co.: G. H. Cady 1919a.
 Jasper Co. to Clark Co.: Newton 1937b.
 Jasper Co. to Cumberland Co.: Newton 1937b.
 Jefferson Co. to White Co.: Andresen 1961, Swann 1948.
 Jersey Co. to DeKalb Co.: Workman 1948.
 Jersey Co. to Kankakee Co.: Workman 1948.
 Jersey Co. to Macoupin Co.: J. N. Payne 1944.
 Knox Co. to Adams Co.: Wanless 1931a.
 Knox Co. to Cook Co.: Johan A. Udden 1914.
 Knox Co. to Peoria Co.: W. H. Smith 1963.
 LaSalle coal field: John Wells Foster 1856.
 Lawrence Co. to Coles Co.: Mylius 1927.
 Lee Co. to Logan Co.: Horberg 1953.
 Logan Co. to Livingston Co.: Horberg 1953.
 McHenry Co. to Kane Co.: Horberg 1953.
 McHenry Co. to Kankakee Co.: Buschbach 1964.
 McLean Co. to Shelby Co.: Horberg 1953.
 Macon Co. to Edgar Co.: Horberg 1953.
 Madison Co. to Cass Co.: W. H. Smith 1961.
 Madison Co. to Jackson Co.: W. H. Smith 1958.
 Madison Co. to Mercer Co.: Lines 1917.
 Madison Co. to Wayne Co.: Lowenstam 1949b.
 Marion Co. to Lawrence Co.: J. M. Weller 1936c.
 Marshall Co. to Montgomery Co.: Whiting 1965b.
 Massac Co. to Woodford Co.: Workman 1956.
 Mercer Co. to Adams Co.: Wanless 1931a.
 Minnesota to Arkansas: Grabau 1937.
 Mississippi River Valley between St. Louis and Commerce, Mo.: Fisk 1944.
 Monroe County and East: J. M. Weller 1945a.
 Monroe Co. through Carlyle Oil Field: E. W. Shaw 1910.
 Morgan Co. to Clinton Co.: R. S. Blatchley 1914a.
 Morgan Co. to Macoupin Co.: J. N. Payne 1944.
 Northeastern Illinois to Western Ontario: Cohee 1945a, 1945b.
 Northern Illinois: Johan A. Udden 1895.
 Ogle Co. to DuPage Co.: Horberg 1953.
 Ohio River Valley above Mound City: Fisk 1944.
 Peoria Co. to Livingston Co.: Horberg 1953.
 Perry Co. to Franklin Co.: Siever 1951a.
 Pike Co. to DeWitt Co.: Whiting 1965b.
 Pope Co. to DeWitt Co.: Workman 1940.
 Pope Co. to White Co.: Swann 1948.
 Pulaski Co. to Hancock Co.: Workman 1956.
 Randolph Co. to Crawford Co.: J. N. Payne 1940.
 Richland Co. to Lawrence Co.: J. N. Payne 1939a.
 Rock Island Co. to Warren Co.: Horberg 1956b.
 Rock Island to Momence: J. M. Weller 1945a.

Cross sections—cont.

- St. Clair Co. to Clark Co.: A. H. Bell 1938e.
 St. Clair Co. to Madison Co.: Bergstrom 1956b.
 St. Clair Co. to Lawrence Co.: DuBois 1945, Workman 1940, 1956.
 St. Louis to Shawneetown: Nickles 1895a.
 Schuyler Co. to Perry Co.: Johan A. Udden 1914.
 Thebes gap, north end: Fisk 1944.
 Thebes gap, south end: Fisk 1944.
 Thebes to East St. Louis: J. M. Weller 1939e.
 Third Principal Meridian: J. M. Weller 1945a.
 Union Co. to Hardin Co.: Workman 1956.
 Union Co. to Hardin Co. and Crittenden Co., Ky.: Tippie 1945.
 Valmeyer to Lawrenceville: R. S. Blatchley 1913a.
 Ware to Buncombe: J. M. Weller 1939e.
 Warsaw and East: J. M. Weller 1945a.
 Waterloo, Sparta, Murphysboro, and Olmstead: Nickles 1895b.
 Wayne Co. to Richland Co.: Andresen 1961.
 Whiteside Co. to White Co.: Frye 1962e.
 Will Co. to Bureau Co.: G. H. Cady 1915a.
 Williamson Co. to Gallatin Co.: W. H. Smith 1957.
 Williamson Co. to Saline Co.: G. H. Cady 1925.
 Winnebago Co. to Kankakee Co.: Templeton 1950.
 Cross-bedding (see also sedimentary structures):
 Andresen 1961, J. E. Lamar 1927d, Mast 1963, P. E. Potter 1955b, 1955d, 1956a, 1958a, 1958b, 1962a, 1963a, 1963c, 1965, Pryor 1960.
 Variance components: J. S. Olson 1954, P. E. Potter 1954.
 Crossville underground liquid petroleum storage:
 A. H. Bell 1956d.
 Crow's Mill Limestone (Pa.): G. H. Cady 1921, E. W. Shaw 1913.
 Cryder Lake Beach: Culver 1922a, Willman 1942b.
 Cryolite, synthetic: Finger 1937b.
 Crypto-volcanic structures: J. S. Brown 1954.
 Cryptoexplosion structure: Buschbach 1963, Emrich 1962.
 Crystal chemistry, silicates: W. F. Bradley 1959a, Serratos 1958a, 1958b.
 Crystal City Quadrangle: Stuart Weller 1939b.
 Crystal Lake elephants: C. R. Smith 1960.
 Cuba City Quadrangle: Mullens 1964.
 Cuba Sandstone (Pa.) (see Vermilionville Ss.): G. H. Cady 1921, Kosanke 1960, Savage 1927, Siever 1959, Wanless 1939, 1955a, 1955b, 1957a.
 Cuivre Terrace: Robertson 1938.
Cumberland County
 Bedrock topography: Horberg 1950a.
 Brines: Meents 1952.
 Clay and shale
 Bonding clay: Grogan 1945.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: W. A. White 1960b.
 Petroleum mud fluids: J. E. Lamar 1931c.
 Coal: G. H. Cady 1944, 1952b, Clegg 1959.
 Drill records: Ross Hanson 1950, J. E. Lamar 1928f, Mylius 1927.

Cumberland County—cont.

- Geologic sections (described outcrops)
 State Highway 131 (Pa.): Kosanke 1960.
 Toledo (Pleis.): MacClintock 1929.
 Webster Creek (Pa.): Kosanke 1960.
- Geophysical studies: Buhle 1953.
- Ground water
 General: Buhle 1953, Horberg 1950a, Leverett 1899a, Selkregg 1957.
 Analyses: Ross Hanson 1950, 1961, A. W. Palmer 1897.
- Limestone and dolomite: Grogan 1940, Krey 1925.
- Loess: Fehrenbacher 1965b, Frye 1962e.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Newton 1937b.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: A. H. Bell 1943c, Clegg 1959, Mylius 1927, E. F. Taylor 1944b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Neoga area guide leaflet: Ill. GS 1962-E.
- Oil and gas
 General: Bain 1906a, F. H. Kay 1917a, Mylius 1923, 1927.
 Analyses: Bain 1908g.
 Development maps: Ill. GS 1965, maps 58, 59, 72, 73.
 Mud-fluid materials: J. E. Lamar 1931c.
 Physical properties: Armon 1964.
- Pools
 Siggins: Mylius 1923, 1927, Phillippi 1955, Squires 1946, 1950b, 1950d.
 Union Township: Mylius 1927.
 Vevay Park: Mylius 1923, 1927.
 York: Mylius 1923, 1927.
- Possibilities: W. S. Blatchley 1906.
- Waterflooding: Pryor 1957, Squires 1946, 1950a, 1950b.
- Physiography: Leighton 1948b, MacClintock 1929.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962a, 1962c.
- Soil report 69
- Stratigraphy
 General: W. S. Blatchley 1906, Mylius 1923, 1927, Selkregg 1957.
 Ordovician: Mylius 1927, Workman 1950b.
 Silurian: Lowenstam 1949b.
 Devonian: Schwalb 1955.
 Mississippian: Mylius 1927, Swann 1958.
 Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1939c, Clegg 1959, 1965a, Kosanke 1960, Mylius 1927, Newton 1937b, J. M. Weller 1942c.
 Pleistocene: Frye 1965c, Leverett 1898b, MacClintock 1929, Willman 1963.
 Structure: Clegg 1965a, Mylius 1927.
 Worthen Survey report (v. 6): Worthen 1875a(2).
- Curlw Coal (Pa.) (see O'Nan Coal): Kosanke 1960, Wanless 1939.
- Curlw Limestone Member (Pa.): Butts 1925, Kosanke 1960, P. E. Potter 1956c, Siever 1957a, Wanless 1939, 1955b, J. M. Weller 1940a, 1942c.
- Curlw Sandstone (Pa.) (see Granger Ss.): G. H. Cady 1926, Kosanke 1960, Siever 1959, Wanless 1939, J. M. Weller 1940a.
- Cutler Coal (Pa.) (see Danville (No. 7) Coal): A. H. Bell 1931a, Kosanke 1950, 1960, W. H. Smith 1957, 1958, Rolley 1951, Wanless 1939.
- Cutler Cyclothem (Pa.): Glass 1958, Kosanke 1960.
- Cutler Limestone (Pa.) (see Piasa Ls.): A. H. Bell 1931a, G. H. Cady 1939c, Kosanke 1960, Rolley 1951, Siever 1957a, Wanless 1939, 1956.
- Cutler Rider Coals (see First, Second, and Third Cutler Rider Coals)
- Cutler Sandstone (Pa.): Kosanke 1960, Siever 1956a.
- Cyclical sedimentation: Dapples 1949, Kosanke 1960, Savage 1930b, Swann 1963, 1964, Johan A. Udden 1912b, Wanless 1931a, 1931b, 1932a, 1938, 1947b, 1950, 1955b, 1957a, 1963a, J. M. Weller 1930a, 1931c, 1942b, 1942c, 1958a, 1958b, 1960, Willman 1942b.
- Base-level control: H. E. Wheeler 1957.
 Climatic (glacial) control: Wanless 1936.
 Diastrophic control: J. M. Weller 1956.
 Northern Mid-Continent: R. C. Moore 1931.
 Ohio: Stout 1931.
 Pennsylvania: Ashley 1931.
 Texas: Plummer 1931.
 West Virginia: Reger 1931.
- Cyclothem (see also named cyclothem): Kosanke 1960, Wanless 1932a, 1938, 1947b, 1957a, J. M. Weller 1960, Willman 1942b.
- Boundaries: J. M. Weller 1935b.
 Origin: Wanless 1936, J. M. Weller 1931a, 1958a, 1961, Willman 1942b.
 Types: Wanless 1947b, J. M. Weller 1942b.
- Cypress Sand: Piersol 1940.
- Cypress Sandstone (Miss.): H. H. Arnold 1939, Bain 1905a, J. W. Baxter 1963a, 1965a, A. H. Bell 1961c, Bleiningter 1912, J. C. Bradbury 1963, Butts 1917a, 1925, Coryell 1939a, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, Harris 1961, J. E. Lamar 1925a, L. K. Lee 1939a, 1939b, McDurmitt 1948, Malott 1952, Piersol 1940, P. E. Potter 1958a, 1962a, 1963c, Ross 1964b, Smoot 1960c, A. H. Sutton 1952, Swann 1948, 1956, 1963, E. O. Ulrich 1917, J. M. Weller 1939e, 1940a, 1940b, 1940c, 1952, Stuart Weller 1906b, 1907a, 1920a, 1920b, 1939a, Workman 1940.
- Isopach map: P. E. Potter 1962a, Pryor 1957.
 Paleogeographic map: Schuchert 1955.
 Structure map: A. H. Bell 1961c, English 1948, McDurmitt 1948.
- Cyrene Limestone Member (Sil.): Keyes 1915, Krey 1924, Savage 1913a, 1914b.

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- Dagley Sand, Pay Zone: A. H. Bell 1963b.
- Daisy Fault: E. S. Bastin 1931b, J. W. Baxter 1965a, Hubbert 1944, J. M. Weller 1952, Stuart Weller 1920b.

- Dale Consolidated Pool: A. H. Bell 1959c.
 Dale Dome: A. H. Bell 1939c.
 Dale-Hoodville Pool: Ver Wiebe 1949.
 Dane Member (Ord.): Templeton 1952, 1963.
 Daniels fossil plant collection: Stewart 1950.
 Danvers Bedrock Valley: Heigold 1964, Horberg 1950a, 1953.
 Danville Bedrock Valley: M. R. Campbell 1900, Horberg 1950a, Wayne 1956.
 Danville coal district: F. H. Kay 1915b.
 Danville (No. 7) Coal Member (Pa.) (see Cutler Coal, Sparland Coal): Andros 1914f, 1915a, Ashley 1902, Athy 1928, J. R. Ball 1952, F. H. Bradley 1870, G. H. Cady 1915a, 1919a, 1921, 1942a, 1944, 1952b, 1955, M. R. Campbell 1900, Clegg 1959, 1961, 1965b, DeWolf 1907b, DuBois 1951, J. A. Harrison 1951, F. H. Kay 1915a, 1915b, Kosanke 1950, 1960, Lowenstam 1951, P. E. Potter 1956c, Pullen 1951, Reinertsen 1964, Savage 1915, Sims 1944, H. L. Smith 1951, W. H. Smith 1961, 1963, Johan A. Udden 1912b, Wanless 1939, 1955b, 1961, Wegemann 1909, J. M. Weller 1939b, Wier 1961, F. E. Williams 1955, Worthen 1882c, L. E. Young 1916b.
 Beryllium in: Stadnichenko 1961.
 Geologic map: Wanless 1961.
 Isopach map: G. H. Cady 1935a, F. H. Kay 1915b.
 Structure map: G. H. Cady 1955, Clegg 1959, 1965b, DuBois 1951, R. H. Howard 1964.
 Danville Quadrangle: M. R. Campbell 1900.
 Danville region, Pleistocene geology: G. E. Ekblaw 1955, Eveland 1952.
 Danville Till (Pleis.): Willman 1963.
 Danville, tufa deposit near: Decker 1912.
 Darmstadt Anticline: A. H. Bell 1929a, 1940b, E. W. Shaw 1912a, 1921.
 Darty Limestone (Miss.): J. M. Weller 1948b.
 Davenport Member (Dev.): Collinson 1958d.
 Davis Coal Member (Pa.): G. H. Cady 1919a, 1944, 1952b, 1955, Kosanke 1950, 1960, P. E. Potter 1956c, 1962c, Pullen 1951, Wanless 1939, 1955b, 1961, J. M. Weller 1940a, Winslow 1959.
 Beryllium in: Stadnichenko 1961.
 Geologic map: Wanless 1961.
 Davis Sandstone (Camb.): Workman 1948.
 Davis Sandstone (Pa.): Siever 1959, J. M. Weller 1940a.
 Davis Syncline: Brecke 1962.
 Daysville Dolomite Member (Ord.): Buschbach 1964, Templeton 1952, 1963.
 Dayton Syncline: Willman 1942b.
 Decatur dam and reservoir: Leighton 1921a, 1923c.
 Decatur North Pool: Whiting 1956.
 Decatur Pool: A. H. Bell 1939f, Whiting 1956.
 Decatur region: Collingwood 1922, 1924b, Workman 1935c.
 Decorah Subgroup, Shale (Ord.): Agnew 1956, J. R. Ball 1952, Bieber 1944, 1947, DuBois 1945, Hackett 1960a, G. M. Kay 1929, J. E. Lamar 1956a, Mullens 1964, Rubey 1952, Sardeson 1907, E. W. Shaw 1916, Templeton 1963, Wanless 1929a, 1957a, J. M. Weller 1940a, Stuart Weller 1939b, Willman 1942b, 1943b, 1947, Ziesel 1962a.
 Paleogeographic map: Schuchert 1955.
 Structure map: Whitlow 1963.
 Deep borings (see also drill records under county): A. H. Bell 1964, Buschbach 1965, M. L. Fuller 1906, Johan A. Udden 1914, Workman 1948.
 Deer Lick Dome: Collinson 1957, Rubey 1952.
 Deer Lick Hollow Faults: Rubey 1952.
 Deer Plain Terrace: Rubey 1952.
 Deerfield Moraine: Bretz 1955.
 Defiance Member (Ord.): Templeton 1963.
 Degonia Sandstone (Miss.): Atherton 1947, J. W. Baxter 1965a, Currier 1944, P. L. Dana 1941, Desborough 1961b, English 1948, Folk 1946, J. E. Lamar 1925a, Leighton 1939, Pettijohn 1964, P. E. Potter 1958a, 1962a, 1963a, 1963c, Siever 1953, Smoot 1960c, Swann 1963, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1920a, 1939a, 1939b, Willman 1949.
 Isopach map: P. E. Potter 1962a, 1963a.
 Sand thickness: Swann 1964.
 DeGraff Coal Member (Pa.) (see First Cutler Rider Coal): Kosanke 1960.
DeKalb County
 Bedrock topography: Caldwell 1938, 1963, 1964, Horberg 1950a, McGinnis 1963b.
 Drill records: C. B. Anderson 1919, Caldwell 1963, Ross Hanson 1950, 1961, Kempton 1963, Lund 1965a, Thwaites 1927, Willman 1942b, Workman 1948.
 Geophysical studies: Beck 1965, McGinnis 1961a, 1963b.
 Ground water
 General: C. B. Anderson 1919, Caldwell 1963, 1964, Hackett 1956a, Horberg 1950a, Leverett 1899a, Thwaites 1927, Walton 1960a.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.
 Artesian waters: C. B. Anderson 1919.
 Igneous rocks: Grogan 1949a.
 Kingston geologic section (Ord.): Savage 1925b.
 Limestone and dolomite: J. C. Bradbury 1965b, Krey 1925.
 Loess: G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Caldwell 1963, Horberg 1953, McGinnis 1963b.
 Glacial: State geol. map, R. C. Anderson 1964, G. E. Ekblaw 1941, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Willman 1942b.
 Structure: Beck 1965, McGinnis 1963b, Thwaites 1927, Willman 1942b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Gas in drift: Meents 1960.
 Physiography: Leighton 1948b, Salisbury 1918.
 Sand and gravel
 Molding sand: Littlefield 1925a.
 Resources: R. C. Anderson 1964.
 Soil report 23
 Stratigraphy
 General: C. B. Anderson 1919, J. C. Bradbury 1965a, Caldwell 1938, McGinnis 1963b, Thwaites 1923.

DeKalb County—cont.

Stratigraphy—cont.

Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c, Grogan 1949a.

Cambrian: Templeton 1950, Willman 1951, Workman 1948.

Ordovician: J. C. Bradbury 1965a, Gutstadt 1958b, Savage 1925b, Willman 1951, Workman 1948.

Pennsylvanian: Savage 1916a.

Pleistocene: W. C. Alden 1909, R. C. Anderson 1964, Frye 1965c, Horberg 1953, Kempton 1963, Leighton 1923a, Leverett 1898a, 1899a, Salisbury 1918, Wascher 1938.

Structure: Thwaites 1927.

Woodstock area guide leaflet: Ill. GS 1960-C.

Worthen Survey report (v. 4): Bannister 1870.

DeKalb Quadrangle: Caldwell 1964.

Bedrock topography: Caldwell 1938.

DeKoven Coal Member (Pa.): Butts 1925, G. H. Cady 1944, 1952b, 1955, Kosanke 1950, 1960, P. E. Potter 1956c, Pullen 1951, W. H. Smith 1957, Wanless 1955b, Winslow 1959.

Beryllium in: Stadnichenko 1961.

DeKoven Cyclothem (Pa.): Kosanke 1960, J. M. Weller 1942c.

DeKoven Quadrangle: J. W. Baxter 1963a.

Delafield drill core: Jon A. Udden 1907.

Deland Dome: Heigold 1964, R. H. Howard 1964.

Delhi Coal (Pa.): Culver 1925a.

DeLong Coal Member (Pa.): Kosanke 1960, Wanless 1952, 1955a.

DeLong Cyclothem: Kosanke 1960, Krumbein 1933a, Wanless 1931a, 1931b, 1957a.

Delta, Borden Siltstone: Swann 1965.

Delwood Coal Member (Pa.): J. W. Baxter 1965a, Kosanke 1950, 1960, J. M. Weller 1940a.

Delwood Cyclothem (Pa.): Kosanke 1960, Wanless 1956, J. M. Weller 1940a.

Delwood Sandstone (Pa.) (see Finnie Ss.): Kosanke 1960, Siever 1959, Wanless 1955b, J. M. Weller 1940a.

Dement Member (Ord.): Templeton 1952, 1963.

Dennison Township Pool: Squires 1943e, 1946.

Depue Anticline: Willman 1942b.

Derby-Doerun Dolomite Member (Camb.): Workman 1948.

Dering Dike: J. C. Bradbury 1962b, G. H. Cady 1919a.

DesMoinesian Series (Pa.): C. L. Cooper 1946, 1947a, Keyes 1940a, Kosanke 1960.

DesPlaines Disturbance: Beck 1965, Buschbach 1964, Emrich 1962.

DesPlaines Quadrangle: W. C. Alden 1902.

DesPlaines River watershed: Pickels 1929.

DesPlaines Valley: J. W. Goldthwait 1909.

DesPlaines valley train: Bretz 1955.

Development maps (see Oil and gas)

Devil's Backbone and Bake Oven: Croneis 1944, Hart 1912, Meents 1965b, J. M. Weller 1944b, Willman 1949, Worthen 1868(2).

Devonian System

Accepted nomenclature (see named units)

Upper Devonian Series

Knobs Megagroup (cont.)

Louisiana Fm. (West)

Devonian System—cont.

Upper Devonian Series—cont.

Knobs Megagroup—cont.

Saverton Sh.

Grassy Creek Sh.

Sweetland Creek Sh.

Blocher Sh. (Southeast)

Alto Fm. (Southwest)

Middle Devonian Series

Hunton Megagroup

(West)

Cedar Valley Ls.

Wapsipinicon Ls.

(South and East)

Lingle Ls.

Grand Tower Ls.

Tioga Bentonite Bed

Cooper Ls. M.

Geneva Dol. M.

Dutch Creek Ss. M.

Lower Devonian Series

Clear Creek Chert

Backbone Ls.

Bailey Ls.

Grassy Knob Chert M.

General: State geol. map, Bassett 1925, Collinson 1955b, 1961, 1962, C. L. Cooper 1944, W. E. Ekblaw 1912, L. B. Freeman 1951, James Hall 1859, Keyes 1902, 1941d, Krey 1924, Lowenstam 1946, 1948b, 1949b, Meents 1965b, Owen 1846, Ross 1963, Savage 1920, 1925a, 1925c, Schuchert 1943, Stainbrook 1935, Johan A. Udden 1897, Warthin 1944, J. M. Weller 1939c, 1940a, 1940c, 1944a, 1944b, Stuart Weller 1899, 1906b, 1907a, Whiting 1965b, Workman 1935d, 1944, 1950b, Worthen 1866a(4).

Correlation chart: G. A. Cooper 1942a.

Electric-log cross-section: Whiting 1958.

Fauna (see also Paleontology, Devonian):

Collinson 1959, G. A. Cooper 1938, 1945,

Eastman 1899, MEEK 1866c, St. John 1875,

Savage 1910c, E. O. Ulrich 1890e, Stuart

Weller 1897a, 1909a.

Isopach map: G. M. Kay 1951, Lowenstam 1948b, Schwab 1955, Sloss 1960, Tester 1935, Workman 1944.

Lithofacies map: Sloss 1960.

Paleoecology: G. A. Cooper 1957.

Paleogeographic map: Schuchert 1923.

Spores: Guennel 1963.

Structure map: A. H. Bell 1940a, G. M. Kay 1951, Lowenstam 1946, Moulton 1928, Mylius 1923.

Symposium in Illinois

Arkansas and Oklahoma: Miser 1944.

Illinois: Caylor 1944, G. A. Cooper 1944,

J. M. Weller 1944a, 1944b, Workman 1944.

Indiana: A. H. Sutton 1944.

Iowa: Stainbrook 1944.

Western Kentucky: L. B. Freeman 1944a.

Northeastern Missouri: E. B. Branson 1944.

Southeastern Missouri: Croneis 1944.

West-Central Tennessee: Born 1944.

DeWitt County

Bedrock topography: Heigold 1964, Horberg 1945, 1950a, Selkregg 1958.

DeWitt County—cont.

- Coal: G. H. Cady 1921.
 Mining: Andros 1915c.
 Reserves: G. H. Cady 1952b.
 Drill records: G. H. Cady 1921, Ross Hanson 1950, 1958, 1961, Horberg 1953, Worthen 1883(1), 1890(2).
 Kickapoo Creek geologic section (Pleis.): Horberg 1953.
 Geophysical studies: Heigold 1964.
 Ground water
 General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Loess: Frye 1962e, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Heigold 1964, Horberg 1945, 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1953.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: G. H. Cady 1921, Heigold 1964, R. H. Howard 1963b, 1964, Whiting 1965b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas: R. H. Howard 1963a.
 Development maps: Ill. GS 1965 maps 96, 97.
 Gas in drift: Meents 1960.
 Niagaran reefs: R. H. Howard 1964.
 Physical properties: Armon 1964.
 Possibilities: Craig Ferris 1964, Garland 1965.
 Wapella East Pool: Craig Ferris 1964, R. H. Howard 1963a, 1963b, 1964.
 Physiography: Leighton 1948b.
 Soil report 67
 Stratigraphy
 General: R. H. Howard 1963a, 1964, Selkregg 1958.
 Silurian: R. H. Howard 1964, Whiting 1965b.
 Devonian: Whiting 1965b.
 Mississippian: Swann 1958.
 Pennsylvanian: G. H. Cady 1921, Worthen 1883(1).
 Pleistocene: G. H. Cady 1921, Frye 1965c, Horberg 1953, W. H. Johnson 1964, Willman 1963.
 Structure: G. H. Cady 1921, Craig Ferris 1964.
 Worthen Survey report: None.
 Diagenesis, structural implications: Grim 1955.
 Diamond drilling (see Drilling; drill records under county)
 Dickson Mounds State Park: Frye 1965a, Wanless 1955a, 1957a.
 Differential thermal analysis (see also under Coal): Grim 1942a, 1944a, 1951c.
 Diffraction-intensity (D.I.) ratios: Frye 1962e, 1963c, Leighton 1965.
 Dimick Fault: J. M. Weller 1952.
 Directory of Illinois Mineral Operators: Christensen 1920.

- Dispersal centers, Paleozoic clastics: P. E. Potter 1961b.
 Dissected Till Plains Section (physiography): Leighton 1948b.
 Districts I to VIII (see Coal)
 Ditch Pool: Root 1928.
 Ditney Coal (Pa.): G. H. Cady 1955, Kosanke 1950, P. E. Potter 1956c.
 Ditney Formation (Pa.): Wanless 1939.
 Divide Cyclothem (Pa.): J. R. Ball 1943.
 Divine Limestone (Ord.): DuBois 1945, J. E. Lamar 1931b, Ostrom 1957b.
 Dix Limestone (Pa.): J. C. Bradbury 1965b.
 Dix Pool: Squires 1946.
 Dixon Quadrangle: Knappen 1926.
 Dixon Springs Graben: Heyl 1965, Ross 1963, J. M. Weller 1952, Stuart Weller 1939a, G. M. Wilson 1959.
 Dodgeville Peneplain: Horberg 1946, U. B. Hughes 1916, Trowbridge 1921.
 Dogtown Landing Fault: Rubey 1952.
 Dolomite (see Limestone and dolomite)
 Dolomitization: Templeton 1963, Van Tuyl 1918.
 Dongola Quadrangle: Stuart Weller 1939a.
 Donnellson Anticline: A. H. Bell 1941b.

Douglas County

- Bedrock topography: Horberg 1945, 1950a, Selkregg 1958.
 Brines: Meents 1952.
 Clay and shale, mineralogy: Smoot 1960a.
 Coal
 Analyses: Abernethy 1961, Aresco 1953-1965, N. H. Snyder 1953.
 Ash fusibility: Abernethy 1961.
 Chlorine in: Abernethy 1965, Gluskoter 1964.
 Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.
 Mined-out areas: Ill. GS 1959b map 16.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports.
 P, Cl, Na, and K in: Abernethy 1965.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, Clegg 1959.
 Drill records: Gutstadt 1958b, Ross Hanson 1950, 1958, Johan A. Udden 1914, W. H. Walker 1961, Workman 1948, Worthen 1890(2).
 Geophysical studies: R. B. Johnson 1954.
 Ground water
 General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958, W. H. Walker 1961, Walton 1962a.
 Analyses: Bartow 1909b, Gluskoter 1965a, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Limestone and dolomite: Ostrom 1957a.
 Loess: Fehrenbacher 1965b.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1945, 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1953, Schwab 1953, Wier 1961.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.

- Douglas County—cont.
 Maps—cont.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Workman 1956.
 Structure: Clegg 1959, Schwalb 1953, E. F. Taylor 1944b, Whiting 1959.
 Mastodon: Bagg 1909.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas: Mylius 1927.
 Development maps: Ill. GS 1965 maps 76, 77, 90.
 Gas in drift: Meents 1960.
 Physical properties: Armon 1964.
 Pools
 Bourbon: A. H. Bell 1958b, Whiting 1959.
 Bourbon North: Whiting 1959.
 Chesterville: Whiting 1959.
 Chesterville East: Whiting 1959.
 Cooks Mills: A. H. Bell 1958b, Whiting 1959.
 Possibilities: DeWolf 1920e, Mylius 1923, 1927.
 Prospecting: Ill. GS 1919a, 1919b, 1920b, Mylius 1920a.
 Underground gas storage: A. H. Bell 1956d.
 Physiography: Leighton 1948b.
 Sandstone: P. E. Potter 1962c.
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 Stratigraphy
 General: G. H. Cady 1920b, Mylius 1927, Selkregg 1958.
 Precambrian: A. H. Bell 1964.
 Cambrian: A. H. Bell 1964, Workman 1948.
 Ordovician: A. H. Bell 1964, Gutstadt 1958b, Mylius 1927, Workman 1948.
 Devonian: Schwalb 1955, Workman 1944.
 Mississippian: Mylius 1927, Swann 1958, Whiting 1959, Workman 1956.
 Pennsylvanian: Clegg 1959, 1965a, Mylius 1927, Ostrom 1957a.
 Pleistocene: Frye 1965c, Horberg 1953, R. B. Johnson 1954.
 Structure: G. H. Cady 1920b, Clegg 1965a.
 Worthen Survey report (v. 6): Worthen 1875a(2).
- Douglas Group (Pa.): C. L. Cooper 1946.
 Downen Pool: Root 1928.
 Downeys Bluff Limestone (Miss.): Atherton 1947, J. W. Baxter 1963a, 1965a, P. E. Potter 1958a, Rexroad 1962, A. H. Sutton 1952, Swann 1948, 1956, 1963, J. M. Weller 1948b, 1952.
 Downeys Bluff sill and dike: Bain 1905a, J. W. Baxter 1965a, J. C. Bradbury 1962b, Stuart Weller 1920b.
 Downs Anticline: Heigold 1964.
 Drainage, engineering and legal aspects: Pickels 1921, 1929.
 Drake-White Hall Anticline: Collingwood 1933.
 Dresbach Sandstone, Group (Camb.): C. B. Anderson 1919, Thwaites 1923, 1927, Wilgus 1933, Willman 1942b, Workman 1926.
 Dresbachian Stage (Camb.): Buschbach 1964, Lochman 1956.
 Isopach map: Edwards 1935.
 Paleogeographic map: Schuchert 1955.
 Structure map: Thwaites 1927, 1935a.
- Drift gas (see Oil and gas)
 Drift, origin, early concepts: E. B. Andrews 1865, Bannister 1897, Desor 1850, John Weller 1866, Foster 1857, Hershey 1897d, Hilgard 1866, Salisbury 1894, Worthen 1866a(1), 1890(1).
 Driftless Area: Agnew 1956, W. C. Alden 1902, Carman 1910, Chamberlin 1885, 1888, R. F. Flint 1931, J. W. Goldthwait 1909, Grant 1907, Heyl 1959, Horberg 1946, 1950a, U. B. Hughes 1916, Leverett 1929b, Salisbury 1891b, 1894, Shipton 1917, Trowbridge 1916, Worthen 1866a(2), G. F. Wright 1892.
 Glacial deposits in: Sardeson 1897b.
 Drill records (see under county)
 Drilling (see also under Oil and gas)
 Diamond-drill exploration in coal field: G. H. Cady 1946, Simon 1962.
 Ground water: C. B. Anderson 1919.
 Oil-well completion: Bays 1944a.
 Wildcats: C. W. Carter 1943.
 Drilling mud: Engelhardt 1953.
 Drilling program: G. H. Cady 1944.
 Drury Formation (Pa.): Desborough 1961d, J. E. Lamar 1925a, Wanless 1939.
 Drury Lake: J. E. Lamar 1925b.
 Drury Sandstone (Pa.): Siever 1956b, 1959.
 Drury Shale Member (Pa.): Desborough 1961b, Harris 1961, Kosanke 1960, J. E. Lamar 1925a, J. M. Weller 1940a.
 Dubuque Formation (Ord.): Doyle 1965, DuBois 1945, G. M. Kay 1935a, Templeton 1952, 1963, Willman 1943b, 1947.
 Dubuque North Quadrangle: Whitlow 1963.
 Dubuque South Quadrangle: C. E. Brown 1960.
 Duck Creek Bedrock Valley: Horberg 1950a.
 Dudley Sands, Pay Zone: A. H. Bell 1957c.
 Duncansville Pool: Bain 1908h.
 Dundas Consolidated Pool: Squires 1946.
 Dune sand (see Sand and gravel)
 Dunleith (E. Dubuque) area: Worthen 1866a(1).
 Dunleith Formation (Ord.): Buschbach 1964, 1965, Doyle 1965, Templeton 1952, 1963.
- DuPage County**
 Bedrock topography: W. C. Alden 1902, Horberg 1950a, Mason 1944, Suter 1959, Trowbridge 1908, 1912, Zeisel 1962a.
 Clay and shale: J. E. Lamar 1934.
 Ceramic tests: W. A. White 1960a.
 Drift thickness: Mason 1942, 1944.
 Drill records: C. B. Anderson 1919, Buschbach 1964, M. L. Fuller 1905, Ross Hanson 1950, 1961, Knowles 1963, Larsen 1965a, Thwaites 1927, Trowbridge 1912, Zeisel 1962a.
 Environmental geology: Hackett 1965a, Larsen 1965a.
 Faulting: Trowbridge 1912.
 Geophysical studies: Beck 1965.
 Giant beaver: F. C. Baker 1930b.
 Ground water
 General: W. C. Alden 1902, C. B. Anderson 1919, Bergstrom 1955, Buswell 1943, Ross Hanson 1945, Horberg 1950a, Knowles 1963, Leverett 1899a, Lohr 1953, Suter 1959, Thwaites 1927, Walton 1960a, 1962a, 1963, 1965.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

DuPage County—cont.

Ground water—cont.

Artesian waters: C. B. Anderson 1919.
Dolomite aquifers: Walton 1963.

Limestone and dolomite: W. C. Alden 1902,
Burchard 1907, Krey 1925, Willman 1943b.

Maps

Bedrock topography: Horberg 1950a,
Suter 1959, Zeisel 1962a.

Drift thickness: State geol. map, Mason
1944.

Geologic: State geol. map, W. C. Alden
1902, Bretz 1955, D. J. Fisher 1925a, Suter
1959, Trowbridge 1912, Zeisel 1962a.

Glacial: State geol. map, Frye 1965c,
Leighton 1961, Leverett 1899a, Suter 1959.

Mineral industries: Ill. GS 1961.

Paleogeologic: Buschbach 1964, Walton
1963.

Structure: Beck 1965, Buschbach 1964,
Suter 1959, Thwaites 1927, Zeisel 1962a.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Mineral production (see USBM Minerals Year-
book, Ill. GS Illinois Mineral Industry)

Oil and gas, underground liquid petroleum stor-
age: A. H. Bell 1956d.

Peat: Soper 1922.

Physiography: Leighton 1948b, Trowbridge
1912.

Quadrangle studies

DesPlaines: W. C. Alden 1902.

Elmhurst: Bretz 1943, 1955.

Hinsdale: Bretz 1943, 1955.

Joliet: D. J. Fisher 1925a.

Riverside: W. C. Alden 1902.

Sag Bridge: Bretz 1943, 1955.

Wheaton: Trowbridge 1912.

Sand and gravel

General: W. C. Alden 1902, J. E. Lamar
1934.

Molding sand: Littlefield 1925a.

Resources: G. E. Ekblaw 1964, Zeisel
1962a.

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Stratigraphy

General: W. C. Alden 1902, C. B. An-
derson 1919, Knowles 1963, Suter 1959,
Thwaites 1923, Zeisel 1962a.

Cambrian: Buschbach 1964.

Ordovician: Buschbach 1964, Savage
1925b, Workman 1950a.

Silurian: Willman 1943b.

Devonian: Stuart Weller 1899.

Pleistocene: Bretz 1955, Frye 1965c, Hor-
berg 1953, Krumbein 1933b, Mason 1942,
Staplin 1963b, Trowbridge 1912, H. L.
Wascher 1938, Willman 1963, Zumberge
1960.

Recent: Trowbridge 1912.

Structure: Buschbach 1964, Suter 1959,
Thwaites 1927.

Worthen Survey report (v. 4): Bannister 1870.

Dupo Anticline: J. M. Weller 1939e.

Dupo Pool: A. H. Bell 1929b, 1939f, Cohee 1941a,
1941b, Newcombe 1931, Piersol 1940,
Squires 1943e, Willman 1949.

Dupo-Waterloo area, structure map: Leighton
1939.

DuQuoin area: D. J. Fisher 1925b.

DuQuoin area—cont.

Coal and oil: Jon A. Udden 1909, Worthen
1868(2).

DuQuoin Anticline, Monocline: A. H. Bell 1938a,
1943c, Brownfield 1954, G. H. Cady 1916,
1938, 1952b, S. K. Clark 1948, Cohee
1939, 1962, Desborough 1961a, Easley
1937, D. J. Fisher 1925b, L. G. Henbest
1928b, Ill. GS 1913, F. H. Kay 1915a,
McGinnis 1961b, Moulton 1929d, Swann
1958, Wanless 1955b.

DuQuoin Coal (Pa.): Worthen 1868(2).

DuQuoin Fault: S. K. Clark 1948.

DuQuoin-Louden Anticlinal Belt: A. H. Bell 1964.

DuQuoin-Sandoval Terrace: R. S. Blatchley 1910a.

Dust storms: Hershey 1899a.

Dutch Creek Sandstone Member (Dev.): Bassett
1925, Caylor 1944, Meents 1965b, Savage
1920, 1925a, J. M. Weller 1939e, 1940a,
1940c, 1944a, 1944b, 1952, Willman 1949.

Dutchtown Limestone (Ord.): A. H. Bell 1964,
DuBois 1945, Templeton 1963, J. M.
Weller 1940a, 1952.

Dwight Anticline: Willman 1942b.

Dykstra Sand, Pay Zone: A. H. Bell 1926b, 1927b,
Moulton 1929d.

Dyer Quadrangle: Bretz 1943, 1955.

E

Eagle Point Member (Ord.): Doyle 1965, Tem-
pleton 1952, 1963.

Eagle Valley Syncline: Butts 1917b, 1925, G. H.
Cady 1926, 1952b, McGinnis 1964, W. H.
Smith 1957, Stuart Weller 1920b.

Earlville Sag: Willman 1942b.

Earth resistivity (see Geophysics)

Earth Science field trips: Carroll 1932, Ill. GS
1960-1965.

Earthquakes: M. L. Fuller 1912, McGinnis 1963a,
Ross 1963, Rubey 1952, A. D. Udden 1912.

Chicago: Shaler 1869.

Illinois Basin: Heinrich 1938, 1952, West-
land 1937.

Kaskaskia: Shaler 1869.

Monroe County: Heinrich 1950, S. M. Mc-
Clure 1940.

New Madrid: John Bradbury 1817, Shaler
1869, E. M. Shepard 1905.

Northwestern Illinois 1934-1935: Fryxell 1940.

Related to water load: McGinnis 1963a.

Southeastern Illinois 1934: Dahm 1935.

Vincennes, Ind., 1887: Anon. 1887b.

East Loudon Anticline: Newton 1941.

East St. Louis area: Fenneman 1907, 1910.

Ground-water geology: Bergstrom 1956b,
Bowman 1907.

Subsurface geology: G. E. Ekblaw 1934.

Eastern Illinois oil fields: J. E. Lamar 1928a,
Mylus 1927.

Eastern Interior Basin (see also Eastern Interior Coal
Basin, Illinois Basin): Ruedemann
1910, Wanless 1955b, J. M. Weller 1931c,
1940b.

Oil developments: A. H. Bell 1940a, 1941a,
1942a, 1943a, 1944a, 1945a, 1946a.

Oil possibilities: Swann 1951a.

- Eastern Interior Basin—cont.
 Pennsylvanian sediments: P. E. Potter 1956a, 1956b, Siever 1956b.
 Structural trends: S. K. Clark 1948.
 Structure map: J. M. Weller 1936b.
- Eastern Interior Coal Basin, Coal Field: Ashley 1902, 1907, P. E. Potter 1958b, Siever 1957b.
 Natural gas: A. H. Bell 1935a.
 Pennsylvanian correlations: Wanless 1939.
- Eastern Shelf: A. H. Bell 1964.
- Eau Claire Formation (Camb.): A. H. Bell 1964, Buschbach 1964, 1965, Cohee 1945b, T. A. Dawson 1960, Doyle 1965, John Webster Foster 1956, Gutstadt 1958a, Hackett 1960a, Lochman 1956, Suter 1959, Thwaites 1923, 1927, Wanless 1957a, Willman 1942b, Workman 1948, Zeisel 1962a.
 Isopach map: A. H. Bell 1964, Buschbach 1964, Suter 1959, Workman 1948.
 Structure map: Suter 1959.
- Economics (see Mineral economics, various mineral resources)
- Economic geology, coal: Voskuil 1933c.
- Eden Shale (Ord.): Gutstadt 1958b.
 Isopach map: Gutstadt 1958b.
- Edenian Stage (Ord.): Templeton 1963.
- Edgar County**
- Bedrock topography: Horberg 1945, 1950a, Selkregg 1958.
 Brines: Meents 1952.
 Clay and shale
 General: Bleininger 1912, J. E. Lamar 1934.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: Smoot 1960a.
 Petroleum mud fluids: J. E. Lamar 1931c.
- Coal
 Analyses: G. H. Cady 1935b, 1948a, Parr 1916.
 Mined-out areas: Ill. GS 1959b maps 16, 17.
 Mining: Annual coal reports.
 Mining practice: Andros 1914f.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, Clegg 1965b.
 Subsidence: L. E. Young 1916b.
- Drill records: R. S. Blatchley 1910a, Ross Hanson 1950, 1958, Horberg 1953.
- Fossil collecting: Shaver 1959.
- Geologic sections (described outcrops)
 Baldwinville (Pa.): Bleininger 1912.
 Clear Creek (Pleis.): MacClintock 1929.
- Ground water
 General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958.
- Limestone and dolomite: Bleininger 1912, Krey 1925, J. E. Lamar 1934.
- Loess: Fehrenbacher 1965b.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1945, 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1953, Schwalb 1953, Wier 1961.
 Glacial: State geol. map, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
- Edgar County—cont.
 Maps—cont.
 Paleogeologic: Workman 1956.
 Structure: A. H. Bell 1943c, Clegg 1965b, Mylius 1923, 1927, Schwalb 1953.
 Mammoth: F. C. Baker 1934a.
 Mastodon: N. C. Anderson 1905, John Wells Foster 1857.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
 Development maps: Ill. GS 1965 maps 73, 74, 75, 76.
 Mud-fluid materials: J. E. Lamar 1931c.
 Physical properties: Armon 1964.
 Possibilities: W. S. Blatchley 1906, DeWolf 1920e, Mylius 1927.
 Prospecting: Ill. GS 1919a, 1919b, 1920b, F. H. Kay 1916b, Mylius 1920a, 1923.
 Sandstone: J. C. Bradbury 1962a.
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- Stratigraphy
 General: W. S. Blatchley 1906, Bleininger 1912, G. H. Cady 1920b, F. H. Kay 1915b, Mylius 1927, Selkregg 1958.
 Ordovician: Mylius 1927.
 Silurian: Lowenstam 1949b.
 Devonian: Schwalb 1955.
 Mississippian: Mylius 1927, Swann 1958, Workman 1956.
 Pennsylvanian: J. C. Bradbury 1962a, Clegg 1965a, 1965b, F. H. Kay 1915b, Mylius 1927, Shaver 1960, J. M. Weller 1942c, G. M. Wilson 1942.
 Pleistocene: Frye 1965c, Horberg 1953, Krumbein 1933b, Leverett 1899a, MacClintock 1929, Wayne 1965.
 Structure: G. H. Cady 1920b, Clegg 1965a, 1965b.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 4): F. H. Bradley 1870.
- Edgewood Formation (Sil.): Athy 1928, J. R. Ball 1939, 1941, Bleininger 1912, Collingwood 1933, Collinson 1954, 1957, D. J. Fisher 1925a, R. H. Howard 1961, Keyes 1915, Krey 1924, Lowenstam 1946, 1948b, Mullens 1964, Pryor 1962a, Ross 1964a, Rubey 1952, Savage 1909b, 1910a, 1913a, 1913c, 1914b, 1916a, 1926, Scobey 1938, Suter 1959, A. H. Sutton 1935, J. M. Weller 1935c, 1939e, 1940a, 1940c, 1952, Willman 1962, Zeisel 1962a.
 Fauna: Ross 1962a, Savage 1910a, 1913a, 1913c.
 Paleogeographic map: Schuchert 1955.
 Edgington Quadrangle: Savage 1921.
 Edinburg Pool: Whiting 1956.
 Edinburg South Pool: Whiting 1956.
 Edinburg West Pool: Whiting 1956.
 Educational extension, program: Carroll 1932, Leighton 1948b, Raasch 1948, G. M. Wilson 1958.
 Educational geology: W. S. Coleman 1962, Collinson 1960b, Dearing 1962, Deette Rolfe 1929, G. M. Wilson 1960.
- Edwards County**
- Bedrock topography: Fidler 1943, Horberg 1950a.
 Brines: Meents 1952.

Edwards County—cont.

Clay and shale

General: M. L. Fuller 1904, J. E. Lamar 1934.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Petroleum mud fluids: J. E. Lamar 1931c.

Mineralogy: C. W. Rolfe 1908, Smoot 1960a, W. A. White 1960b.

Petrology: Grim 1957, C. W. Rolfe 1908.

Refractory clay: J. E. Lamar 1956b.

Coal

General: M. L. Fuller 1903.

Analyses: G. H. Cady 1944.

Mined-out areas: Ill. GS 1959b map 25.

Reserves: G. H. Cady 1944, 1952b, H. L. Smith 1951.

Strippable reserves: Culver 1925b.

Geophysical studies: Pryor 1956c.

Ground water: M. L. Fuller 1904, Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c.

Limestone and dolomite: Krey 1925.

Loess: Fehrenbacher 1965b, Frye 1962e.

Maps (see also type of map, stratigraphic units)

Bedrock topography: M. L. Fuller 1904, Horberg 1950a.

Geologic: State geol. map, M. L. Fuller 1904.

Drift thickness: State geol. map.

Glacial: State geol. map, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: L. K. Lee 1939b, Siever 1951a, Workman 1956.

Structure: A. H. Bell 1943c, Easton 1943, Siever 1951a, H. L. Smith 1951, Swann 1951b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Cohee 1942a, M. L. Fuller 1904.

Development maps: Ill. GS 1965 maps 36, 40.

Mud-fluid materials: J. E. Lamar 1931c.

Physical properties: Armon 1964.

Possibilities: Easton 1943.

Waterflooding: Pryor 1957, Squires 1950a.

Physiography: M. L. Fuller 1904, Leighton 1948b, MacClintock 1929.

Quadrangle studies, Patoka: M. L. Fuller 1904.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962a, 1962c, 1963c, Siever 1953, 1956b.

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Stratigraphy

General: M. L. Fuller 1904, Workman 1950b.

Mississippian: L. K. Lee 1939b, Siever 1951a, Swann 1951b, 1958, Workman 1956.

Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, M. L. Fuller 1904, M. E. Hopkins 1958, Siever 1951a, H. L. Smith 1951.

Pleistocene: Fidler 1948, Frye 1965c.

Structure: Easton 1943, M. L. Fuller 1904, L. K. Lee 1939b, H. L. Smith 1951, Swann 1951b.

Worthen Survey report (v. 6): Worthen 1875a(2).

Edwards River: Leverett 1899a.

Effingham County

Bedrock topography: Horberg 1950a.

Brines: Meents 1952.

Clay and shale: W. A. White 1959a, 1960a, 1960b.

Coal

Mining and production: Annual coal reports.

Reserves: G. H. Cady 1944, 1952b, DuBois 1951, Siever 1950.

Strippable reserves: Culver 1925b.

Copper erratic: Crook 1929.

Drill records: Ross Hanson 1950, 1958, Worthen 1883(1), 1890(2).

Geologic sections (described outcrops)

Altamont (Pleis.): MacClintock 1929.

Effingham (Pleis.): Leighton 1930f.

Effingham Northeast (Pleis.): MacClintock 1929.

Salt Fork Tributary (Pa.): Kosanke 1960.

Shoal Creek (Pa.): Kosanke 1960.

Geophysical studies: P. L. Lyons 1948, Pryor 1956c.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957, Walton 1960b, 1962a.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961.

Limestone and dolomite: Graf 1950b, Grogan 1940, Krey 1925.

Loess: Fehrenbacher 1965b, Frye 1962e, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map.

Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: L. K. Lee 1939b, Workman 1956.

Structure: A. H. Bell 1943c, DuBois 1951, Newton 1941, Pye 1944, Siever 1950, E. F. Taylor 1944b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Neoga area guide leaflet: Ill. GS 1962-E.

Oil and gas

Development maps: Ill. GS 1965 maps 52, 53, 59, 60.

Physical properties: Armon 1964.

Possibilities: Newton 1941.

Secondary recovery: Pryor 1957.

Physiography: Leighton 1948b, MacClintock 1929.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962a, 1962c, 1963a, Pye 1944.

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Springs: Peale 1886.

Stratigraphy

General: Selkregg 1957.

Ordovician: Gutstadt 1958b, Workman 1950b.

Devonian: Schwalb 1955, Workman 1944.

Mississippian: L. K. Lee 1939b, Pye 1944, Swann 1958, 1963, Workman 1956.

Effingham County—cont.

Stratigraphy—cont.

Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1939c, 1944, DuBois 1951, Kosanke 1960, Newton 1941, J. M. Weller 1941a, 1942c, Worthen 1883(1).

Pleistocene: J. A. Brophy 1959, G. E. Ekblaw 1957, Frye 1965c, Leighton 1930f, 1962, MacClintock 1929, 1933, Simonson 1954, Willman 1963.

Structure: DuBois 1941, L. K. Lee 1939b, J. M. Weller 1941a.

Uranium: Ostrom 1955.

Worthen Survey report (v. 6): Broadhead 1875.

Effingham damsite: G. E. Ekblaw 1957.

Effingham Limestone Member (Pa.): Kosanke 1960, Wanless 1956.

Elco Gravel (Cre.-Pleis.): J. E. Lamar 1953a.

Eldena Member (Ord.): Templeton 1952, 1963.

Eldorado Pool: A. H. Bell 1956a, 1957c.

Eldorado Quadrangle: R. S. Blatchley 1910a.

Eldoran Epoch (Pleis.): G. F. Kay 1933, Willman 1942b.

Electric logging (see Geophysics)

Electric logs

Connate-water resistivity: Wyllie 1949.

Electrokinetics: Street 1959a, 1959b, 1961.

Electron microscopy

Rock surface: Kahle 1964.

Sand surface texture: J. J. Porter 1962.

Elevations (see Spirit leveling)

Elgin Quadrangle, Pleistocene stratigraphy: Leighton 1928, 1930d.

Elgin region, glacial history: Leighton 1925b.

Elgin Shale Member (Ord.): Buschbach 1965.

Elizabeth Quadrangle: G. H. Cox 1910, E. W. Shaw 1916, Trowbridge 1916.

Elizabethtown Plain: Stuart Weller 1920b.

Elkhorn Creek Bedrock Valley: Horberg 1950a.

Ellisville Coal (Pa.): Culver 1925a.

Elm Member (Ord.): Templeton 1952, 1963.

Elmhurst Quadrangle: Bretz 1943, 1955.

Elmhurst Sandstone Member (Camb.): Buschbach 1964.

Elmwood Syncline: Wanless 1957a.

Elviran Stage, Elvira Group (Miss.): Swann 1963, J. M. Weller 1939f, 1940b.

Embarrass River Buried Valley: Hubbard 1904b.

Embarrass River Valley, land reclamation: J. A. Harman 1913.

Embarrass River watershed: Pickels 1929.

Embayment Megagroup (Cre.-Ter.): Pryor 1961a, Swann 1961.

Eminence Dolomite (Camb.): A. H. Bell 1964, Buschbach 1964, 1965, Workman 1948.

Isopach map: Buschbach 1964, Workman 1948.

Empire Fault: Bain 1905a, J. M. Weller 1952.

Enamel composition and viscosity: Yee 1955, 1956.

Energy consumption: Voskuil 1934b.

Engineering geology

General: G. E. Ekblaw 1931a, Leighton 1923d.

As a profession: G. E. Ekblaw 1937b.

Chicago district: Suehrstedt 1929.

Chicago subsoils: Peck 1954.

Dam construction: G. E. Ekblaw 1937a, Jellicoff 1930.

Engineering geology—cont.

Decatur damsite: Leighton 1923c.

Effingham damsite: G. E. Ekblaw 1957.

Geophysical methods: Bays 1945b.

Glacial geology: Leighton 1926a.

Highways: G. E. Ekblaw 1936, Lieberman 1938.

History: G. E. Ekblaw 1953.

Karst topography: J. E. Lamar 1928c.

Lake Springfield Dam: G. E. Ekblaw 1940f.

Landslides: G. E. Ekblaw 1932a.

Mapping: DeWolf 1923.

Properties of soils: Grim 1948a, Liu 1965.

Reservoir sites: Leighton 1924, 1935a.

Rock falls: G. E. Ekblaw 1930a.

Shore erosion control: Wood 1938.

Soils: Thornburn 1963.

Soil profile in highway construction: G. E. Ekblaw 1940b.

Till plasticity: Deere 1957.

Topographic mapping: Herron 1926.

Englewood Quadrangle: Bretz 1943, 1955.

English River Siltstone (Miss.): J. M. Weller 1940b, 1941b, Workman 1956.

Isopach map: Workman 1956.

Environmental geology: Larsen 1965a, Sheaffe 1963.

Drilling program, Chicago region: Hackett 1965a.

Ground-water contamination: Hackett 1965b.

Land use and development: G. E. Ekblaw 1961.

Regional planning, geological influences: G. E. Ekblaw 1961.

Related to Shelbyville Moraine: Hubbard 1904a.

Urban: Hackett 1965b.

Eocene Series (Ter.): W. B. Clark 1891, J. E. Lamar 1948, Parmelee 1921, Pryor 1962a.

1962b, Purdy 1907, Ross 1963, J. M. Weller 1940a.

Eola underground liquid petroleum storage: A. H. Bell 1956d.

Eolian deposits, map of: James Thorp 1952.

Equality (No. 7) Coal (Pa.): DeWolf 1907a, 1907b.

Equality-Shawneetown Quadrangles: Butts 1925.

Erian Group (Dev.): J. M. Weller 1944a.

Eskers (see Kames)

Essex Limestone (Sil.): Athy 1928, Savage 1912, 1913a, 1913c.

Establishment Member (Ord.): Templeton 1952, 1963.

Etherly Coal (Pa.): Culver 1925a.

Eureka Fault: J. W. Baxter 1965a, J. M. Weller 1952.

Evanston, Lake Michigan sediments: J. P. Todd 1938.

Evanston Quadrangle: Bretz 1943, 1955.

Evanston Stage (Lake Chicago): D. J. Fisher 1925a.

Evanston-Waukegan region: Atwood 1908.

Evansville Valley: P. E. Potter 1965.

Evaporites: Grim 1960, Saxby 1957.

Everett Member (Ord.): Templeton 1952, 1963.

Everton Group, Formation (Ord.): A. H. Bell 1964, Templeton 1963, J. M. Weller 1940a.

Exeter Coal (Pa.): Culver 1925a, Worthen 1868(2).

Exline Cyclothem (Pa.): Kosanke 1960, Wanless 1957a, 1958.

Fauna: Wanless 1958.

- Exline Limestone Member (Pa.): Kosanke 1960, Wanless 1957a.
 Exploration, early geological observations: John Bradbury 1817.
 Extinct lakes: E. W. Shaw 1915.

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- Face brick (see Clay and shale)
 Facies (General, see also under stratigraphic units)
 Analysis: Sloss 1949.
 Mississippian: Swann 1958.
 Pennsylvanian: Wanless 1955b.
 Silurian: Lowenstam 1946.
 Classification: Willman 1958b.
 Maps (see also under stratigraphic units): Wanless 1965.
 Model: P. E. Potter 1959.
 Fairfield Basin: A. H. Bell 1964.
 Fairmount Limestone (Pa.): Bleining 1912.
 Fairplay Member (Ord.): Doyle 1965, Templeton 1952, 1963.
 Fairview Syncline: Wanless 1957a.
 Fairview-Rosiclare Fault: Hubbert 1944.
 Farm Creek Intraglacial Substage (Pleis.): Leighton 1965.
 Farm Ridge Moraine: Leighton 1953, Willman 1942b.
 Farmdale Drift (Pleis.): G. E. Ekblaw 1955, Leighton 1950b, 1961, 1963, Shaffer 1954b, 1956.
 Farmdale Loess, Silt (Pleis.): J. R. Ball 1952, Collinson 1954, Eveland 1952, Frye 1958b, 1960b, 1962e, Horberg 1949, 1953, 1956b, Leighton 1949a, 1950b, 1953, 1958a, 1965, B. W. Ray 1962, Ruhe 1957, Shaffer 1954b, 1956, Wanless 1955a, 1957a, Wascher 1947.
 Farmdale Substage (Pleis.): Leighton 1950b, 1958a, 1960, 1963.
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 Farmington Anticline: Wanless 1957a.
 Farmington Shale Member (Pa.): Kosanke 1960, MacClintock 1959, Reinertsen 1964, Savage 1927, Wanless 1939, 1957a, Willman 1942b.
 Fancher-Mode Anticline: Newton 1941.
 Faults (see also named faults and under Structure):
 State geol. map, J. W. Baxter 1963a, Butts 1925, G. H. Cady 1939e, Currier 1944, Desborough 1958, Emrich 1962, Hubbert 1934, Ross 1963, Rubey 1952, Stonehouse 1955, Templeton 1952, J. M. Weller 1940a, 1940b, Stuart Weller 1920b, Willman 1951.
 Tracing with magnetometer: P. S. McClure 1932.

Fayette County

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 Brines: Meents 1952.
 Clay and shale
 Bonding clay: Grogan 1945.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: Smoot 1960a, W. A. White 1960b.
 Coal
 General: F. H. Kay 1915a.
 Mining: Andros 1914e, E. W. Shaw 1923.
 Reserves: G. H. Cady 1944, 1952b, DuBois 1951, Siever 1950, J. N. Payne 1944.

Fayette County—cont.

- Drill records: A. H. Bell 1964, Ross Hanson 1950, F. H. Kay 1915a, Warthin 1944.
 Geologic sections (described outcrops)
 East Vandalia (Pleis.): MacClintock 1929.
 Hagerstown (Pleis.): Leighton 1949a.
 Hickory Creek (Pleis.): MacClintock 1929.
 Loudon (Pleis.): MacClintock 1929.
 Ramsey Northeast (Pleis.): MacClintock 1929.
 Geophysical studies: Pryor 1956c.
 Ground water
 General: Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.
 Limestone and dolomite: Krey 1925.
 Loess: Frye 1962e, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, E. W. Shaw 1923.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: A. H. Bell 1943c, R. S. Blatchley 1914a, DuBois 1951, F. H. Kay 1915a, Newton 1941, J. N. Payne 1944, Pye 1944, E. W. Shaw 1923, Siever 1950, Sloan 1939, Smoot 1958, E. F. Taylor 1944b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Molding sand: Littlefield 1925a, 1925b.
 Oil and gas
 Development maps: Ill. GS 1965 maps 51, 52, 60, 61.
 Humble Oil Co. deep test: Calvert 1963.
 Physical properties: Armon 1964.
 Pools
 Loudon: Anon. 1960a, McCaslin 1947, Sloan 1939, C. T. Smith 1946, F. B. Taylor 1939.
 St. James: D. L. Stevenson 1964.
 St. Paul: D. L. Stevenson 1964.
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 Possibilities: R. S. Blatchley 1910a, Newton 1941, Oil & Gas J 1964, J. N. Payne 1944, D. L. Stevenson 1964.
 Sand properties: Piersol 1940.
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 Physiography: Leighton 1948b, MacClintock 1929, E. W. Shaw 1923.
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 Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1961a, 1962a, 1962c, 1963a, Piersol 1940, Pye 1944.
 Soil report 52
 Springs: Peale 1886.
 Stratigraphy
 General: Selkregg 1957, E. W. Shaw 1923, Smoot 1958.
 Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.
 Cambrian: A. H. Bell 1964, Calvert 1963.

- Fayette County—cont.
Stratigraphy—cont.
- Ordovician: A. H. Bell 1964, Calvert 1963, Smoot 1958.
 - Silurian: Lowenstam 1949b, Smoot 1958.
 - Devonian: Meents 1965b, Schwalb 1955, Warthin 1944, Workman 1944.
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 - Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1939c, 1944, DuBois 1951, F. H. Kay 1915a, Newton 1941, J. N. Payne 1944, P. E. Potter 1961a, Smoot 1958, E. W. Shaw 1923, Wanless 1955b, J. M. Weller 1941a, 1942c.
 - Pleistocene: Frye 1965c, Leighton 1959, 1961, MacClintock 1929, 1933, Willman 1963.
 - Structure: DuBois 1951, R. S. Blatchley 1914a, F. H. Kay 1915a, Meents 1965b, J. N. Payne 1944, Smoot 1958, J. M. Weller 1941a.
 - Worthen Survey report (v. 6): Broadhead 1875.
- Fayette Breccia (Dev.): W. E. Ekblaw 1912.
Federal-State cooperation: Mendenhall 1931.
Feldspar (see also under county): R. E. Hunter 1965, Willman 1942a.
Autogenic: Baskin 1956.
- Fern Glen Formation (Miss.): J. R. Ball 1952, Collingwood 1933, Collinson 1954, 1957, 1958e, Fenneman 1910, Harris 1961, Krey 1924, Leighton 1939, R. C. Moore 1929, 1935, J. M. Weller 1940b, Stuart Weller 1939a, Willman 1949.
- Fauna: R. H. Benson 1955, Echols 1956, A. K. Miller 1942, Stuart Weller 1909b.
Isopach map: Kissling 1961.
Structure map: Moulton 1926f.
- Fernvale Limestone (Cape Limestone) (Ord.): DuBois 1945, Gregor 1936, Savage 1909b, 1910a, J. M. Weller 1940a, 1940c, Stuart Weller 1939a, Willman 1949.
- Ferruginous Sandstone (Aux Vases Sandstone) (Miss.): Keyes 1922c.
Festus Terrace: Robertson 1938.
- Finnie Sandstone Member (Pa.) (see Delwood Ss.): J. W. Baxter 1963a, 1965a, Harris 1961, Kosanke 1960, P. E. Potter 1963a, Wanless 1939.
Isopach map: P. E. Potter 1963a.
- Fireclay (see also Clay and shale): Parmelee 1921, Purdy 1907.
- First Cutler Rider Coal (Pa.) (see DeGraff Coal): Kosanke 1950, 1960.
- First Vein Coal (Pa.) (see Danville (No. 7) Coal): Bement 1909, G. H. Cady 1919a, Wanless 1939.
- Fishhook Anticline: R. H. Howard 1961.
- Fishhook Pool: R. H. Howard 1961, Meents 1958a.
- Fithian Cyclothem (Pa.): Peppers 1964, W. A. White 1958a.
- Fithian, illite at: Grim 1951c, W. A. White 1958a.
- Flannigan Coal Member (Pa.): Kosanke 1960, Newton 1937b, Wanless 1939.
- Flannigan Cyclothem (Pa.): Kosanke 1960, Newton 1937b.
- Flannigan Terrace: G. H. Cady 1939e.
- Flat Creek Coal Member (Pa.): Kosanke 1960.
Flat Creek Cyclothem (Pa.): Kosanke 1960.
Flat Rock Pool: F. H. Kay 1917a, Piersol 1940, Rich 1916a, Squires 1943e, Tough 1919.
Flat Rock Sand: Tough 1919.
Structure map: Tough 1919.
- Flint clay (see Clay and shale)
- Florence Gravel (Pleis.): Hershey 1895a.
Florenzia Formation (Pleis.): Hershey 1897b.
Fluorine chemicals: Finger 1949, 1960.
- ### Fluorine chemistry
- General: H. S. Clark 1954, Finger 1940, 1951b, 1952, 1954, 1961b, 1964, 1965a.
 - Analytical methods: H. S. Clark 1951, McVicker 1938.
 - Antipyretic activity: Lu 1962.
 - Aromatic compounds: Finger 1944a, 1951a, 1956a, 1956b, 1959a, 1959b, 1962, 1963, 1964, 1965a.
 - Aromatic fluorine as fungicides: Finger 1955.
 - Benzotrifluorides: Finger 1944c, 1946.
 - Binary metallic fluorides: Deadmore 1961a.
 - Carcinogenicity: J. A. Miller 1953.
 - Complex fluorides: Deadmore 1962d.
 - Crystal structure of K_3SiF_7 : Deadmore 1962a.
 - Dimethyl sulphone: Starr 1962.
 - Fluorocyclo-benzenes and pyridines: Finger 1965b.
 - Fluorine in aromatic nuclei: Finger 1940.
 - Fluorine-substituted benzoates: Lu 1962.
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 - Phase relations: Deadmore 1960b.
 - Plant growth regulators: Finger 1959a.
 - Reactions with oxides: Deadmore 1962c.
 - Solid state reactions: Deadmore 1962c.
 - Stability of inorganic compounds: Deadmore 1961a, 1962d.
 - Synthesis of 3,5-dinitrobenzotrifluoride: O. F. Williams 1945.
 - Synthetic cryolite: Finger 1937b.
 - 2,4-dinitrofluorobenzene: Finger 1953.
 - 2,6-difluoropyridine: Finger 1961a.
 - Thermal stability of titanium oxyfluoride: Deadmore 1961b.
- Fluorite (see also Fluorspar)
Liquid inclusions: Czamanske 1963, Freas 1961, W. E. Hall 1963, Newhouse 1932.
Temperature of formation: Grogan 1952.
- ### Fluorspar, Fluorspar district
- (See also Fluorine chemistry, Fluorite, and under Hardin and Pope Counties)
- General: Bain 1904a, 1904b, 1905a, E. S. Bastin 1932, Brush 1852, Burk 1901, S. F. Emmons 1893, W. H. Emmons 1929, Fohs 1910, Hatmaker 1938, Ill. State Div Indus. Planning and Dev. 1959, J. E. Lamar 1928d, 1965, S. M. McClure 1947b, Owen 1846, Pough 1932, Risser 1961, Silliman 1819, 1821a, 1821b, E. O. Ulrich 1903, 1905, J. M. Weller 1940a, 1952, Stuart Weller 1920b.

Fluorspar, Fluorspar district—cont.

- Barite: J. C. Bradbury 1959a, Brecke 1964a.
 Bedding-replacement deposits: Brecke 1962, Currier 1937a, 1937b, 1944, Grogan 1949b.
 Beneficiation: Hamrich 1949.
 Chemical analyses: E. S. Bastin 1931b, J. S. Brown 1954, Burchard 1911, W. E. Hall 1963, Hatmaker 1938, Ladoo 1927.
 Chemical prospecting: Grogan 1951.
 Chemical raw material: F. H. Reed 1936.
 Core drilling: Bishop 1948.
 Earth resistivity: Hubbert 1944.
 Economics: Currier 1944, Finger 1960, Hamrick 1949, Hatmaker 1938, Leighton 1949b, J. H. Pratt 1905, Schwerin 1926.
 Experimental replacement of limestone: J. W. Baxter 1963b.
 Exploration: Bishop 1947b, 1949, A. S. Swanson 1948, J. M. Weller 1952.
 Grades: Hamrick 1949, Pogue 1918, F. H. Reed 1936.
 History: Bain 1904a, John Bradbury 1817, Cleveland 1822, Norwood 1866.
 Mineralogy: Bain 1904a, 1907b, E. S. Bastin 1931b, Brecke 1962, Grawe 1949, Grogan 1952, Gunnell 1933.
 Mining and milling: O. E. Anderson 1953, Anon. 1958, Bailie 1960, E. S. Bastin 1931b, J. W. Baxter 1965a, Bishop 1947a, Blayney 1921, Burchard 1911, Burmeister 1952, Cronk 1930, Currier 1944, A. H. Fay 1926, Fellman 1926, Finger 1960, Fohs 1907, W. H. Harrison 1960, Harwood 1903, Hatmaker 1938, C. F. Jackson 1936, Ladoo 1927, G. Montgomery 1960, Muir 1947, A. B. Needham 1949, Reeder 1930, 1932, R. W. Schaefer 1961, J. M. Weller 1952, Stuart Weller 1920b.
 Ore bodies shapes: Joralemon 1952.
 Origin: Amstutz 1964, Bain 1904a, 1905a, 1907b, E. S. Bastin 1931b, 1942, Brecke 1962, 1964b, Currier 1937b, 1944, Freas 1961, W. E. Hall 1963, Ohle 1959, Schwerin 1928, Spurr 1926, J. M. Weller 1952, Stuart Weller 1920b.
 Outlying occurrences: J. C. Bradbury 1957a.
 Pellets: Jackman 1963b.
 Production statistics (see Mineral economics)
 Reserves: Currier 1937a, Finger 1961b, Hamrick 1949, J. M. Weller 1952.
 Sands: Grogan 1951.
 Seismic studies: R. B. Johnson 1957, 1964.
 Structure: J. W. Baxter 1963a, 1965a, Heyl 1961, Ross 1963, J. M. Weller 1940a, 1952, Stuart Weller 1920b.
 Temperature of mineralization: Freas 1961.
 Types of deposits: J. M. Weller 1952.
 Unique war mineral: Leighton 1944c.
 Uses: Deadmore 1957, Finger 1949, 1960, 1961b, Hatmaker 1938, Ladoo 1927, Machin 1940, J. M. Weller 1952.
 Vanadium staining control: J. E. Lamar 1957b.
 Water control: R. W. Schaefer 1961.

Fluvial deposition: Frye 1961b.

Flux rock (see Limestone and dolomite)

Folley Limestone (Ord.): Keyes 1898.

Folios in Illinois: Boardman 1953, M. C. Fuller 1904, Ill. GS List of Pubs.

Fond du Lac Sandstone (Precamb.-Camb.): J. M. Weller 1945a, Workman 1948.

Ford County

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 Brines: Meents 1952.
 Clay and shale: J. E. Lamar 1934.
 Chemical analyses: W. A. White 1959a.
 Refractory clay: J. E. Lamar 1956b.
 Drill records: Ross Hanson 1950, 1958, 1961, Warthin 1944, Workman 1948.
 Geophysical studies: Beck 1965.
 Ground water
 General: John Webster Foster 1954, Horberg 1950a, Leverett 1896, 1899a, R. C. Scott 1962, Selkregg 1958.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Heigold 1964, Horberg 1945, 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1953, Schwalb 1953.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: Athy 1928, Beck 1965, Heigold 1964, R. H. Howard 1964, Schwalb 1953.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas, gas in drift: Meents 1960.
 Sand and gravel, molding sand: Willman 1939b.
 Soil report 54
 Stratigraphy
 General: Selkregg 1958.
 Cambrian: Workman 1948.
 Ordovician: Gutstadt 1958b, Workman 1948.
 Silurian: Lowenstam 1949b.
 Devonian: Warthin 1944.
 Pleistocene: Frye 1965c, Horberg 1953, Hubbard 1911, Leverett 1899a, R. S. Stauffer 1937, Wascher 1938, Zumberge 1960.
 Worthen Survey report (v. 4): F. H. Bradley 1870.
 Ford Station Limestone Member (Miss.): Swann 1963.
 Forreton Member (Ord.): Templeton 1952, 1963.
 Fort Atkinson Limestone (Ord.): J. C. Bradbury 1965a, Buschbach 1964, 1965, Templeton 1963.
 Fort Payne Chert, Formation (Miss.): J. W. Baxter 1965a, Butts 1917a, Ross 1964b.
 Fossil hunting: Collinson 1956a, 1960a, Shaver 1959.
 Fossils (see Biostratigraphy; Paleontology)
 Fosterburg-Staunton Anticline: A. H. Bell 1941b.
 Fox Lake Moraine: Leighton 1953, W. E. Powers 1940, Suter 1959.
 Fox River Moraine: Leverett 1899a.
 Fox River Torrent: Willman 1942b.
 Fox River watershed: Pickels 1929.
 Fox Valley history: Leighton 1925b, Willman 1942b.
 Fox Valley Member (Camb.): Buschbach 1964.
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- Fraileys Shale (Miss.): J. W. Baxter 1963a, 1965a, J. C. Bradbury 1963, McFarlan 1955, P. E. Potter 1963a, Swann 1963.
- Francis Creek Shale Member (Pa.): S. E. Ekblaw 1931, Kosanke 1960, Krumbein 1947, E. S. Richardson 1953a, Savage 1927, Wanless 1931b, 1939, 1955a, 1955b, 1957a, Willman 1942b.
- Franconia Formation, Sandstone (Camb.): A. H. Bell 1964, Buschbach 1964, 1965, Doyle 1965, John Webster Foster 1956, Hackett 1960a, Lochman 1956, Suter 1959, Templeton 1952, Thwaites 1923, 1927, Wanless 1957a, Willman 1942b, 1951, Workman 1926, 1948, Zeisel 1962a.
- Isopach map: Buschbach 1964, Workman 1948.
- Paleogeographic map: Schuchert 1955.
- Franconian Stage (Camb.): Buschbach 1964.
- Frankfort Quadrangle: Bretz 1943, 1955.
- Franklin County**
- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Clay and shale
- Chemical analyses: W. A. White 1959a.
- In coal mines: Stull 1917.
- Mineralogy: P. E. Potter 1958b, Smoot 1960a.
- Coal**
- General: G. H. Cady 1916, 1938, Fieldner 1932, D. J. Fisher 1925b, Ill. GS 1913, Savage 1910b.
- Analyses: Abernethy 1961, Aresco 1953-1965, C. G. Ball 1935b, E. T. Benson 1935, G. H. Cady 1910, 1916, 1919e, 1934, 1935b, 1948a, H. M. Cooper 1942a, Fieldner 1942b, G. W. Hawley 1923, Helfinstine 1946, J. A. Holmes 1906, 1908, Lindgren 1908, L. C. McCabe 1934a, Ovitz 1918, B. C. Parks 1956, Parr 1915a, 1916, Piersol 1935, 1936, Rees 1941, Savage 1910b, E. W. Shaw 1912b, N. H. Snyder 1953, Gilbert Thiessen 1934c, W. F. Wheeler 1908a, Zubovic 1964.
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- Beryllium in: Stadnichenko 1961.
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- Coking (see Coke): W. B. Warren 1938.
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- Mined-out areas: Ill. GS 1959b maps 29, 30.
- Mineral matter: Abernethy 1965, C. G. Ball 1935b.
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- Franklin County—cont.
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- P, Cl, Na, and K in: Abernethy 1965.
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- Physical tests: J. A. Holmes 1906, 1908.
- Production: Annual coal reports.
- Production 1880-1909: DeWolf 1911.
- Reserves: G. H. Cady 1916, 1944, 1948b, 1952b, DeWolf 1908b, Savage 1911a.
- Subsidence: L. E. Young 1916b.
- Sulfur in coal: Gilbert Thiessen 1934c, G. H. Cady 1919a, 1919e.
- Drill records: Jon A. Udden 1910a.
- Geophysical studies: Pryor 1956c, Pullen 1953.
- Ground water
- General: Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c.
- Analyses: Gluskoter 1965a, Ross Hanson 1950, Howell 1948.
- Igneous rocks: Clegg 1956.
- Lake deposits: E. W. Shaw 1915.
- Limestone and dolomite, petrology: P. E. Potter 1958b.
- Loess: Fehrenbacher 1965b.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, E. W. Shaw 1912b, 1915.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Siever 1951a.
- Structure: A. H. Bell 1943c, E. T. Benson 1935, R. S. Blatchley 1910a, G. H. Cady 1910, 1916, 1938, 1948b, Darton 1915, D. J. Fisher 1925b, Howell 1948, Pye 1944, Savage 1910b, E. W. Shaw 1912b, Siever 1951a, Swann 1951b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
- Benton water flood: Cameron 1951, Squires 1951.
- Development maps: Ill. GS 1965 maps 17, 18, 23, 24.
- Pools
- Benton: Howell 1948, Kornfeld 1952, Parkison 1957.
- Dale Consolidated: A. H. Bell 1959c.
- Waterflooding: Parkison 1957, Pryor 1957, Squires 1950a.
- Physiography: G. H. Cady 1910, R. F. Flint 1941, Leighton 1948b, MacClintock 1929, Savage 1910b, E. W. Shaw 1912b.
- Quadrangle studies
- Herrin: Savage 1910b, 1911a, 1911b, E. W. Shaw 1912b.
- West Frankfort: G. H. Cady 1910.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1958b, 1962a, 1962c, Siever 1953.
- Stratigraphy
- General: A. H. Bell 1964, R. S. Blatchley 1910a, DeWolf 1911, E. W. Shaw 1912b.
- Mississippian: P. L. Dana 1941, P. E. Potter 1958a, Pye 1944, Siever 1951a, Swann 1951b, 1958.

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 Stratigraphy—cont.
 Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1910, 1916, 1944, DeWolf 1911, D. J. Fisher 1925b, M. E. Hopkins 1958, Savage 1910b, 1911a, 1911b, Siever 1951a.
 Pleistocene: G. H. Cady 1916, Frye 1965c, Leighton 1961.
 Structure: E. T. Benson 1935, G. H. Cady 1916, 1938, S. K. Clark 1948, DeWolf 1911, D. J. Fisher 1925b, Savage 1910b, 1911a, 1911b, Stonehouse 1955, Swann 1951b.
 West Frankfort reservoir sediment: V. H. Jones 1937b, Stall 1951c.
 Worthen Survey report (v. 6): Worthen 1875a(2).
- Redonia Limestone Member (Miss.): Amstutz 1964, Bain 1905a, J. W. Baxter 1963a, Brecke 1962, Currier 1944, Folk 1946, Graf 1950b, Harris 1961, J. E. Lamar 1959, L. K. Lee 1939b, J. N. Payne 1940, Swann 1948, 1963, Tippie 1945, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1906b, 1907a, 1920b, 1939a.
- Reeburg Gas Pool: Meents 1959.
 Reeburg gas storage area: A. H. Bell 1961c, 1962b.
 Reeport Quadrangle: Doyle 1965.
 Friendsville Coal Member (Pa.): G. H. Cady 1952b, 1955, M. L. Fuller 1903, 1904, Kosanke 1950, 1960, Wanless 1939.
 Distribution map: G. H. Cady 1955.
 Structure map: Collingwood 1924a.
- Fucoids (see also under Paleontology): Templeton 1963, Johan A. Udden 1898a.
- Fuels (see also Coal, Mineral economics, Oil and gas)
 Competitive position: Voskuil 1936b.
 Heating oil market: Voskuil 1937b.
 In industry: Voskuil 1951a, 1957a, 1958, 1963.
 Synthetic liquid: F. H. Reed 1948a.
- Gulda Limestone (Pa.): Siever 1957a.
 Guller's earth (see Clay and shale): Amero 1951, Grim 1933, 1935a, J. E. Lamar 1928d, Leighton 1949b.
- Fulton County**
 Bedrock topography: Horberg 1950a, 1950b, W. H. Walker 1965, Wanless 1957a.
 Brines: Meents 1952.
 Clay and shale
 General: J. E. Lamar 1934, Parmelee 1921, Savage 1921a.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: Grim 1957, W. A. White 1960b.
 Refractory clay: J. E. Lamar 1956b, Lines 1917.
 Resources: W. A. White 1963.
- Coal
 General: G. H. Cady 1921, Culver 1925a, Ill. GS 1913, McFadden 1962, Wanless 1957a.
 Analyses: Abernethy 1961, Aresco 1953-1965, Ashley 1902, G. H. Cady 1921, 1935b, 1948a, H. M. Cooper 1942a, Fieldner 1942b, G. W. Hawley 1923, B. C. Parks 1956, Parr 1904, 1906b, 1915a, 1916, Savage 1921a, N. H. Snyder 1953, Gilbert Thiessen 1934c, Zubovic 1964.
 Ash analyses: Rees 1964, Gilbert Thiessen 1934c.
 Ash fusibility: Abernethy 1961.
 Beryllium in: Stadnichenko 1961.
 Boghead: Kosanke 1951.
 Cannel: Barrett 1922b.
 Chlorine in: Abernethy 1965, Gluskoter 1964.
 Economics of strip coal mining: H. D. Graham 1948.
 Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.
 Losses: C. A. Allen 1925.
 Mined-out areas: Ill. GS 1959b maps 11, 14.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports, C. A. Allen 1925, Andros 1915b, 1915c, G. H. Cady 1921, H. M. Cooper 1942b, Culver 1925a, Inman 1960, Savage 1921a.
 Minor elements in: Zubovic 1964.
 P, Cl, Na, and K in: Abernethy 1965.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, DeWolf 1908b.
 Strip-mine reclamation: H. D. Graham 1948.
 Strippable reserves: Culver 1925b, W. H. Smith 1963.
 Subsidence: L. E. Young 1916b.
 Sulfur in coal: Gilbert Thiessen 1934c.
- Copper erratic: Crook 1929.
 Dickson Mounds State Park: Frye 1965a, Wanless 1955a.
 Drill records: G. H. Cady 1921, Culver 1925a, Ross Hanson 1950, 1958, 1961, Leverett 1899a, Savage 1921a, Wanless 1957a, Worthen 1883(1), 1890(2).
 Farmington area guide leaflet: Ill. GS 1963-B.
 Feldspar: R. E. Hunter 1965, Willman 1942a.
 Fossil plant localities: Collinson 1960a.
 Geologic sections (described outcrops)
 Aylesworth Branch (Pa.): Savage 1921a.
 Babylon (Miss., Pa.): Wanless 1957a.
 Badger Creek (Miss., Pa.): Wanless 1957a.
 Banner (Pleis.): A. B. Leonard 1960.
 Bernadotte (Pa.): Wanless 1957a.
 Bethel School (Pa.): Wanless 1955a.
 Big Creek (Pa.): Savage 1921a, Wanless 1957a.
 Big Sister Creek (Pleis.): Wanless 1955a, 1957a.
 Canton (Pleis.): J. G. Smith 1964.
 Canton Southwest (Pa.): Savage 1921a.
 Coal Creek (Pa.): Kosanke 1960.
 C. B. & Q. Railroad Cut (Pa.): Kosanke 1960.
 Cuba (Pa.): Wanless 1957a.
 Duncan Mills (Pa.): Wanless 1955a, 1957a.
 East Creek (Pleis.): Wanless 1957a.
 Enion (Pleis.): F. C. Baker 1929, Wanless 1929b.
 Fiatt Mine (Pa., Pleis.): Wanless 1955a.

Fulton County—cont.

Geologic sections—cont.

- Fiatt Station (Pa.): Savage 1921a.
 Francis Creek (Pa.): Wanless 1957a.
 Hipple School (Pleis.): Frye 1960c, 1963c, 1965a.
 Jake Creek (Pa.): Wanless 1957a.
 Littlers Creek (Pa.): Savage 1921a.
 London Mills North (Pa.): Savage 1921a.
 Marietta Station (Pa.): Savage 1921a, Wanless 1957a.
 Middle Copperas Creek (Pa., Pleis.): Kosanke 1960, Wanless 1955a.
 Middle Grove (Pleis.): Leighton 1949a.
 Oak Grove School (Pa.): Wanless 1957a.
 Otter Creek (Pleis.): Wanless 1957a.
 Seahorne Branch (Pa., Pleis.): Wanless 1957a.
 Seville Station (Pa.): Savage 1921a.
 Sepo (Pleis.): R. L. Jones 1964.
 Shaw Creek (Pa.): Savage 1921a.
 Spoon River (Pa.): Wanless 1957a.
 Summum (Pa.): Wanless 1957a.
 T. P. & W. Railroad Cut (Pa.): Kosanke 1960, Wanless 1957a.
 Tater Bridge (Pa.): Wanless 1957a.
 Tater Creek (Pa.): Wanless 1957a.
 Turkey Branch (Pa.): Savage 1921a, Wanless 1957a.

Loess: Frye 1962e, 1963c, G. D. Smith 1942.
 Ground water

General: Bergstrom 1956a, Horberg 1950a, 1950b, Leverett 1899a, Savage 1921a, W. H. Walker 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Hydrology and chemistry: Horberg 1950b.

Limestone and dolomite

General: Krey 1925, J. E. Lamar 1934.

Building stone: Savage 1921a.

Resources: Harvey 1964.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a,

1950b, W. H. Walker 1965, Wanless 1957a.

Drift thickness: State geol. map.

Geologic: State geol. map, Horberg 1950b, Savage 1921a, W. H. Walker 1965, Wanless 1957a.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Wanless 1957a.

Structure: G. H. Cady 1921, Moulton 1925d, Savage 1916b, 1921a, Wanless 1957a, Whiting 1965b.

Mastodon: N. C. Anderson 1905.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

Gas in drift: Savage 1916b.

Oil shale: Barrett 1922b.

Possibilities: Moulton 1925d, Savage 1916b, 1921a, Wanless 1957a.

Physiography: Glock 1932, Leighton 1948b, W. H. Walker 1965, Wanless 1957a.

Quadrangle studies

Avon: Savage 1921a.

Beardstown: Wanless 1957a, 1958.

Canton: Savage 1921a.

Glasford: Wanless 1957a, 1958.

Havana: Wanless 1957a, 1958.

Vermont: Wanless 1957a, 1958.

Fulton County—cont.

Radiocarbon dates: Rubin 1958, 1960.

Sand and gravel

General: Savage 1921a.

Mineralogy: R. E. Hunter 1965, Willman 1942a.

Sandstone: J. C. Bradbury 1962a, Sieve 1956b, Wanless 1957a.

Sandstone channels: S. E. Ekblaw 1931.

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Stratigraphy

General: Bergstrom 1956a, Horberg 1950b, Savage 1921a, W. H. Walker 1965, Wanless 1957a.

Cambrian: Wanless 1957a.

Silurian: Lowenstam 1950, Whiting 1965b.

Devonian: Whiting 1965b.

Mississippian: Harvey 1964, Wanless 1957a, J. S. Williams 1957.

Pennsylvanian: J. C. Bradbury 1962a.

G. H. Cady 1921, Culver 1925a, S. E.

Ekblaw 1931, Kosanke 1960, Krumbein

1933a, 1947, Rusnak 1957, Savage 1921a

1927, W. H. Smith 1963, Wanless 1931a

1932b, 1955a, 1957a, 1958, J. M. Weller

1936a, 1942c, W. A. White 1963, Worthen

1882c, 1883(1).

Pleistocene: W. C. Alden 1917, F. C.

Baker 1929, 1931b, 1932, J. A. Brophy

1959, Frye 1963c, 1965a, Horberg 1950b.

Leighton 1961, 1965, A. B. Leonard 1960.

Leverett 1899a, MacClintock 1933, Mun-

son 1965, Savage 1917a, Staplin 1963c,

Wanless 1929b, 1955a, 1957a, Willman

1963.

Recent: F. C. Baker 1918.

Structure: G. H. Cady 1921, Moulton 1925d,

Savage 1916b, Wanless 1957a.

Uranium: Ostrom 1955.

Worthen Survey report (v. 4): Worthen 1870.

Fults Limestone Member (Miss.): J. W. Baxter

1960b.

Fungicides: Finger 1952, 1954.

G

Galatia Quadrangle: R. S. Blatchley 1910a, De Wolf 1908a.

Galatia Sandstone (Pa.): G. H. Cady 1926.

Galena (see Lead and zinc)

Galena Group, Dolomite, Limestone, Formation

(Ord.) (see also Galena-Platteville):

Agnew 1956, Athy 1928, Bain 1905b, 1907b.

J. R. Ball 1952, A. H. Bell 1964, Bieber

1942, J. C. Bradbury 1959b, 1965a, Bretz

1923, 1938, C. E. Brown 1960, Buschbach

1964, 1965, G. H. Cady 1919b, 1920b,

Cohee 1945a, G. H. Cox 1910, 1911, 1914,

Culver 1922a, Doyle 1965, DuBois 1945,

Edson 1935, D. J. Fisher 1925a, Grant

1908, Hackett 1960a, James Hall 1851,

Hobbs 1895, Horberg 1950b, R. H. How-

ard 1961, G. M. Kay 1929, 1935b, Keyes

1922a, 1937a, 1937b, Knappen 1926, J. E.

Lamar 1934, 1955a, Lowenstam 1948b,

Galena Group—cont.

Mullens 1964, Ross 1964b, Sardeson 1896, 1897a, 1907, 1937, Savage 1908, 1921b, E. W. Shaw 1916, James Shaw 1873, Shrock 1933, Templeton 1952, 1963, Thwaites 1927, Trowbridge 1916, Johan A. Udden 1896, Wanless 1929a, 1957a, J. M. Weller 1935c, 1952, Whitlow 1963, Whitney 1866, Willman 1942b, 1943a, 1943b, 1947, Worthen 1866a(4), Zeizel 1962a.

Distribution map: Sardeson 1907.

Fauna: Meek 1868a, E. W. Shaw 1916, Templeton 1963, Trowbridge 1916.

Isopach map: Buschbach 1964, DuBois 1945.

Paleogeographic map: Schuchert 1955.

Structure map: C. E. Brown 1960, Buschbach 1965, Cohee 1945a, Emrich 1962, John Webster Foster 1956, Grant 1908, Horberg 1946, 1950a, R. H. Howard 1961, Lowenstam 1948b, Pirtle 1932, E. W. Shaw 1916, Suter 1959, Templeton 1952, Trowbridge 1916, Wanless 1929a, Whiting 1965b, Willman 1942b, 1951.

Galena Junction Syncline: Willman 1947.

Galena Quadrangle: E. W. Shaw 1916, Trowbridge 1916.

Galena Syncline: J. C. Bradbury 1956, E. W. Shaw 1916, Willman 1947.

Galena Upland: Bain 1906b, Horberg 1946, 1950a, Trowbridge 1913.

Galena-Platteville Dolomite, Limestone, Formation (Ord.) (see Galena Group, Platteville Limestone): C. B. Anderson 1919, Caldwell 1964, John Webster Foster 1956, Hershey 1894, Ostrom 1957b, Poor 1927, Deette Rolfe 1929, C. O. Sauer 1916, Savage 1921c, Suter 1959, Workman 1926.

Isopach map: J. R. Ball 1935, Cohee 1945a, Suter 1959.

Galesburg dam, construction: Jelliff 1930.

Galesburg Plain: Horberg 1950a, Leighton 1948b.

Galesburg Quadrangle, oil possibilities: Poor 1927.

Galesville Sandstone (Camb.): A. H. Bell 1961c, 1964, Buschbach 1964, Guststadt 1958a, Hackett 1960a, Lochman 1956, Ostrom 1964, Wanless 1957a, Willman 1942b, Workman 1948, Zeizel 1962a.

Isopach map: Buschbach 1964, Willman 1942b, Workman 1948.

Structure map: A. H. Bell 1961c, Bergstrom 1955, Hackett 1960a, Willman 1942b.

Gallatin County

Bedrock topography: Fildar 1943, Horberg 1950a.

Brines: Meents 1952.

Carrier Mills area guide leaflet: Ill. GS 1965-A.

Caves: Bretz 1942.

Chert: J. W. Baxter 1965a, Butts 1925.

Clay and shale

General: J. W. Baxter 1965a.

Mineralogy: Smoot 1960a.

Resources: J. W. Baxter 1963a, Parham 1963a.

Coal

General: J. W. Baxter 1965a, Butts 1925, G. H. Cady 1919a, 1939e, Ill. GS 1913, Pullen 1951.

Gallatin County—cont.

Coal—cont.

Analyses: Aresco 1953-1965, G. H. Cady 1919a, 1934, 1935b, 1948a, DeWolf 1907a, 1907b, Fieldner 1942b, G. W. Hawley 1923, Helfinstine 1946, Lindgren 1908, B. C. Parks 1956, Parr 1915a, 1916, Zubovic 1964.

Beryllium in: Stadnichenko 1961.

Mined-out areas: Ill. GS 1959b maps 30, 32.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, Andros 1914c, G. H. Cady 1919a, DeWolf 1907a.

Minor elements in: Zubovic 1964.

P, Cl, Na, and K in: Abernethy 1965.

Petrology: Rees 1947.

Preparation: Boley 1949.

Production: Annual coal reports.

Reserves: G. H. Cady 1944, 1952b, Pullen 1951.

Strippable reserves: Culver 1925b, L. G. Henbest 1929, W. H. Smith 1957.

Subsidence: L. E. Young 1916b.

Drill records: A. H. Bell 1939c, G. H. Cady 1919a, Ross Hanson 1950.

Earthquakes: M. L. Fuller 1912.

Feldspar: Willman 1942a.

Fluorspar: J. W. Baxter 1963a, 1965a, Brush 1852, Silliman 1819, 1821a, 1821b.

Geologic sections (described outcrops)

Karbers Ridge (Miss.): Stuart Weller 1920b.

Shawneetown (Pleis.): F. C. Baker 1928b.

Geophysical studies: McGinnis 1964, Pullen 1953.

Giant beaver: F. C. Baker 1930b, LeConte 1854b.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956a.

Analyses: Bartow 1909b, Ross Hanson 1950, A. W. Palmer 1897.

Harrisburg area guide leaflet: Ill. GS 1960-F.

Igneous rocks: J. W. Baxter 1965a, J. C. Bradbury 1962b, Clegg 1956, L. G. Henbest 1929, McGinnis 1964, Oesterling 1952, Pullen 1951.

Iron ore: J. W. Baxter 1965a.

Lead and zinc: J. W. Baxter 1963a.

Limestone and dolomite: J. W. Baxter 1963a, 1965a, Butts 1925, Krey 1925.

Loess: Fehrenbacher 1965b, L. L. Ray 1963b.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, J. W. Baxter 1963a, 1965a, Butts 1925, E. O. Ulrich 1905, J. M. Weller 1940b, 1952.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Ostrom 1961a, P. E. Potter 1965, Siever 1951a.

Structure: A. H. Bell 1943c, Butts 1925, G. H. Cady 1919a, 1939e, DeWolf 1907a, English 1948, McDurmitt 1948, Pullen 1951, Siever 1951a, Swann 1951b.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Gallatin County—cont.

- Oil and gas
 General: R. S. Blatchley 1910a, Cohee 1942a, Swann 1951b.
 Development maps: Ill. GS 1965 maps 19, 20.
 Oil shale: Barrett 1922b.
- Pools
 Herald: McDurmitt 1948, Swann 1951b.
 Inman East: Swann 1951a, 1951b.
 Omaha: A. H. Bell 1959c, English 1948, Swann 1951b.
 Roland: Swann 1951a, 1951b.
 Possibilities: J. W. Baxter 1963a, 1965a, A. H. Bell 1939c, R. S. Blatchley 1910a, Butts 1925.
 Waterflooding: Pryor 1957, Squires 1950a.
- Physiography: Butts 1925, R. F. Flint 1941, Leighton 1948b, MacClintock 1929.
- Quadrangle studies
 Equality: Butts 1925.
 Karbers Ridge: J. W. Baxter 1965a.
 Saline Mines: J. W. Baxter 1963a.
 Shawneetown: Butts 1925.
- Sand and gravel
 Mineralogy: Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b.
- Sandstone: Andresen 1961, J. W. Baxter 1965a, Biggs 1955, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1954, 1962a, 1962c, 1963a, 1965, Siever 1953, 1956b, Swann 1951b.
- Springs: Peale 1886.
- Stratigraphy
 General: A. H. Bell 1964, R. S. Blatchley 1910a, Butts 1925, E. O. Ulrich 1905, Stuart Weller 1926c, Workman 1950b.
 Devonian: Meents 1965b.
 Mississippian: J. W. Baxter 1963a, 1965a, Butts 1925, P. L. Dana 1941, English 1948, P. E. Potter 1958a, 1965, Siever 1951a, Swann 1948, 1951b, 1958, J. M. Weller 1940b.
 Pennsylvanian: Andresen 1961, J. W. Baxter 1963a, 1965a, J. C. Bradbury 1962a, Butts 1925, G. H. Cady 1919a, 1944, DeWolf 1907a, 1907b, English 1948, M. E. Hopkins 1958, Jillson 1930, Wallace Lee 1916, Lesquereux 1866a, Parham 1963a, P. E. Potter 1965, Pullen 1951, Siever 1951a, W. H. Smith 1957, Worthen 1882c.
 Tertiary: Salisbury 1892.
 Pleistocene: F. C. Baker 1928b, 1931b, G. H. Cady 1919a, Fiddler 1948, Staplin 1963b, G. F. Wright 1890.
 Structure: J. W. Baxter 1963a, 1965a, G. H. Cady 1919a, 1939e, S. K. Clark 1948, DeWolf 1907a, English 1948, McGinnis 1964, Meents 1965b, Pullen 1951, 1953, Stonehouse 1955, Swann 1951b.
 Uranium: Ostrom 1955, Vine 1962.
 Worthen Survey report (v. 6): E. T. Cox 1875.
- Galum Limestone Member (Pa.): A. H. Bell 1931a, Kosanke 1960, Siever 1957a, Wanless 1939.
- Gamma-ray activity: W. L. Russell 1944.
- Ganister (see also Chert, Silica): J. E. Lamar 1928d, 1953a, Leighton 1949b, Parmelee 1946, Weigel 1927.
- Garden Plain Esker: Leverett 1899a, Shaffe 1954b, 1956.
- Garnavillo Member (Ord.): Templeton 1952, 1963.
- Gas (see Oil and gas)
- "Gas" Sand: R. S. Blatchley 1913a.
 Structure map: R. S. Blatchley 1913a.
- Gasconade Dolomite (Ord.): Workman 1948.
- Gasperian Stage (Miss.): Swann 1963.
- Geberding Pool: Root 1928.
- Geneva Dolomite Member (Dev.): Meents 1965b, Schwalb 1955.
 Isopach map: Schwalb 1955.
- Genevian Stage (Miss.): Swann 1963.
- Genoa Moraine: W. C. Alden 1904.
- Gentry Coal Member (Pa.) (see Battery Rock Coal)
 J. W. Baxter 1963a, 1965a, Kosanke 1960.
- Geochemical prospecting: J. C. Bradbury 1955a.
- Geochemistry (see also chemistry under rock type): Ernst 1964.
 Carbonate geochemistry bibliography: Graf 1960e.
 Carbonate rocks: Graf 1960a, 1960b, 1960c, 1960d.
 Isotopic analyses: Graf 1960d.
 Silica: Siever 1959.
- Geodes: Bassler 1909, Beachler 1892, Collinson 1964b, J. B. Hayes 1964, Hinds 1919, McKinley 1935, Perkins 1871, Robertson 1940, 1942, 1944, 1951, Van Tuyl 1912a, 1916, [1925], Wherry 1918, Worthen 1857.
 Petroliferous: Collinson 1964b, Robertson 1942, Spitznas 1949.
- Geographic positions: H. M. Wilson 1907.
- Geologic history, general: Anon. 1914, Livesay 1951.
- Geologic history through microscope: Workman 1931a.
- Geologic map of Illinois: James Hall 1843a, Hitchcock 1887, Horberg 1950a, Ill. GS 1961a, Leverett 1899a, Marcou 1853, Owen 1846, J. M. Weller 1945a, Stuart Weller 1906b, 1907a, 1912, 1917, Worthen 1875b.
- Geologic maps, general (see also county and quadrangle)
 Early mapping: Hutchins 1778, H. N. Stevens 1905, G. W. White 1962.
 Chicago region: Bretz 1943, Fryxell 1927.
 History: Hitchcock 1887.
 Index: Boardman 1953, Hitchcock 1872.
 North America: Stose 1946.
 Northwestern Illinois: Irving 1880.
 Progress and program: DeWolf 1923, Leighton 1934b, Logan 1866, J. M. Weller 1937c, 1939g.
 Relief model: Lawrence Martin 1910.
 Southern Illinois: J. M. Weller 1940b.
 United States: Lobeck 1941, Stose 1932.
- Geologic sections (see county): Named described sections of outcrops, including many with names devised from the accompanying text. Many sections identified only by township, range, and section are not included. The stratigraphic position of the section is identified by System, or Systems, abbreviated as follows:
 Pleis. — Pleistocene (Series)
 Ter. — Tertiary
 Cre. — Cretaceous
 Pa. — Pennsylvanian
 Miss. — Mississippian
 Dev. — Devonian

- Geologic sections—cont.
 Sil. — Silurian
 Ord. — Ordovician
 Camb. — Cambrian
 Precamb. — Precambrian
 Geological philosophy: Leighton 1931c.
 Geological Survey of Illinois history: N. W. Bliss 1890.
 J. G. Norwood, pioneer state geologist: **Keyes 1940d.**
 Progress report: Norwood 1853.
 Amos Henry Worthen, life and work: N. W. Bliss 1890.
 Geological surveys, history of: Leighton 1951c, Merrill 1906.
 Geology and the chemistry teacher: Cohee 1940a.
 Geology and the State: Mendenhall 1931.
 Geology for everyone: Carroll 1931a.
 Geology for young men: Bain 1908c.
 Geology, history: GSA 1941.
- Geophysics**
 (See also under county)
 General: Bays 1942a, Hunzicker 1949, P. L. Lyons 1948.
 Aeromagnetic studies: Beck 1965, J. R. Henderson 1951a, 1951b, 1958, McGinnis 1964.
 Electric logging: Street 1961, E. F. Taylor 1944a.
 Exploration in fluorspar district: J. M. Weller 1952.
 Gamma-ray activity: W. L. Russell 1944.
 Geophysical logs: Buschbach 1965, Meents 1965b.
 Gravity surveys: Heigold 1964, McGinnis 1963b, Woollard 1943.
 Magnetic surveys: Jenny 1941, P. S. McClure 1932, Woollard 1943.
 Vertical magnetic intensity maps: P. S. McClure 1932, McGinnis 1961b.
 Magnetic gradient: Jenny 1939.
 Oil prospecting: Cohee 1938a.
 Radioactivity of coal: Patterson 1954.
 Radio wave transmission: Pullen 1950, 1953.
 Resistivity: Bays 1943a, 1944b, 1945c, Buhle 1953, 1955, 1958a, 1958b, 1964, Dobrovolsky 1953, John Webster Foster 1951a, Hubbert 1932a, 1932b, 1934, 1944, P. S. McClure 1935, Workman 1937c.
 Glacial deposits: Hackett 1956b, McGinnis 1961a.
 Ground water: Bays 1943b, 1950, Pryor 1956c.
 Seismic studies: R. B. Johnson 1954, 1957, 1964, McGinnis 1961a, Rudman 1960.
- Geothermal gradients: Van Ostrand 1934, 1935.
 Germanium: Machin 1956, Zubovic 1964.
 Giant beaver: F. C. Baker 1930b, Cahn 1929, 1936, LeConte 1854b.
 Gibson City Dome: Heigold 1964.
 Gila Coal (Pa.): Newton 1937b.
 Gila Cyclothem (Pa.): Kosanke 1960, Newton 1937b, 1941.
 Gila Limestone Member (Pa.): Kosanke 1960, Newton 1937b, Wanless 1939.
 Gila Pool: A. H. Bell 1959c.
 Gilberts Moraine: Leighton 1934b.
 Gilchrist Shale (Pa.): Wanless 1929a, 1939.
 Gillespie gas storage area: A. H. Bell 1961c, 1962b.
- Gillespie Quadrangle: Wallace Lee 1915, 1917, 1926.
 Gimlet Coal (Pa.): Wanless 1957a.
 Gimlet Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, MacClintock 1959, Newton 1937b, Wanless 1931a, 1931b, 1957a, 1958, Willman 1942b.
 Fauna: Wanless 1958.
 Gimlet Sandstone Member (Pa.): Kosanke 1960, MacClintock 1959, Wanless 1957a.
 Girardeau Limestone (Sil.): J. R. Ball 1939, 1941, Bleining 1912, J. E. Lamar 1959, Pryor 1962a, Savage 1909b, 1910a, 1913a, 1913c, 1914b, 1926, J. M. Weller 1940a, 1940c.
 Fauna: Savage 1910a, 1913a, 1913c, E. O. Ulrich 1926.
 Paleogeographic map: Schuchert 1955.
 Glacial boulders: Hubbard 1911.
 Glacial boundary: G. F. Wright 1892.
 Glacial depression and forebulge: Frye 1963d.
 Glacial drift, permeability: Knodle 1949.
 Glacial lakes (see under Pleistocene)
 Glacial map: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Glacial Period, Glacial geology (see Pleistocene Series)
 Glacial Period life: F. C. Baker 1920b.
 Glacial record and deep-sea temperatures: Frye 1962a.
 Glacial striae: W. C. Alden 1902, Barrows 1910, Chamberlin 1888, D. J. Fisher 1925a, Leverett 1899a, Pettijohn 1964, Wanless 1957a.
 Glacial time, prehistoric man: Leighton 1932b.
 Glaciation, southern limit: Bonnell 1922, Harris 1961, J. E. Lamar 1925b, Willman 1963.
 Glasford cryptoexplosion structure: Buschbach 1963.
 Glasford Quadrangle: Wanless 1957a, 1958.
 Pleistocene stratigraphy: Leighton 1930d.
 Glass sand (see Sand and gravel)
 Glaucinite: Bagg 1910, Grim 1951a.
 Glen Dean Limestone (Miss.): J. W. Baxter 1963a, 1965a, J. C. Bradbury 1963, Butts 1925, Cohee 1942b, C. L. Cooper 1941, Coryell 1939a, Currier 1944, P. L. Dana 1941, DuBois 1951, English 1948, Folk 1946, Harris 1961, J. E. Lamar 1925a, 1959, L. K. Lee 1939b, J. M. Parks 1953, P. E. Potter 1958a, 1963a, Rexroad 1958b, Ross 1964b, Smoot 1958, A. H. Sutton 1934b, 1952, Swann 1963, E. O. Ulrich 1917, J. M. Weller 1940a, 1940b 1940c, 1952, Stuart Weller 1920a, 1920b, 1939a, Willman 1949, Workman 1940.
 Fauna: Coryell 1942, Croneis 1932a, McFarlan 1942, A. H. Sutton 1939, Zeller 1953.
 Isopach map: Cohee 1942b.
 Paleogeographic map: Schuchert 1955.
 Structure map: DuBois 1951, Sloan 1939, Smoot 1958, Spitznagel 1939b.
- Glen Park Limestone, "Glen Park" Formation (Miss.): P. E. Cloud 1948, Collinson 1954, 1958c, 1961, R. C. Moore 1935, Rubey 1952, Workman 1956.
 Isopach map: Workman 1956.
 Glenarm Pool: Whiting 1956.
 Glenco Member (Ord.): Templeton 1963.
 Glenhaven Member (Ord.): Templeton 1952, 1963.
 Glenridge Anticline: A. H. Bell 1926b.

- Glenwood Formation, Shale (Ord.) (see also Glenwood-St. Peter): Agnew 1956, Bevan 1925b, 1926, Buschbach 1964, 1965, Dapples 1955, Doyle 1965, S. G. Elder 1937, John Webster Foster 1956, Hackett 1960a, Knappen 1926, Deette Rolfe 1929, Templeton 1952, 1963, Wanless 1929a, 1957a, Willman 1942b, Workman 1957a, Zeizel 1962a.
- Isopach map: Buschbach 1964, Willman 1942b.
- Structure map: Buschbach 1964, Cohee 1945b, Hackett 1956a, McGinnis 1963b, Suter 1959, Willman 1942b, Zeizel 1962a.
- Glenwood Stage, Beach (Lake Chicago): W. C. Alden 1902, 1904, 1918, Atwood 1908, F. C. Baker 1912, J. R. Ball 1929a, Bretz 1939, 1951, 1955, 1964, J. W. Goldthwait 1909, Hough 1953, 1958, Leverett 1899a, 1915, G. F. Wright 1918.
- Aquatic life: J. R. Ball 1929a.
- Paleogeographic map: J. W. Goldthwait 1909.
- Glenwood-St. Peter Sandstone (Ord.): Suter 1959, Zeizel 1962a.
- Isopach map: Suter 1959, Zeizel 1962a.
- Cross-bedding: P. E. Potter 1961b.
- Golconda Dike: Bain 1905a, J. C. Bradbury 1962b.
- Golconda Group, Limestone (Miss.): Atherton 1947, J. W. Baxter 1963a, 1965a, Butts 1917a, 1925, C. L. Cooper 1941, Coryell 1939a, Croncis 1939b, Currier 1944, P. L. Dana 1941, Easton 1943, English 1948, Folk 1946, Harris 1961, Keyes 1933e, J. E. Lamar 1925a, 1959, McFarlan 1955, Malott 1952, J. M. Parks 1953, Ross 1964b, Rexroad 1961b, A. H. Sutton 1934b, 1952, Swann 1948, 1963, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1920a, 1920b, 1939a, Workman 1940.
- Fauna: Easton 1945a, McFarlan 1942, A. H. Sutton 1939, Zeller 1953.
- Paleogeographic maps: Schuchert 1955.
- Structure map: Brownfield 1954, Cohee 1942a, Easton 1943, P. E. Potter 1956c.
- Golconda, mammoth: Crook 1926.
- Golconda Quadrangle: Stuart Weller 1921a.
- Gold: Hershey 1899b, Knappen 1926.
- Gold Hill Anticline: Brokaw 1916.
- Golden Eagle Coal (Pa.): Culver 1925a.
- Goldengate Pool: Meents 1965b.
- Good Hope Dike: J. W. Baxter 1965a.
- Good Hope Quadrangle: Nebel 1919, Savage 1921c.
- Goose Creek Fault System: J. W. Baxter 1963a, 1965a, R. B. Johnson 1957.
- Goose Lake area: Grim 1939a.
- Goose Lake Clay (see also Clay and shale): Grim 1939a, Kosanke 1960, Parmelee 1922, Wanless 1939.
- Goose Lake Valley: Carman 1910.
- Gordonville Member (Ord.): Templeton 1963.
- Goreville Anticlinal Nose: J. M. Weller 1940a.
- Goreville Limestone Member (Miss.): Swann 1963.
- Gower Member (Sil.): Carman 1910.
- Graham-Ginte Syncline: Willman 1947.
- Grand Detour Esker: Knappen 1926.
- Grand Detour Formation (Ord.): A. H. Bell 1964, Buschbach 1964, Doyle 1965, Templeton 1952, 1963.
- Grand Tower area: Warthin 1944.
- Grand Tower Limestone (Dev.): Bassett 1925 Caylor 1944, C. L. Cooper 1944, W. F. Hoover 1944, J. E. Lamar 1959, Meents 1965b, Ross 1964b, Savage 1910c, 1921, 1925a, J. M. Weller 1939e, 1940a, 1940c, 1944a, 1944b, 1952, Stuart Weller 1928, Whiting 1965b, Willman 1949.
- Facies map: Meents 1965b.
- Fauna: Meek 1868a, Savage 1910c.
- Isopach map: Meents 1965b, Whiting 1965b.
- Paleogeographic map: Schuchert 1955.
- Granger Sandstone Member (Pa.) (see Curlew Ss.): Kosanke 1960.
- Grants Intrusive: J. C. Bradbury 1962b.
- Granville Basin: Willman 1942b.
- Grape Creek Coal (Pa.) (see Herrin (No. 6) Coal): Ashley 1902, F. H. Bradley 1870, G. H. Cady 1942a, M. R. Campbell 1900, Culver 1925b, F. H. Kay 1915b, Kosanke 1960, Wanless 1939, J. M. Weller 1939b.
- Flora: M. R. Campbell 1900.
- Isopach map: G. H. Cady 1935a.
- Graphite: Shrode 1954a.
- Graphite wettability: Eissler 1962.
- Grassy Creek Shale (Dev.): J. R. Ball 1952, Col-linson 1954, 1958b, 1961, 1964b, Keyes 1898, R. C. Moore 1929, Wanless 1957a, J. M. Weller 1936d, 1940b, J. S. Williams 1957, Workman 1956.
- Isopach map: Workman 1956.
- Grassy Knob Chert, Limestone (Dev.): Bassett 1925, J. E. Lamar 1948, 1953a, Ross 1964b, Savage 1925a, J. M. Weller 1939c, 1940a, 1940c, 1944a, 1944b, Workman 1944.
- Gravel (see Sand and gravel)
- Grays Lake Quadrangle: W. E. Powers 1940.
- Grayville West Pool: Squires 1950b.
- Great Lake Section (Physiography): Horberg 1950a, Leighton 1948b.
- Great Lakes Basin: F. P. Shepard 1937.
- Great Lakes, origin: Claypole 1882.
- Green River Bedrock Valley: John Webster Foster 1956, Horberg 1950a.
- Green River Glacial Lobe: Leighton 1923a, Shaffer 1954b, 1956.
- Green River Lowland: John Webster Foster 1956, Horberg 1946, Leighton 1948b, 1961, Shaffer 1954a.
- Green River watershed: Pickels 1929.
- Greenbush Coal Member (Pa.): Kosanke 1950, 1960, Wanless 1939, 1957a.
- Greenbush Cyclothem (Pa.): Kosanke 1960, Wanless 1931a, 1931b, 1957a, 1958.
- Fauna: Wanless 1958.
- Greenbush Limestone Member (Pa.): Wanless 1957a.
- Greenbush Sandstone (Pa.): Siever 1959.
- Greenbush Shale (Pa.): Wanless 1931b.
- Greene County**
- Bedrock topography: Horberg 1950a.
- Clay and shale
- General: J. E. Lamar 1934, Parmelee 1921, 1922, Rubey 1952.
- Bonding clay: Grim 1940f.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: Grim 1957, W. A. White 1960b.

Greene County—cont.

Clay and shale—cont.

Refractory clay: Lines 1917, Parmelee 1921, Purdy 1907.

Resources: Parham 1963a.

Coal

General: Culver 1925a, Rubey 1952.

Analyses: G. H. Cady 1935b, 1948a, Parr 1916.

Mined-out areas: Ill. GS 1959b map 19.

Mining: Annual coal reports, Andros 1915b.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, J. N. Payne 1942.

Strippable reserves: W. H. Smith 1961.

Subsidence: L. E. Young 1916b.

Drill records: Collingwood 1933, Easton 1942.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Fossil horsetooth: O. P. Hay 1909.

Geologic sections (described outcrops)

Bluffdale (Pleis.): A. B. Leonard 1960.

Carrollton (Pleis.): MacClintock 1929.

Eldred (Pleis.): R. L. Jones 1964.

Hillview (Pleis.): Frye 1962e, R. L. Jones 1964.

Whitehall (Pa.): Parmelee 1921, Purdy 1907.

Ground water

General: Bergstrom 1957, Horberg 1950a, Leverett 1899a.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

Limestone and dolomite: Krey 1925, J. E. Lamar 1934, Rubey 1952.

Loess: Frye 1962e, Leighton 1950b, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Rubey 1952, J. M. Weller 1940b.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Structure: Collingwood 1933, J. N. Payne 1942, Rubey 1952, W. H. Smith 1961, Whiting 1965b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas, possibilities: Collingwood 1933, Easton 1942.

Physiography: Leighton 1948b, MacClintock 1929, Rubey 1952.

Quadrangle studies, Hardin: Rubey 1952.

Sand and gravel: Rubey 1952.

Mineralogy: R. E. Hunter 1965, Willman 1942a.

Sandstone: J. C. Bradbury 1962a, Siever 1956b.

Stratigraphy

General: Bergstrom 1957, Collingwood 1933, Rubey 1952.

Ordovician: H. W. Scott 1951, Workman 1941.

Silurian: Lowenstam 1949b, Whiting 1965b.

Devonian: Whiting 1965b.

Mississippian: Beachler 1892, J. M. Weller 1940b, J. S. Williams 1957, Workman 1956.

Greene County—cont.

Stratigraphy—cont.

Pennsylvanian: J. C. Bradbury 1962a, Culver 1925a, Parham 1963a, J. N. Payne 1942, W. H. Smith 1961, Wanless 1947b, J. M. Weller 1930c.

Pleistocene: Frye 1965c, R. L. Jones 1963a, Leighton 1965, A. B. Leonard 1960, Leverett 1899a, MacClintock 1929, 1933, Willman 1963.

Recent: Stall 1959.

Structure: Collingwood 1933, Meents 1954, J. N. Payne 1942.

Tufa: Rubey 1952.

Uranium: Ostrom 1955.

Worthen Survey report (v. 3): Worthen 1868(2).

Greenfield Coal (Pa.): Culver 1925a.

Greenridge Syncline: J. R. Ball 1952.

Greensand (see Sand and gravel)

Greenup Cyclothem (Pa.): Kosanke 1960, Newton 1937b, 1941.

Greenup Limestone Member (Pa.): Kosanke 1960, Newton 1937b, Wanless 1939, 1955b, J. M. Weller 1942c.

Paleogeographic map: Schuchert 1955.

Greenville Dome: A. H. Bell 1941b.

Greenville Gas Field: A. H. Bell 1935a.

Greenville Pool: R. S. Blatchley 1914a.

Greenville Front: D. B. McLaughlin 1954.

Griffin Pool: Spitznagel 1939b.

Griffin-Mt. Carmel Fault: S. K. Clark 1948.

Grimes Anticline: Easton 1942.

Grindstaff Cyclothem (Pa.): Kosanke 1960, J. M. Weller 1940a.

Grindstaff Sandstone Member (Pa.): J. W. Baxter 1963a, 1965a, Butts 1925, Desborough 1959a, Kosanke 1960, P. E. Potter 1957, Siever 1959, Wanless 1939.

Ground water

(See also under county)

General:

Anon. 1956b, Bergstrom 1956b, 1958a, 1958c, S. E. Ekblaw 1932, John Webster Foster 1953, Gerber 1935b, 1945, Howson 1947, Ill. State Div. Indus. Planning and Dev. 1958, Ill. Water and Drouth Study Comm. 1957, Leverett 1896, 1899a, 1905, McGuinness 1951, Mead 1893, R. B. Riggs 1890, C. W. Rolfe 1903, Thwaites 1927, Walton 1962a, 1963, C. B. Williams 1915.

Analyses:

W. C. Alden 1902, C. B. Anderson 1914, 1919, Bartow 1908a, 1908b, 1909a, 1909b, 1913, Boruff 1929, Bowman 1907, Buswell 1941, 1943, G. H. Cady 1912b, 1919b, Carney 1897, Corson 1916, Emrich 1963a, D. J. Fisher 1925a, Gerber 1935a, 1935b, Glenn 1906, Gluskoter 1965a, Habermeyer 1925, 1938, 1940, Hackett 1956b, Ross Hanson 1945, 1950, 1955, 1958, 1961, Hinds 1919, Horberg 1950b, Howell 1948, Ill. State Water Sur. 1920, 1940, 1957, Knappen 1926, Knowles 1963, T. E. Larson 1949, 1951, 1960, 1963, Leverett 1896, Lohr 1953, H. F. Lucas 1958, A. W. Palmer 1897, 1903, Pryor 1956b, 1956c, Rees 1928, Savage 1907, 1921b, 1921c, Schicht 1965, E. W. Shaw 1913, 1916, 1921, 1923, C. U. Shepard 1838, H. F. Smith 1948, 1950a, Suter 1959, Johan A. Udden

Ground water—cont.

Analyses—cont.

- 1915, W. H. Walker 1965, H. J. Weiland 1916, C. B. Williams 1915, Worthen 1870, Zeisel 1962a.
- Anna well pollution: Workman 1928.
- Aquifer evaluation: Suter 1952, Walton 1961, 1964c.
- Argonne National Laboratory: Knowles 1963.
- Artesian wells: C. B. Anderson 1915a, Bartow 1909b, Pratt 1882, C. W. Rolfe 1890, A. R. Schultz 1907, E. M. Shepard 1905, Leander Stone 1886, Walton 1960b, Willman 1942b.
- Associated with coal: Gluskoter 1965a.
- Bedrock valleys: Amsbary 1955, Horberg 1943b, 1950a, Ill. Water & Drouth Study Comm. 1957, W. D. P. Warren 1927, Workman 1932, 1937b.
- Bloomington, history: Maxwell 1923.
- Boiler waters: C. B. Anderson 1919, Bartow 1909b.
- Brines (see also under county): Bredehoeft 1963, Dapples 1959, Meents 1952.
- Cambrian-Ordovician aquifer: Walton 1962a.
- Classification of water: Bartow 1909b.
- Chlorine in: Gluskoter 1964.
- Computer analysis: Walton 1960a, 1964a.
- Cretaceous aquifers: Boswell 1965.
- Dolomite aquifers: Walton 1963.
- Dolomite wells, shallow: Csallany 1963.
- Drouth study: Ill. Water and Drouth Study Comm. 1957.
- Earth resistivity studies (see also Geophysics): Buhle 1953, 1955, 1958b, 1964, Workman 1937c.
- Exploration: Bays 1943b, Buhle 1955, Workman 1930.
- Flowing wells (see Artesian wells)
- Fluid flow: Rose 1958c.
- Electrokinetics: Street 1959b, 1961.
- Electroviscosity: Street 1959a.
- Kozeny paradox: Rose 1957a.
- Farm supply: John Webster Foster 1954.
- Gas storage in aquifers: Witherspoon 1962.
- Geohydrologic units: Hackett 1960a, Maxey 1963, Suter 1959, Zeisel 1962a.
- Geophysical investigations (see also Earth resistivity): Bays 1942a, 1945b, 1950, Buhle 1958a, Leighton 1945a, W. J. Roberts 1947.
- Geophysical logging water wells: Bays 1943a, 1943b, 1944b, 1945c.
- Glacial drift reservoirs: John Webster Foster 1953, Leighton 1933e.
- Hydrogeology: Maxey 1964a, Mead 1893.
- Hydrologic investigations: USGS 1960-1966.
- Hydrology: John Webster Foster 1951b, Horberg 1950b, Schicht 1961.
- Hydrostratigraphic units: Maxey 1964b.
- Illinois laws: Anon. 1960b.
- Industrial: Lohr 1953.
- Infiltration capacity values: Horner 1940.
- Joliet munitions plants: Gobble 1942.
- Lake County resettlement project: Lamb 1942.
- Law, water use: Mann 1964.
- Leaky artesian aquifers: Walton 1960b.
- Levels through 1961: R. R. Russell 1963.
- Limestone and dolomite aquifers: Bergstrom 1958c.
- Limestone wells: Workman 1931b.

Ground water—cont.

- Maps: Bergstrom 1958b.
- Mathematical models: Walton 1960a.
- Medicinal springs: Bartow 1909b.
- Mineralization: Thwaites 1935b.
- Oil field instruments use: Bays 1942c.
- Permeability of drift: Knodle 1949.
- Pollution: Workman 1928.
- Radiation environments: Holtzman 1964.
- Radioactivity: Emrich 1963a, T. E. Larson 1960, 1961, H. F. Lucas 1958, Clarence Scholl 1917, R. C. Scott 1962.
- Recharge of deep aquifer: Foley 1955.
- Refuse disposal: Sheaffer 1963.
- Reservoirs: Kazmann 1958.
- Resources, general: Bergstrom 1958c, Gerber 1937a, Hackett 1960b, Ill. State Chamber of Commerce Water Resource Committee 1956, McGuinness 1951.
- Resources in regions (see also county)
- Central: W. H. Walker 1961.
- East St. Louis: Bergstrom 1956b, Bowman 1907, Bruin 1953, Fenneman 1910, Searcy 1952.
- East-central: Selkregg 1958.
- Havana: W. H. Walker 1965.
- Northeastern: C. B. Anderson 1915a, Bergstrom 1962, Bruin 1964, Buswell 1950, T. E. Larson 1964, Pincus 1962, Prickett 1964, Sheaffer 1963, Suter 1959, Walton 1964c, 1965, Zeisel 1962a.
- Northern: Caldwell 1963, Csallany 1963, G. E. Ekblaw 1930b, Gerber 1930, Hackett 1960a, Walton 1962b, Willman 1942b.
- Northwestern: Bergstrom 1955, John Webster Foster 1956, Hackett 1956a.
- Peoria: Horberg 1950b, Suter 1944.
- Rockford: J. N. Payne 1938, H. F. Smith 1950b.
- South-central: Selkregg 1957.
- Southeastern: Walton 1965.
- Southern: Cushing 1963, Glenn 1906, Ill. State Water Sur. 1949, 1957, Annemarie Krause 1941, Pryor 1956a, Roos 1942.
- Southwestern: Walton 1965.
- Western: Bergstrom 1956a, 1957, Wanless 1957a.
- Salt-water springs: Willman 1942b.
- Sandstone wells, deep: Walton 1962a, 1962b, 1964b.
- Specific capacity data: Walton 1963.
- Springs (see under county)
- Static head: C. B. Anderson 1919.
- Subsurface methods: Bays 1945b.
- Subsurface sample studies: Hackett 1960b.
- Supplies and research: Frye 1962b.
- Temperature: C. B. Anderson 1919.
- Train loading effect: W. J. Roberts 1947.
- Uranium in: R. C. Scott 1962.
- Waterflooding in oil fields: Pryor 1957.
- Water storage during floods: Suter 1947.
- Well drilling: Bays 1942b, 1942c, Imbt 1933, H. F. Smith 1957.
- Well locations: Imbt 1933.
- Grove Church Shale (Miss.): Swann 1963.
- Grover Gravel (Ter.): Rubey 1952, Willman 1958a.
- Grundite (see also Clay and shale): Eschenburg 1956.

Grundy County

- Bedrock topography: Horberg 1950a, Suter 1959, Willman 1940, 1942b.

Grundy County—cont.

Clay and shale

- General: Culver 1922a, Eschenburg 1956, J. E. Lamar 1931b, 1934, Parmelee 1921, 1922, Willman 1942b.
 Bonding clay: Grim 1940f.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 In coal mines: Stull 1917.
 Mineralogy: Grim 1938b, 1939a, W. A. White 1960b.
 Refractory clay: Lines 1917, Parmelee 1921, Willman 1942b.
 Resources: W. A. White 1964a.

Coal

- General: G. H. Cady 1915a, Culver 1922a, Dinsmore 1889, Ill. GS 1913, Jasper Johnson 1875, Rothwell 1891, Willman 1942b.
 Analyses: Ashley 1902, G. H. Cady 1935b, 1948a, Culver 1922a, Fieldner 1942b, Lindgren 1908, B. C. Parks 1956, Parr 1904, 1906b, 1915b, 1916, Willman 1942b, Zubovic 1964.
 Ash analyses: Rees 1964.
 Beryllium in: Stadnichenko 1961.
 Flora (see Mazon Creek fossils)
 Mined-out areas: Ill. GS 1959b maps 1, 7, 8.
 Mining: Annual coal reports, Andros 1914a, Anon. 1896b, H. M. Cooper 1942b, Culver 1922a, C. O. Sauer 1916.
 Minor elements in: Zubovic 1964.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, DeWolf 1908b.
 Strippable reserves: Culver 1925b.
 Subsidence: L. E. Young 1916b.

- Drill records: C. B. Anderson 1919, Buswell 1941, G. H. Cady 1915a, Culver 1922a, Ross Hanson 1950, 1961, J. E. Lamar 1933, Willman 1942b.

Feldspar: Willman 1942a.

Fossils (see Mazon Creek fossils)

Geologic sections (described outcrops)

- Aux Sable Creek (Ord.): Savage 1925b.
 Bill's Run (Pleis.): C. O. Sauer 1916.
 Goose Lake (Pa.): Culver 1922a, Parmelee 1921.
 Hog Run (Pleis.): C. O. Sauer 1916.
 Mazon River (Pa.): Culver 1922a.
 Nettle Creek (Pleis.): Willman 1942b.
 Waupecan Creek (Pa.): Willman 1942b.

Geophysical studies: Beck 1965.

Ground water

- General: C. B. Anderson 1919, Bergstrom 1955, Buswell 1941, Culver 1922a, Horberg 1950a, Leverett 1899a, Suter 1959, Thwaites 1927, Willman 1942b.
 Analyses: Ross Hanson 1950, 1961, A. W. Palmer 1897.

Artesian waters: C. B. Anderson 1919.

- Limestone and dolomite: Culver 1922a, Goldsmith 1958b, Krey 1925, J. E. Lamar 1931b, 1933, Ostrom 1957b.

Maps (see also type of map, stratigraphic units)

- Bedrock topography: Culver 1922a, Horberg 1950a, Suter 1959, Willman 1942b.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Culver 1922a, Horberg 1953, J. E. Lamar 1931b, Ostrom

Grundy County—cont.

Maps—cont.

Geologic—cont.

- 1957b, C. O. Sauer 1916, Suter 1959, Willman 1942b.

- Glacial: State geol. map, G. E. Ekblaw 1941, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.

- Mineral industries: Ill. GS 1961, Willman 1942b.

Paleogeologic: Willman 1942b.

- Structure: Athy 1928, Beck 1965, G. H. Cady 1915a, Culver 1922a, Suter 1959, Thwaites 1927, Willman 1942b.

- Mastodon: N. C. Anderson 1905, Bagg 1909.

- Mineral economics: Voskuil 1942d.

- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

- Morris area guide leaflet: Ill. GS 1961-C.

- Oil and gas, possibilities: Culver 1922a.

- Physiography: Culver 1922a, Leighton 1948b, C. O. Sauer 1916, Willman 1942b.

Quadrangle studies

- Marseilles: Willman 1942b.

- Morris: Culver 1922a.

Sand and gravel

- General: Culver 1922a, Willman 1942b.

- Mineralogy: Willman 1942a.

- Molding sand: Littlefield 1925a, Willman 1939b.

- Sandstone: J. C. Bradbury 1962a, P. E. Potter 1963a, Siever 1956b, Willman 1942b.

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- Springs: Peale 1886.

Stratigraphy

- General: C. B. Anderson 1919, Culver 1922a, C. O. Sauer 1916, Suter 1959, Willman 1942b.

- Ordovician: Culver 1922a, Gutstadt 1958b, J. E. Lamar 1931b, Savage 1924b, 1925b, Templeton 1963.

- Mississippian: Romer 1934.

- Pennsylvanian: J. C. Bradbury 1962a, G. H. Cady 1915a, F. M. Carpenter 1938, Culver 1922a, Gregory 1950, Romer 1934, Wanless 1947b, Willman 1942b.

- Pleistocene: F. C. Baker 1922a, 1931b, G. H. Cady 1915a, Dinsmore 1889, Horberg 1953, Leverett 1899a, C. O. Sauer 1916, Sharp 1942, Willman 1942b, 1963, Zumberge 1960.

- Structure: Culver 1922a, Horberg 1950a, Thwaites 1927, Willman 1942b.

- Uranium: Ostrom 1955.

- Worthen Survey report (v. 4): F. H. Bradley 1870.

Guidebooks (see also Ill. GS Guide Leaflets)

- Baltimore and Ohio Railroad: Grimsley 1933.

- Central: Leighton 1932a, 1953.

- Mississippi Valley: Leighton 1949a.

- Northeastern: Frye 1965b, Leighton 1932a, 1953, Lowenstam 1956, Willman 1950, 1962.

- Northern: Frye 1965a, 1965b, Templeton 1952.

- Northwestern: J. M. Weller 1935c.

- St. Louis Region: Collinson 1954, 1958e, Willman 1958a.

- Southeastern: G. M. Wilson 1959.

- Southern: Harris 1961.

- Southwestern: Swann 1956, J. M. Weller 1939e, Willman 1949.

Guidebooks—cont.

- Western: Collinson 1954, 1957, 1961, Frye 1963c, 1965a, Wanless 1955a, J. M. Weller 1941b.
- Gulf Coastal Plain Province: G. E. Murray 1961.
- Gulfian Series (Cre.): State geol. map, Pryor 1960, 1961b.
- Facies map: Pryor 1960.
- Isopach map: Pryor 1960, 1961b.
- Gumbotil: V. T. Allen 1959, 1962, Frye 1960a, 1960b, Leighton 1930f, 1962, Leverett 1930, Simonson 1954, Trowbridge 1961.
- Uses: J. E. Lamar 1938b.
- Gunn Member (Camb.): Buschbach 1964, Templeton 1950.
- Gunter Sandstone (Ord.): A. H. Bell 1964, Buschbach 1964, Ostrom 1957b, Templeton 1952, Wanless 1957a, Willman 1951, Workman 1948.
- Gurley fossil collection: Stuart Weller 1900a.
- Guttenberg Formation (Ord.): Agnew 1956, Buschbach 1964, 1965, Doyle 1965, DuBois 1945, G. M. Kay 1929, Mullens 1964, Templeton 1952, 1963, Willman 1947.
- Structure map: J. C. Bradbury 1956.
- Gypsum and anhydrite (see also county): Ill. State Div. Indus. Planning and Dev. 1959, Krumbain 1951, J. E. Lamar 1938d, 1957b, 1965, Saxby 1957.

H

- Hadley Bedrock Valley: Bretz 1955, Horberg 1943b, Suter 1959.
- Hadley Gravel Member (Cre.): Frye 1964a.
- Halide systems, phase relations: Deadmore 1960a.
- Hall Cyclothem (Pa.): Kosanke 1960, Wanless 1947b, J. M. Weller 1942c.
- Hall Limestone Member (Pa.): Kosanke 1960, Wanless 1956, J. M. Weller 1942c.
- Halloysite (see Clay and shale)
- Hamburg Member, Oolite (Dev.): J. R. Ball 1952, P. E. Cloud 1948, J. M. Weller 1940b, Stuart Weller 1906c, J. S. Williams 1957.

Hamilton County

- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Clay and shale, mineralogy: Smoot 1960a, 1960b.
- Coal
- Mining and production: Annual coal reports.
- Reserves: G. H. Cady 1939e, 1944, 1952b, Rolley 1951.
- Drill records: Bain 1908g, A. H. Bell 1939c, R. S. Blatchley 1910a, Jon A. Udden 1907.
- Geophysical studies: Pryor 1956c.
- Ground water: Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c, R. B. Riggs 1890.
- Limestone and dolomite: Graf 1950b.
- Loess: Fehrenbacher 1965b.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Hamilton County—cont.

Maps—cont.

- Mineral industries: Ill. GS 1961.
- Paleogeologic: Siever 1951a.
- Structure: A. H. Bell 1943c, G. H. Cady 1939e, Rolley 1951, Siever 1951a, Swann 1951b, 1958.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
- Dale Consolidated Pool: A. H. Bell 1959c.
- Development maps: Ill. GS 1965 maps 18, 19, 22, 23, 34, 35.
- Possibilities: A. H. Bell 1939c.
- Waterflooding: Pryor 1957, Squires 1950a.
- Physiography: R. F. Flint 1941, Leighton 1948b, MacClintock 1929.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962a, 1962c, 1963c, Smoot 1960b.
- Springs: Peale 1886, R. B. Riggs 1890, USGS 1890.
- Stratigraphy
- General: A. H. Bell 1964, R. S. Blatchley 1910a, Swann 1958.
- Devonian: Meents 1965b.
- Mississippian: P. E. Potter 1958a, Siever 1951a, Swann 1948, 1951b, 1958, 1964.
- Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, M. E. Hopkins 1958, Rolley 1951, Siever 1951a.
- Pleistocene: Leighton 1961, Leverett 1899a.
- Structure: G. H. Cady 1939e, Meents 1965b, Rolley 1951, Stonehouse 1955, Swann 1951b.
- Worthen Survey report (v. 6): Worthen 1875a(2).
- Hamilton Limestone, Group (Dev.): Bleininger 1912, Meek 1861c, Savage 1908, 1925a, Worthen 1868(2), 1870, 1873(2).
- Facies map: L. B. Freeman 1951.
- Fauna: Meek 1868a.
- Hamp Fault: J. W. Baxter 1965a, J. S. Brown 1954, J. M. Weller 1952.
- Hamp Mine Dikes: J. W. Baxter 1965a.

Hancock County

- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Building stone: Conover 1884.
- Clay and shale
- General: Bleininger 1912, Hinds 1917, J. E. Lamar 1934, Savage 1921c.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: W. A. White 1960b.
- Refractory clay: Lines 1917.
- Resources: W. A. White 1963.
- Coal
- General: Culver 1925a, Hinds 1914, 1917, Savage 1921c.
- Analyses: G. H. Cady 1948a, Parr 1916, Reinertsen 1964.
- Mined-out areas: Ill. GS 1959b map 13.
- Mining: Annual coal reports, Andros 1915b.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1952b.

Hancock County—cont.

Coal—cont.

- Strippable reserves: Culver 1925b, Reinertsen 1964.
 Subsidence: L. E. Young 1916b.
 Drill records: A. H. Bell 1932e, Culver 1925a, M. L. Fuller 1906, Ross Hanson 1950, 1958, Krey 1924, Leverett 1899a, Nebel 1919, Workman 1948, Worthen 1890(2).
 Feldspar: Willman 1942a.
 Fluorspar: J. C. Bradbury 1957a.
 Geodes: Collinson 1964b, J. B. Hayes 1964, McKinley 1935, Perkins 1871, Van Tuyl 1912a, 1916, [1925], Wherry 1918.
 Geologic sections (described outcrops)
 Cedar Glen (Miss.): Collinson 1964b, Van Tuyl [1925].
 Elderville (Pleis.): Horberg 1956b.
 Fountain Green (Pleis.): Hinds 1919.
 Fountain Green Township (Miss.): Hinds 1919, Savage 1921c, Wanless 1957a.
 Geode Glen, Type Warsaw (Miss.): Collinson 1964b.
 Grays Quarry (Miss.): Collinson 1964b, Rexroad 1965a.
 Hamilton (Ter., Pleis.): Horberg 1956b, Leighton 1949a.
 Jackson Cemetery (Miss.): Collinson 1964b.
 LaHarpe Creek (Miss.): Savage 1921c.
 Larry Creek (Miss.): J. M. Weller 1941b.
 Mt. Mariah (Miss.): Collinson 1964b.
 Nauvoo (Miss.): Van Tuyl [1925].
 Niota (Miss.): Van Tuyl [1925].
 Panther Creek (Miss.): Hinds 1919.
 Soap Factory Hollow (Miss.): Van Tuyl [1925].
 Sonora, Mt. Mariah (Miss.): Collinson 1964b, Van Tuyl [1925], J. M. Weller 1941b.
 Spillman Creek (Miss.): Rexroad 1965a.
 Tyson South (Miss.): Collinson 1964b.
 Warsaw (Miss.): Bleining 1912, Collinson 1964b, Keyes 1933c, Rexroad 1965a, Van Tuyl [1925], J. M. Weller 1941b.
 Geophysical studies: Buhle 1953.
 Ground water
 General: Bergstrom 1957, Buhle 1953, Horberg 1950a, Leverett 1899a, Savage 1921c.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, A. W. Palmer 1897.
 Hamilton area guide leaflet: Ill. GS 1961-B.
 Lake Carthage sediment: Stall 1953.
 Limestone and dolomite
 General: Hinds 1917, Krey 1925, J. E. Lamar 1934, Savage 1921c.
 Cement materials: Bleining 1912, Hinds 1917, 1919.
 Mineralogy: Goldsmith 1962.
 Loess: Frye 1962e, Leighton 1950b.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Hinds 1919, Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Shaffer 1954a, J. M. Weller 1940b.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Workman 1944.
 Structure: A. H. Bell 1932e, 1943c, Hinds 1914, 1917, Krey 1924, Morse 1915, Nebel

Hancock County—cont.

Maps—cont.

Structure—cont.

- 1919, Reinertsen 1964, Savage 1921c, Whiting 1965b.
 Mastodon: N. C. Anderson 1905, Bagg 1909.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas: Hinds 1919, F. H. Kay 1917a.
 Colmar-Plymouth Pool: R. S. Blatchley 1914c, Flood 1934, 1938.
 Development maps: Ill. GS 1965 map M.
 Gas in drift: Meents 1960.
 Petroliferous geodes: Collinson 1964b, Spitznas 1949.
 Possibilities: A. H. Bell 1932e, Hinds 1914, Morse 1915, Nebel 1919, Savage 1921c.
 Physiography: Hinds 1919, Leighton 1948b, Savage 1921c.
 Quadrangle studies
 Colchester: Hinds 1917, 1919.
 LaHarpe: Nebel 1919, Savage 1921c.
 Sand and gravel: Hinds 1917, Savage 1921c.
 Glass sand: Hinds 1919.
 Mineralogy and petrology: G. W. Andrews 1958, J. E. Lamar 1951, Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b.
 Orange sands: Salisbury 1891a.
 Sandstone: Hinds 1917, Savage 1921c, Siever 1956b.
 Sandstone channels: S. E. Ekblaw 1931.
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 Springs: Peale 1886.
 Stratigraphy
 General: Ballard 1938, Bergstrom 1957, Bleining 1912, Hinds 1919, Krey 1924, Morse 1915, Nebel 1919.
 Cambrian: Workman 1948.
 Ordovician: Agnew 1955b, Workman 1948.
 Silurian: Whiting 1965b.
 Devonian: Whiting 1965b, Workman 1935d, 1944.
 Mississippian: Bassler 1937, Beachler 1892, A. H. Bell 1932e, Butts 1915, Collinson 1964b, Gordon 1895, James Hall 1857b, Hinds 1917, Keyes 1933c, Morse 1915, Savage 1921c, A. H. Sutton 1938, Van Tuyl 1912b, [1925], J. M. Weller 1940b, 1941b, Stuart Weller 1908, J. S. Williams 1957, Workman 1956, Worthen 1857.
 Pennsylvanian: Culver 1925a, S. E. Ekblaw 1931, Hinds 1914, 1917, Keyes 1940a, Reinertsen 1964, Savage 1921c, Wanless 1931b, W. A. White 1963.
 Tertiary: Gordon 1892, J. E. Lamar 1951, Leighton 1949a, Salisbury 1892.
 Pleistocene: Horberg 1956b, Leighton 1961, Leverett 1899b, Savage 1921c, Shaffer 1954a, Willman 1963.
 Structure: A. H. Bell 1932e, Hinds 1914.
 Worthen Survey report (v. 1): Worthen 1866a(2).
 Haney Limestone (Miss.): J. W. Baxter 1963a, 1965a, J. C. Bradbury 1963, McFarlan 1955, P. E. Potter 1963a, Swann 1963, 1964.
 Isopach map: Swann 1964.

- Hanging Rock Sandstone (Pa.): Worthen 1875a(2).
 Hannibal Shale, Group (Miss.): J. R. Ball 1952,
 R. H. Benson 1958, Collingwood 1933,
 Collinson 1954, 1957, 1958b, 1958e, 1961,
 1964a, Conkin 1965, Keyes 1892b, Krey
 1924, R. C. Moore 1929, 1935, Rubey
 1952, Wanless 1929a, 1957a, J. M. Weller
 1940b, 1941b, J. S. Williams 1957, Work-
 man 1956.
- Hanover Limestone Member (Pa.): Kosanke
 1960, J. E. Lamar 1934, Reinertsen 1964,
 Wanless 1939, 1955b, 1957a, J. M. Weller
 1942c, Willman 1942b.
- Hardin County**
- Barite: J. C. Bradbury 1959a, Brecke 1964a.
 Bedrock topography: Horberg 1950a.
 Building stone: Conover 1884.
 Caves: Bretz 1942, 1961.
 Chert: J. W. Baxter 1965a.
 Clay and shale
 General: J. W. Baxter 1965a, J. E.
 Lamar 1948, 1959.
 Bonding clay: Grogan 1945.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: Smoot 1960a.
 Refractory clay: J. E. Lamar 1956b.
 Resources: J. W. Baxter 1963a, J. C.
 Bradbury 1960a.
 Coal: J. W. Baxter 1963a, 1965a.
 Mining and production: Annual coal re-
 ports.
 Reserves: G. H. Cady 1952b.
 Strippable reserves: W. H. Smith 1957.
 Cryptovolcanic structure: J. S. Brown 1954.
 Drill records: Ross Hanson 1950, J. M. Weller
 1940a.
 Feldspar: R. E. Hunter 1965, Willman 1942a.
 Fluorspar
 General: O. E. Anderson 1953, Anon.
 1958, Bailie 1960, Bain 1904a, 1904b,
 1905a, E. S. Bastin 1931b, 1932, 1942, J.
 W. Baxter 1963a, 1965a, Bishop 1948, John
 Bradbury 1817, Brecke 1964a, Burk 1901,
 Burmeister 1952, Cleveland 1822, Currier
 1937b, 1944, S. F. Emmons 1893, W. H.
 Emmons 1929, Fellman 1926, Finger 1960,
 Fohs 1907, 1910, W. E. Hall 1963, Harwood
 1903, Hatmaker 1938, Ladoo 1927, Mont-
 gomery 1960, Muir 1947, A. B. Needham
 1949, Pough 1932, Reeder 1930, 1932, R. W.
 Schaefer 1961, Schwerin 1928, Spurr 1926,
 A. S. Swanson 1948, E. O. Ulrich 1903,
 J. M. Weller 1940a, 1952, Stuart Weller
 1920b.
 Bedding-replacement deposits: E. S. Bas-
 tin 1932, Grogan 1949b.
 Cave in Rock district: Brecke 1962, A. B.
 Needham 1949.
 Crystal-Victory Mine: Montgomery 1960.
 Daisy Mine: Muir 1947.
 Dubois fluorite property: A. S. Swan-
 son 1948.
 Hillside Mine: Reeder 1932.
 Knox Mine: Burmeister 1952.
 Lee Mine: Bishop 1947b.
 Minerva No. 1 Mine: O. E. Anderson
 1953, Montgomery 1960.
 Mining and milling: W. H. Harrison
 1960, C. F. Jackson 1936.
 Mining history: Norwood 1866.
 Optical fluorite: Pogue 1918.
 Ore genesis: Amstutz 1964.
- Hardin County—cont.
 Fluorspar—cont.
 Ozark-Mahoning Mine: Bailie 1960.
 Photoluminescence: Gunnell 1933.
 Rare earths: Trace 1960.
 Rosiclare Mine: W. H. Harrison 1960,
 R. W. Schaefer 1961.
 Victory Mine: Bishop 1948.
 Yingling Mine: Burmeister 1952.
- Geologic sections (described outcrops)
 Battery Rock (Pa.): Kosanke 1960.
 Benzon Mine (Miss.): G. M. Wilson
 1959.
 Big Creek (Miss.): Stuart Weller 1920b.
 Birds Point (Miss.): Stuart Weller 1920b.
 Downeys Bluff (Miss.): G. M. Wilson
 1959.
 Eichorn (Pleis.): J. E. Lamar 1948.
 Fairview Point (Miss.): Bleininger 1912.
 Golconda Bluff (Miss.): Stuart Weller
 1920b.
 Harris Creek (Miss.): Rexroad 1958b.
 Hicks Branch (Dev., Miss.): Workman
 1956.
 Indian Point (Miss.): Swann 1956, J. M.
 Weller 1939e, Stuart Weller 1920b.
 Rosiclare (Miss.): E. O. Ulrich 1905,
 Stuart Weller 1920b.
 Geophysical studies: R. B. Johnson 1957,
 1964, Hubbert 1944, McGinnis 1964, Pul-
 len 1953, J. M. Weller 1952.
 Golconda area guide leaflet: Ill. GS 1962-A.
 Ground water
 General: Horberg 1950a, Leverett 1899a,
 Pryor 1956a.
 Analyses: Ross Hanson 1950.
 Igneous rocks: Bain 1904a, 1905a, J. W. Bax-
 ter 1965a, J. C. Bradbury 1955b, 1962b,
 Brecke 1962, Clegg 1956, McGinnis 1964,
 F. G. Snyder 1965, Tolman 1939, J. M.
 Weller 1940a, 1952, Stuart Weller 1920b.
 Iron ore: J. W. Baxter 1965a, Stuart Weller
 1920b.
 Lead and zinc
 General: J. W. Baxter 1963a, Cleave-
 land 1822, Fohs 1910, E. O. Ulrich 1903,
 Stuart Weller 1920b, Worthen 1868(2).
 Also lead mine: Grogan 1946.
 Mining: John Bradbury 1817.
 Limestone and dolomite
 General: J. W. Baxter 1963a, 1965a,
 Krey 1925, J. E. Lamar 1934, 1959, Stuart
 Weller 1920b.
 Agricultural limestone: Van Horn 1907.
 Cement materials: Bleininger 1912, J. E.
 Lamar 1956b, 1959.
 Insoluble residues: Tippie 1943.
 Mineralogy: Graf 1950b, Grim 1937a.
 Resources: J. W. Baxter 1963a, Harvey
 1962.
 Loess: J. W. Baxter 1963a, 1965a, Fehren-
 bacher 1965b.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Bain 1905a,
 J. W. Baxter 1963a, 1965a, J. E. Lamar
 1948, F. G. Snyder 1965, E. O. Ulrich
 1905, J. M. Weller 1940b, 1952, Stuart
 Weller 1920b.
 Mineral industries: Ill. GS 1961.

Hardin County—cont.

Maps—cont.

Paleogeologic: L. B. Freeman 1944a, Ostrom 1961a, P. E. Potter 1965, Workman 1956.

Structure: Butts 1917b, J. M. Weller 1940a, 1952, Stuart Weller 1920b.

Mineral industries: J. E. Lamar 1928d.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas, possibilities: J. W. Baxter 1963a, 1965a, Butts 1917b, J. M. Weller 1940a, Stuart Weller 1920b.

Oil shale: Barrett 1922b, Winchester 1919.

Physiography: Bain 1905a, R. F. Flint 1941, Leighton 1948b, J. M. Weller 1952, Stuart Weller 1920b.

Pyromorphite: Grogan 1946.

Quadrangle studies

Cave in Rock: J. W. Baxter 1963a.

Dekoven: J. W. Baxter 1963a.

Karbers Ridge: J. W. Baxter 1965a.

Repton: J. W. Baxter 1963a.

Rosiclare: J. W. Baxter 1965a.

Saline Mines: J. W. Baxter 1963a.

Sand and gravel, mineralogy: R. E. Hunter 1965, Willman 1942a.

Sandstone: J. W. Baxter 1963a, 1965a, Biggs 1955, P. E. Potter 1962c, 1965.

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Springs: Peale 1886.

Stratigraphy

General: Bain 1904a, 1905a, J. W. Baxter 1963a, 1965a, A. H. Bell 1964, Bleininger 1912, J. S. Brown 1954, Butts 1917b, S. F. Emmons 1893, Swann 1958, E. O. Ulrich 1905, J. M. Weller 1940a, 1952, Stuart Weller 1921a, 1921b, 1926c, G. M. Wilson 1959.

Ordovician: Gutstadt 1958b, Workman 1950b.

Silurian: Lowenstam 1950.

Devonian: J. M. Weller 1940a, Stuart Weller 1920b, Workman 1944.

Mississippian: Atherton 1947, Bain 1905a, J. W. Baxter 1963a, 1965a, Butts 1917a, Coryell 1939a, 1939b, 1942, Croneis 1932a, Geis 1936, McFarlan 1942, 1955, P. E. Potter 1958a, 1965, Rexroad 1962, A. H. Sutton 1931, 1932, 1934a, 1952, Swann 1948, 1958, 1963, Tippie 1945, E. O. Ulrich 1917, J. M. Weller 1940a, 1940b, 1948b, 1952, Stuart Weller 1920a, 1920b, Workman 1956.

Pennsylvanian: J. W. Baxter 1963a, 1965a, Jillson 1930, Kosanke 1960, Wallace Lee 1916, P. E. Potter 1965, W. H. Smith 1957, J. M. Weller 1940a, Stuart Weller 1920b.

Pleistocene: J. W. Baxter 1963a, 1965a, J. M. Weller 1940a.

Stromatolite and witherite: Grawe 1949.

Structure: Bain 1904a, 1905a, J. W. Baxter 1963a, 1965a, Brecke 1962, J. S. Brown 1954, S. K. Clark 1948, Currier 1944, Hubbert 1934, 1944, McGinnis 1964, Stonehouse 1955, J. M. Weller 1952.

Uranium: J. C. Bradbury 1955b, Ostrom 1955.

Worthen Survey report (v. 1): Worthen 1866a(6).

Hardin Quadrangle: Rubey 1952.

Hardin Sand, Pay Zone: Lowenstam 1948b.

Hardin Syncline: Collinson 1954, 1957, Rubey 1952.

Hardinsburg Formation, Sandstone (Miss.): J. W. Baxter 1963a, 1965a, Butts 1917a, 1925, Coryell 1939a, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, Hoffmeister 1961, J. E. Lamar 1925a, P. E. Potter 1958a, 1962a, 1963a, 1963c, Ross 1964b, A. H. Sutton 1934b, 1952, Swann 1948, 1963, 1964, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1920b, 1939a, Workman 1940.

Flora: Hoffmeister 1955b.

Isopach map: P. E. Potter 1962a, 1963a.

Harmony Hill Shale Member (Ord.): Templeton 1952, 1963.

Harris Valley: Heigold 1964.

Harrisburg Fault: G. H. Cady 1919a.

Harrisburg (No. 5) Coal Member (Pa.): Andros 1914c, 1915a, Butts 1925, G. H. Cady 1916, 1917, 1919a, 1925, 1926, 1927, 1942a, 1944, 1952b, 1955, Clegg 1955a, 1959, 1965b, DeWolf 1907a, 1907b, 1908a, English 1948, D. J. Fisher 1925a, J. A. Harrison 1951, L. G. Henbest 1929, F. H. Kay 1915a, Kosanke 1950, 1960, Lowenstam 1951, C. E. Marshall 1958, Noe' 1926, Parham 1963b, B. C. Parks 1956, P. E. Potter 1956c, Pullen 1951, Rolley 1951, Savage 1909a, 1910b, E. W. Shaw 1912b, Siever 1950, 1951b, Sims 1944, H. L. Smith 1951, W. H. Smith 1957, 1958, Wanless 1939, 1965, J. M. Weller 1939b, F. E. Williams 1955, Winslow 1959, L. E. Young 1916b.

Beryllium in: Stadnichenko 1961.

Friability: C. M. Smith 1930.

Isopach map: G. H. Cady 1935a, J. A. Harrison 1951, Sims 1944.

Methane in: Darton 1915.

Structure map: Butts 1925, G. H. Cady 1919a, 1925, DeWolf 1907a, 1907b, 1908, English 1948, P. E. Potter 1956c.

Harrison Creek Anticline: Heyl 1965, J. M. Weller 1940a, 1940c.

Harristown Pool: Whiting 1956.

Harrodsburg Limestone (Miss.): J. W. Baxter 1965a, Pinsak 1957, Ross 1964b, Stuart Weller 1906b, 1907a.

Hartline Chert (Miss.): J. E. Lamar 1953a, J. M. Weller 1940c.

Harvey Quadrangle: Bretz 1943, 1955.

Havana Quadrangle: Wanless 1957a, 1958.

Pleistocene stratigraphy: Leighton 1928.

Havana Strath: John Webster Foster 1951a, Horberg 1946, 1950a, W. H. Walker 1965.

Havana Terrace: W. H. Walker 1965, Wanless 1957a.

Haw Creek Dome: Poor 1927.

Hazel Green Member (Ord.): Templeton 1952, 1963.

Hazelhurst Esker: Leverett 1899a.

Hazelwood Member (Ord.): Templeton 1952, 1963.

Heathsville Pool: Rich 1916a.

Heavy liquids, reclaiming: Cohee 1937.

Heavy minerals

Cambrian: Wilgus 1933.

Cretaceous-Tertiary: G. W. Andrews 1958, Frye 1964a, J. E. Lamar 1930b, Pryor 1960.

Mississippian: Atherton 1960, Biggs 1955.

Heavy minerals—cont.

- Mounting method: C. W. Spencer 1960.
 Ordovician: J. E. Lamar 1927d, Willman 1943a.
 Paleozoic: P. E. Potter 1961b.
 Pennsylvanian: Andresen 1961, Atherton 1960, Biggs 1955, J. C. Bradbury 1962a, M. E. Hopkins 1958, Parham 1959a, P. E. Potter 1958b, Siever 1956b.
 Pleistocene: Frye 1960c, 1962e, 1964a, 1965a, Leighton 1950b, Manos 1961, Shrode 1954b, Wascher 1960, Willman 1963.
 Weathering profiles: J. A. Brophy 1959, Frye 1960c.
 Hebert Pool: Rich 1916b.
 Helderbergian Group, Series; Helderberg Limestone (Dev.): Bleininger 1912, James Hall 1859, 1874, Meek 1868a, Savage 1908, 1920, J. M. Weller 1944a, Worthen 1868(2), 1871.
 Hely Member (Ord.): Templeton 1952, 1963.

Henderson County

- Bedrock topography: Horberg 1950a.
 Brines: Meents 1952.
 Building stone: Conover 1884.
 Caves: Bretz 1961.
 Clay and shale: Savage 1921c, W. A. White 1963.
 Coal: Culver 1925a, Reinertsen 1964, Savage 1921c.
 Drill records: Ross Hanson 1950, Leverett 1899a, Nebel 1919, Wanless 1929a.
 Feldspar: R. E. Hunter 1965, Willman 1942a.
 Geologic sections (described outcrops)
 Dallas City (Pleis.): Frye 1962e.
 Ellison Creek (Miss.): Savage 1921c.
 Ground water: Bergstrom 1956a, Horberg 1950a, Leverett 1899a, Savage 1921c.
 Analyses: Bartow 1909b, Ross Hanson 1950.
 Limestone and dolomite: Krey 1925, J. E. Lamar 1934, Savage 1921c.
 Cement materials: Bleininger 1912, J. E. Lamar 1956b.
 Loess: Frye 1962e, Shimek 1908.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Currier 1944, Shaffer 1954a, J. M. Weller 1940b.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: A. H. Bell 1928a, Currier 1944, Nebel 1919, Reinertsen 1964, Savage 1921c, Whiting 1965b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Gas in drift: Meents 1960.
 Possibilities: A. H. Bell 1928a, Moulton 1925d, Nebel 1919, Savage 1921c.
 Physiography: Currier 1944, Leighton 1948b, Savage 1921c.
 Quadrangle studies
 LaHarpe: Nebel 1919, Savage 1921c.
 Sand and gravel: Savage 1921c, Johan A. Udden 1898b.
 Mineralogy: R. E. Hunter 1965, Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b.
 Sandstone: Savage 1921c.

Henderson County—cont.

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 Stratigraphy
 General: A. H. Bell 1928a, Bergstrom 1956a, Bleininger 1912, Nebel 1919.
 Ordovician: Agnew 1955b, Gutstadt 1958b.
 Silurian: Whiting 1965b.
 Devonian: Whiting 1965b.
 Mississippian: Currier 1944, Savage 1921c, J. M. Weller 1940b, J. S. Williams 1957.
 Pennsylvanian: Culver 1925a, Reinertsen 1964, Savage 1921c, Wanless 1931b, W. A. White 1963.
 Pleistocene: Frye 1965c, Leighton 1961, Savage 1921c, Shaffer 1954a.
 Structure: A. H. Bell 1928a, Meents 1954.
 Worthen Survey report (v. 4): H. A. Green 1870.
 Hennepin Quadrangle: G. H. Cady 1912b, 1919b.
 Hennepin Syncline: Willman 1942b.

Henry County

- Bedrock topography: Carman 1910, Horberg 1950a.
 Clay and shale
 Mineralogy: Chatard 1886, F. W. Clarke 1897, Parham 1961.
 Coal
 Analyses: Abernethy 1961, Aresco 1953, 1965, G. H. Cady 1935b, 1948a, Fieldner 1942b, L. C. McCabe 1935, Parr 1904, 1906b, 1916, Rees 1943b, N. H. Snyder 1953, Zubovic 1964.
 Ash analyses: Rees 1964.
 Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.
 Beryllium in: Stادنichenko 1961.
 Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.
 Mined-out areas: Ill. GS 1959b maps 3, 6.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports, Andros 1915b, H. M. Cooper 1942b.
 Minor elements in: Zubovic 1964.
 P, Cl, Na, and K in: Abernethy 1965.
 Petrology: Rees 1947.
 Preparation: L. C. McCabe 1935, 1939a, Mitchell 1937.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, Culver 1925a.
 Strippable reserves: G. H. Cady 1937c, W. H. Smith 1963.
 Subsidence: L. E. Young 1916b.
 Drill records: Culver 1925a, DuBois 1945, M. L. Fuller 1905, Ross Hanson 1950, 1958, 1961, Johan A. Udden 1914, Wanless 1929a, Warthin 1944, Workman 1948.
 Feldspar: Willman 1942a.
 Geologic sections (described outcrops)
 Cambridge (Pa.): Willman 1942b.
 Kewanee (Pleis.): Leighton 1949a.
 Ground water
 General: Bergstrom 1956a, Horberg 1950a, Leverett 1899a, Thwaites 1927.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Limestone and dolomite: Krey 1925.

Henry County—cont.

- Loess: Carman 1910, Frye 1962e, Leighton 1950b, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
Bedrock topography: Carman 1910, Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Carman 1910, Horberg 1953, Shaffer 1954a.
- Glacial: State geol. map, G. E. Ekblaw 1941, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Structure: Buschbach 1965, Thwaites 1927.
- Mastodon: N. C. Anderson 1905, Bagg 1909.
- Milan-Rock Island area guide leaflet: Ill. GS 1960-D.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Physiography: Carman 1910, Leighton 1948b.
- Sand and gravel
General: Horberg 1950b, Johan A. Udden 1898b.
- Dune sand: Carman 1910.
- Mineralogy: G. W. Andrews 1958, Willman 1942a.
- Molding sand: Littlefield 1925a, 1925b, Willman 1939b.
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- Stratigraphy
General: Bergstrom 1956a, Buschbach 1965, Carman 1910.
- Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.
- Cambrian: A. H. Bell 1964, Buschbach 1965, Workman 1948.
- Ordovician: A. H. Bell 1964, Buschbach 1965, Gutstadt 1958b, Workman 1948.
- Devonian: Warthin 1944.
- Pennsylvanian: Culver 1924, 1925a, O'Brien 1963b, Parham 1961, Rhodes 1952, W. H. Smith 1963, Wanless 1931b, 1932b.
- Tertiary: Horberg 1950b.
- Pleistocene: W. C. Alden 1917, F. C. Baker 1928b, Culver 1925a, Frye 1958b, 1965a, Horberg 1953, Leighton 1923a, Leverett 1898b, Shaffer 1954a, Willman 1963.
- Structure: Horberg 1950a, Meents 1954, Thwaites 1927.
- Uranium: Ostrom 1955.
- Worthen Survey report (v. 5): James Shaw 1873.

- Herald Fault: Pullen 1951.
- Herald Pool: McDurmitt 1948, Swann 1951b.
- Herald-Phillipstown Fault: J. A. Harrison 1951, Pryor 1956b.
- Hermon Coal Underclay (Pa.): O'Brien 1963b.
- Hermon Coal Member (Pa.) (see Lower DeLong Coal): Kosanke 1960, W. H. Smith 1963.
- Hermon Cyclothem (Pa.) (see Lower DeLong Cyc.): Kosanke 1960.
- Herod Fault: J. M. Weller 1952, Stuart Weller 1920b.
- Herrin Limestone (Pa.) (see Brereton Ls.): J. R. Ball 1952, A. H. Bell 1931a, G. H. Cady 1926, Kosanke 1960, Lowenstam 1951, Pullen 1951, Rolley 1951, Siever 1951b, 1957a, H. L. Smith 1951, Wanless 1955b.
- Herrin (No. 6) Coal Member (Pa.) (see Grape Creek (No. 6) Coal): Andros 1914c, 1914d,

Herrin (No. 6) Coal Member—cont.

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- Colchester (No. 2) Coal to Danville (No. 7) Coal: P. E. Potter 1956c.
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- Galena-Platteville: Cohee 1945a, Wanless 1957a, Willman 1942b.
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- Hardinsburg to Jackson: Swann 1958.
- Harrisburg (No. 5) Coal to Herrin (No. 6) Coal: Lowenstam 1951, P. E. Potter 1962c.

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Lake deposits: E. W. Shaw 1915.

Limestone and dolomite:

- General: Krey 1925, J. E. Lamar 1925a,
 1934.

- Building stone: J. E. Lamar 1925a.

- Cement materials: Bleininger 1912, J. E.
 Lamar 1956b.

- Mineralogy: Grim 1937a.

Loess: Leighton 1950a, E. W. Shaw 1912b,
 G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

- Bedrock topography: Horberg 1950a.

- Drift thickness: State geol. map.

- Geologic: State geol. map, Desborough
 1958, 1961b, J. E. Lamar 1925a, E. W.
 Shaw 1912b, J. M. Weller 1940b, 1940c,
 Stuart Weller 1939b.

- Glacial: State geol. map, R. F. Flint
 1959, Leighton 1961, Leverett 1899a.

- Mineral industries: Ill. GS 1961.

- Structure: A. H. Bell 1943c, R. S. Blatch-
 ley 1910a, G. H. Cady 1917, 1938, Dar-
 ton 1915, D. J. Fisher 1925b, J. E. Lamar
 1925a, Root 1928, Savage 1910b, E. W.
 Shaw 1912b.

Mastodon: Bagg 1909.

Mineral production (see USBM Minerals Year-
 book, Ill. GS Illinois Mineral Industry)

Oil and gas

- Development maps: Ill. GS 1965 maps 16,
 17.

Pools

- Ava-Campbell Hill: A. H. Bell 1940b.

- Carter: Root 1928.

- Combs: Root 1928.

- Ditch: Root 1928.

- Downen: Root 1928.

- Lange: Root 1928.

- Morris: Root 1928.

- Rickenburg: Root 1928.

- Possibilities: A. H. Bell 1938a, J. E. La-
 mar 1925a, St. Clair 1917b, 1917d.

- Prospecting: Mylius 1920b.

Physiography:

- Cozzens 1940, Desborough
 1961b, R. F. Flint 1941, Hart 1912,
 J. E. Lamar 1925a, Leighton 1948a, Mac-
 Clintock 1929, Marbut 1898, Savage 1910b,
 E. W. Shaw 1912b, J. E. Todd 1892, Wor-
 then 1868(2).

Quadrangle studies

- Alto Pass: J. M. Weller 1940c.

- Campbell Hill: Stuart Weller 1939b.

- Carbondale: J. E. Lamar 1925a.

- Herrin: Savage 1910b, 1911a, 1911b,
 E. W. Shaw 1912b.

- Murphysboro: E. W. Shaw 1911b, 1912b.

Jackson County—cont.

Quadrangle studies—cont.

- Pomona: Desborough 1961b

Sand and gravel

- General: J. E. Lamar 1925a.

- Mineralogy: R. E. Hunter 1965.

- Molding sand: Littlefield 1925a, 1925b.

- Sandstone: Biggs 1955, J. C. Bradbury 1962a,
 M. E. Hopkins 1958, P. E. Potter 1958b,
 1962a, Siever 1953, 1956b, E. W. Shaw
 1912b.

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Stratigraphy

- General: Bleininger 1912, Desborough
 1958, Leighton 1939, St. Clair 1917b, E. W.
 Shaw 1911a, 1912b, Stuart Weller 1926c,
 1939b.

- Cretaceous: J. M. Weller 1940c.

- Ordovician: Grohskopf 1948, J. M. Weller
 1940c.

- Silurian: Lowenstam 1949b, J. M. Weller
 1940c.

- Devonian: Bassett 1925, Bassler 1937,
 G. A. Cooper 1945, Savage 1908, 1910c,
 1920, 1925c, Warthin 1944, J. M. Weller
 1940c, Stuart Weller 1897a, Willman 1949,
 Workman 1944.

- Mississippian: Coryell 1939a, P. L. Dana
 1941, Desborough 1961b, 1961d, Gut-
 schick 1965, J. E. Lamar 1925a, Rexroad
 1961a, 1965b, Root 1928, St. Clair 1917d,
 A. H. Sutton 1934a, Swann 1958, 1963,
 J. M. Weller 1940b, 1940c, Stuart Weller
 1908, 1920a, 1939b, Willman 1949, Work-
 man 1956, Zeller 1953.

- Pennsylvanian: J. C. Bradbury 1962a, G. H.
 Cady 1917, Desborough 1959a, 1961a,
 1961b, 1961d, D. J. Fisher 1925b, M. E.
 Hopkins 1958, J. E. Lamar 1925a, Les-
 queux 1866a, Parham 1963a, Poor 1925,
 St. Clair 1917d, Savage 1910b, 1911a,
 1911b, E. W. Shaw 1910, Wanless 1947b,
 J. M. Weller 1942c.

- Pleistocene: F. C. Baker 1931b, G. H.
 Cady 1917, Desborough 1961, Frye 1965c,
 J. E. Lamar 1925a, 1925b, Leighton 1961,
 Leverett 1899a, E. W. Shaw 1911c, Stap-
 lin 1963b, J. E. Todd 1891, G. F. Wright
 1890.

- Structure: Broadhead 1889, G. H. Cady 1917,
 1938, S. K. Clark 1948, Desborough 1958,
 1961b, 1961c, G. E. Ekblaw 1925c, Root
 1928, St. Clair 1917b, 1917d, Savage 1910b,
 1911a, 1911b, Stonehouse 1955, J. M.
 Weller 1940c, Stuart Weller 1939b.

- Uranium: Ostrom 1955.

- Worthen Survey report (v. 3): Worthen
 1868(2).

- Jackson Park Quadrangle: Bretz 1943, 1955.

- Jackson Pay Zone: Folk 1946.

- Jackson Pool: Rich 1916a.

- Jacksonville area: A. H. Bell 1927a, Collingwood
 1923a.

- Jacksonville Coal (Pa.): Culver 1925a.

- Jacksonville gas field: A. H. Bell 1935a, 1939f.

- Jacksonville Moraine: J. R. Ball 1952, Frye 1965a,
 Leighton 1961, Wanless 1957a.

- Jacksonville Substage (Pleis.): Frye 1965a, 1965b,
 1965c, W. H. Johnson 1964, Leighton
 1950b, Wanless 1957a, Willman 1963.

- Jake Creek Sandstone Member (Pa.): Kosanke
 1960, Wanless 1957a.

- Jake Creek Shale (Pa.): Kosanke 1960, Siever 1956a.
- Jamestown Anticline: A. H. Bell 1931a.
- Jamestown Coal Member (Pa.): A. H. Bell 1931a, G. H. Cady 1955, Clegg 1965b, Kosanke 1950, 1960, P. E. Potter 1956c, Wanless 1939, 1955b, F. E. Williams 1955.
- Jamestown Cyclothem (Pa.) (see Pokeberry Cyc.): J. R. Ball 1952, Kosanke 1960.
- Jamestown Limestone (Pa.) (see Conant Ls.): A. H. Bell 1931a, G. H. Cady 1955, Kosanke 1960, Pullen 1951, Siever 1957a, Wanless 1939, J. M. Weller 1942c, F. E. Williams 1955.
- Jamestown Sand, Pay Zone: A. H. Bell 1945b.
- Jasper County**
- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Clay and shale: W. A. White 1959a, 1960a, 1960b.
- Coal
- Mined-out areas: Ill. GS 1959b map 24.
- Mining and production: Annual coal reports.
- Reserves: G. H. Cady 1944, 1952b, F. E. Williams 1955.
- Geologic sections (described outcrops)
- Big Muddy Creek (Pa.): Kosanke 1960.
- Mint Creek (Pa.): Kosanke 1960.
- West Crooked Creek (Pa.): Kosanke 1960.
- Geophysical studies: Pryor 1956c.
- Ground water: Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957.
- Analyses: Ross Hanson 1961.
- Limestone and dolomite: Grogan 1940, Krey 1925.
- Loess: Fehrenbacher 1965b, Frye 1962e.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Newton 1937b, Wier 1961.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: L. K. Lee 1939b, Workman 1956.
- Structure: A. H. Bell 1943c, E. F. Taylor 1944b, F. E. Williams 1955.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas: Theron Wasson 1938.
- Development maps: Ill. GS 1965 maps 53, 54, 58, 59.
- Gila Pool: A. H. Bell 1959c.
- Physical properties: Armon 1964.
- Possibilities: W. S. Blatchley 1906, Mylius 1923, 1927.
- Secondary recovery: Pryor 1957, Squires 1946, 1950a.
- Physiography: Leighton 1948b, MacClintock 1929.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962a, 1962c, 1963a.
- Soil report 68
- Stratigraphy
- General: W. S. Blatchley 1906, Mylius 1927, Selkregg 1957.
- Ordovician: Mylius 1927, Workman 1950b.
- Jasper County—cont.
- Stratigraphy—cont.
- Silurian: Lowenstam 1949b.
- Devonian: Schwab 1955, Workman 1944.
- Mississippian: L. K. Lee 1939b, Mylius 1927, Swann 1958, Workman 1956.
- Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, Kosanke 1960, Mylius 1927, C. E. Needham 1931, Newton 1937b, F. E. Williams 1955.
- Pleistocene: Frye 1965c, Leighton 1961, Willman 1963.
- Structure: A. H. Bell 1964, L. K. Lee 1939b.
- Vertebrate fossils: E. C. Olson 1946.
- Worthen Survey report (v. 6): Worthen 1875a(2).
- Jefferson City-Cotter Dolomite (Ord.): Workman 1948.
- Jefferson City Dolomite (Ord.): Krey 1924.
- Jefferson County**
- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Clay and shale
- Bonding clay: Grogan 1945.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: Grim 1957, Smoot 1960a.
- Coal
- General: G. H. Cady 1916, 1938, D. J. Fisher 1925b, Ill. GS 1913.
- Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1935b, 1948a, Fieldner 1942b, C. E. Marshall 1958, Parr 1916, N. H. Snyder 1953.
- Ash analyses: Rees 1964.
- Ash fusibility: Abernethy 1961.
- Chlorine in: Gluskoter 1964.
- Coke: C. E. Marshall 1958.
- Free-swelling index: Abernethy 1961.
- Grindability: Abernethy 1961.
- Low sulfur: G. H. Cady 1919d.
- Mined-out areas: Ill. GS 1959b maps 26, 29, 30.
- Mining: Annual coal reports, H. M. Cooper 1942b.
- Petrology: C. E. Marshall 1958.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1916, 1944, 1952b, Siever 1950.
- Strippable reserves: Culver 1925b.
- Drill records: A. H. Bell 1938a, R. S. Blatchley 1910a, Warthin 1944.
- Geophysical logs: Wyllie 1949.
- Geophysical studies: Pryor 1956c.
- Ground water
- General: Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c.
- Analyses: Bartow 1909b, Gluskoter 1965a.
- Lake deposits: E. W. Shaw 1915.
- Limestone and dolomite: J. C. Bradbury 1965b, Krey 1925.
- Loess: Fehrenbacher 1965b, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map.
- Glacial: State geol. map, R. F. Flint 1959, Leighon 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Siever 1951a.
- Structure: A. H. Bell 1943c, Brownfield 1954, G. H. Cady 1916, D. J. Fisher 1925b,

Jefferson County—cont.

Maps—cont.

Structure—cont.

Folk 1946, Pye 1944, E. W. Shaw 1912a, Siever 1950, 1951a, Swann 1951b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

Development maps: Ill. GS 1965 maps 23, 24, 33, 34.

Dix Pool: Squires 1946.

King Pool: Folk 1946.

Possibilities: R. S. Blatchley 1910a, Folk 1946.

Secondary recovery: Pryor 1957, Squires 1946, 1950a.

Physiography: R. F. Flint 1941, Leighton 1948b, MacClintock 1929.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962c, Pye 1944.

Springs: Peale 1886.

Stratigraphy

General: R. S. Blatchley 1910a, Brownfield 1954.

Devonian: Folk 1946, Meents 1965b, Warthin 1944.

Mississippian: Folk 1946, Pye 1944, Siever 1951a, Swann 1948, 1951b, 1958, 1965, Workman 1956.

Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, 1965b, G. H. Cady 1916, D. J. Fisher 1925b, Folk 1946, M. E. Hopkins 1958, Mueller 1957, Siever 1951a.

Pleistocene: G. H. Cady 1916, Frye 1965c, Leighton 1961.

Structure

General: Meents 1965b, Swann 1951b.

Faults: G. H. Cady 1916, 1938.

Tufa: Rubey 1952.

Uranium: Ostrom 1955.

Worthen Survey report (v. 3): Henry Engelmann 1868.

Jersey County

Bedrock topography: Horberg 1950a.

Brines: Meents 1952.

Building stone: Conover 1884.

Caves: Bretz 1961.

Chert: J. E. Lamar 1934.

Clay and shale: E. H. Lines 1917, Parham 1963a, Rubey 1952.

Coal: Rubey 1952, Culver 1925a.

Analyses: Parr 1916.

Mined-out areas: Ill. GS 1959b map 22.

Mining: Annual coal reports, Andros 1915b.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Culver 1925a, J. N. Payne 1942.

Strippable reserves: W. H. Smith 1961.

Subsidence: L. E. Young 1916b.

Cross sections: Workman 1941.

Drill records: Collingwood 1933, Easton 1942, Ross Hanson 1950, 1961, Krey 1924, Johan A. Udden 1914, Workman 1948.

Geodes: Robertson 1940.

Geologic sections (described outcrops)

Chautauqua (Miss.): Collinson 1954, 1958e, R. C. Moore 1929.

Chautauqua West (Miss.): Collinson 1957.

Jersey County—cont.

Geologic sections—cont.

Grafton (Sil.): Savage 1926.

Jerseyville Hollow (Dev., Miss.): Collinson 1958e, Workman 1956.

Nutwood "The Narrows" (Miss.): Workman 1956.

Pere Marquette State Park (Ord., Sil., Dev., Miss., Pleis.): Collinson 1954, 1957, 1958e.

Teneriffe School (Dev., Miss.): Collinson 1954, 1957, 1958e.

Twin Springs (Ord., Sil., Dev., Miss.): Collinson 1954, 1958e, Rubey 1952.

Grafton area guide leaflet: Ill. GS 1960-B.

Ground water

General: Bergstrom 1957, Horberg 1950a,

Leverett 1899a.

Analyses: Bartow 1909b, Ross Hanson

1950, 1958, 1961.

Limestone and dolomite: Krey 1925, J. E. Lamar 1934, 1956b, Rubey 1952, Willman 1943b.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Rubey 1952, J. M. Weller 1940b.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a, Rubey 1952.

Mineral industries: Ill. GS 1961.

Paleogeologic: Workman 1956.

Structure: Collingwood 1933, Krey 1924, J. N. Payne 1942, Rubey 1952, W. H. Smith 1961, Whiting 1965b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas possibilities: R. S. Blatchley 1910a, Collingwood 1933, Easton 1942, Krey 1924.

Physiography: Leighton 1948b, MacClintock 1929, Rubey 1952.

Quadrangle studies

Brussels: Rubey 1952.

Hardin: Rubey 1952.

Radiocarbon dates: Rubin 1960.

Sand and gravel: Rubey 1952.

Stratigraphy

General: Bergstrom 1957, Collingwood 1933, Collinson 1954, 1957, Krey 1924, Meek 1861c, Rubey 1952.

Cambrian: Workman 1948.

Ordovician: Templeton 1963, Workman 1948.

Silurian: Savage 1913a, 1913c, 1914b, 1926, Whiting 1965b, Willman 1943b.

Devonian: Whiting 1965b, A. J. Scott 1961b.

Mississippian: Collinson 1954, 1957, J. E. Conkin 1965, Echols 1956, Kissing 1961,

A. K. Miller 1951, R. C. Moore 1929, J. M. Weller 1940b, Stuart Weller 1909b,

J. S. Williams 1957, Workman 1956.

Pennsylvanian: Culver 1925a, Parham 1963a, J. N. Payne 1942, Savage 1916a, W. H. Smith 1961, Wanless 1931b, 1947b, J. M. Weller 1930d, 1942c.

Pleistocene: Frye 1965c, Leverett 1898b, Robertson 1938, Rubey 1952.

Structure: V. B. Cole 1961, Collingwood 1933, McQueen 1941, Rubey 1952.

Jersey County—cont.

- Uranium: Ostrom 1955.
 Worthen Survey report (v. 3): Worthen 1868(2).

Joachim Dolomite (Ord.): A. H. Bell 1964, Col-linson 1954, 1957, Dapples 1955, DuBois 1945, Grohskopf 1948, Krey 1924, Krumbain 1951, Rubey 1952, Templeton 1963, J. M. Weller 1940a, 1952, Stuart Weller 1907b.

Jo Daviess County

- Barite: Shipton 1915.
 Bedrock topography: Horberg 1946, 1950a, Trowbridge 1916.
 Building stone: Conover 1884.
 Calcite: Erickson 1965.
 Caves: Bretz 1938, 1961, Trowbridge 1916.
 Clay and shale

General: J. E. Lamar 1934, E. W. Shaw 1916, Trowbridge 1916.

- Bonding clay: Grogan 1945.
 Chemical analyses: W. A. White 1959a.
 Refractory clay: J. E. Lamar 1956b.

Development history: Schockel 1916.

- Driftless Area: Shipton 1917.
 Drill records: Ross Hanson 1950, Thwaites 1927, Trowbridge 1916.

Galena area guide leaflet: Ill. GS 1965-D.

Geologic sections (described outcrops)

- Apple River (Ord.): E. W. Shaw 1916.
 East Dubuque (Ord.): Templeton 1963.
 Elizabeth (Ord., Sil.): E. W. Shaw 1916, J. M. Weller 1935c.

Elmville (Ord.): Trowbridge 1916, J. M. Weller 1935c.

Furnace School (Ord.): E. W. Shaw 1916.

Galena (Ord., Sil.): E. W. Shaw 1916.

Galena Junction (Ord.): Templeton 1963.

Galena Northeast (Ord.): Templeton 1963.

Galena River (Ord.): Trowbridge 1916.

Galena Roadcut (Ord.): Templeton 1963.

Hanover (Ord., Sil.): E. W. Shaw 1916, Trowbridge 1916.

Millbrig Northeast (Ord.): Templeton 1963.

Millbrig Southeast (Ord.): Templeton 1963.

Oak Ridge School (Sil.): E. W. Shaw 1916.

Rodden (Sil.): J. E. Lamar 1934.

Scales Mound (Ord.): J. F. James 1890, Savage 1924b, 1925b, E. W. Shaw 1916, Templeton 1963, Trowbridge 1916.

Stockton (Ord., Sil.): E. W. Shaw 1916, Trowbridge 1916, J. M. Weller 1935c.

Wise Lake (Ord.): Templeton 1963.

Winston (Sil.): Savage 1914b.

Geophysical studies: Agnew 1955a.

Ground water

General: Hackett 1956a, Horberg 1950a, Leverett 1899a, E. W. Shaw 1916, Thwaites 1927.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

Lead and zinc

General: Agnew 1946, 1955a, Anon. 1866b, 1878, Bain 1905b, 1906b, 1907b, E. S. Bastin 1939a, 1939b, Behre 1935,

Jo Daviess County—cont.

Lead and zinc—cont.

General—cont.

- J. C. Bradbury 1955a, 1957b, 1959b, 1961, Chamberlin 1882a, W. A. Cole 1957, G. H. Cox 1910, 1911, 1914, Dale 1952, R. E. Davis 1906, W. H. Emmons 1917, 1929, Erickson 1965, Grant 1908, W. E. Hall 1963, Heyl 1955, Holt 1948a, 1948b, C. T. Jackson 1865, Lincoln 1945, Locke 1840, R. R. Reynolds 1958, 1964, E. W. Shaw 1916, Spurr 1924, Terry 1948, Trowbridge 1916, Van Hise 1902, Whitney 1866, Willman 1946, 1947.

Bautsch mine: Bailey 1951, Heyl 1955, Zinner 1946.

Blewett ore deposit: Holt 1948a.

Eagle-Pitcher operations: Dale 1952.

Exploration: Zinner 1946.

Graham-Snyder mine: Heyl 1955.

Gray and Bautsch ore deposits: Zinner 1946.

Lead mining: Bauche 1752, Heyl 1955, Edwin James 1827, Locke 1840.

Mine waste and Galena River bed sediment: Clifford Adams 1944.

Mining: Anon. 1866a, 1906b.

Prospecting: Willman 1946.

Royal Princess ore deposit: Holt 1948b.

Skene mine: Terry 1948.

Temperature of ore deposition: Bailey 1951.

Tri-State mine: W. A. Cole 1957.

Vinegar Hill mine: Heyl 1955.

Lena area guide leaflet: Ill. GS 1961-D.

Limestone and dolomite: Grim 1937a, Krey 1925, J. E. Lamar 1934, E. W. Shaw 1916, Trowbridge 1916, Willman 1943b.

Loess: F. W. Clarke 1897, G. D. Smith 1942, Trowbridge 1916.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Bain 1905b, 1906b, J. C. Bradbury 1956, C. E. Brown 1960, G. H. Cox 1910, 1914, Grant 1908, J. E. Lamar 1934, Mullens 1964, E. W. Shaw 1916, Trowbridge 1916, Whitlow 1963, Whitney 1866, Willman 1947.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Structure: J. C. Bradbury 1956, C. E. Brown 1960, Grant 1908, Mullens 1964, E. W. Shaw 1916, Thwaites 1927, Trowbridge 1916, Whitlow 1963, Willman 1947.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Meteorite: W. F. Read 1963.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Mississippi River sediments: Swensen 1942.

Oil shale: Barrett 1922b, J. E. Lamar 1956a, E. W. Shaw 1916.

Physiography: Bain 1905b, C. E. Brown 1960, G. H. Cox 1910, 1914, Hershey 1893a, Heyl 1959, U. B. Hughes 1916, Leighton 1948b, Mullens 1964, E. W. Shaw 1916, Trowbridge 1913, 1916, 1921.

Pyrite and marcasite: Born 1934, Julien 1902.

Quadrangle studies

Cuba City: Mullens 1964.

Dubuque North: Whitlow 1963.

Jo Daviess County—cont.

Quadrangle studies—cont.

- Dubuque South: C. E. Brown 1960.
 Elizabeth: E. W. Shaw 1916, Trowbridge 1916.
 Galena: E. W. Shaw 1916, Trowbridge 1916.
 Lancaster: Grant 1907.
 Mineral Point: Grant 1907.
 New Diggings: Mullens 1964.
 Shullsburg: Mullens 1964.

Sand and gravel: Littlefield 1925a, 1925b, Trowbridge 1916, Willman 1939b, 1942a.

Sinkholes: Heyl 1959, Trowbridge 1916.

Springs: Trowbridge 1916.

Stratigraphy

- General: Agnew 1955a, Bain 1905b, G. H. Cox 1914, Grant 1907, James Hall 1858, Heyl 1955, 1959, E. W. Shaw 1916, Trowbridge 1916, Willman 1946.
 Cambrian: G. H. Cox 1910.

Ordovician: Agnew 1955b, 1956, Bain 1905b, 1906b, C. E. Brown 1960, G. H. Cox 1910, 1911, Grant 1908, Gutstadt 1958b, J. F. James 1890, G. M. Kay 1929, 1935a, Ladd 1929, Mullens 1964, Sardeson 1937, Savage 1924b, 1925b, Templeton 1963, Trowbridge 1916, Whitlow 1963, Willman 1943b, 1946, 1947.

Silurian: Mullens 1964, Savage 1914b, A. H. Sutton 1935, Willman 1943b, 1947.

Pleistocene: Chamberlin 1885, Frye 1965c, Leidy 1862, Leighton 1923a, Leverett 1899a, 1942b, Shaffer 1956, Staplin 1963b, Whitlow 1963.

Recent: Trowbridge 1914.

Structure: Agnew 1955a, J. C. Bradbury 1956, 1960b, Heyl 1955, 1959, Leith 1932, Mullens 1964, R. R. Reynolds 1958, Thwaites 1927.

Jointing: Hobbs 1905, E. W. Shaw 1916.

Uranium: Ostrom 1955.

Worthen Survey report (v. 5): James Shaw 1873, Whitney 1866.

Johnson County

Bedrock topography: Horberg 1950a.

Caves: Bretz 1961.

Clay and shale

General: J. E. Lamar 1925a, 1934, 1948, 1959, Parmelee 1921.

Chemical analyses: W. A. White 1959a.

Petrology: P. E. Potter 1958b.

Refractory clay: J. E. Lamar 1956b.

Resources: Parham 1963a.

Coal

General: J. E. Lamar 1925a.

Mined-out areas: Ill. GS 1959b map 32.

Mining and production: Annual coal reports.

Strippable reserves: Culver 1925b, W. H. Smith 1957.

Drill records: Warthin 1944, J. M. Weller 1940a.

Fossil localities: Collinson 1960a, Sohn 1961.

Geologic sections (described outcrops)

Belknap (Miss.): Bleininger 1912, Swann 1956.

Cache River (Miss.): Bleininger 1912.

Goreville (Pa.): J. E. Lamar 1948.

Johnson County—cont.

Geologic sections—cont.

Interstate 57 (Pa.): Harris 1961.

Joppa Junction (Miss.): Swann 1956.

Ozark Station (Pa.): J. E. Lamar 1948, Parmelee 1921.

Vienna South (Miss.): Rexroad 1958b.

West Vienna (Miss.): J. E. Lamar 1948.

White Hill Quarry (Miss., Pleis.): Leighton 1949a, 1950b, Swann 1956.

Geophysical studies: Pullen 1953.

Ground water

General: Horberg 1950a, J. E. Lamar 1925a, Leverett 1899a, Pryor 1956a.

Analyses: Bartow 1909b.

Limestone and dolomite

General: Krey 1925, J. E. Lamar 1925a, 1934, 1959, J. M. Parks 1953, Van Horn 1907.

Agricultural limestone: Van Horn 1907.

Building stone: J. E. Lamar 1925a.

Cement materials: Bleininger 1912, J. E. Lamar 1956b, 1959.

Mineralogy and petrology: P. E. Potter 1958b.

Loess: Fehrenbacher 1965b, Frye 1962e, Leighton 1950b.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, C. L. Cooper 1944, J. E. Lamar 1925a, 1948, J. M. Weller 1940b, Stuart Weller 1939a.

Mineral industries: Ill. GS 1961.

Structure: J. E. Lamar 1925a, Pye 1944, J. M. Weller 1940a.

Marion area guide leaflet: Ill. GS 1963-A.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Mineral industries: J. E. Lamar 1928d.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Ochre and sienna: J. E. Lamar 1948, Hewitt Wilson 1933.

Oil and gas

Oil shale: Barrett 1922b, Parr 1921.

Possibilities: Brokaw 1916, J. E. Lamar 1925a, J. M. Weller 1940a.

Physiography: J. E. Lamar 1925a, Leighton 1948b, R. F. Flint 1941.

Quadrangle studies

Brownfield: Stuart Weller 1939a.

Carbondale: J. E. Lamar 1925a.

Dongola: Stuart Weller 1939a.

Vienna: Stuart Weller 1939a.

Sand and gravel: J. E. Lamar 1925a.

Sandstone: Biggs 1955, P. E. Potter 1958b, 1963a, Siever 1956b.

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Springs: Peale 1886.

Stratigraphy

General: Bleininger 1912, Swann 1956, J. M. Weller 1940a, Stuart Weller 1926c.

Devonian: Warthin 1944, Workman 1944.

Mississippian: Atherton 1947, Brokaw 1916, Butts 1917a, C. L. Cooper 1947b,

Coryell 1939a, Easton 1945a, Gutschick

1965, J. E. Lamar 1925a, McFarlan 1942,

P. E. Potter 1958a, Pye 1944, Rexroad

1961a, 1962, 1965b, Swann 1956, 1958,

1963, Tippie 1945, E. O. Ulrich 1917, J. M.

Weller 1940a, 1940b, Stuart Weller

1920a, 1939a, Workman 1956, Zeller 1953.

- Johnson County—cont.
 Stratigraphy—cont.
 Pennsylvanian: Brokaw 1916, Kosanke 1960, J. E. Lamar 1925a, Parham 1963a, W. H. Smith 1957, J. M. Weller 1936a, 1940a.
 Tertiary: C. L. Cooper 1944.
 Pleistocene: J. E. Lamar 1925a, Staplin 1963b, J. M. Weller 1940a.
 Structure: Stonehouse 1955, J. M. Weller 1940a.
 Uranium: Ostrom 1955.
 Vienna City reservoir: G. E. Ekblaw 1937a.
 Worthen Survey report (v. 1): Henry Engelmann 1866.
- Johnson Creek Bedrock Valley: Horberg 1950a.
 Johnson North Pool: Squires 1950b.
 Johnson South Pool: Squires 1950b.
 Johnson Township Pool: Bain 1908h, Mylius 1923, 1927.
 Johnsonville Pool: Squires 1946.
 Joint systems: Bretz 1923, Dapples 1934, D. J. Fisher 1925a, J. W. Goldthwait 1909, J. E. Lamar 1925a, E. W. Shaw 1916, Wanless 1957a, Willman 1942b, Zeisel 1962a.
 Joliet Conglomerate (Pleis.): D. J. Fisher 1925a, J. W. Goldthwait 1909.
 Joliet District: D. J. Fisher 1928.
 Joliet Dolomite, Limestone (Sil.): Collinson 1954, Pinsak 1964, Rubey 1952, Savage 1926, A. H. Sutton 1935, J. M. Weller 1935c, Willman 1943b, 1950, 1962, Zeisel 1962a.
 Fauna: Dunn 1942, A. K. Miller 1944, Savage 1926.
 Paleogeographic map: Schuchert 1955.
 Solution cavities: Bretz 1940.
 Joliet outwash plain: D. J. Fisher 1925a, J. W. Goldthwait 1909.
 Joliet Quadrangle: D. J. Fisher 1925a.
 Jonesboro Quadrangle: J. M. Weller 1940b.
 Joppa Member (Miss.): J. W. Baxter 1963a, Swann 1963.
 Jordan Sand, Pay Zone: Moulton 1925b, Rich 1916b.
 Jordan Sandstone (Camb.): C. B. Anderson 1919, Lochman 1956, Ostrom 1957b, 1964, Thwaites 1923, 1927, Willman 1942b, Workman 1926, 1948.
 Structure map: Trowbridge 1935b.
 Julian Limestone (Ord.): Keyes 1922a.
 Junction City Dome: A. H. Bell 1926b, Brownfield 1954, St. Clair 1917c, E. W. Shaw 1923.
- ### K
- Kames and eskers: R. C. Anderson 1962, 1964, Block 1960, Bretz 1955, Doyle 1965, G. E. Ekblaw 1964, D. J. Fisher 1925a, R. F. Flint 1931, Hershey 1897a, Leverett 1899a, MacClintock 1959, Trowbridge 1912, Upham 1894, Willman 1942b.
 Kane Anticline: Collingwood 1933.
- ### Kane County
- Bedrock topography: Caldwell 1963, Horberg 1950a, Suter 1959.
 Bonding clay: Grim 1940f.
 Building stone: Conover 1884.
- Kane County—cont.
 Clay and shale: J. E. Lamar 1934.
 Bonding clay: Grogan 1945.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Petrology: Grim 1957.
 Copper erratic: Crook 1929.
 Drill records: C. B. Anderson 1919, Buschbach 1964, Caldwell 1963, Kempton 1963, Lund 1965a, Johan A. Udden 1914.
 Elgin area, glacial history: Leighton 1925b.
 Environmental geology: Hackett 1965a.
 Geologic sections (described outcrops)
 Batavia (Sil.): J. E. Lamar 1934.
 Silver Glen School (Ord., Sil.): J. E. Lamar 1934.
 Geophysical studies: Beck 1965.
 Ground water
 General: C. B. Anderson 1919, Bergstrom 1955, Caldwell 1963, Horberg 1950a, Leverett 1899a, Lohr 1953, B. L. Palmer 1933, Suter 1959, Thwaites 1927, Walton 1960a.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Artesian waters: C. B. Anderson 1919.
 Kaneville Esker: Lukert 1965.
 Limestone and dolomite: Burchard 1907, Krey 1925, J. E. Lamar 1934.
 Loess: Wascher 1960.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a, Suter 1959.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Caldwell 1963, Horberg 1953, Suter 1959.
 Glacial: State geol. map, Block 1960, G. E. Ekblaw 1941, R. F. Flint 1959, Frye 1965a, Leighton 1961, Leverett 1899a, Suter 1959.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Buschbach 1964.
 Structure: Beck 1965, Buschbach 1964, Suter 1959, Thwaites 1927.
 Mastodon: Florence Anderson 1937, N. C. Anderson 1905, Bagg 1909, W. E. Powers 1936, C. R. Smith 1936, Wilber 1861.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Gas in drift: Meents 1960.
 Natural gas: A. H. Bell 1935a.
 Peat: Soper 1922.
 Sand and gravel
 General: Block 1960, J. E. Lamar 1934.
 Molding sand: Littlefield 1925a, 1925b.
 Resources: G. E. Ekblaw 1964.
 Soil report 17
 Springs: Peale 1886.
 Stratigraphy
 General: C. B. Anderson 1919, Suter 1959, Thwaites 1923, I. B. Wasson 1932.
 Cambrian: Buschbach 1964, Templeton 1950, I. B. Wasson 1932.
 Ordovician: Buschbach 1964, Gutstadt 1958b, Workman 1950a.
 Silurian: J. R. Ball 1940c.
 Pleistocene: Block 1960, Frye 1965c, Horberg 1953, Kempton 1963, Leighton 1925b, 1934b, 1961, Leverett 1898a, 1899a, W. E. Powers 1936, C. R. Smith 1936, Staplin 1963b, Zumberge 1960.

Kane County—cont.

- Structure: Buschbach 1964, Horberg 1950a, Thwaites 1927.
 Woodstock area guide leaflet: Ill. GS 1960-C.
 Worthen Survey report (v. 4): Bannister 1870.

Kaneville Esker: Leverett 1899a, Lukert 1965.

Kankakee underground liquid petroleum storage: A. H. Bell 1956d.

Kankakee Arch: Beck 1965, A. H. Bell 1964, Buschbach 1964, Cohee 1945b, 1962, Eardley 1951a, G. E. Ekblaw 1938, Emrich 1962, D. A. Green 1957, P. B. King 1951, Leverett 1889b, Lockett 1947, Pirtle 1932, Willman 1942b, 1943a.

Kankakee County

Bedrock topography: Horberg 1950a.

Building stone: Conover 1884.

Caves: Bretz 1961.

Clay and shale

General: Athy 1928, W. A. White 1959a, 1960a, 1960b.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: W. A. White 1960b.

Coal

General: G. H. Cady 1915a, Dinsmore 1889.

Analyses: Aresco 1953-1965.

Chlorine in: Gluskoter 1964.

Mined-out areas: Ill. GS 1959b map 8.

Mining: Annual coal reports, Andros 1914a, Athy 1928, Quintin Clark 1893, Toenges 1936.

Production: Annual coal reports.

Reserves: Athy 1928, G. H. Cady 1952b.

Strippable reserves: G. H. Cady 1937c.

Drill records: C. B. Anderson 1919, Athy 1928, J. W. Baxter 1957, Buschbach 1964, Ross Hanson 1950, 1958, 1961, Johan A. Udden 1914, Workman 1948.

Feldspar: Willman 1942a.

Geologic sections (described outcrops)

Essex (Sil.): Athy 1928, Savage 1913c.

Rock Creek Canyon (Sil.): Willman 1962.

Geophysical studies: Beck 1965.

Ground water

General: C. B. Anderson 1919, Athy 1928, Bergstrom 1955, Horberg 1950a, Leverett 1899a, Lohr 1953.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Artesian waters: C. B. Anderson 1919.

Karst topography: G. E. Ekblaw 1925b.

Limestone and dolomite

General: Athy 1928, W. C. Day 1899, Krey 1925, J. E. Lamar 1934, Willman 1943b.

Calclitic limestone underground: J. W. Baxter 1957.

Mineralogy: Grim 1937a.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Athy 1928, Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Athy 1928.

Glacial: State geol. map, G. E. Ekblaw 1941, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Kankakee County—cont.

Maps—cont.

Paleogeologic: Buschbach 1964.

Structure: Athy 1928, Beck 1965, A. H. Bell 1961c, Buschbach 1964, G. H. Cady 1915a.

Marl: Athy 1928.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas, underground gas storage: A. H. Bell 1956d, 1961c, 1962b, Peterson 1956b.

Peat: Soper 1922.

Physiography: Athy 1928, Leighton 1948b.

Quadrangle studies, Herscher: Athy 1928.

Sand and gravel: Athy 1928, Willman 1939b, 1942a.

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Solution features: Bretz 1940.

Stratigraphy

General: C. B. Anderson 1919, Athy 1928, I. B. Wasson 1932.

Cambrian: A. H. Bell 1964, Buschbach 1964, Templeton 1950, I. B. Wasson 1932, Workman 1948.

Ordovician: Athy 1928, A. H. Bell 1964, Buschbach 1964, Gutstadt 1958b, Workman 1948, 1950a.

Silurian: Athy 1928, G. E. Ekblaw 1925b, Foerste 1925, Lowenstam 1949b, Savage 1913a, 1926, Willman 1943b.

Pennsylvanian: Athy 1928, G. H. Cady 1915a, G. E. Ekblaw 1925b.

Pleistocene: Athy 1928, G. H. Cady 1915a, G. E. Ekblaw 1925a, Frye 1965c, P. W. Harrison 1957, Horberg 1953, Krumbain 1933b, Zumberge 1960.

Worthen Survey report (v. 4): F. H. Bradley 1870.

Kankakee Dolomite (Sil.): Athy 1928, Collinson 1954, 1957, D. J. Fisher 1925a, R. H. Howard 1961, Pinsak 1964, Savage 1926, Scobey 1938, A. H. Sutton 1935, J. M. Weller 1935c, Willman 1962, Zeisel 1962a.

Fauna: Savage 1926.

Paleogeographic map: Schuchert 1955.

Structure map: Athy 1928.

Kankakee Flood, Torrent: Athy 1928, G. E. Ekblaw 1925a, Frye 1965c, Leighton 1932a, 1949a, 1953, Wanless 1955a, 1957a, Willman 1942b.

Kankakee Plain: Leighton 1948b.

Kankakee River watershed: Pickels 1929.

Kansas Stage, Drift, Till (Pleis.): J. R. Ball 1952, A. H. Bell 1929c, G. H. Cady 1919b, Carman 1910, G. E. Ekblaw 1957, Eveland 1952, Fenneman 1910, John Webster Foster 1951a, Frye 1964a, 1965a, 1965b, 1965c, Hershey 1896a, 1896c, 1897a, 1897d, 1901, Hinds 1919, Horberg 1950b, 1953, 1956b, W. H. Johnson 1964, Leighton 1930f, Leverett 1898c, MacClintock 1933, 1959, Manos 1961, Rubey 1952, Savage 1921b, 1921c, E. W. Shaw 1913, W. H. Walker 1965, Wanless 1927, 1929a, 1929b, 1955a, 1957a, Willman 1942b, 1963.

Remnant magnetism: Wyman Harrison 1961.

Structure map: John Webster Foster 1951a.

Kansas City Group (Pa.): C. L. Cooper 1946.

Kaolin (see Clay and shale)

Karbers Ridge: Bain 1905a, Stuart Weller 1920b.

- Karbers Ridge Quadrangle: J. W. Baxter 1965a.
 Karnak Limestone Member (Miss.): J. W. Baxter 1963a, Swann 1963.
 Karst topography and solution features (see also under Physiography)
 Pre-Pennsylvanian: Bretz 1940, G. E. Ekblaw 1925b, Siever 1951a.
 Pre-St. Peter: Buschbach 1961, 1964.
 Kaskaskia Limestone (Miss.): James Hall 1857b, 1858, 1859, Keyes 1892b, 1922b, 1922c, 1931a, 1931b, 1936, S. A. Miller 1879, Stuart Weller 1906b, 1907.
 Kaskaskia River Valley
 Maps and mapping: G. E. Ekblaw 1937c.
 Mineral resources: J. C. Bradbury 1963, Leighton 1937c.
 Stratigraphy and structure: G. E. Ekblaw 1937d.
 Water resources: Gerber 1937b.
 Kaskaskia River watershed: Pickels 1929.
 Kaskaskia Sequence (Dev.-Miss.): Keyes 1892b, Sloss 1949, 1963, Swann 1961, 1963.
 Keeneyville Moraine: Zeisel 1962a.
 Kellerville Pool: R. H. Howard 1961.
 Kempton Bedrock Valley: Horberg 1950a.
 Kempton Syncline: Willman 1942b.
- Kendall County**
 Bedrock topography: Horberg 1950a, Suter 1959, Willman 1940, 1942b.
 Clay and shale: Culver 1922a.
 Coal: Culver 1922a.
 Drill records: C. B. Anderson 1919, Ross Hanson 1950, 1961, Lund 1965a, J. N. Payne 1939b, Johan A. Udden 1914, Willman 1942b.
 Geophysical studies: Beck 1965.
 Ground water
 General: C. B. Anderson 1919, Bergstrom 1955, Culver 1922a, Horberg 1950a, Leverett 1899a, Suter 1959, Thwaites 1927, Walton 1960a, Willman 1942b.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.
 Artesian waters: C. B. Anderson 1919.
 Lead and zinc: J. C. Bradbury 1957a, J. N. Payne 1939b.
 Limestone and dolomite: Burchard 1907, Culver 1922a, Krey 1925, Ostrom 1957b, Willman 1943b.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Culver 1922a, Horberg 1950a, Suter 1959, Willman 1942b.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Culver 1922a, J. N. Payne 1939b, Ostrom 1957b, Suter 1959, Willman 1942b.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a, Suter 1959.
 Mineral industries: Ill. GS 1961, Willman 1942b.
 Paleogeologic: Willman 1942b.
 Structure: Athy 1928, Beck 1965, J. E. Lamar 1928b, Suter 1959, Thwaites 1927, Willman 1942b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas possibilities: Culver 1922a.
 Physiography: Culver 1922a, Leighton 1948b.
- Kendall County—cont.
 Quadrangle studies
 Marseilles: Willman 1942b.
 Morris: Culver 1922a.
 Sand and gravel
 General: Culver 1922a, Willman 1942b.
 Molding sand: Littlefield 1925a, 1925b.
 Resources: G. E. Ekblaw 1962a, 1964.
 Silica sand: J. E. Lamar 1928b.
 Sandstone: J. E. Lamar 1928b.
 Soil report 75
 Springs: Peale 1886.
 Stratigraphy
 General: C. B. Anderson 1919, Suter 1959, Willman 1942b.
 Ordovician: Bevan 1926, Culver 1922a, J. E. Lamar 1928b, Savage 1924b, 1925b, Willman 1943a.
 Silurian: Willman 1943b.
 Pennsylvanian: Culver 1922a, Savage 1916a, Willman 1942b.
 Pleistocene: Frye 1965c, Horberg 1953, Leverett 1899a, E. S. Riggs 1937, Wascher 1938, Willman 1942b, Zumberge 1960.
 Structure: Thwaites 1927, Willman 1942b.
 Worthen Survey report (v. 4): Bannister 1870.
 Yorkville area guide leaflet: Ill. GS 1965-C.
 Yorkville geologic section (Ord., Sil.): Savage 1925b.
- Kenner Pool: A. H. Bell 1959c, Lowenstam 1951.
 Kentland Valley: Wayne 1956.
 Kenyon Member (Camb.): Templeton 1950.
 Keokuk Limestone (Miss.): J. R. Ball 1952, Beachler 1892, A. H. Bell 1932e, Bleininger 1912, Collingwood 1933, Collinson 1964b, Coryell 1919, Currier 1922, Gordon 1895, H. A. Green 1870, James Hall 1857b, 1858, 1859, J. B. Hayes 1964, Hinds 1919, Keyes 1892b, J. E. Lamar 1934, 1959, R. C. Moore 1935, Morse 1915, Nebel 1919, Robertson 1951, Rubey 1952, Savage 1921c, Spreng 1961, Van Tuyl 1916, [1925], Wanless 1957a, J. M. Weller 1940a, 1940b, 1941b, Stuart Weller 1906b, 1907b, 1914, 1939a, 1939b, J. S. Williams 1957, Willman 1949, Worthen 1866a(3), 1868(2), 1870, 1873(1).
 Fauna: Hinds 1919, Meek 1868a, 1873, Rexroad 1965a, A. H. Sutton 1939, Worthen 1883(2).
 Paleogeographic map: Schuchert 1955.
 Structure map: B. B. Cox 1927.
- Kerton Creek Coal Member (Pa.): S. E. Ekblaw 1931, Kosanke 1960, W. H. Smith 1963, Wanless 1939, 1952, 1957a.
 Kewanee Coal (Pa.): Ashley 1902.
 Kewanee Group (Pa.): J. W. Baxter 1963a, Kosanke 1960, W. H. Smith 1963.
 Kickapoo beds (Pleis.): C. O. Sauer 1916.
 Kickapoo Creek Bedrock Valley: Horberg 1950a.
 Kickapoo Sand, Pay Zone: Mylius 1927.
 Kidd Limestone Member (Miss.): J. W. Baxter 1960b.
- Kimmswick Limestone, Subgroup (Ord.): A. H. Bell 1929b, R. S. Blatchley 1914a, J. H. Bradley 1925, Buschbach 1964, Collinson 1954, DuBois 1945, Krey 1924, J. E. Lamar 1950a, 1955a, 1959, Leighton 1939, Mylius 1927, Piersol 1940, Pryor 1962a, Rubey 1952, Savage 1909b, 1910a, Templeton 1963, Ulrich 1911, J. M. Weller

Kimmswick Limestone—cont.

1940a, 1940c, Stuart Weller 1907b, 1907d, 1909b, Willman 1949.

Fauna: J. H. Bradley 1925, 1930, Savage 1910a.

Structure map: State geol. map, A. H. Bell 1929b, 1964, Cohee 1962, Meents 1954, Smoot 1958.

Kimmswick Quadrangle: Stuart Weller 1939b.

Kinderhook-New Albany Shale (Dev., Miss.):

A. H. Bell 1938e, R. H. Howard 1961.

Structure map: A. H. Bell 1938e, 1940a, 1941a, R. H. Howard 1961.

Kinderhookian Series, Kinderhook Group, Shale

(Miss.): A. H. Bell 1928a, 1943c,

Bleininger 1912, Bowman 1907, Collinson

1958e, 1961, 1964b, Fenneman 1910, 1911,

H. A. Green 1870, R. H. Howard 1961,

Keyes 1892b, 1900b, 1902, 1916b, 1938b,

R. C. Moore 1929, 1935, Rubey 1952,

Johan A. Udden 1908a, Wanless 1929a,

1957a, J. M. Weller 1935c, 1940b, 1952,

Stuart Weller 1906b, 1907b, 1914, Work-

man 1950b, 1956, Worthen 1866a(3),

1866b, 1868(2), 1870, 1873(1).

Fauna: Collinson 1959, C. L. Cooper 1948,

Keyes 1897, 1900a, Meek 1868a, Wach-

smuth 1890, Stuart Weller 1905, 1909a,

1909b.

Isopach map: Tester 1935, Wanless 1957a,

Workman 1956.

Paleogeographic map: Schuchert 1955.

Structure map: A. H. Bell 1943c, Wanless

1957a.

King Pool: Folk 1946.

Kingdom Sandstone Member (Ord.): Buschbach

1964, 1965, Templeton 1952, 1963.

Kings Lake Formation (Ord.): Templeton 1963.

Kings Quadrangle: Bretz 1923.

Kinkaid Limestone (Miss.): Atherton 1947, J. W.

Baxter 1965a, Butts 1925, C. L. Cooper

1941, 1947b, Coryell 1939a, Cronies 1939c,

Currier 1944, P. L. Dana 1941, Desborough

1961b, Easton 1945b, English 1948, Folk

1946, Harris 1952, J. E. Lamar 1925a,

1959, Leighton 1939, J. M. Parks 1953,

Siever 1953, Swann 1963, J. M. Weller

1940a, 1940b, 1940c, 1952, Stuart Weller

1920a, 1920b, 1939a, 1939b, Willman 1949,

Workman 1940.

Fauna: Coryell 1939a, Gutschick 1965, Rex-

road 1961a, Zeller 1953.

Paleogeographic map: Schuchert 1955.

Structure map: English 1948.

Kincaid Pool: Whiting 1956.

Kincaid South Pool: Whiting 1956.

Kirkwood Bedrock Valley: Horberg 1950a.

Kirkwood Sand, Pay Zone: A. H. Bell 1928d,

1932b, R. S. Blatchley 1909, 1912e, 1913a,

G. H. Cady 1920b, Rich 1916b, Squires

1943e.

Structure map: A. H. Bell 1928d, 1932b, R. S.

Blatchley 1913a, G. H. Cady 1920b, Rich

1916b, Squires 1943e.

Kiser Creek Member (Cre.): Frye 1964a.

Kishwaukee River watershed: Pickels 1929.

Knobs Megagroup (Dev.-Miss.): Swann 1961.

Knox County

Bedrock topography: Horberg 1950a, Wanless

1957a.

Knox County—cont.

Clay and shale

General: J. E. Lamar 1934, Savage 1921a

Ceramic tests: Parham 1960, W. A. White

1960a.

Chemical analyses: W. A. White 1959a

Mineralogy: C. W. Rolfe 1908, W. A.

White 1960b.

Petrology: Grim 1957, C. W. Rolfe 1908

Refractory clay: J. E. Lamar 1956b.

Coal

General: G. H. Cady 1921, Culver 1925a

Lesquereux 1866a, Savage 1916b.

Analyses: Abernethy 1961, Aresco 1953

1965, G. H. Cady 1921, 1935b, 1948a

Fieldner 1942b, Helfinstine 1946, Parr 1904

1906b, 1916, Savage 1921a, Zubovic 1964

Ash analyses: Rees 1964.

Ash fusibility: Abernethy 1961.

Beryllium in: Stadnichenko 1961.

Chlorine in: Gluskoter 1964.

Cleaning: Boley 1949.

Economics of strip coal mining: H. D.

Graham 1948.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Mined-out areas: Ill. GS 1959b maps 6

11.

Mining: Annual coal reports, Andros

1915b, 1915c, G. H. Cady 1921, H. N.

Cooper 1942b, Savage 1921a.

Minor elements: Zubovic 1964.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Culver

1925a, Jelliff 1925.

Strip mine reclamation: H. D. Graham

1948.

Strippable reserves: G. H. Cady 1937c,

Culver 1925b, W. H. Smith 1963.

Subsidence: L. E. Young 1916b.

Dam construction: Jelliff 1930.

Drill records: G. H. Cady 1921, Culver 1925a,

Ross Hanson 1950, 1958, Johan A. Udden

1914, Wanless 1929a.

Farmington area guide leaflet: Ill. GS 1963-B.

Fossil plant localities: Collinson 1960a.

Ground water

General: Bergstrom 1956a, Horberg

1950a, Leverett 1899a, Lohr 1953, Savage

1921a.

Analyses: Bartow 1909b, Ross Hanson

1950, 1958, 1961, A. W. Palmer 1897.

Lake Bracken sediment: V. H. Jones 1937a,

B. O. Larson 1951b.

Lake Calhoun sediment: Glymph 1937, Stall

1952a.

Limestone and dolomite: Krey 1925.

Building stone: Savage 1921a.

Cement materials: J. E. Lamar 1956b.

Loess: Leighton 1950b, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a,

Wanless 1957a.

Drift thickness: State geol. map.

Geologic: State geol. map, Savage 1921a,

Wanless 1957a.

Glacial: State geol. map, R. F. Flint 1959,

Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Wanless 1957a.

Knox County—cont.

Maps—cont.

Structure: G. H. Cady 1921, Moulton 1925d, Savage 1916b, 1921a, Wanless 1957a, Whiting 1965b.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

Gas in drift: Savage 1916b.

Possibilities: Moulton 1925d, Poor 1927, Savage 1916b, 1921a.

Quadrangle studies

Avon: Savage 1916b, 1921a.

Canton: Savage 1916b, 1921a.

Galesburg: Poor 1927.

Glasford: Wanless 1957a.

Sand and gravel: Savage 1921a.

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Stratigraphy

General: Bergstrom 1956a, Savage 1921a, Wanless 1957a.

Cambrian: Wanless 1957a.

Ordovician: Gutstadt 1958b.

Silurian: Lowenstam 1950, Whiting 1965b.

Devonian: Whiting 1965b.

Mississippian: Wanless 1957a, J. S. Williams 1957.

Pennsylvanian: G. H. Cady 1921, Culver 1924, 1925a, Jelliff 1923, 1925, 1926, Lesquereux 1866a, Parham 1963c, Savage 1921a, W. H. Smith 1963, Wanless 1931a, 1931b, 1932b, 1957a, J. M. Weller 1942a, 1942c.

Pleistocene: Frye 1965c, Leighton 1961, Leverett 1898b, 1899a, Savage 1917a, Wanless 1957a.

Structure: Moulton 1925d, Savage 1916b, Wanless 1957a.

Uranium: Ostrom 1955.

Worthen Survey report (v. 4): H. A. Green 1870.

Knox Megagroup, Dolomite (Camb.-Ord.): A. H. Bell 1964, Buschbach 1964, T. A. Dawson 1960, Gutstadt 1958a, Swann 1961.

Structure map: Stearns 1962.

Kozeny paradox: Rose 1957a.

Kraft Pool: Squires 1946.

Kress Member (Ord.): Buschbach 1964, Templeton 1963.

Kritesville Syncline: Rubey 1952.

Kyte River Bedrock Valley: Horberg 1950a.

L

LaCenter Quadrangle: Pryor 1962a.

Lacey Member (Camb.): Buschbach 1964, Templeton 1950.

"Lafayette" Gravel, Lafayette Formation (Ter.): G. W. Andrews 1958, J. R. Ball 1952, Bretz 1961, Chamberlin 1906, Fenneman 1910, 1911, Fisk 1949, Frye 1963d, Glenn 1906, Gordon 1892, Horberg 1946, 1950a, 1956b, J. E. Lamar 1930b, 1951, 1953a, Leighton 1949a, 1950b, McGee 1891, P. E. Potter 1955b, 1955c, Pryor 1962a, Purdy

"Lafayette" Gravel, Lafayette Formation—cont.

1907, Ross 1963, 1964b, Salisbury 1891a, Wanless 1957a, J. M. Weller 1940a, Stuart Weller 1907b.

LaGrange Formation (Ter.): Glenn 1906, J. E. Lamar 1930b, Purdy 1907.

LaHarpe Quadrangle: Nebel 1919, Savage 1921c.

Lake Border Moraines: W. C. Alden 1902, Bretz 1939, 1955, Leverett 1897, 1899a, Zumberge 1960.

Lake Bracken sedimentation: V. H. Jones 1937a.

Lake Calhoun sedimentation: Glymph 1937.

Lake Centralia-Salem Oil Field: Love 1955.

Lake County

Beach sand transport: Krumbein 1950.

Bedrock topography: Goldthwait 1909, Horberg 1950a, Suter 1959.

Bog floras: Waterman 1923.

Building stone: Conover 1884.

Clay and shale: J. E. Lamar 1934.

Drill records: C. B. Anderson 1919, Buschbach 1964, DuBois 1945, Ross Hanson 1950, 1958, 1961, Lamb 1942, Leverett 1899a, Prickett 1964, Thwaites 1927, Walton 1965, Worthen 1890(2).

Environmental geology: Hackett 1965a, Larsen 1965a.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Geophysical studies: Beck 1965.

Ground water

General: C. B. Anderson 1919, Atwood 1908, Bergstrom 1955, Gerber 1935a, Horberg 1950a, Lamb 1942, Leverett 1899a, Lohr 1953, Prickett 1964, Suter 1959, Thwaites 1927, Walton 1960a, 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Artesian waters: C. B. Anderson 1919, Atwood 1908.

Limestone and dolomite: Burchard 1907, Krey 1925, Ostrom 1956.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a, Suter 1959.

Drift thickness: State geol. map.

Geologic: State geol. map, Suter 1959.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a, Suter 1959.

Mineral industries: Ill. GS 1961.

Paleogeologic: Buschbach 1964.

Structure: Beck 1965, Buschbach 1964, Suter 1959, Thwaites 1927.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Peat: Soper 1922.

Physiography: Atwood 1908, Leighton 1948b, Rudd 1956.

Pollen from bog: Artist 1936.

Quadrangle studies

Highland Park: Bretz 1943, 1955.

Wheeling: Bretz 1943, 1955.

Sand and gravel: Burchard 1907.

Mineralogy: R. E. Hunter 1965, Landon 1930, Pettijohn 1931, Willman 1942a.

Molding sand: Littlefield 1925a.

Resources: G. E. Ekblaw 1960, 1964.

Sand dunes: Atwood 1908.

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Springs: Peale 1886.

Lake County—cont.

Stratigraphy

General: C. B. Anderson 1919, J. W. Goldthwait 1909, Suter 1959.

Cambrian: Buschbach 1964.

Ordovician: Buschbach 1964, Gutstadt 1958b, Workman 1950a.

Silurian: Ostrom 1956.

Pleistocene: Atwood 1908, Frye 1965c, J. W. Goldthwait 1906, 1908, 1909, Horberg 1953, Leverett 1899a, W. E. Powers 1940, Wascher 1938, Zumberge 1960.

Recent: Atwood 1908, F. C. Baker 1918.

Structure: Buschbach 1964, J. W. Goldthwait 1909, Thwaites 1927.

Worthen Survey report (v. 4): Bannister 1870.

Lake Creek Coal Member (Pa.) (see Third Cutler Rider Coal): Kosanke 1960.

Lake Decatur sedimentation: C. B. Brown 1947.

Lake Michigan: W. C. Alden 1918, Atwood 1908, Leverett 1899a, Thwaites 1927.

Beach cusps: C. E. Needham 1929.

Beach sand: Hough 1935, Krumbein 1953b, 1956a, 1959, Pettijohn 1931.

Dune development: J. S. Olson 1958.

Erosion studies: J. R. Ball 1938b, Hardin 1952, U. S. Army Eng. 1953, Wood 1938.

Glacial drift beneath: Edmund Andrews 1867.

Sediment movement: J. W. Johnson 1956.

Sediments: Hough 1935, Krumbein 1954, J. P. Todd 1938.

Shore processes: Krumbein 1950.

Lake Michigan Basin, history: F. P. Shepard 1937, Zumberge 1955.

Lake Michigan Glacial Lobe: Chamberlin 1882b, Frye 1960b, 1965c, Horberg 1956a, Leighton 1961, Leverett 1899a, Willman 1963, Zumberge 1960.

Lake Michigan watershed: Pickels 1929.

Lakes (see named lakes, also Pleistocene, glacial lakes)

Lakewood Anticline: Newton 1941.

Lakewood Pool: Newton 1941.

Lamoine Terrace: Hinds 1919.

Lamotte Sandstone (Camb.): Workman 1949.

Lampasas Group (Pa.): Wanless 1947b.

Isopach map: Wanless 1947b.

Lancaster Peneplain: Bain 1906b, Grant 1907, Horberg 1946, 1950a, U. B. Hughes 1916, Trowbridge 1921.

Lancaster Quadrangle: Grant 1907.

Land reclamation: Bain 1908h, J. A. Harman 1913, 1916.

Landforms: Bier 1956.

Landslides: G. E. Ekblaw 1930a, 1932a, Wanless 1957a.

Lange Pool: Root 1928.

Lansing Group (Pa.): C. L. Cooper 1946.

LaSalle Anticlinal Belt, Anticline: Andros 1914a, Beck 1965, A. H. Bell 1943c, 1964, R. S. Blatchley 1910a, 1912c, 1913a, W. S. Blatchley 1906, G. H. Cady 1912a, 1912b, 1915a, 1919b, 1920a, 1952b, S. K. Clark 1948, Clegg 1959, 1965a, 1965b, Cohee 1939, 1962, Eardley 1949, Easley 1937, Ede 1919, G. E. Ekblaw 1930b, H. C. Freeman 1868, D. A. Green 1957, Hager 1949, Ill. GS 1913, F. H. Kay 1917a, Keyes 1916a, Levorsen 1960, McGinnis

LaSalle Anticlinal Belt, Anticline—cont.

1961b, Moss 1936, Moulton 1929d, Mylius 1921d, 1927, J. N. Payne 1939a, C. O. Sauer 1916, Savage 1931, Swann 1951a, 1958, Templeton 1952, Thwaites 1927, Wanless 1955b, H. A. Wheeler 1911a, Willman 1942b, Workman 1935b, 1950b.

LaSalle County

Barite: Shrode 1952.

Bedrock topography: Horberg 1950a, McGinnis 1963b, Willman 1940, 1942b.

Brines: Willman 1942b.

Building stone: Conover 1884.

Clay and shale

General: Bleiningner 1912, G. H. Cady 1912b, 1919b, J. E. Lamar 1934, Parmelee 1921, 1922, Willman 1942b.

Ceramic tests: Parham 1959b, W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Clay products: Ede 1919.

In coal mines: Stull 1917.

Mineralogy: C. W. Rolfe 1908, W. A. White 1960b.

Petrology: Grim 1957, C. W. Rolfe 1908.

Refractory clay: J. E. Lamar 1956b, E. H. Lines 1917, Parmelee 1921, Purdy 1907, Willman 1942b.

Reserves: Parham 1959b, W. A. White 1959b.

Coal

General: G. H. Cady 1915a, 1919b, Dinsmore 1889, Ede 1919, John Wells Foster 1856, Ill. GS 1913, Lesquereux 1866a, J. M. Weller 1939b, Willman 1942b.

Analyses: Ashley 1902, G. H. Cady 1912b, 1919b, 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, J. A. Holmes 1906, Parr 1904, 1906b, 1915a, 1916, N. H. Snyder 1953, W. F. Wheeler 1908a, Willman 1942b.

Ash analyses: Rees 1964.

Discovery: Hutchins 1778, Bement 1929.

Mine subsidence: C. A. Herbert 1927.

Mined-out areas: Ill. GS 1959b maps 2, 7.

Mining: Annual coal reports, Andros 1914a, H. M. Cooper 1942b, Peltier 1910, C. O. Sauer 1916, Toenges 1936.

Mining history: Spooner 1952.

Physical tests: J. A. Holmes 1906.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, DeWolf 1908b.

Strippable reserves: G. H. Cady 1937c.

Subsidence: L. E. Young 1916b.

Copper erratic: Crook 1929.

Drill records: C. B. Anderson 1919, G. H. Cady 1912a, 1915a, M. L. Fuller 1905, 1906, Ross Hanson 1950, 1961, Horberg 1953, Kempton 1963, Leverett 1896, Thwaites 1927, Johan A. Udden 1914, Willman 1942b.

Feldspar: Willman 1942a.

Galena: V. T. Allen 1932a.

Geologic sections (described outcrops)

Bailey Falls (Pa.): Bleiningner 1912.

Cedar Creek (Pa., Pleis.): G. H. Cady 1919b, C. O. Sauer 1916.

Covel Creek (Pa.): Willman 1942b.

Covel Creek (Pleis.): Willman 1942b.

LaSalle County—cont.

Geologic sections—cont.

- Crooked Leg Creek (Pleis.): Willman 1942b.
 Dalzell (Pleis.): C. O. Sauer 1916.
 Dayton (Pa.): Parmelee 1921.
 Deadly Run (Pleis.): Willman 1942b.
 Deer Park (Ord.): Templeton 1963, Willman 1942b.
 Deer Park North (Pa.): Parmelee 1921.
 Deer Park South (Pa.): Willman 1942b.
 Deer Park West (Pa.): Bleining 1912.
 Egg Bag Creek (Pleis.): Willman 1942b.
 Fox River (Pleis.): Willman 1942b.
 Illinois Canyon (Pa.): Willman 1942b.
 Indian Creek (Pleis.): C. O. Sauer 1916, Willman 1942b.
 Klein Bridge (Pa.): Willman 1942b.
 LaSalle (Pa.): Bleining 1912.
 LaSalle South (Pa.): G. H. Cady 1919b.
 LaSalle-Utica (Ord.): Bleining 1912, R. P. Stevens 1858a.
 Little Horseshoe Canyon (Pa.): Willman 1942b.
 Little Vermilion River (Pa.): Bleining 1912, Willman 1942b.
 Lowell (Ord., Pa.): G. H. Cady 1919b, Parmelee 1921, Willman 1942b.
 Marseilles (Spicer) Gravel Pit (Pleis.): Frye 1965b, Willman 1942b.
 Mission Creek (Pleis.): Willman 1942b.
 North Kickapoo Creek (Pa.): Willman 1942b.
 Oglesby (Pa.): Bleining 1912.
 Ottawa East (Ord., Pa.): Parmelee 1921, Willman 1942b.
 Pecumsaugan Creek (Ord.): G. H. Cady 1919b.
 Peru (Pa.): Bleining 1912.
 Sandy Ford (Pa.): Willman 1942b.
 Seneca (Pleis.): Willman 1942b.
 Seneca Northwest (Pleis.): C. O. Sauer 1916.
 Split Rock (Ord.): Templeton 1963.
 Starved Rock (Ord.): Templeton 1963.
 Starved Rock Southwest (Pa.): Willman 1942b.
 Streator (Pa.): Willman 1942b.
 Sulphur Springs (Pleis.): Willman 1942b.
 Twin Bluffs (Pa.): Parmelee 1921.
 Utica South (Ord., Pa.): Parmelee 1921.
 Utica West (Ord.): J. E. Lamar 1934.
 Vermilion River (Pleis.): Willman 1942b.
 Wedron (Pleis.): Frye 1965a, Leighton 1953, A. B. Leonard 1960, C. O. Sauer 1916, Willman 1942b.
 Wilsman (Pa.): Willman 1942b.
- Geophysical studies: Beck 1965, McGinnis 1961a, 1963b.
- Ground water
 General: C. B. Anderson 1919, Bartow 1913, G. H. Cady 1919b, Hackett 1956a, Horberg 1950a, Leverett 1899a, Thwaites 1927, Willman 1942b.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.
 Artesian waters: C. B. Anderson 1919, G. H. Cady 1912b, Willman 1942b.
- Limestone and dolomite
 General: Eckel 1905, Ede 1919, H. C. Freeman 1885, Krey 1925, J. E. Lamar 1934, 1960b, Willman 1942b.

LaSalle County—cont.

Limestone and dolomite—cont.

- Cement materials: Bleining 1912, G. H. Cady 1908, 1912b, 1919b, H. C. Freeman 1885, J. E. Lamar 1956b.
 Mineralogy and petrology: Goldsmith 1958b, Grim 1937a, Ostrom 1957a.
 Trace elements: Ostrom 1957c.
- Loess: Frye 1962e, G. D. Smith 1942, Wascher 1960, Willman 1942b.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: G. H. Cady 1919b, Horberg 1950a, Willman 1942b.
 Drift thickness: State geol. map.
 Geologic: State geol. map, G. H. Cady 1919b, Horberg 1953, McGinnis 1963b, C. O. Sauer 1916, Willman 1942b.
 Glacial: State geol. map, G. E. Ekblaw 1941, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961, G. H. Cady 1908, Willman 1942b.
 Paleogeologic: Willman 1942b.
 Structure: Beck 1965, A. H. Bell 1961c, G. H. Cady 1919b, J. E. Lamar 1928b, McGinnis 1963b, Thwaites 1927, Willman 1942b.
- Mineral economics: Voskuil 1942d.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Mineral resources: Elmer Baldwin 1877.
- Oil and gas: G. H. Cady 1919b.
 Gas in drift: Meents 1960.
 Natural gas: Ashburner 1886, Weeks 1892a.
 Possibilities: Willman 1942b.
 Underground gas storage: A. H. Bell 1961c, 1962b.
 Vermilion River seep: Ashburner 1886, USBM 1965.
- Paleobotany: C. D. White 1914.
 Peat: Willman 1942b.
- Physiography: G. H. Cady 1912b, 1919b, Leighton 1948b, C. O. Sauer 1916, Willman 1942b.
- Quadrangle studies
 LaSalle: G. H. Cady 1912b, 1919b.
 Marseilles: Willman 1942b.
 Ottawa: Willman 1942b.
 Streator: Willman 1942b.
- Radiocarbon dates: J. R. Arnold 1951, R. F. Flint 1955, Horberg 1955a, Libby 1951, 1952b, Rubin 1960, Suess 1954.
- Sand and gravel
 General: G. H. Cady 1912b, 1919b, Ede 1919, J. E. Lamar 1934, Willman 1942b.
 Mineralogy and petrology: Wadell 1935, Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b, Willman 1942b.
 Silica sand: J. E. Lamar 1928b, Weigel 1927, Willman 1942b.
- Sandstone: J. C. Bradbury 1962a, G. H. Cady 1919b, J. E. Lamar 1927d, 1928b, P. E. Potter 1963a, Willman 1942b.
- Soil report 5
 Springs: G. H. Cady 1919b, Peale 1886, C. U. Shepard 1838.
- Starved Rock area guide leaflet: Ill. GS 1962-C.
- Starved Rock State Park: G. H. Cady 1918b, Willman 1942b.

LaSalle County—cont.

- Stratigraphy
 General: C. B. Anderson 1919, Bleininger 1912, G. H. Cady 1912a, 1912b, 1919b, Calkins 1877, Ede 1919, McGinnis 1963b, C. O. Sauer 1916, C. U. Shepard 1838, Willman 1942b.
 Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.
 Cambrian: A. H. Bell 1964, Willman 1951.
 Ordovician: A. H. Bell 1964, Bevan 1926, Bieber 1944, G. H. Cady 1918b, 1919b, 1920b, Gutstadt 1958b, J. E. Lamar 1928b, Sardeson 1926, Templeton 1963, E. O. Ulrich 1944, Willman 1943a, 1951.
 Silurian: Cady 1919b, Lowenstam 1949b.
 Pennsylvanian: J. C. Bradbury 1962a, E. B. Branson 1905, G. H. Cady 1908, 1915a, 1919b, Dinsmore 1889, DuBois 1941, 1943, Lesquereux 1866a, Ostrom 1957a, Parham 1963c, Rhodes 1952, Savage 1928, H. W. Scott 1944a, R. P. Stevens 1858a, Wanless 1947b, J. M. Weller 1942c, Willman 1942b, Worthen 1882c.
 Permian (Pennsylvanian): Norwood 1858.
 Pleistocene: G. H. Cady 1915a, 1918b, 1919b, Frye 1965a, 1965b, 1965c, Horberg 1953, Kempton 1963, A. B. Leonard 1960, Leverett 1898a, 1899a, McGee 1890, C. O. Sauer 1916, Staplin 1963b, Wascher 1938, Willman 1942b, 1963.
 Structural materials: Jon A. Udden 1910b.
 Structure: G. H. Cady 1912b, 1919b, 1920b, Thwaites 1927, Willman 1942b.
 Tufa: Willman 1942b.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 3, 7): H. C. Freeman 1868, Worthen 1883(1).
 Yorkville area guide leaflet: Ill. GS 1965-C.
- LaSalle Cyclothem (Pa.): S. E. Ekblaw 1934, Geis 1936, Kosanke 1960, Newton 1937b, 1941, Wanless 1939, J. M. Weller 1936c, 1958b.
- LaSalle Formation (Pa.): DeWolf 1910, Savage 1910b.
- LaSalle Limestone Member (Pa.): G. H. Cady 1908, 1919b, 1920b, Kosanke 1960, J. E. Lamar 1934, Newton 1937b, Ostrom 1957a, 1957c, Shrode 1952, Wanless 1939, 1947b.
 Structure map: G. H. Cady 1920b.
- LaSalle (No. 2) Coal (Pa.) (see Colchester (No. 2) Coal): G. H. Cady 1919b, 1942a, 1952b, Kosanke 1950, 1960, Pullen 1951, Willman 1942b.
 Isopach map: G. H. Cady 1935a.
 Structure map: G. H. Cady 1919b, Willman 1942b.
- LaSalle Quadrangle: G. H. Cady 1912b, 1919b.
 LaSalle region, mineral resources: Buzzard 1923.
 Last Chance Fault: J. M. Weller 1952.
 Late Sangamon Loess (Pleis.) (see Farmdale Loess, Roxana Loess): Leighton 1926b, 1928, 1931b, G. D. Smith 1942, Wanless 1929a, Wascher 1947.

Lawrence County

- Bedrock topography: Fidler 1943, Horberg 1950a.
 Berryville coal ball locality: Stewart 1951b.

Lawrence County—cont.

- Brines: Albright 1938, E. S. Bastin 1926a, 1930, A. H. Bell 1932b, Meents 1952, Mylius 1927.
 Clay and shale
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a
 Mineralogy: W. A. White 1960b.
 Petroleum mud fluids: J. E. Lama 1931c.
- Coal
 General: P. E. Potter 1956c.
 Coal balls: Mamay 1962, Stewart 1951b
 Mined-out areas: Ill. GS 1959b map 25
 Reserves: G. H. Cady 1944, 1952b, P. E. Potter 1956c.
 Drill records: Bain 1908g, A. H. Bell 1928d, R. F. Blatchley 1911, R. S. Blatchley 1910a, 1913a, DuBois 1945, Ross Hanson 1950, Rich 1916a, 1916b, Johan A. Udden 1914, Warthin 1944.
 Fossil plant localities: Collinson 1960a.
 Geologic sections (described outcrops)
 Berryville (Pa.): Mamay 1962.
 St. Francisville (Pleis.): F. C. Baker 1928b.
 Geophysical studies: Buhle 1953, J. R. Henderson 1951a, Pryor 1956c.
 Geothermal gradient: Van Orstrand 1935.
 Ground water
 General: Buhle 1953, Horberg 1950a, Leverett 1899a, Pryor 1956c, R. C. Scott 1962, Selkregg 1957.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961.
 Limestone and dolomite: Graf 1950b.
 Loess: Fehrenbacher 1965b, J. E. Lamar 1931c.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Newton 1937b.
 Glacial: State Geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: P. E. Potter 1956c, Siever 1951a, Workman 1956.
 Structure: A. H. Bell 1928d, 1943c, G. H. Cady 1920b, P. E. Potter 1956c, Rich 1916b, Siever 1951a, Squires 1943c.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Musk-ox: Galbreath 1963.
- Oil and gas
 General: Bain 1908h, 1909b, R. S. Blatchley 1909, 1912e, 1912f, 1913a, W. S. Blatchley 1906, F. H. Kay 1917a, Mylius 1923, 1927.
 Analyses: Bain 1908g.
 Applegate flood area: A. H. Bell 1934a.
 Corrosion: J. E. Lamar 1928a.
 Development maps: Ill. GS 1965 maps 38, 39, 55, 56.
 Developments: A. H. Bell 1928d, F. H. Kay 1916b, Moulton 1926j.
 McClosky flood area: A. H. Bell 1934a.
 Mud-fluid materials: J. E. Lamar 1931c.
 Natural gas: A. H. Bell 1935a, Rich 1916a.
 Oil field farm map: Ill. GS 1934b.
 Oil sand: Mylius 1923.

Lawrence County—cont.

Oil and gas—cont.

Physical properties: Armon 1964.

Pools

Applegate: Squires 1943e.

Billett: Rich 1916b.

Birds: Rich 1916a.

Dennison Township: Squires 1943e.

Hebert: Rich 1916b.

Murphy: Rich 1916b, Squires 1943e.

Russellville gas field: Peterson 1942a.

St. Francisville: Rich 1916b, Squires 1943e.

Possibilities: W. S. Blatchley 1906, Rich 1916a.

Repressuring operations: A. H. Bell 1932d.

Sand properties: Piersol 1940.

Secondary recovery: A. H. Bell 1932a,

1932b, Davison 1960, L. C. Powell 1954,

Pryor 1957, Squires 1938a, 1943b, 1943e,

1944a, 1946, 1949b, 1950a, 1950d.

Structure diorama: Squires 1944d.

Well data: R. S. Blatchley 1913a.

Physiography: Leighton 1948b, MacClintock 1929, Rich 1916a.

Sand and gravel: Littlefield 1925a, 1925b.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962c, Siever 1956b.

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Stratigraphy

General: A. H. Bell 1964, R. S. Blatchley 1910a, 1912e, 1913a, W. S. Blatchley 1906, Selkregg 1957, Swann 1958.

Devonian: Meents 1965b, Warthin 1944, Workman 1944.

Mississippian: A. H. Bell 1932b, R. S. Blatchley 1913a, Rich 1916a, 1916b, Siever 1951a, Swann 1958, Workman 1956.

Pennsylvanian: Andresen 1961, R. S. Blatchley 1913a, J. C. Bradbury 1962a, G. H. Cady 1944, Mamay 1962, Newton 1937b, P. E. Potter 1956c, Rich 1916a, 1916b, H. W. Scott 1941, Siever 1951a, J. M. Weller 1942c.

Pleistocene: F. C. Baker 1928b, F. W. Cox 1923, Fidler 1936, 1948, Leighton 1961.

Structure: A. H. Bell 1928d, R. S. Blatchley 1912e, 1913a, G. H. Cady 1920b, D. A. Green 1957, Meents 1965b.

Worthen Survey report (v. 6): Worthen 1875a(2).

Lawrence County pools: R. S. Blatchley 1913a, Piersol 1940.

Lawson Shale Member (Pa.) (see Sheffield Sh.): Kosanke 1960.

Lead and zinc

(See also under county)

General: Bain 1904c, E. S. Bastin 1926a, Ill. State Div. Indus. Planning and Dev. 1959, J. E. Lamar 1965, Owen 1846.

Fluorspar District: Amstutz 1964, Bain 1907b, E. S. Bastin 1931b, J. W. Baxter 1965a, Bishop 1947a, Fohs 1910, Harwood 1903, Osterling 1952, Silliman 1819, E. O. Ulrich 1903, 1905, Stuart Weller 1920b, Worthen 1866a(6).

Lead and zinc—cont.

Northwestern Illinois

General: Agnew 1946, 1955a, Anon. 1866a, 1866b, 1878, Bain 1905b, 1906b, 1907b, Bauche 1752, Behre 1935, J. C. Bradbury 1955a, 1956, 1957b, 1959b, 1960b, Chamberlin 1882a, G. H. Cox 1910, 1911, 1914, Dale 1952, R. E. Davis 1906, S. F. Emmons 1894, W. H. Emmons 1917, 1929, Erickson 1965, Garrels 1941, Grant 1908, James Hall 1858, Heyl 1955, 1959, Holt 1948a, 1948b, Irving 1880, C. T. Jackson 1865, Edwin James 1827, Jenney 1894, Jensen 1957, Leith 1932, Lincoln 1945, Locke 1840, Newhouse 1932, R. R. Reynolds 1958, 1964, Schockel 1916, E. R. Scott 1935, E. W. Shaw 1916, James Shaw 1873, Spurr 1924, Terry 1948, Trowbridge 1916, Van Hise 1902, Whitney 1866, Willman 1946, 1947, Zinner 1946.

Bautsch mine: Bailey 1951.

Bottom-run deposits: Bailey 1951.

Calcite deposition: Erickson 1965.

Eagle Picher operations: Dale 1952.

Economics: Heyl 1959, Hodge 1842.

Fluid inclusions: Bailey 1951, Erickson 1965, W. E. Hall 1963, Leith 1932, Newhouse 1932.

History of mining: Barrett 1922a, G. H. Cox 1914, Heyl 1955, Norwood 1866, James Shaw 1873, J. M. Weller 1935c, Worthen 1866a(6).

Isotopes: Kulp 1956.

Lead diggings: Bain 1905b, J. C. Bradbury 1959b, G. H. Cox 1914, Heyl 1955, 1959, Willman 1946.

Mineralogy and paragenesis: E. S. Bastin 1939b, J. C. Bradbury 1961, Jensen 1957.

Mining and milling: Anon. 1906b, Bain 1905b, W. A. Cole 1957, Dale 1952, Heyl 1959, Willman 1946.

Origin: Bailey 1951, Bain 1905b, 1906b, E. S. Bastin 1926a, 1939a, J. C. Bradbury 1961, Chamberlin 1882a, G. H. Cox 1910, 1911, 1914, W. H. Emmons 1929, Erickson 1965, Garrels 1941, Heyl 1959, Leith 1932, Ohle 1959, R. R. Reynolds 1958, 1964, E. R. Scott 1935, Spurr 1924, Willman 1946.

Outlying occurrences: J. C. Bradbury 1957a, Willman 1946.

Spectrographic analyses: J. C. Bradbury 1961.

Structure: J. C. Bradbury 1956, 1960b, Heyl 1959, Willman 1947.

Sulfate and chloride relations: J. C. Bradbury 1957b.

Zoning: J. C. Bradbury 1961.

Production statistics (see also Mineral economics): Heyl 1955, Willman 1946.

Galena replacing Pennsylvanian rootlet: V. T. Allen 1932a.

Kendall County, near Millbrook: J. N. Payne 1939b.

Union County: Desborough 1959b.

Leaf River Esker: R. F. Flint 1931, Leverett 1899a.

Leclaire Limestone (Sil.): Norton 1895, Worthen 1862.

Lecthaylus Shale (Sil.): Lowenstam 1948a.

Lee County

- Amboy area guide leaflet: Ill. GS 1962-D.
 Bedrock topography: Caldwell 1963, John Webster Foster 1956, Horberg 1950a, McGinnis 1963b.
 Building stone: Conover 1884.
 Clay and shale: J. E. Lamar 1934, Parr 1921.
 Chemical analyses: W. A. White 1959a.
 Refractory clay: J. E. Lamar 1956b.
 Copper and gold: Knappen 1926.
 Copper erratic: Crook 1929.
 Drill records: Caldwell 1963, DuBois 1945, Ross Hanson 1950, 1961, Kempton 1963, Knappen 1926, Thwaites 1927, Tiffany 1890, Willman 1942b, Workman 1948, Worthen 1890(2).
 Feldspar: Willman 1942a.
 Geologic sections (described outcrops)
 Dixon (Ord.): Bleininger 1912.
 Dixon East (Ord.): Templeton 1963.
 Dixon North (Ord.): Templeton 1952, 1963.
 Dixon, River Street (Ord.): Templeton 1952.
 Franklin Creek (Ord.): Knappen 1926.
 Rochelle South (Camb., Ord.): Templeton 1952.
 West Dixon Pit (Pleis.): Knappen 1926.
 Geophysical studies: Beck 1965, McGinnis 1961a, 1963b.
 Ground water
 General: Caldwell 1963, John Webster Foster 1956, Hackett 1956a, Ross Hanson 1955, Horberg 1950a, Knappen 1926, Leverett 1899a, Thwaites 1927.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.
 Igneous rocks: Grogan 1949a.
 Limestone and dolomite
 General: Krey 1925, Knappen 1926, J. E. Lamar 1934, Willman 1943b.
 Cement materials: Bleininger 1912, Knappen 1926, J. E. Lamar 1956b.
 Loess: Knappen 1926, G. D. Smith 1942, Wascher 1960.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a, Templeton 1952.
 Drift thickness: State geol. map.
 Geologic: State geol. map, G. H. Cady 1920b, Caldwell 1963, John Webster Foster 1956, Horberg 1953, Knappen 1926, McGinnis 1963b, Willman 1951.
 Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: John Webster Foster 1956, Willman 1942b.
 Structure: Beck 1965, John Webster Foster 1956, Knappen 1926, J. E. Lamar 1928b, McGinnis 1963b, Templeton 1952, Thwaites 1927, Willman 1942b.
 Meteorite: B. H. Wilson 1947.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Gas in drift: Meents 1960.
 Possibilities: Knappen 1926.
 Peat: Knappen 1926, Soper 1922.
 Physiography: Leighton 1948b, Deette Rolfe 1929.
 Potash: Knappen 1926, Parr 1921.

Lee County—cont.

- Pyrite: Knappen 1926.
 Quadrangle study, Dixon: Knappen 1926.
 Rochelle area guide leaflet: Ill. GS 1964-C.
 Sand and gravel
 General: John Webster Foster 1956, Knappen 1926.
 Mineralogy and petrology: Willman 1942a.
 Molding sand: Littlefield 1925a.
 Silica sand: Knappen 1926, J. E. Lamar 1928b.
 Sandstone: J. E. Lamar 1928b.
 Soil report 37
 Stratigraphy
 General: Bleininger 1912, John Webster Foster 1956, McGinnis 1963b, Deette Rolfe 1929, Thwaites 1923, I. B. Wasson 1932.
 Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c, Grogan 1949a.
 Cambrian: A. H. Bell 1964, G. H. Cady 1920b, John Webster Foster 1956, Templeton 1950, 1952, I. B. Wasson 1932, Willman 1951, Workman 1948.
 Ordovician: Bassler 1950, Bevan 1926, Bieber 1944, G. H. Cady 1920b, Carozzi 1956, John Webster Foster 1956, Guttschick 1954a, 1954b, Gutstadt 1958b, D. M. Henderson 1956, J. E. Lamar 1928b, H. W. Scott 1951, Templeton 1952, 1963, Willman 1943b, 1951, N. H. Winchell 1896, Workman 1948.
 Pleistocene: W. C. Alden 1909, R. F. Flint 1931, John Webster Foster 1956, Frye 1965a, 1965c, Horberg 1953, Kempton 1963, Leighton 1923a, 1961, Leverett 1899a, 1942b, McGee 1890, Shaffer 1956, Templeton 1952, Willman 1963.
 Structural materials: Jon A. Udden 1910b.
 Structure: G. H. Cady 1920b, Thwaites 1927, Willman 1951.
 Worthen Survey report (v. 5): James Shaw 1873.
 Lee Fault: J. W. Baxter 1963a, 1965a, J. S. Brown 1954, Heyl 1965, J. M. Weller 1952, Stuart Weller 1920b.
 Lemont Drift (Pleis.): Bretz 1955, J. W. Goldthwait 1909, Horberg 1955b.
 Lenzburg Anticline: A. H. Bell 1929a.
 LeRoy Moraine: G. E. Ekblaw 1941, Frye 1965b.
 Levan Anticline: Root 1928.
 Levels, primary (see also Spirit leveling): H. M. Wilson 1907.
 Levias Limestone Member (Miss.): J. W. Baxter 1963a, 1965a, Currier 1944, Easton 1943, Folk 1946, Harris 1961, J. E. Lamar 1950a, 1959, J. M. Parks 1953, J. N. Payne 1940, A. H. Sutton 1951, Swann 1948, 1963, Tippie 1943, 1945, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1939a.
 Structure map: Easton 1943, 1944b.
 Levings Member (Cre.): Pryor 1962a.
 Liberty Sandstone (Pa.): Kosanke 1960, Siever 1956a.
 Lick Creek Sandstone (Pa.) (see Battery Rock Ss.): Kosanke 1960, J. E. Lamar 1925a, Siever 1956b, 1959, Wanless 1939.
 Structure map: J. E. Lamar 1925a.
 Lightweight aggregate: Sweeney 1965.

Liman Substage (Pleis.) (see Payson Substage):
Frye 1964a, 1965c, W. H. Johnson 1964.
Lime (see Limestone and dolomite)
Lime-sinter and lime-soda processes: Grim 1945a.

Limestone and dolomite

(See also under county)

General: W. C. Alden 1902, Brecke 1962, DeWolf 1920c, Ill. State Div. Indus. Planning and Dev. 1959, Krey 1925, J. E. Lamar 1927a, 1931a, 1959, 1965, Risser 1961.

Acid etching: J. E. Lamar 1950a.

Agricultural limestone: DeTurk 1938, Grogan 1940, Krey 1925, J. E. Lamar 1943, Van Horn 1907, Voskuil 1932a, 1933a, 1934a, 1935, 1936a, 1937a, 1938a, 1939a, 1940a, 1941a, 1942a, 1943a, 1944a, 1945a, 1946a, 1947a, 1948a.

Bibliography of geochemistry: Graf 1960e.

Bibliography of uses: J. E. Lamar 1961.

Bioalcalarenites: Ostrom 1957a.

Building stone: W. C. Alden 1903, Anon. 1884b, Ill. GS 1934a, Krey 1925, J. E. Lamar 1935a, 1942b, 1945, 1955a, Leighton 1934e, Sanborn 1938, Trowbridge 1916.

Calclitic limestone: J. W. Baxter 1957.

Ca/Mg ratios: Chilingir 1956.

Cement, history: Barrett 1922a.

Chemical analyses: W. C. Alden 1902, Athy 1928, J. R. Ball 1952, J. W. Baxter 1960b, 1964, 1965b, Blaney 1866, 1868, Bleiningier 1912, J. C. Bradbury 1963, 1965a, 1965b, Brecke 1962, Burchard 1907, G. H. Cady 1908, W. C. Day 1899, Eckel 1905, 1913, D. J. Fisher 1925a, Goldsmith 1962, Graf 1952, 1960c, 1960d, 1962b, Grim 1945a, Harvey 1964, Krey 1925, J. E. Lamar 1929a, 1931b, 1933, 1934, 1953b, 1956b, 1956c, 1957a, 1959, Littlefield 1925a, Mylius 1927, Rubey 1952, Jon A. Udden 1910b, Van Horn 1907, Willman 1943b, 1950, Worthen 1868(2).

Chemical and physical specifications: J. E. Lamar 1961.

Chemistry: Deadmore 1959, Goldsmith 1957, Graf 1955a, 1955b, 1958.

Clay minerals in: Grim 1937a, Ostrom 1961a.

Coal-mine dusting: Bowles 1925.

Concrete aggregate: Burchard 1907.

Crystal chemistry: W. F. Bradley 1953b, Goldsmith 1958b, 1960, 1962, Graf 1955b, 1960a, 1962a, J. E. Lamar 1955c.

Deep deposits: J. W. Baxter 1964.

Differential thermal analysis: W. F. Bradley 1953b, Graf 1952, Siever 1957a.

Directory of producers: Busch 1961a.

Economics (see also Mineral economics):
Busch 1961c, J. E. Lamar 1934, 1937a, Risser 1959b, Voskuil 1932a, 1933a, 1934a, 1935, 1936a, 1937a, 1938a, 1939a, 1940a, 1941a, 1942a, 1943a, 1943b, 1944d, 1945a, 1946a, 1947a, 1948a.

Extreme southern Illinois: J. E. Lamar 1928d.

Ferrous dolomites: Goldsmith 1962.

Fluxes: Krey 1925.

Freezing and thawing tests: Willman 1941b, 1944.

Geochemistry: Graf 1960a, 1960b, 1960c, 1960d.

High-calcium limestone: J. W. Baxter 1960b, J. E. Lamar 1931b.

High-purity dolomite: Willman 1943b.

Limestone and dolomite—cont.

High-purity limestone: Graf 1950a.

History: Barrett 1922a.

Hydrothermal syntheses: Graf 1956.

Impact resistance: Harvey 1963.

Insoluble residues: Collinson 1955b, J. E. Lamar 1926b, Meents 1965b, Tippie 1943, Willman 1943b.

Isotopic composition: Epstein 1963, Graf 1960d.

Lime: Barrett 1922a, Krey 1925, J. E. Lamar 1937a, Leighton 1934e.

Burning: G. L. Clark 1940.

Hydration and calcination: Deadmore 1959.

Plastic properties: Deadmore 1958.

Mineralogy: J. W. Baxter 1960b, Goldsmith 1955, 1957, 1958b, 1961, Graf 1955a, 1955b, 1958, 1960a, 1961, Grim 1937a, D. M. Henderson 1956, Hobbs 1895, P. W. Hughes 1960, Siever 1957a.

Morris, drilling near: J. E. Lamar 1933.

Natural cement: G. H. Cady 1908, 1919b, H. C. Freeman 1885, Krey 1925.

Oolite: Graf 1950b.

Origin: Epstein 1963, D. M. Henderson 1956.

Outcrop map: J. E. Lamar 1950b.

Petrology: Graf 1950a, 1950b, J. E. Lamar 1926b, Meents 1965b, P. E. Potter 1958b.

Physical properties: Athy 1928, J. R. Ball 1952, J. C. Bradbury 1963, Burchard 1907, Graf 1955b, Harvey 1963, 1964, Krey 1925, J. E. Lamar 1927c, 1929a, 1931b, 1959, 1961, Rubey 1952, James Shaw 1873.

Portland cement: Bleiningier 1912, G. H. Cady 1908, 1919b, Eckel 1905, 1913, Krey 1925, J. E. Lamar 1929a, 1956b, Leighton 1934e.

Production statistics (see also Mineral economics): W. C. Day 1892.

Protodolomite: Graf 1956.

Quarry practice: Krey 1925.

Research programs: J. E. Lamar 1938a.

Resin-bearing limestone: J. E. Lamar 1938d.

Resources: J. W. Baxter 1965b, Bleiningier 1912, J. C. Bradbury 1963, 1965a, 1965b, Ill. State Div. Indus. Planning and Dev. 1959, Krey 1925, J. E. Lamar 1929a, 1959, Leighton 1944d, Ostrom 1956, Wanless 1957a, Willman 1942b, Worthen 1880.

Road material tests: Krey 1925.

Rock wool: J. E. Lamar 1934, 1937c, 1949, Leighton 1934e.

Sampling: J. E. Lamar 1956c.

Sedimentary structures: Terzaghi 1940.

Sewage disposal filter beds: J. E. Lamar 1927c, 1927e.

Slickolites: Nitecki 1962.

Sodium sulphate soundness test: Willman 1941b.

Soundness, Chicago area dolomite: Willman 1941b.

Southern Illinois: Leighton 1949b.

Spectrographic analyses: Ostrom 1957c.

Stability relations: Graf 1955b.

Stabilized roads: Lieberman 1938.

Structural and compositional variations: Goldsmith 1958b.

Technologic trends: Ill. GS 1935c, 1936d.

Terrazzo chips: Harvey 1962.

Textures: Wanless 1957a.

Thermoluminescence: J. M. Parks 1953.

Till intruded into: Deere 1957, Doyle 1965.

- Limestone and dolomite—cont.
- Trace elements: Graf 1962b, J. E. Lamar 1956c, Ostrom 1957c.
 - Uses (general): Graf 1955b, Krey 1925, J. E. Lamar 1938c, 1959, 1961.
 - Water-soluble salts: J. E. Lamar 1953b.
 - Whiting: Hewitt Wilson 1937.
 - X-ray diffraction analysis: P. W. Hughes 1960.
- Limonite (see also Iron ore): J. C. Bradbury 1959b, J. E. Lamar 1938d.
- Lincoln Anticline, Dome: Cohee 1962, Collingwood 1933, Collinson 1954, 1958e, Heigold 1964, R. H. Howard 1964, Koenig 1961, Krey 1924, McQueen 1941, Rubey 1952, W. V. Searight 1961, J. M. Weller 1941b, J. S. Williams 1957.
- Lincoln Hills Section (Physiography): Horberg 1950a, Leighton 1948b.
- Lindahl-Udden Memorial: Leighton 1951a.
- Lindley Pay Zone: R. S. Blatchley 1914a.
Structure map: R. S. Blatchley 1914a.
- Lingle Limestone (Dev.) Bassett 1925, Caylor 1944, G. A. Cooper 1942b, 1957, C. L. Cooper 1944, W. F. Hoover 1944, J. E. Lamar 1948, 1959, Savage 1920, 1925a, Smoot 1958, C. R. Stauffer 1952, Warthin 1944, J. M. Weller 1939e, 1940a, 1940c, 1944b, 1952, Whiting 1965b, Willman 1949.
- Fauna: Meek 1868a, Orr 1964.
 - Isopach map: Whiting 1965b.
 - Paleogeographic map: Schuchert 1955.
 - Structure map: Smoot 1958.
- Litchfield Coal Member (Pa.): G. H. Cady 1952b, F. H. Kay 1915a, Kosanke 1960.
- Litchfield Dome: Wallace Lee 1926.
- Litchfield Pool: Wallace Lee 1915.
- Little Bear Soil (Cre.): Pryor 1962a, Ross 1963, 1964b.
- Little Grassy Creek Lake: J. E. Lamar 1925b.
- Little Rock Esker: Leverett 1899a.
- Little Saline Limestone (Dev.) (see Backbone Ls.): Caylor 1944, Savage 1925a, 1925c.
Fauna: Savage 1925c.
- Little Vermilion Cyclothem (Pa.): C. L. Cooper 1946, Kosanke 1960, Wanless 1947b.
- Little Vermilion Limestone Member (Pa.): C. L. Cooper 1946, Kosanke 1960, Wanless 1947b.
- Little Wabash Basin: Horberg 1950a.
- Little Wabash watershed: Pickels 1929.
- Littleton Anticline: Wanless 1957a.
- Liverpool Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, Wanless 1931a, 1931b, 1947b, 1957a, 1958, Willman 1942b.
Fauna: Wanless 1958.
- Livingston County**
- Bedrock topography: Horberg 1950a, Selkregg 1958, Willman 1940, 1942b.
 - Clay and shale: J. E. Lamar 1934, Willman 1942b.
 - Bonding clay: Grim 1940f.
 - Ceramic tests: W. A. White 1960a.
 - Chemical analyses: W. A. White 1959a.
 - Mineralogy: W. A. White 1960b.
 - Petrology: Grim 1957.
- Coal
- General: Anon. 1907a, G. H. Cady 1915a, Dinsmore 1889, Willman 1942b.
- Livingston County—cont.
- Coal—cont.
- Analyses: G. H. Cady 1935b, 1948a, Hawley 1923, Parr 1904, 1906b, 1916, Willman 1942b.
 - Cardiff coal basin: Anon. 1907a, G. H. Cady 1915a.
 - Mined-out areas: Ill. GS 1959b maps 7, 8, 10.
 - Mining: Annual coal reports, Andros 1914a, H. M. Cooper 1942b.
 - Production: Annual coal reports.
 - Reserves: G. H. Cady 1952b.
 - Drill records: G. H. Cady 1915a, Ross Hanson 1950, 1958, Johan A. Udden 1914, Willman 1942b, Worthen 1890(2).
 - Geologic sections (described outcrops)
 - Bradley Bridge (Pa.): Willman 1942b.
 - Long Point Creek (Pleis.): Willman 1942b.
 - Moon Creek (Pa.): Willman 1942b.
 - Short Point Creek (Pleis.): Willman 1942b.
 - Geophysical studies: Beck 1965.
 - Ground water
 - General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958, Willman 1942b.
 - Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 - Limestone and dolomite
 - General: Krey 1925, J. E. Lamar 1929a, 1934, Willman 1942b.
 - Cement materials: J. E. Lamar 1956b.
 - Mineralogy and petrology: Ostrom 1957a.
 - Resources: J. W. Baxter 1964.
 - Trace elements: Ostrom 1957c.
 - Loess: G. D. Smith 1942, Wascher 1960, Willman 1942b.
 - Maps (see also type of map, stratigraphic units)
 - Bedrock topography: Heigold 1964, Horberg 1950a, Willman 1942b.
 - Drift thickness: State geol. map.
 - Geologic: State geol. map, Horberg 1953, Willman 1942b.
 - Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Willman 1942b.
 - Mineral industries: Ill. GS 1961, Willman 1942b.
 - Paleogeologic: Willman 1942b.
 - Structure: Athy 1928, Beck 1965, A. H. Bell 1961c, G. H. Cady 1915a, Heigold 1964, Willman 1942b.
 - Mineral economics: Voskuil 1942d.
 - Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 - Oil and gas
 - Gas in drift: Meents 1960.
 - Prospecting: Mylius 1920b.
 - Underground gas storage: A. H. Bell 1961c.
 - Pol'en from peat: C. D. Griffin 1952.
 - Pontiac area guide leaflet: Ill. GS 1963-E.
 - Quadrangle studies
 - Streator: Willman 1942b.
 - Sand and gravel: Willman 1942b.
 - Sandstone: P. E. Potter 1963a.
 - Soil reports 25, 72
 - Stratigraphy
 - General: G. H. Cady 1915a, 1920b, Dinsmore 1889, Selkregg 1958, Willman 1942b.

Livingston County—cont.

Stratigraphy—cont.

- Pennsylvanian: Anon. 1907a, G. H. Cady 1915a, Ostrom 1957a, Willman 1942b.
 Pleistocene: G. H. Cady 1915a, Frye 1965c, Horberg 1953, Hubbard 1911, Wascher 1938, Willman 1942b, Zumberge 1960.
 Structural materials: Jon A. Udden 1910b.
 Structure: Horberg 1950a, Willman 1942b.
 Worthen Survey report (v. 6): H. C. Freeman 1875.

Livingston Cyclothem (Pa.): J. R. Ball 1943.

Livingston Limestone Member (Pa.): Clegg 1965b, C. L. Cooper 1946, Deere 1957, Kosanke 1960, Ostrom 1957a, 1957c, P. E. Potter 1956c, Pryor 1956b, J. M. Weller 1942c, Wier 1961, Worthen 1875a(2).

Isopach map: Pryor 1956b.
 Structure map: Pryor 1956b.

Llandoveryan (Sil.) graptolite: Ross 1962a.

Loess

General: Bartow 1909b, Collinson 1954, Ekblaw 1957, Eveland 1952, Frye 1962e, 1965c, O. P. Hay 1878, G. F. Kay 1928, Leighton 1949a, 1950b, 1961, A. B. Leonard 1960, Leverett 1899a, 1904, 1929a, 1929d, 1930, Savage 1916c, G. D. Smith 1942, Johan A. Udden 1898b, Worthen 1866a(2).

Chemical analyses: Chamberlin 1885, Clarke 1897, Fehrenbacher 1965a, Frye 1962b, M. L. Fuller 1904, J. E. Lamar 1934, USGS 1887, G. F. Wright 1890.

Dust storms: Hershey 1899a.

Ecology: F. C. Baker 1932.

Fauna (see also Paleontology): F. C. Baker 1920a, 1928b, Hubricht 1962, Leonard 1957a, 1960.

Microfossils: R. L. Jones 1963a.

Grain-size analyses: M. R. Campbell 1900, Fehrenbacher 1965a, Leighton 1950b, Leverett 1899a, L. L. Ray 1963b, E. W. Shaw 1912b, G. D. Smith 1942.

Magnetic susceptibility: R. L. Jones 1964.

Mineral analyses: Beavers 1957, Fehrenbacher 1965a, Frye 1962e, 1965a, 1965b, Glass 1964, Munson 1965, G. D. Smith 1942, Whiteside 1948.

Origin: Chamberlin 1897, Fisk 1951, Frye 1962e, Hershey 1897c, 1900, Nathaniel Holmes 1868, Leighton 1950b, Savage 1916c, E. W. Shaw 1912b, Shimek 1908, J. E. Todd 1897, Trowbridge 1916.

Regional correlations: Frye 1963b.

Regions (see also General)

Central: Frye 1963c, 1965b, Glass 1964, Willman 1942b.

Northeastern: Frye 1965b, Wascher 1960.

Northwestern: Bretz 1923, Carman 1910, Doyle 1965, Hershey 1895a, 1896a, Knappen 1926, Shaffer 1954a, 1956, Trowbridge 1916.

Southern: Fehrenbacher 1965a, 1965b, Pryor 1962a, Ross 1964b, J. M. Weller 1940a.

Southeastern: Butts 1925, Fehrenbacher 1965b, Sittler 1960.

Southwestern: Fenneman 1910, Frye 1963c, 1965b, Willman 1958a.

Western: Frye 1963c, 1965a, Rubey 1952, Savage 1917a, 1921b, 1921c.

Loess—cont.

Stratigraphy (see named units)

Thickness map: Fehrenbacher 1965b, Frye 1965c, Leighton 1950a, Sittler 1960, G. D. Smith 1942, James Thorp 1952, Wascher 1960.

Thickness, thin area: B. W. Ray 1962.

Zirconium content: J. D. Alexander 1962.

Logan County

Bedrock topography: Horberg 1945, 1950a, Selkregg 1958, E. W. Shaw 1913, W. H. Walker 1965.

Brines: Meents 1952.

Coal

General: Ill. GS 1913, G. H. Cady 1921, Clegg 1961, E. W. Shaw 1913.

Analyses: Aresco 1953-1965, Ashley 1902, G. H. Cady 1921, 1935b, 1948a, Hawley 1923, J. A. Holmes 1908, Lindgren 1908, Parr 1904, 1906b, 1915a, 1916, N. H. Snyder 1953.

Losses: C. A. Allen 1925.

Mined-out areas: Ill. GS 1959b map 15.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1915c, G. H. Cady 1921, H. M. Cooper 1942b.

P, Cl, Na, and K in: Abernethy 1965.

Physical tests: J. A. Holmes 1908.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Clegg 1961, DeWolf 1908b.

Squeezes in mines: Freer 1892.

Subsidence: L. E. Young 1916b.

Drill records: G. H. Cady 1921, Ross Hanson 1950, Worthen 1890(2).

Geologic sections (described outcrops)

Lincoln (Pa.): Bleining 1912.

Sugar Grove School (Pleis.): W. H. Johnson 1964.

Geophysical studies: McGinnis 1961a.

Ground water

General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Savage 1907, Selkregg 1958, E. W. Shaw 1913, W. H. Walker 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

Limestone and dolomite

General: Krey 1925, J. E. Lamar 1934.

Cement materials: Bleining 1912, J. E. Lamar 1956b.

Loess: Leighton 1950b, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Heigold 1964, Horberg 1945, 1950a, E. W. Shaw 1913, W. H. Walker 1965.

Drift thickness: State geol. map.

Geologic: State geol. map, Horberg 1953, E. W. Shaw 1913, W. H. Walker 1965.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Workman 1956.

Structure: G. H. Cady 1921, Clegg 1961, Heigold 1964, R. H. Howard 1964, Savage 1915, E. W. Shaw 1913, Whiting 1965b.

Mineral production (See USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Logan County—cont.

- Oil and gas
Development maps: Ill. GS 1965 maps 87, 88, 97.
Gas in drift: Meents 1960.
Possibilities: Garland 1965.
Physiography: Leighton 1948b, E. W. Shaw 1913, W. H. Walker, 1965.
Quadrangle studies
Springfield: Savage 1915, E. W. Shaw 1913.
Soil report 39
Stratigraphy
General: Bleininger 1912, Savage 1907, Selkregg 1958, E. W. Shaw 1913, W. H. Walker 1965.
Ordovician: Gutstadt 1958b.
Silurian: Whiting 1965b.
Devonian: Whiting 1965b.
Mississippian: Workman 1956.
Pennsylvanian: G. H. Cady 1921, Clegg 1961.
Pleistocene: Frye 1965c, Horberg 1953, W. H. Johnson 1964, Leverett 1899a, Wascher 1938, Willman 1963.
Recent: Stall 1959.
Structural materials: Jon A. Udden 1910b.
Structure: A. H. Bell 1964, Swann 1958.
Uranium: Ostrom 1955.
Worthen Survey report (v. 4): Bannister 1870.
- Logs (see drill records under county)
Lombard Dolomite Member (Camb.): Buschbach 1964.
Longbranch Monocline: G. H. Cady 1939e.
Longwall mining (see Coal)
Lonsdale Limestone Member (Pa.): G. H. Cady 1919b, 1939c, 1921, Kosanke 1960, J. E. Lamar 1934, MacClintock 1959, Ostrom 1957c, Siever 1957a, Wanless 1939, 1955b, 1957a, J. M. Weller 1942c, Willman 1942b, Worthen 1873(2).
Structure map: Wanless 1957a.
Louden Anticline: Cohee 1939, 1962, DuBois 1951, Newton 1941.
Louden Pool: Cohee 1939, P. L. Lyons 1948, McCaslin 1947, Piersol 1940, Sloan 1939, C. T. Smith 1946, F. B. Taylor 1939, Ver Wiebe 1949.
Loughridge Sandstone Member (Ord.): Buschbach 1964, Templeton 1952, 1963.
Louisiana Limestone (Miss.): J. R. Ball 1952, Collingwood 1933, Collinson 1954, 1958e, 1961, 1964b, J. E. Conkin 1964, Keyes 1892b, Krey 1924, R. C. Moore 1929, 1935, Rubey 1952, J. M. Weller 1940b, Stuart Weller 1907b, J. S. Williams 1943, 1957, Workman 1956.
Fauna: A. J. Scott 1961a.
Isopach map: Workman 1956.
Louisville Anticline: J. M. Weller 1936c.
Loveland Loess, Silt (Pleis.): Collinson 1954, G. E. Ekblaw 1957, Eveland 1952, Frye 1965a, 1965b, Horberg 1953, 1956b, G. F. Kay 1928, Leighton 1949a, 1950b, 1961, Leverett 1929a, 1929b, Pryor 1962a, Ross 1964b, James Thorp 1952, Wanless 1957a, Willman 1958a.
Lovell Member (Camb.): Templeton 1950.
Lower Anticline: Easton 1942.
Lowell Clay (Pa.): G. H. Cady 1912b, Wanless 1939.
Lowell Cyclothem (Pa.): Kosanke 1960, Newton 1941, Willman 1942b.
Lowell Coal Member (Pa.): Kosanke 1960, W. H. Smith 1961, Willman 1942b.
Lower Bogota Coal (Pa.): Wanless 1939.
Lower Bogota Cyclothem (Pa.): Newton 1937b, 1941.
Lower DeLong Coal (Pa.) (see Hermon Coal): Kosanke 1960, Wanless 1936, 1956, 1957a.
Lower DeLong Cyclothem (Pa.) (see Hermon Cyc.): Kosanke 1960, Wanless 1931a, 1956, 1957a.
Lower Liverpool Coal (Pa.): Wanless 1931a, 1939, 1957a.
Lower Liverpool Cyclothem (Pa.): Wanless 1931a, 1957a.
Lower Livingston Limestone (Pa.) (see Livingston Ls.): Kosanke 1960, J. M. Weller 1942c.
Lower Magnesian Limestone (Ord.): Barrows 1910, Bartow 1909b, R. S. Blatchley 1914a, Bleininger 1912, G. H. Cady 1908, 1915a, 1920b, G. H. Cox 1910, J. W. Goldthwait 1909, Savage 1921c, James Shaw 1873, Johan A. Udden 1896, Stuart Weller 1906b, 1907b, Whitney 1866, Worthen 1866a(4).
Lower Ohara Limestone (Miss.): Stuart Weller 1920b, Workman 1937a.
Lower Partlow Sand: Mylius 1927, Squires 1943e.
Structure map: A. H. Bell 1934a, Mylius 1927, Squires 1943e.
Lower Siggins Sand, Pay Zone: Mylius 1927.
Lower Silurian System (Ord.): James Hall 1851.
Lower Willis Coal (Pa.), Beryllium in: Stadnichenko 1961.
Luminescence: Graf 1960a.
Lusk Creek Fault Zone: Heyl 1965, J. M. Weller 1952.
Lusk Cyclothem (Pa.): Kosanke 1960, Wanless 1956, J. M. Weller 1940a.
Lusk Shale Member (Pa.): J. W. Baxter 1963a, 1965a, Desborough 1961d, Harris 1961, Kosanke 1960, P. E. Potter 1963a, 1965, J. M. Weller 1940a, 1952.

M

- McCleary's Bluff Coal (Pa.): Kosanke 1950, 1960, Wanless 1939.
McClosky Lime, Sand, Oolite, Pay Zone: H. H. Arnold 1939, A. H. Bell 1928d, 1932a, 1932b, 1938f, R. S. Blatchley 1912e, 1913a, W. F. Cloud 1941, Folk 1946, Hager 1937, L. K. Lee 1939b, Moulton 1927a, 1927b, Piersol 1940, Rich 1916b, C. H. Riggs 1945a, 1945b, Squires 1938a, 1943e, Theron Wasson 1938, Workman 1937a.
Structure map: H. H. Arnold 1939, A. H. Bell 1932b, R. S. Blatchley 1913a, Squires 1943e, Workman 1937a.
McClure Anticline Nose: J. M. Weller 1940a.
McCormick Anticline: Brokaw 1916, Heyl 1965, J. M. Weller 1940a, G. M. Wilson 1959.
McCormick Fault: P. E. Potter 1957.
McCormick Group (Pa.): J. W. Baxter 1963a, Kosanke 1960, W. H. Smith 1963.
McCraney (McKerney) Limestone: Collinson 1961, 1964b, Keyes 1940c, Stainbrook 1950, J. M. Weller 1940b, 1941b, Workman 1956.
Fauna: A. J. Scott 1961a.
Isopach map: Workman 1956.

- McCune Limestone (Ord.): Keyes 1898, Templeton 1963.
- McDonough County**
- Bedrock topography: Cartwright 1965, Horberg 1950a, Wanless 1957a.
- Brines: Meents 1952.
- Clay and shale
- General: G. H. Cady 1921, Hinds 1917, 1919, J. E. Lamar 1934, Parmelee 1921, 1922, Savage 1921a, 1921c.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- In coal mines: Stull 1917.
- Mineralogy: W. A. White 1960b.
- Refractory clay: Lines 1917, Parmelee 1921, Purdy 1907.
- Resources: W. A. White 1963.
- Coal**
- General: Culver 1925a, Hinds 1917, 1919.
- Analyses: G. H. Cady 1935b, 1948a, M. R. Campbell 1913, 1914, Culver 1925a, Hawley 1923, Hinds 1919, Parr 1915a, 1916, Reinertsen 1964, Savage 1921a.
- Mined-out areas: Ill. GS 1959b map 12.
- Mining: Annual coal reports, Andros 1915b, Savage 1921a.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1925b, Culver 1925a.
- Strippable reserves: G. H. Cady 1937c, Reinertsen 1964.
- Subsidence: L. E. Young 1916b.
- Colchester area guide leaflet: Ill. GS 1964-B.
- Drill records: A. H. Bell 1932c, Culver 1925a, Ross Hanson 1950, 1958, Hinds 1919, Leverett 1899a, Nebel 1919, Savage 1921a, Wanless 1957a, Worthen 1883(1).
- Fossil plant localities: Collinson 1960a.
- Geologic sections (described outcrops)
- Baptist Creek (Miss., Pa.): Savage 1921c.
- Camp Creek (Pa.): Hinds 1919.
- Charles Johnson Farm (Pa.): Hinds 1919.
- Colchester (Miss., Pa.): Hinds 1919, Parmelee 1921.
- Colchester Brick and Tile Co. (Pa.): Hinds 1919.
- Eagle School (Miss., Pa.): Hinds 1919.
- Gin Ridge (Pa.): Hinds 1919.
- Rattlesnake Den Hollow (Miss., Pa.): Hinds 1919.
- Tennessee (Miss.): Hinds 1919.
- Wigwam Hollow (Pa.): Hinds 1919.
- Geophysical studies: Cartwright 1965.
- Ground water
- General: Bergstrom 1956a, Cartwright 1965, Hinds 1919, Horberg 1950a, Leverett 1896, 1899a, Savage 1921a, 1921c.
- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, A. W. Palmer 1897.
- Lead and zinc: Hinds 1919.
- Limestone and dolomite
- General: Hinds 1917, Krey 1925, Savage 1921c.
- Building stone: Hinds 1919, Savage 1921a.
- Cement materials: Hinds 1917, 1919.
- Resources: Harvey 1964.
- Loess: G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Hinds 1919, Horberg 1950a, Wanless 1957a.
- McDonough County—cont.
- Maps—cont.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Savage 1921a, Wanless 1957a.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Wanless 1957a, Workman 1944.
- Structure: A. H. Bell 1943c, G. H. Cady 1921, Hinds 1914, 1917, R. H. Howard 1961, Morse 1915, Moulton 1925d, Nebel 1919, Reinertsen 1964, Savage 1921a, 1921c, Wanless 1957a, Whiting 1965b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
- General: Hinds 1917, 1919, F. H. Kay 1916b, 1917a.
- Development map: Ill. GS 1965 map M.
- Gas in drift: Hinds 1919.
- Pools
- Colmar: A. H. Bell 1939f, R. H. Howard 1961, Morse 1915.
- Plymouth: A. H. Bell 1939f, R. S. Blatchley 1914c, Flood 1934, 1938, R. H. Howard 1961.
- Possibilities: Hinds 1914, Moulton 1925d, 1926b, Nebel 1919, Savage 1921a, 1921c, Wanless 1957a.
- Sand properties: Piersol 1940.
- Paleobotany: C. D. White 1914.
- Physiography: Glock 1932, Hinds 1919, Leighton 1948b, Savage 1921c, Wanless 1957a.
- Quadrangle studies
- Avon: Savage 1921a.
- Colchester: Hinds 1917, 1919.
- Good Hope: Nebel 1919, Savage 1921c.
- LaHarpe: Nebel 1919, Savage 1921c.
- Macomb: Hinds 1917, 1919.
- Vermont: Wanless 1957a, 1958.
- Sand and gravel: Hinds 1917, 1919, Savage 1921a, 1921c.
- Sandstone: J. C. Bradbury 1962a, Hinds 1917, 1919, Savage 1921c.
- Soil report 7
- Spring Lake sediment: Stall 1949.
- Stratigraphy
- General: Bergstrom 1956a, Hinds 1919, R. H. Howard 1961, Nebel 1919, Savage 1921a, 1930a, Wanless 1957a.
- Ordovician: Gutstadt 1958b.
- Silurian: Whiting 1965b.
- Devonian: Whiting 1965b, Workman 1935d, 1944.
- Mississippian: Harvey 1964, Hinds 1917, Savage 1921c, Wanless 1957a, J. S. Williams 1957.
- Pennsylvanian: J. C. Bradbury 1962a, Culver 1925a, Hinds 1914, 1917, Lesquereux 1866a, Reinertsen 1964, Savage 1921a, 1921c, Wanless 1931b, 1957a, 1958, W. A. White 1963, Worthen 1883(1).
- Pleistocene: Savage 1921c, Wanless 1957a, Willman 1963.
- Structure: Moulton 1925d, 1926b, Wanless 1957a.
- Worthen Survey report (v. 5): Worthen 1873(1).
- Macedonia Cyclothem (Pa.): Kosanke 1960, J. M. Weller 1940a.

- McFarlan Plain: Stuart Weller 1920b.
 McGees Creek Bedrock Valley: Horberg 1950a.
 McGregor Member (Ord.): Agnew 1956, Mullens 1964.

McHenry County

- Bedrock topography: Horberg 1950a, McGinnis 1963b, Suter 1959.
 Belvidere area guide leaflet: Ill. GS 1963-C.
 Bog floras: Waterman 1923.
 Building stone: Conover 1884.
 Clay and shale: J. E. Lamar 1934.
 Drill records: C. B. Anderson 1919, Buschbach 1964, Ross Hanson 1950, 1958, 1961, Kempton 1963, Leverett 1899a, Lund 1965b, Prickett 1964, Walton 1965.
 Elephants: C. R. Smith 1960.
 Environmental geology: Hackett 1965a, Larsen 1965a.
 Feldspar: Willman 1942a.
 Geophysical studies: Beck 1965, McGinnis 1961a, 1963b.
 Ground water
 General: C. B. Anderson 1919, Bergstrom 1955, Horberg 1950a, Leverett 1899a, Prickett 1964, Sasman 1957, Suter 1959, Thwaites 1927, Walton 1960a, 1965.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Artesian waters: C. B. Anderson 1919.
 Limestone and dolomite: Burchard 1907, Krey 1925, Ostrom 1956.
 Loess: Frye 1962e, Wascher 1960.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a, Suter 1959.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1953, McGinnis 1963b, Suter 1959.
 Glacial: State geol. map, R. C. Anderson 1962, R. F. Flint 1959, Leighton 1961, Suter 1959, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Buschbach 1964.
 Structure: Beck 1965, Buschbach 1964, McGinnis 1963b, Suter 1959, Thwaites 1927.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Mineral resources: Anon. 1922a.
 Oil and gas, gas in drift: Meents 1960.
 Physiography: Anon. 1922a, Leighton 1948b.
 Radiocarbon dates: Ives 1964.
 Sand and gravel
 General: R. C. Anderson 1962, Burchard 1907, J. E. Lamar 1934.
 Mineralogy and petrology: Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b.
 Resources: G. E. Ekblaw 1964.
 Soil reports 21, 81
 Stratigraphy
 General: C. B. Anderson 1919, McGinnis 1963b, Suter 1959.
 Cambrian: Buschbach 1964.
 Ordovician: Buschbach 1964, Workman 1950a.
 Silurian: Ostrom 1956.
 Pleistocene: R. C. Anderson 1962, F. C. Baker 1931b, Frye 1965c, Horberg 1953,

McHenry County—cont.

Stratigraphy—cont.
 Pleistocene—cont.

- Kempton 1963, Leighton 1923a, Leverett 1898a, 1899a, W. E. Powers 1940, Willman 1963, Zumberge 1960.
 Structure: Thwaites 1927.
 Woodstock area guide leaflet: Ill. GS 1960-C.
 Worthen Survey report (v. 4): Bannister 1870.
 Mackinaw Bedrock Valley: Heigold 1964, Horberg 1950a.
 Mackinaw River watershed: Pickels 1929.
 Mackinaw Valley: W. H. Walker 1965.
 McKinley Anticline: A. H. Bell 1940b.

McLean County

- Bedrock topography: Heigold 1964, Horberg 1945, 1950a, Newberry 1870b, Selkregg 1958.
 Brines: Meents 1952.
 Clay and shale, in coal mines: Stull 1917.
 Coal
 Analyses: G. H. Cady 1921, 1935b, 1948a, Hawley 1923, Parr 1904, 1906b, 1915a, 1916.
 Cannel: Ashley 1918.
 Exploration: Anon. 1888.
 Mined-out areas: Ill. GS 1959b map 10.
 Mining: Annual coal reports, Andros 1915c, G. H. Cady 1921.
 Production: Annual coal report.
 Reserves: G. H. Cady 1952b.
 Subsidence: L. E. Young 1916b.
 Copper erratic: Crook 1929.
 Drill records: G. H. Cady 1921, Ross Hanson 1950, 1958, 1961, Horberg 1953, Leverett 1899a, Willman 1942b, Worthen 1890(2).
 Geophysical studies: Beck 1965, Heigold 1964.
 Ground water
 General: Bartow 1908a, John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Lohr 1953, Maxwell 1923, Selkregg 1958, Walton 1962a, Workman 1937c.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Lake Bloomington Spillway (Money Creek) geologic section (Pleis.): DeHeinzelin 1958, Leighton 1953, A. B. Leonard 1960.
 Loess: Frye 1962e, G. D. Smith 1942, Wascher 1960.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Heigold 1964, Horberg 1945, 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1953, Schwalb 1953.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Willman 1942b, Workman 1956.
 Structure: Beck 1965, G. H. Cady 1921, Heigold 1964, R. H. Howard 1963b, 1964, Schwalb 1953, Whiting 1965b, Willman 1942b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Money Creek sediment: Stall 1958.

McLean County—cont.

- Oil and gas
Development maps: Ill. GS 1965 maps 96, 97, 104.
Gas in drift: Meents 1960.
Niaganar reefs: R. H. Howard 1964.
Possibilities: Garland 1965.
Radiocarbon dates: R. F. Flint 1955, Rubin 1955, 1958, Suess 1954.
Saybrook core: Anon. 1888, Hugh Murray 1893.
Soil report 10
Stratigraphy:
General: G. H. Cady 1920b, Selkregg 1958.
Silurian: Whiting 1965b, R. H. Howard 1964.
Devonian: Whiting 1965b.
Mississippian: Workman 1956.
Pennsylvanian: Anon. 1888, G. H. Cady 1921.
Pleistocene: F. C. Baker 1930b, Frye 1965b, 1965c, Horberg 1953, Hubbard 1911, Leighton 1923a, A. B. Leonard 1960, Leverett 1899a, McGee 1890, Newberry 1869, Wascher 1938, Willman 1963.
Recent: F. C. Baker 1918.
Worthen Survey report (v. 4): Bannister 1870.

McLeansboro Group, Formation (Pa.): J. R. Ball

- 1952, J. W. Baxter 1963a, R. S. Blatchley 1913a, 1914a, Butts 1925, G. H. Cady 1915a, 1916, 1917, 1919a, 1919b, 1921, 1926, 1939c, 1942a, 1952b, Clegg 1959, Culver 1924, 1925a, Currier 1922, DeWolf 1910, Ill. GS 1913, F. H. Kay 1915a, 1915b, Kosanke 1947, 1950, 1960, Wallace Lee 1915, 1926, Lowenstam 1951, MacClintock 1959, Mylius 1927, P. E. Potter 1956c, Pryor 1956b, Rich 1916a, 1916b, Rolley 1951, Rubey 1952, Savage 1910b, 1915, 1921a, 1921b, E. W. Shaw 1912b, 1913, 1921, 1923, H. L. Smith 1951, W. H. Smith 1958, 1961, 1963, Tough 1919, Johan A. Udden 1915, Wanless 1939, 1955b, 1957a, J. M. Weller 1940a, Willman 1942b, Winslow 1959, L. E. Young 1916b.

- Fauna: DuBois 1943, Wallace Lee 1926, Savage 1924a, E. W. Shaw 1913, Wanless 1958.

- Isopach map: Wanless 1955b.

- Paleogeographic map: Schuchert 1955.

- Spores: Kosanke 1950, Peppers 1964.

McNairy Formation, Sand (Cre.) (see Ripley Fm.):

- Boswell 1965, Cushing 1964, Parmelee 1921, Pryor 1960, 1961b, 1962a, Ross 1963, 1964b, L. W. Stephenson 1914, J. M. Weller 1940a.

- Facies map: P. E. Potter 1963b, Pryor 1960.

- Isopach map: Pryor 1960.

- Paleogeographic map: Pryor 1960.

Macomb area, water supply: Cartwright 1965.

Macomb Dome: Hinds 1919.

Macomb Quadrangle: Hinds 1914, 1917, 1919.

Macomb region, geological history: Savage 1930a.

Macon County

- Bedrock topography: Horberg 1945, 1950a, Selkregg 1958.

Macon County—cont.

- Clay and shale, in coal mines: Stull 1917.
Coal

- General: Ill. GS 1913.

- Analyses: G. H. Cady 1921, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Lindgren 1908, Parr 1904, 1906b, 1915a, 1916, J. N. Payne 1944.

- Losses: C. A. Allen 1925.

- Mined-out areas: Ill. GS 1959b map 15.

- Mining: Annual coal reports, C. A. Allen 1925, Andros 1915c, G. H. Cady 1921, H. M. Cooper 1942b, Toenges 1936.

- Production: Annual coal reports.

- Reserves: G. H. Cady 1952b, Clegg 1961, DeWolf 1908b.

- Subsidence: L. E. Young 1916b.

- Copper erratic: Crook 1929.

- Decatur Dam site: Leighton 1921a, 1923c.

- Drill records: G. H. Cady 1921, Collingwood 1922, 1924b, Ross Hanson 1950, 1958, Horberg 1953, Worthen 1883(1), 1890(2).

- Geophysical studies: Buhle 1953.

Ground water

- General: Buhle 1953, Horberg 1950a, Leverett 1899a, Selkregg 1958.

- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

- Lake Decatur: C. B. Brown 1947.

- Lake Decatur geologic section (Pleis.): Horberg 1953.

- Loess: G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

- Bedrock topography: Heigold 1964, Horberg 1945, 1950a.

- Drift thickness: State geol. map.

- Geologic: State geol. map, Horberg 1953.

- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

- Mineral industries: Ill. GS 1961.

- Paleogeologic: Whiting 1956.

- Structure: G. H. Cady 1921, Clegg 1961, Collingwood 1924b, Heigold 1964, R. H. Howard 1964, J. N. Payne 1944, E. F. Taylor 1944b, Whiting 1956, 1965b.

- Mastodon: N. C. Anderson 1905, Bagg 1909.

- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

- Development maps: Ill. GS 1965 maps 78, 79, 87, 88, 89.

- Gas in drift: Meents 1960.

- Physical properties: Armon 1964.

Pools

- Blackland: Whiting 1956.

- Decatur: A. H. Bell 1939f, Whiting 1956.

- Decatur North: Whiting 1956.

- Harristown: Whiting 1956.

- Oakley: Whiting 1956.

- Possibilities: Collingwood 1922, 1924b, J. N. Payne 1944.

- Production: Whiting 1956.

- Sandstone: P. E. Potter 1962c.

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- Springs: Peale 1886.

Stratigraphy

- General: R. H. Howard 1964, Selkregg 1958, Whiting 1956, Workman 1935c.

- Silurian: Whiting 1958, 1965b.

Macon County—cont.

Stratigraphy—cont.

- Devonian: Whiting 1958, 1965b, Workman 1944.
 Mississippian: J. N. Payne 1944, Swann 1958.
 Pennsylvanian: G. H. Cady 1921, Clegg 1961, J. N. Payne 1944, Worthen 1883(1).
 Pleistocene: Frye 1965a, Horberg 1953, W. H. Johnson 1964, Leverett 1899a, McGee 1890.
 Worthen Survey report (v. 6): Broadhead 1875.

- Macoupin Coal (Pa.) (see Womac Coal): Kosanke 1950, Newton 1937b, J. N. Payne 1942, P. E. Potter 1956c, Wanless 1955b.

Macoupin County

- Bedrock topography: Horberg 1950a, Wallace Lee 1926.
 Bend Meteorite: Roy 1951, B. H. Wilson 1938, 1939.
 Brines: Meents 1952.
 Clay and shale
 General: J. R. Ball 1952, Wallace Lee 1926, W. H. Smith 1965.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: W. A. White 1960b.
 Petrology: Grim 1957.

Coal

- General: Ill. GS 1913, F. H. Kay 1915a, J. M. Weller 1939b.
 Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, J. A. Holmes 1906, 1908, Wallace Lee 1926, Lindgren 1908, L. C. McCabe 1934a, B. C. Parks 1956, Parr 1904, 1906b, 1915a, 1916, N. H. Snyder 1953.
 Ash analyses: Rees 1964.
 Ash fusibility: Abernethy 1961.
 Chlorine in: Abernethy 1965, Gluskoter 1964.
 Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.
 Losses: C. A. Allen 1925.
 Mined-out areas: Ill. GS 1959b maps 19, 22.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e, Anon. 1896a, 1897, H. M. Cooper 1942b.
 P, Cl, Na, and K in: Abernethy 1965.
 Petrology: L. C. McCabe 1934a, Rees 1947.
 Physical tests: J. A. Holmes 1906, 1908.
 Production: Annual coal reports.
 Reserves: J. R. Ball 1952, G. H. Cady 1952b, DeWolf 1908b, J. N. Payne 1942.
 Strippable reserves: W. H. Smith 1961.
 Subsidence: C. A. Herbert 1927, L. E. Young 1916b.
 Drill records: J. R. Ball 1952, Easton 1942, Ross Hanson 1958, F. H. Kay 1912, 1915a, Wallace Lee 1926, Saxby 1957, Worthen 1890(2).
 Geologic sections (described outcrops)
 Antioch Church (Pleis.): J. R. Ball 1952.
 Bear Creek (Pa., Pleis.): J. R. Ball 1952.
 Burroughs Branch (Pa.): J. R. Ball 1952.

Macoupin County—cont.

Geologic sections—cont.

- Cottonwood Creek (Pleis.): J. R. Ball 1952.
 Macoupin Creek (Pa.): J. R. Ball 1952.
 Massa Creek (Pa.): J. R. Ball 1952.
 Moody Clay Pit (Pleis.): J. R. Ball 1952.
 Rock Branch (Pa.): Kosanke 1960.
 Sawyerville (Pleis.): Frye 1963c.
 Spanish Needle Creek (Pa.): Wallace Lee 1926.
 Staunton (Pleis.): Wallace Lee 1926, MacClintock 1929.
 Sugar Creek (Pa., Pleis.): J. R. Ball 1952, E. W. Shaw 1913.
 Turner Creek (Pa.): Kosanke 1960.
 Washington School (Pleis.): J. R. Ball 1952.
 Ground water
 General: J. R. Ball 1952, Horberg 1950a, Wallace Lee 1926, Leverett 1899a, Selkregg 1957.
 Analyses: Bartow 1909b, Ross Hanson 1958, A. W. Palmer 1897.
 Gypsum and anhydrite: Saxby 1957.
 Limestone and dolomite: J. R. Ball 1952, Krey 1925, J. E. Lamar 1934, Wallace Lee 1926.
 Loess: Frye 1963c, Leighton 1950b, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: J. R. Ball 1952, Horberg 1950a, Wallace Lee 1926.
 Drift thickness: State geol. map.
 Geologic: State geol. map, J. R. Ball 1952, Wallace Lee 1926.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Workman 1956.
 Structure: J. R. Ball 1952, A. H. Bell 1943c, 1961c, F. H. Kay 1912, 1915a, Wallace Lee 1915, 1917, 1926, Mylius 1919, J. N. Payne 1941, 1942, W. H. Smith 1961.
 Meteorite: Nichols 1939, B. H. Wilson 1938, 1939.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 General: R. S. Blatchley 1914a, F. H. Kay 1917a, 1917b, Wallace Lee 1915, 1926.
 Development maps: Ill. GS 1965 maps 63, 68.
 Natural gas: A. H. Bell 1935a.
 Physical properties: Armon 1964.
 Pools
 Carlville: R. S. Blatchley 1910a, F. H. Kay 1912, Wallace Lee 1915.
 Staunton gas: F. H. Kay 1916b, Mylius 1919.
 Possibilities: J. R. Ball 1952, R. S. Blatchley 1910a, Easton 1942, F. H. Kay 1912, Moulton 1926b.
 Underground gas storage: A. H. Bell 1961c, 1962b.
 Peat: J. R. Ball 1952.
 Physiography: J. R. Ball 1938a, Glock 1932, Wallace Lee 1926, Leighton 1948b, MacClintock 1929.
 Quadrangle studies
 Carlville: J. R. Ball 1943, 1952.
 Gillespie: Wallace Lee 1926.
 Mount Olive: Wallace Lee 1926.

Macoupin County—cont.

- Sand and gravel: J. R. Ball 1952.
 Sandstone: Andresen 1961, J. R. Ball 1952,
 P. E. Potter 1961a, 1963c.
 Soil report 50
 Stratigraphy
 General: J. R. Ball 1952, R. S. Blatchley
 1914a, F. H. Kay 1912, Wallace Lee 1915,
 1926, Mylius 1919, Selkregg 1957.
 Silurian: Lowenstam 1949b, 1950.
 Devonian: Meents 1965b, Workman 1944.
 Mississippian: Swann 1958, Workman
 1956.
 Pennsylvanian: Andresen 1961, J. R. Ball
 1943, G. H. Cady 1939c, S. E. Ekblaw 1934,
 Geis 1936, F. H. Kay 1915a, Kosanke 1960,
 Wallace Lee 1915, 1917, 1926, Lesquereux
 1866a, J. N. Payne 1942, P. E. Potter 1961a,
 Rhodes 1952, W. H. Smith 1961, Sturgeon
 1964, Jon A. Udden 1908, Wanless 1931b,
 J. M. Weller 1942c.
 Pleistocene: J. R. Ball 1938a, Frye 1963c,
 1965c, Leighton 1961, MacClintock 1929,
 1933, Willman 1963.
 Structure: J. R. Ball 1952, A. H. Bell 1941b,
 R. S. Blatchley 1914a, Meents 1965b, Moul-
 ton 1926b, Hiram Young 1892.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 5): Worthen
 1873(1).

- Macoupin Creek Bedrock Valley: Horberg 1950a.
 Macoupin Creek Terrace: Rubey 1952.
 Macoupin Creek watershed: Pickels 1929.
 Macoupin Cyclotheth (Pa.): J. R. Ball 1943, 1952,
 S. E. Ekblaw 1934, Kosanke 1960, Newton
 1937b, Wanless 1931b, 1939, J. M. Weller
 1936c, 1958b,
 Fauna: H. W. Scott 1941.
 Macoupin Dome: Easton 1942, Wallace Lee 1915.
 Macoupin Limestone Member (Pa.): J. R. Ball
 1952, Clegg 1965b, Kosanke 1960, Newton
 1937b, J. N. Payne 1942, Siever 1957a, Wan-
 less 1939, 1955b.
 McWade Fault: Hubbert 1944.
 McWain Sandstone Member (Pa.): J. R. Ball 1943,
 1952, Kosanke 1960.

Madison County

- Bedrock topography: Bergstrom 1956b, Hor-
 berg 1950a.
 Brines: Meents 1952.
 Building stone: Conover 1884.
 Caves: Fenneman 1910.
 Clay and shale
 General: Fenneman 1910, 1911, J. E. Lar-
 mar 1934, Parmelee 1921, W. A. White
 1956, Johan A. Udden 1915.
 Bonding clay: Grim 1940f.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Petrology: Grim 1957, P. E. Potter 1958b,
 C. W. Rolfe 1908, W. A. White 1960b.
 Refractory clay: J. E. Lamar 1956b, Lines
 1917.
 Resources: Parham 1963a.
 Coal
 General: Fenneman 1910, 1911, Ill. GS
 1913, F. H. Kay 1915a, J. M. Weller 1939b,
 Johan A. Udden 1915.

Madison County—cont.

- Coal—cont.
 Analyses: Abernethy 1961, Aresco 1953-
 1965, G. H. Cady 1935b, 1948a, Fieldner
 1942b, Hawley 1923, J. A. Holmes 1906,
 1908, E. W. Parker 1906a, 1906b, Parr
 1904, 1906b, 1915a, 1916, N. H. Snyder
 1953, Johan A. Udden 1915.
 Ash analyses: Rees 1964.
 Ash fusibility: Abernethy 1961.
 Chlorine in: Abernethy 1965, Gluskoter
 1964.
 Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.
 Losses: C. A. Allen 1925.
 Mined-out areas: Ill. GS 1959b maps 22,
 27.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports, C. A. Allen
 1925, Andros 1914e, H. M. Cooper 1942b.
 P, Cl, Na, and K in: Abernethy 1965.
 Physical tests: J. A. Holmes 1906, 1908,
 E. W. Parker 1906a.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1944, 1952b, Cul-
 ver 1925a, DeWolf 1908b.
 Strippable reserves: W. H. Smith 1961.
 Subsidence: L. E. Young 1916b.
 Cross sections: Workman 1941.
 Drill records: Bergstrom 1956b, Collingwood
 1933, Culver 1925a, Fenneman 1911, Ross
 Hanson 1950, 1958, 1961, F. H. Kay 1915a,
 Saxby 1957, Schicht 1965, Searcy 1952,
 E. M. Shepard 1907, Johan A. Udden
 1915, Walton 1962a.
 Earthquake: Heinrich 1950.
 Feldspar: Willman 1942a.
 Geologic sections (described outcrops)
 Alton Bluff (Miss.): J. W. Baxter 1965b,
 Collinson 1954, 1957, 1958e, Willman
 1958a.
 Alton Mine (Miss.): J. W. Baxter 1965b.
 Alton North (Miss.): Bleining 1912.
 Alton Quarry (Pleis.): A. B. Leonard
 1960.
 Clifton Terrace (Miss.): J. W. Baxter 1965b.
 Collinsville (Pa.): J. W. Baxter 1965b.
 Collinsville (Pleis.): R. L. Jones 1964.
 Dorsey (Pleis.): Frye 1963c.
 East Alton (Pleis.): Leighton 1949a.
 East St. Louis (Pa.): J. E. Lamar 1934.
 Fosterburg (Pa.): J. W. Baxter 1965b.
 Godfrey (Miss., Pa.): J. W. Baxter
 1965b.
 Hop Hollow (Miss.): J. W. Baxter 1965b.
 Melville (Miss.): J. W. Baxter 1965b.
 Moro (Pa.): J. W. Baxter 1965b.
 North Alton (Miss.): J. W. Baxter 1965b.
 Olin Quarry (Miss.): J. W. Baxter 1965b,
 Collinson 1954, 1958e.
 Piasa Creek (Miss.): Bleining 1912.
 Pleasant Grove School (Pleis.): Frye
 1960b, 1963c, 1965b, Willman 1958a.
 Reliance Whiting Quarry (Miss., Pleis.):
 J. W. Baxter 1965b, Frye 1963c, 1965b.
 Riehl Quarry (Miss.): J. W. Baxter
 1965b, Collinson 1957, 1958e, Rexroad
 1965a.
 St. Paul's Church Section (Pleis.): Will-
 man 1958a.

Madison County—cont.

Geologic sections—cont.

Silver Creek East Fork (Pa.): J. W. Baxter 1965b.

Terrapin Ridge (Pleis.): Willman 1958a.

Giant beaver: F. C. Baker 1930b.

Ground water

General: Bergstrom 1956b, Bowman 1907, Bruin 1953, Fenneman 1910, 1911, Horberg 1950a, Horner 1940, Leverett 1899a, Lohr 1953, Schicht 1965, Searcy 1952, Selkregg 1957, Johan A. Udden 1915, Walton 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Gypsum and anhydrite: Saxby 1957.

Karst topography: Bowman 1907.

Limestone and dolomite

General: J. W. Baxter 1965b, Collinson 1958e, W. C. Day 1899, Fenneman 1911, Krey 1925, J. E. Lamar 1934.

Building stone: Fenneman 1910, Johan A. Udden 1915.

Cement materials: J. E. Lamar 1956b.

Mineralogy: Grim 1937a.

Loess: F. C. Baker 1920a, Bowman 1907, Fenneman 1910, Frye 1962e, 1963c, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Bergstrom 1956b, Horberg 1950a, Johan A. Udden 1915.

Drift thickness: State geol. map.

Geologic: State geol. map, J. W. Baxter 1965b, Bergstrom 1956b, Johan A. Udden 1915.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Structure: A. H. Bell 1926e, 1943c, 1961c, Collingwood 1933, F. H. Kay 1915a, Lowenstam 1946, 1948b, 1950, J. N. Payne 1941, E. W. Shaw 1912a, W. H. Smith 1961, Johan A. Udden 1915.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Mineral economics: Risser 1962b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Johan A. Udden 1915.

Development maps: Ill. GS 1965 maps 45, 49.

Pools

Collinsville: A. H. Bell 1939f.

Marine: A. H. Bell 1949d, Lowenstam 1946, 1948b.

St. Jacob: Spitznagel 1942, Sterrett 1942.

Possibilities: A. H. Bell 1926e, 1941b, R. S. Blatchley 1910a, Collingwood 1933, Fenneman 1911.

Secondary recovery: Pryor 1957.

Underground gas storage: A. H. Bell 1961c, 1962b.

Physiography: Fenneman 1910, R. F. Flint 1941, Leighton 1948a, MacClintock 1929, Johan A. Udden 1915.

Quadrangle studies

Belleville: Johan A. Udden 1915.

Breese: Johan A. Udden 1915.

Radiocarbon dates: Ives 1964, Libby 1954b, Rubin 1956, 1958, 1960.

Madison County—cont.

Sand and gravel: Fenneman 1910, 1911.

Mineralogy and petrology: Willman 1942a.

Molding sand: Littlefield 1925a, 1925b.

Sandstone: Andresen 1961, P. E. Potter 1961a.

Sewage disposal: J. E. Lamar 1927e.

Springs: Bowman 1907.

Stratigraphy

General: J. W. Baxter 1965b, Bergstrom 1956b, Bleininger 1912, Bowman 1907, Collingwood 1933, Collinson 1954, 1957, 1958e, G. E. Ekblaw 1934, Fenneman 1910, 1911, Selkregg 1957, Johan A. Udden 1915.

Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.

Cambrian: A. H. Bell 1964.

Ordovician: A. H. Bell 1964.

Silurian: Lowenstam 1946, 1948b, 1949b, 1950, 1957.

Devonian: Lowenstam 1946, 1948b.

Mississippian: J. W. Baxter 1965b, Collinson 1958e, Fenneman 1911, James Hall 1857b, Swann 1958, 1965, Stuart Weller 1908, Workman 1956.

Pennsylvanian: Andresen 1961, J. W. Baxter 1965b, G. H. Cady 1944, Culver 1925a, L. G. Henbest 1928b, F. H. Kay 1915a, Parham 1963a, P. E. Potter 1961a, Savage 1927, W. H. Smith 1961, Jon A. Udden 1908, Wanless 1934, 1947b, J. M. Weller 1942c.

Pleistocene: F. C. Baker 1928b, 1931b, Fenneman 1911, Frye 1960b, 1963c, 1965b, R. L. Jones 1963a, Leighton 1921b, 1959, 1965, A. B. Leonard 1960, Robertson 1938, Staplin 1963b, Willman 1958a, 1963.

Structural materials: Jon A. Udden 1910b.

Structure: A. H. Bell 1926e, 1928b, 1941b, V. B. Cole 1961, Collingwood 1933, Lowenstam 1948b, Johan A. Udden 1915.

Worthen Survey report (v. 1): Worthen 1866a(5).

Magnesian calcite, in nature: Goldsmith 1955.

Magnesian (Galena) Limestone (Ord.): James Hall 1857b.

Magnetic anomalies: Jenny 1941.

Magnetic declination: Henry Ganett 1896.

Magnetic gradient map: Jenny 1939.

Magnetic separators: J. J. Ferris 1938.

Magnetic susceptibility of loess: R. L. Jones 1964.

Magnetism (remnant), Pleistocene silts: Wyman Harrison 1961.

Magnetometer surveys (see Geophysics)

Magnolia Limestone (Ord.): DuBois 1945.

Mahomet Bedrock Valley, Teays Valley: Coffey 1961, Eveland 1952, John Webster Foster 1951a, Heigold 1964, Horberg 1945, 1946, 1950a, 1953, Manos 1961, Thornbury 1958, Ver Steeg 1945, W. H. Walker 1965, Wayne 1952, 1956.

Mahomet Beds (Pleis.): Cable 1921, 1929.

Mahomet Dome: A. H. Bell 1961c, Heigold 1964, R. H. Howard 1964.

Mahomet Sand (Pleis.): Horberg 1953.

Mahomet underground gas storage: A. H. Bell 1962b.

Main Pool: Squires 1950b.

Makanda Anticline: St. Clair 1917d.

Makanda Coal (Pa.): G. H. Cady 1952b, Winslow 1959.

- Makanda Sandstone (Pa.) (see Pounds Ss.): Kosanke 1960, J. E. Lamar 1925a, Siever 1959, Wanless 1939, 1947b, J. M. Weller 1940a.
- Mammalian faunas, shift in: L. A. Adams 1923.
- Mammoth: N. C. Anderson 1905, F. C. Baker 1934a, E. T. Cox 1875, Crook 1926, Johan A. Udden 1905, Willman 1941a.
- Mammoth Cave Megagroup (Sil.-Dev.): J. W. Baxter 1963a, Swann 1961, 1963.
- Man, during glacial time: Leighton 1932b.
- Manhattan Moraine: G. E. Ekblaw 1941, Frye 1965b, Leighton 1953.
- Manito Bog: Tehon 1938.
- Manito Terrace: W. H. Walker 1965, Wanless 1957a.
- Manitoban Substage: Leighton 1933a.
- Mankato Substage (Pleis.): Bretz 1955, Frye 1960b, G. F. Kay 1933, Keyes 1933a, Leighton 1933a, 1957a, 1960, Leverett 1933, Willman 1942b.
- Plants: Kaeser 1958.
- Manley Coal Member (Pa.) (see Babylon Coal): Kosanke 1960.
- Mansfield Sandstone (Pa.): Bain 1905a, W. S. Blatchley 1906, Wanless 1939.
- Maple Mill Shale (Miss.): J. R. Ball 1952, Wanless 1957a, J. M. Weller 1940b, Workman 1956.
- Isopach map: Workman 1956.
- Maps (see Bedrock topography, Geologic, Glacial, Mineral industries, and Structure maps under county; and Distribution, Facies, Isopach, Paleogeographic, and Structure maps under stratigraphic units)
- Maquoketa Shale, Group (Ord.): Agnew 1956, C. B. Anderson 1919, Athy 1928, Bain 1905b, J. R. Ball 1952, Bays 1945a, A. H. Bell 1964, R. S. Blatchley 1914a, J. C. Bradbury 1965a, Buschbach 1963, 1965, G. H. Cady 1915a, 1919b, Caldwell 1964, Carman 1910, Cohee 1948b, Collingwood 1933, Collinson 1954, G. H. Cox 1910, 1911, 1914, Culver 1922a, Doyle 1965, DuBois 1945, John Webster Foster 1956, Grant 1908, Gutstadt 1958a, 1958b, Harris 1961, Hershey 1893b, Horberg 1950b, R. H. Howard 1961, J. F. James 1890, Krey 1924, Ladd 1929, J. E. Lamar 1934, Mulens 1964, Mylius 1927, Pryor 1962a, Ross 1964b, Rubey 1952, Sardeson 1896, 1897a, 1907, Savage 1908, 1921b, 1921c, 1924b, E. W. Shaw 1916, Sloss 1960, Suter 1959, Templeton 1963, Thwaites 1927, Trowbridge 1916, Wanless 1929a, 1957a, J. M. Weller 1935c, 1940a, 1952, Stuart Weller 1907b, 1907d, 1939b, Willman 1942b, 1947, 1949, 1962, Zeisel 1962a.
- Facies map: Buschbach 1964, DuBois 1945, Suter 1959.
- Fauna: C. C. Branson 1941, Rhoads 1962, Savage 1925b, E. W. Shaw 1916, Trowbridge 1916, E. O. Ulrich 1888a, J. W. Wells 1944.
- Isopach map: Buschbach 1964, DuBois 1945, Ladd 1935, Suter 1959, Willman 1942b, Zeisel 1962a.
- Paleogeographic map: Schuchert 1955.
- Pre-Richmond unconformity: Stuart Weller 1907d.
- Structure map: Suter 1959, Wanless 1929a, Willman 1942b, Zeisel 1962a.
- Maquoketa Shale, Group—cont.
- Marble (see Building stone)
- Marcasite (see also Pyrite): J. C. Bradbury 1959b, S. M. McClure 1947b.
- Marengo Moraine: W. C. Alden 1904, G. E. Ekblaw 1941, Leighton 1923a, 1953, Leverett 1899a.
- Marietta Limestone (Pa.): Savage 1930a.
- Marigold Oolite: A. H. Sutton 1934b, Swann 1963.
- Marine Reef, Pool: A. H. Bell 1949d, Lowenstam 1946, 1948b, 1950, 1952, 1957.
- ### Marion County
- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Clay and shale
- General: J. E. Lamar 1934.
- Bonding clay: Grogan 1945.
- Chemical analyses: W. A. White 1959a.
- Coal
- General: Ill. GS 1913, F. H. Kay 1915a.
- Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, J. A. Holmes 1906, Parr 1904, 1906b, 1915b, 1916, E. W. Shaw 1923, N. H. Snyder 1953, Zubovic 1964.
- Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.
- Beryllium in: Stadnichenko 1961.
- Chlorine in: Abernethy 1965, Gluskoter 1964.
- Discovery: Henry Engelmann 1878.
- Free-swelling index: Abernethy 1961.
- Grindability: Abernethy 1961.
- Losses: C. A. Allen 1925.
- Mined-out areas: Ill. GS 1959b map 26.
- Mineral matter: Abernethy 1965.
- Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e, H. M. Cooper 1942b, E. W. Shaw 1923.
- Minor elements: Zubovic 1964.
- P, Cl, Na, and K in: Abernethy 1965.
- Physical tests: J. A. Holmes 1906.
- Preparation: L. C. McCabe 1939a, Mitchell 1937.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1944, 1952b, Siever 1950.
- Strippable reserves: Culver 1925b.
- Subsidence: L. E. Young 1916b.
- Cross sections: Workman 1941.
- Drill records: R. F. Blatchley 1911, R. S. Blatchley 1910a, Cohee 1941b, F. H. Kay 1915a, Leverett 1899a, Johan A. Udden 1914, J. M. Weller 1936c, Worthen 1883(1), 1890(2).
- Geophysical studies: Hunzicker 1949, Pryor 1956c.
- Ground water
- General: Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957, E. W. Shaw 1923.
- Analyses: Bartow 1909b.
- Helm geologic section (Pleis.): Leighton 1930f.
- Limestone and dolomite
- General: J. C. Bradbury 1965b, Graf 1950b, Krey 1925.
- Loess: Fehrenbacher 1965b.

Marion County—cont.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, E. W. Shaw 1923.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Siever 1951a.

Structure: H. H. Arnold 1939, A. H. Bell 1926a, 1926b, 1927b, 1934a, 1943c, R. S. Blatchley 1910a, Brownfield 1954, Easton 1944b, F. H. Kay 1915a, H. L. Koch 1939, Pye 1944, St. Clair 1917c, E. W. Shaw 1912a, 1923, Siever 1950, 1951a, Smoot 1958, Squires 1943e, J. M. Weller 1936c.

Mastodon: N. C. Anderson 1905, Bagg 1909, John Wells Foster 1857.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: A. H. Bell 1926a, R. S. Blatchley 1910a, Cohee 1938a, F. H. Kay 1916b, 1917a, 1917b, H. A. Wheeler 1922.

Development maps: Ill. GS 1965 maps 42, 43, 51, 52.

Developments: Moulton 1926j.

Physical properties: Armon 1964.

Pools

Centralia: A. H. Bell 1927b, 1939b, Cohee 1941b, H. L. Koch 1939, Moulton 1929d.

Lake Centralia: Love 1955.

Odin: Leon Krause 1952.

Patoka: Barger 1950, Witherspoon 1955a.

Salem: H. H. Arnold 1939, Cohee 1941b, Jerry Thorp 1940.

Sandoval: A. H. Bell 1927b, 1934a, W. F. Hoover 1944, Moulton 1929d, Spitznagle 1939a, Squires 1943e, 1946.

Wamac: A. H. Bell 1926a, Moulton 1929d.

Possibilities: A. H. Bell 1926a, R. S. Blatchley 1910a, Easton 1944b, St. Clair 1917c, J. M. Weller 1936c.

Salem unit flood: Squires 1951.

Sand properties: Piersol 1940.

Secondary recovery: Love 1955, Pryor 1957, Squires 1943e, 1946, 1950a, 1950d.

Physiography: Leighton 1948b, MacClintock 1929, E. W. Shaw 1923.

Quadrangle studies, Centralia: E. W. Shaw 1923.

Salem area guide leaflet: Ill. GS 1960-A.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962a, 1962c, 1963a.

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Stratigraphy

General: A. H. Bell 1927b, R. S. Blatchley 1910a, Brownfield 1954, Moulton 1929d, St. Clair 1917c, Selkregg 1957, E. W. Shaw 1923, Smoot 1958.

Precambrian: A. H. Bell 1964.

Cambrian: A. H. Bell 1964.

Ordovician: A. H. Bell 1964, Gutstadt 1958b, Smoot 1958.

Silurian: Lowenstam 1949b, 1950, Smoot 1958.

Marion County—cont.

Stratigraphy—cont.

Devonian: Caylor 1944, W. F. Hoover 1944, Meents 1965b, Schwab 1955, Workman 1944.

Mississippian: H. H. Arnold 1939, Pye 1944, Siever 1951a, Smoot 1958, Swann 1958, J. M. Weller 1936c, Workman 1956.

Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, 1965b, G. H. Cady 1944, F. H. Kay 1915a, Kosanke 1960, Prescott 1938, E. W. Shaw 1923, Siever 1951a, Smoot 1958, J. M. Weller 1936c, 1942c, Worthen 1883(1).

Pleistocene: Frye 1965c, Leighton 1930f, 1959, MacClintock 1929.

Structure: A. H. Bell 1927b, Easton 1944b, Meents 1965b, Moulton 1929d, Smoot 1958, J. M. Weller 1936c.

Vertebrate fossils: E. C. Olson 1946.

Worthen Survey report (v. 3): Henry Engelmann 1868.

Marissa Dome: A. H. Bell 1929a, E. W. Shaw 1921.

Marl: Athy 1928, J. E. Lamar 1938d, 1965, W. E. Powers 1936, C. R. Smith 1936.

Marmaton Group (Pa.): C. L. Cooper 1946, 1947a.

Marseilles Anticline: Willman 1942b.

Marseilles Moraine: R. C. Anderson 1955, Athy, 1928, Culver 1922a, P. W. Harrison 1957, Krumbein 1956a, Leighton 1934b, Leverett 1899a, C. O. Sauer 1916, Willman 1942b, Zumberge 1960.

Marseilles Quadrangle: Willman 1942b.

Mineral economics: Voskuil 1942d.

Marshall County

Bedrock topography: Horberg 1950a, 1950b, Selkregg 1958.

Clay and shale: J. E. Lamar 1934.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: W. A. White 1960b.

Petrology: Grim 1957.

Resources: W. A. White 1964a.

Coal

General: G. H. Cady 1915a, Ill. GS 1913.

Analyses: G. H. Cady 1935b, 1948a, Hawley 1923, Parr 1906b, 1915a, 1916.

Mined-out areas: Ill. GS 1959b map 7.

Mining: Annual coal reports, Andros 1914a, H. M. Cooper 1942b.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b.

Strippable reserves: W. H. Smith 1963.

Subsidence: L. E. Young 1916b.

Drill records: G. H. Cady 1915a, Ross Hanson 1950, 1961, Johan A. Udden 1914, Willman 1942b, Worthen 1883(1), 1890(2).

Feldspar: William 1942a.

Gas in drift: Meents 1960.

Geologic sections (described outcrops)

Sandy Creek (Pleis.): Horberg 1953.

Sparland (Pa.): Bleininger 1912, G. E. Ekblaw 1932a.

Varna (Pleis.): Frye 1962e.

Ground water

General: John Webster Foster 1954, Horberg 1950a, 1950b, Leverett 1899a, Selkregg 1958.

Marshall County—cont.

Ground water—cont.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

Hydrology and chemistry: Horberg 1950b.

Landslides: G. E. Ekblaw 1932a.

Limestone and dolomite: Bleininger 1912, Krey 1925, J. E. Lamar 1934.

Loess: Frye 1962e, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Barrows 1910, Horberg 1950a, 1950b.

Drift thickness: State geol. map.

Geologic: State geol. map, Barrows 1910, Horberg 1950b, 1953.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Willman 1942b.

Structure: G. H. Cady 1915a, Whiting 1965b, Willman 1942b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Molding sand: Littlefield 1925a, 1925b.

Physiography: Barrows 1910, Leighton 1948b.

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Stratigraphy

General: Barrows 1910, Bleininger 1912, Horberg 1950b, Selkregg 1958.

Ordovician: Gutstadt 1958b.

Silurian: Whiting 1965b.

Devonian: Whiting 1965b.

Pennsylvanian: G. H. Cady 1915a, W. H. Smith 1963, Wanless 1931b, Worthen 1883(1).

Pleistocene: Barrows 1910, G. H. Cady 1915a, Frye 1965c, Horberg 1950b, 1953, Leverett 1899a, McGee 1890, Wascher 1938.

Recent: Barrows 1910.

Structure: Horberg 1950a.

Worthen Survey report (v. 5): James Shaw 1873.

Marshall Limestone (Pa.): J. E. Lamar 1934.

Marshall Syncline: Clegg 1965a, 1965b.

Marshall-Sidell Syncline: A. H. Bell 1943c, Mylius 1927, Wanless 1955b.

Martinsville Dome: Clegg 1965a, Moulton 1929d, Mylius 1923, 1927, Newton 1937b.

Martinsville Lime, Pay Zone (Miss.): Mylius 1927.

Martinsville Limestone (Pa.): Worthen 1875a(2).

Martinsville Pool: Cohee 1941a, 1941b, Moulton 1926a, 1929d, Mylius 1927.

Marywood Member (Camb.): Buschbach 1964.

Mascoutah Dome: E. W. Shaw 1921.

Mason Anticline: Newton 1941.

Mason County

Bedrock topography: Horberg 1945, 1950a, Selkregg 1958, W. H. Walker 1965.

Brines: Meents 1952.

Clay and shale: J. E. Lamar 1934.

Coal

General: G. H. Cady 1921, Culver 1925a.

Mining: Annual coal reports, Andros 1915c.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b.

Subsidence: L. E. Young 1916b.

Drill records: Ross Hanson 1950, Leverett 1899a, Walton 1965, Wanless 1957a.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Mason County—cont.

Geologic sections (described outcrops)

Mason County (Pleis.): A. B. Leonard 1960.

Riverside Park (Pleis.): Wanless 1957a.

Geophysical studies: McGinnis 1961a.

Ground water

General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958, W. H. Walker 1965, Walton 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

Lake Chautauqua sediment: Stall 1951a.

Loess: Frye 1962e, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1945, 1950a, W. H. Walker 1965.

Drift thickness: State geol. map.

Geologic: State geol. map, W. H. Walker 1965, Wanless 1957a.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Wanless 1957a.

Structure: G. H. Cady 1921, Meents 1954, Wanless 1957a, Whiting 1965b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Peat: Soper 1922.

Physiography: Glock 1932, Leighton 1948b, W. H. Walker 1965, Wanless 1957a.

Quadrangle studies

Beardstown: Wanless 1957a, 1958.

Havana: Wanless 1957a, 1958.

Radiocarbon dates: J. R. Arnold 1951.

Sand and gravel

Mineralogy: R. E. Hunter 1965, Willman 1942a.

Molding sand: Willman 1939b.

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Stratigraphy

General: Selkregg 1958, W. H. Walker 1965, Wanless 1957a, Workman 1948.

Silurian: Lowenstam 1950, Whiting 1965b.

Devonian: Whiting 1965b.

Mississippian: Wanless 1957a.

Pennsylvanian: Wanless 1931b, 1957a, 1958.

Pleistocene: Frye 1965c, W. H. Johnson 1964, A. B. Leonard 1960, Wanless 1957a.

Recent: F. C. Baker 1918.

Structure: A. H. Bell 1964, Wanless 1957a.

Worthen Survey report (v. 4): Bannister 1870.

Mason Pool: Newton 1941.

Massac County

Bedrock topography: Horberg 1950a.

Caves: Bretz 1961.

Clay and shale

General: J. E. Lamar 1934, 1948, 1959, Parmelee 1921, 1922, Pryor 1962a, Shrode 1953.

Bonding clay: Grogan 1945.

Chemical analyses: W. A. White 1959a.

Refractory clay: Parmelee 1921, Purdy 1907.

Resources: Ross 1964b.

Drill records: Ross Hanson 1950, 1958, J. M. Weller 1940a.

Geologic sections (described outcrops)

Brookport (Pleis.): J. E. Lamar 1948.

Massac County—cont.

Geologic sections—cont.

- Choat "Badlands" (Pleis.): Leighton 1949a.
 New Columbia (Miss., Cre., Pleis.): Parmelee 1921.
 Rineking Cut (Miss., Pleis.): J. E. Lamar 1948.
 Round Knob (Cre., Ter.): J. E. Lamar 1948, Parmelee 1921, Purdy 1907.

Ground water

- General: Horberg 1950a, Leverett 1899a, Pryor 1956a, Ross 1964b.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Limestone and dolomite

- General: Krey 1925, J. E. Lamar 1934, 1959.

Cement materials: J. E. Lamar 1959.

Resources: Ross 1964b.

- Loess: Fehrenbacher 1965b, Leighton 1950b, Pryor 1962a, Ross 1964b.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, C. L. Cooper 1944, J. E. Lamar 1948, Pryor 1962a, Ross 1964b, E. O. Ulrich 1905, J. M. Weller 1940b, Stuart Weller 1939a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Ross 1963.

Structure: Pryor 1962a, Ross 1963, J. M. Weller 1940a.

Mineral industries: J. E. Lamar 1928d.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas possibilities: Ross 1964b, J. M. Weller 1940a.

Physiography: R. F. Flint 1941, Leighton 1948b, Pryor 1962a.

Quadrangle studies

Brownfield: Stuart Weller 1939a.

LaCenter: Pryor 1962a.

Paducah: Ross 1964b.

Smithland: Ross 1964b.

Vienna: Stuart Weller 1939a.

Sand and gravel: J. E. Lamar 1929c.

Mineralogy and petrology: Pryor 1962a, Shrode 1953.

Resources: Ross 1964b.

Silica: Pryor 1962a.

Stratigraphy

General: Pryor 1962a, Ross 1963, 1964b, Shrode 1953, E. O. Ulrich 1905, J. M. Weller 1940a, Stuart Weller 1926c.

Ordovician: Pryor 1962a.

Silurian: Pryor 1962a.

Mississippian: McFarlan 1942, P. E. Potter 1958a, Ross 1964b, E. W. Shaw 1917, Swann 1958, 1963, J. M. Weller 1940a, 1940b, Stuart Weller 1939a, Workman 1956.

Pennsylvanian: E. W. Shaw 1917.

Cretaceous: J. E. Lamar 1930b, G. E. Murray 1961, Parmelee 1921, Pryor 1961a, Purdy 1907, Ross 1963, 1964b, J. M. Weller 1940a.

Tertiary: C. L. Cooper 1944, McGee 1891, G. E. Murray 1961, Parmelee 1921, Pryor 1961a, 1962a, Purdy 1907, Ross 1963, 1964b, J. M. Weller 1940a.

Pleistocene: Finch 1964, J. M. Weller 1940a.

Massac County—cont.

Structure: A. H. Bell 1964, Ross 1963, Stonehouse 1955.

Worthen Survey report (v. 1): Henry Engelmann 1866.

Mastodon: N. C. Anderson 1905, Anon. 1870, 1882, Bagg 1909, E. T. Cox 1875, John Welles Foster 1857, S. P. Lathrop 1851, Penhallow 1891, W. E. Powers 1936, E. S. Riggs 1937, C. R. Smith 1936, 1960, H. N. Stevens 1905, Johan A. Udden 1905, Whitteley 1851, Wilber 1861.

Matson Member (Ord.): Templeton 1963.

Mattoon Anticline: Clegg 1959, 1965a.

Mattoon Formation (Pa.): Kosanke 1960, Wier 1961.

Mattoon Pool: Anon. 1946, Kniseley 1946, Simmons 1957.

Mattoon, glacial drift aquifers: John Webster Foster 1951b.

Mattoon, water supply: Workman 1930.

Maumee Terrace: Fidler 1936.

Maunie Fault: J. A. Harrison 1951, Pryor 1956b, Pullen 1951.

Maunie South Pool: Squires 1950b, 1950d.

Maxwell Limestone (Pa.): Bleining 1912.

Mayfield Member (Camb.): Templeton 1950.

Maynardville Dolomite (Camb.): Calvert 1963.

Mazomanie Formation (Camb.): Thwaites 1923, 1927.

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Medusa Member (Ord.): Templeton 1952, 1963.

Megacyclothems: J. M. Weller 1958b.

Megagroups: Swann 1961.

Megaspores (see Paleobotany)

Menard County

Bedrock topography: Horberg 1945, 1950a,

Menard County—cont.

Bedrock topography—cont.

Selkregg 1958, E. W. Shaw 1913, W. H. Walker 1965.

Clay and shale

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: W. A. White 1960b.

Petrology: Grim 1957.

Coal

General: G. H. Cady 1921, Ill. GS 1913, E. W. Shaw 1913.

Analyses: Ashley 1902, G. H. Cady 1935b, 1948a, Hawley 1923, Parr 1904, 1906b, 1915a, 1916, E. W. Shaw 1913.

Losses: C. A. Allen 1925.

Mined-out areas: Ill. GS 1959b map 14.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1915c, G. H. Cady 1921, H. M. Cooper 1942b.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Clegg 1961.

Subsidence: L. E. Young 1916b.

Drill records: G. H. Cady 1921, Ross Hanson 1950, 1958, E. W. Shaw 1913, W. H. Walker 1961, Worthen 1883(1).

Geologic sections (described outcrops)

Petersburg (Pleis.): Willman 1963.

Petersburg Dam (Pleis.): W. H. Johnson 1964.

Rock Creek Township (Pleis.): W. H. Johnson 1964.

Geophysical studies: McGinnis 1961a.

Ground water

General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Savage 1907, R. C. Scott 1962, Selkregg 1958, E. W. Shaw 1913, W. H. Walker 1961, 1965, Walton 1962a, Workman 1937c.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Limestone and dolomite: Krey 1925, Ostrom 1957c.

Loess: Frye 1962e, Leighton 1950b, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1945, 1950a, E. W. Shaw 1913, W. H. Walker 1965.

Drift thickness: State geol. map.

Geologic: State geol. map, E. W. Shaw 1913, W. H. Walker 1965.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Structure: G. H. Cady 1921, Clegg 1961, Savage 1915, E. W. Shaw 1913, Whiting 1965b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Physiography: Leighton 1948b, MacClintock 1929, E. W. Shaw 1913, W. H. Walker 1965.

Quadrangle studies

Springfield: Savage 1915, E. W. Shaw 1913.

Tallula: E. W. Shaw 1913.

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Stratigraphy

General: Savage 1907, Selkregg 1958, E. W. Shaw 1913, W. H. Walker 1965.

Menard County—cont.

Stratigraphy—cont.

Silurian: Whiting 1965b.

Devonian: Whiting 1965b.

Pennsylvanian: G. H. Cady 1921, Clegg 1961, Wanless 1931b, Worthen 1883(1).

Pleistocene: Frye 1965c, W. H. Johnson 1964, Staplin 1963b, Willman 1963.

Recent: F. C. Baker 1918, Stall 1959.

Uranium: Ostrom 1955.

Worthen Survey report (v. 4): Bannister 1870.

Menard Limestone (Miss.): Atherton 1947, J. W. Baxter 1963a, 1965a, J. C. Bradbury 1963, Butts 1917a, 1925, C. L. Cooper 1941, Coryell 1939a, Croneis 1939d, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, Harris 1961, J. E. Lamar 1925a, 1959, Leighton 1939, J. M. Parks 1953, P. E. Potter 1958a, 1963a, Rexroad 1965b, Ross 1964b, Siever 1951a, 1953, A. H. Sutton 1952, Swann 1951b, 1963, Tippie 1942, E. O. Ulrich 1917, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1913, 1914, 1920a, 1920b, 1939a, 1939b, Willman 1949, Workman 1940.

Fauna: McFarlan 1942, Zeller 1953.

Structure map: Root 1928, Siever 1951a, Swann 1951b.

Mendon Coal (Pa.): Culver 1925a.

Mendon Moraine: Frye 1964a, 1965a, 1965b, W. H. Johnson 1964, Leighton 1961.

Mendota Anticline: Willman 1942b.

Meppen Syncline: Collinson 1954, 1957, Rubey 1952.

Meramec Group (Miss.): Bowman 1907, Keyes 1940b, Laudon 1948, R. C. Moore 1935, Swann 1963, J. M. Weller 1939f, 1940b, Stuart Weller 1906b, 1907a, 1908, 1914, 1920b, Workman 1950b.

Meramec-Osage Upland: Horberg 1950a.

Mercer County

Bedrock topography: Horberg 1950a.

Clay and shale

General: Parmelee 1921, Savage 1921b, Wanless 1929a.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: Parham 1961, W. A. White 1960b.

Petrology: Grim 1957.

Refractory clay: Lines 1917.

Coal

Analyses: G. H. Cady 1935b, 1948a, Hawley 1923, Parr 1904, 1906b, 1915a, 1916, Savage 1921b, Wanless 1929a.

Mined-out areas: Ill. GS 1959b maps 4, 5.

Mining: Annual coal reports, Andros 1915b, Culver 1925a, Savage 1921b.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Culver 1925a.

Strippable reserves: W. H. Smith 1963.

Subsidence: L. E. Young 1916b.

Drill records: Culver 1925a, Ross Hanson 1950, 1958, 1961, Savage 1921b, Thwaites 1927, Wanless 1929a.

Mercer County—cont.

- Feldspar: Willman 1942a.
 Fossil plant localities: Collinson 1960a.
 Geologic sections (described outcrops)
 Eliza Creek (Pleis.): Savage 1921b.
 Griffin (Pa.): Parmelee 1921, Wanless 1929a.
 Keating Creek (Pleis.): Horberg 1956b.
 Pope Creek (Pa., Pleis.): Horberg 1956b, Wanless 1929a.
 Shale City (Pa.): Wanless 1929a.
 Sherrard (Pleis.): Savage 1921b.
- Ground water
 General: Bergstrom 1956a, Horberg 1950a, Leverett 1899a, Savage 1921b, Thwaites 1927, Wanless 1929a.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
- Limestone and dolomite
 General: Krey 1925, Savage 1921b, Wanless 1929a.
 Building stone: Wanless 1929a.
 Cement materials: Savage 1921b.
 Trace elements: Ostrom 1957c.
- Loess: G. D. Smith 1942, Wanless 1929a.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a, Wanless 1929a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Savage 1921b, Wanless 1929a.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a, Shaffer 1954a.
 Mineral industries: Ill. GS 1961.
 Structure: Horberg 1950a, Thwaites 1927, Wanless 1927, 1929a.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas possibilities: Savage 1921b, Wanless 1927, 1929a.
- Physiography: Leighton 1948b, Savage 1921b, Wanless 1929a.
- Quadrangle studies
 Alexis: Wanless 1927, 1928, 1929a.
 Edgington: Savage 1921b.
 Milan: Savage 1921b.
- Sand and gravel: Savage 1921b, Johan A. Udden 1898b, Wanless 1929a, Willman 1942a.
- Sandstone: J. C. Bradbury 1962a.
- Soil report 29
- Springs: Wanless 1929a.
- Stratigraphy
 General: Bergstrom 1956a, Savage 1921b.
 Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.
 Cambrian: A. H. Bell 1964, Savage 1921b.
 Ordovician: Agnew 1955b, A. H. Bell 1964, Savage 1921b.
 Silurian: Lowenstam 1949b, Savage 1921b.
 Devonian: Savage 1921b.
 Pennsylvanian: J. C. Bradbury 1962a, Culver 1924, 1925a, O'Brien 1963b, Parham 1961, Savage 1921b, W. H. Smith 1963, Sturgeon 1964, Wanless 1929a, 1931a, 1931b, 1932b, J. M. Weller 1942c.
 Pleistocene: F. C. Baker 1928b, Horberg 1956b, Leverett 1899a, Savage 1921b, Shaffer 1954a, Staplin 1963b, Wanless 1928, 1929a, Willman 1963.

Mercer County—cont.

- Structure: Thwaites 1927, Wanless 1929a.
 Worthen Survey report (v. 4): H. A. Green 1870.
- Meredosia Channel: Carman 1910, Horberg 1950a, Shaffer 1954a.
- Merom Sandstone Member (Pa.): Kosanke 1960, Newton 1937b, Wanless 1939, Wier 1961.
- Mesozoic Era (see Cretaceous System)
- Metallurgical coke (see Coke)
- Metals (see also Beryllium, Gold, Iron, Lead and zinc, Silver, Uranium): J. E. Lamar 1965.
- Metamora Moraine: G. E. Ekblaw 1941, Frye 1965a, Leighton 1953, A. B. Leonard 1960.
- Meteorites: W. F. Read 1963, Wylie 1948.
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- Methane in coal (see also under county): Darton 1915.
- Methoxyl, determination of: Yohe 1950b.
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- Metz Member (Ord.): Templeton 1963.
- Mica: Grim 1937b.
- Micas, infrared absorption: Serratos 1958b.
- Michigan Basin: Cohee 1945a, 1945b, 1948a, 1948b, 1965, Pirtle 1932, J. M. Weller 1936b.
- Michigan River: Swann 1963, 1964, 1965.
- Microscope, accessory stage: J. E. Lamar 1929b.
- Middle DeLong Coal (Pa.) (see Brush Coal): Kosanke 1960, Wanless 1956.
- Middle DeLong Cyclothem (Pa.) (see Brush Cyc.): Kosanke 1960, Wanless 1931a, 1956, 1957a.
- Middle Devonian Series: State geol. map, G. A. Cooper 1944, Grabau 1940, J. M. Weller 1944b.
 Isopach map: Sloss 1960.
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- Middletown Bedrock Valley: Horberg 1950a, W. H. Walker 1965.
- Midway Group (Ter.): Cushing 1964, Parmelee 1921, J. M. Weller 1940c.
- Mifflin Formation (Ord.): A. H. Bell 1964, Buschbach 1964, Doyle 1965, DuBois 1945, Templeton 1952, 1963.
 Fauna: H. W. Scott 1951.
- Milan Quadrangle: Savage 1921b.
- Military geology: Salisbury 1918.
- Mill Creek Bedrock Valley: Horberg 1950a.
- Millbrig Syncline: E. W. Shaw 1916, Willman 1947.
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- Millersburg Formation (Pa.): M. L. Fuller 1904, Wanless 1939.
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- Millstadt Anticline: A. H. Bell 1941b.
- Millstone Grit: E. T. Cox 1875, Worthen 1866a(4), 1868(2).
- Mincke Member (Ord.): Templeton 1963.
- Mine rescue work: R. Y. Williams 1910.

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- Alton-Chester Belt: S. M. McClure 1946c.
 Clay and silica: S. M. McClure 1946b.
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 Fluorspar District: S. M. McClure 1946a,
 1953b, 1955, Schraut 1951.
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 Statistics: (1906) Lines 1908, (1917-1965)
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 1913-1914: Skewes 1917b.
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 1917-1918: Barrett 1922a.
 1919-1939: Voskuil 1941c.
 1931: Voskuil 1932b.
 1932: Voskuil 1933d.
 1933: Voskuil 1934d.
 1934: Voskuil 1936d.
 1935: Voskuil 1936e.
 1936: Voskuil 1937c.
 1937: Voskuil 1938d.
 1938: Voskuil 1939b.
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 1941: Voskuil 1943c.
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Mineral economics—cont.

Illinois mineral industry—cont.

- 1943: Voskuil 1944c.
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 1956: Busch 1957.
 1957: Busch 1958.
 1958: Busch 1959.
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- Mississippian System**
 Accepted nomenclature (see named units)
Chesterian Series
Elviran Stage
 Grove Church Sh.
 Kinkaid Ls.
 Goreville Ls. M.
 Cave Hill M.
 Negli Creek Ls. M.
 Degonia Ss.
 Clore Fm.
 Ford Station Ls. M.
 Tygett Ss. M.
 Cora Ls. M.
 Palestine Ss.
 Menard Ls.
 Allard Ls. M.
 Scottsburg Ls. M.
 Walche Ls. M.
 Waltersburg Ss.
 Vienna Ls.

Mississippian System—cont.

Chesterian Series—cont.

Tar Springs Ss.

Hombergian Stage

Glen Dean Ls.

Hardinsburg Ss.

Haney Ls.

Fraileys Sh.

Big Clifty Ss. M.

Gasperian Stage

Beech Creek Ls.

Cypress Ss.

Ridenhower Fm.

Reelsville Ls. M.

Sample Ss. M.

Beaver Bend Ls. M.

Bethel Ss.

Downeys Bluff Ls.

Yankeetown Ss.

Renault Ls.

Shetlerville M.

Popcorn Ss. Bed

Groups (West)

Pope Megagroup (Grove Church-Aux Vases)

Okaw (Glen Dean-Beech Creek)

Paint Creek (Ridenhower-Downeys Bluff)

Groups (East)

Pope Megagroup (Grove Church-Bethel)

Golconda (Haney-Beech Creek)

West Baden (Cypress-Bethel)

Cedar Bluff (Downeys Bluff-Renault)

*Valmeyeran Series**Genevievian Stage*

Renault Ls. (cont.)

Bryantsville Breccia Bed

Levias Ls. M.

Aux Vases Ss.

Rosiclare Ss. M.

Ste. Genevieve Ls.

Joppa M.

Karnak Ls. M.

Spar Mountain Ss. M.

Fredonia Ls. M.

Lost River Chert Bed

Base of *Genevievian Stage*

(West)

St. Louis Ls.

Salem Ls.

Rocher Ls. M.

Chalfin Ls. M.

Fults Ls. M.

Kidd Ls. M.

Sonora Ss.

Warsaw Sh.

Keokuk Ls.

Burlington Ls.

Fern Glen Fm.

Sedalia Ls.

(Central and South)

St. Louis Ls.

Salem Ls.

Harrodsburg Ls.

Fort Payne Chert

Springville Sh.

State Pond Member

(Central and East-central)

St. Louis Ls.

Salem Ls.

Harrodsburg Ls.

Borden Siltstone

Mississippian System—cont.

Kinderhookian Series

(West)

North Hill Group (Starrs Cave-McCraney)

Starrs Cave Ls.

Prospect Hill Siltstone

McCraney Ls.

Hannibal Sh.

Nutwood Sh. M.

"Glen Park" Fm.

(Central, South, and East)

Chouteau Ls. (also West)

New Albany Group

Hannibal Sh.

Mammoth Cave Megagroup

(East: Downeys Bluff-Harrodsburg)

(West: Ste. Genevieve-Chouteau)

Knobs Megagroup

(East: Borden-Alto, see Dev.)

(West: Hannibal-Sylamore, see Dev.)

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1961, 1962, Coryell 1939a, Henry Engel-

mann 1863, James Hall 1857b, Keyes 1892a,

1892b, 1914, 1923b, Krey 1924, J. E.

Lamar 1925a, Meek 1873, R. C. Moore

1935, 1936, Mylius 1927, Owen 1846.

P. E. Potter 1963a, Ross 1963, Schuchert

1943, Smoot 1958, A. H. Sutton 1932,

Swann 1963, Van Tuyl [1925], J. M. Weller

1939f, 1940a, 1940b, 1940c, Stuart Weller

1906b, 1907a, 1914, 1920a, 1920b, Work-

man 1937a, 1950b, Worthen 1866a(3),

1868(1), 1870.

Argillaceous sediments: Weaver 1958.

Classification: Swann 1963, E. O. Ulrich 1917,

1922, J. M. Weller 1940b, Stuart Weller

1898, 1920a.

Comparison with Europe: R. C. Moore 1937.

Correlation chart: J. M. Weller 1948a.

Differentiation from Pennsylvanian sediments:

Atherton 1960.

Erosional channels: P. E. Potter 1963b.

Fauna: Collinson 1955a, 1959, Coryell 1939b,

Meek 1866c, A. K. Miller 1951, St. John

1875, A. H. Sutton 1939, 1940, Stuart

Weller 1909a, 1911, 1914, 1926a, Worthen

1890(3), Zeller 1953.

Flora: Hoffmeister 1955b, Winslow 1959.

Fossil collecting: Stuart Weller 1926b.

Fossils in Pennsylvanian conglomerate: Poor

1925.

Isopach map: G. M. Kay 1951, Smoot 1958,

J. M. Weller 1936b.

Isopach map (post-Kinderhook): Sloss 1960,

Tester 1935.

Lithofacies map: Sloss 1960.

Osage-Meramec contact: Laudon 1948.

Paleoecology: J. S. Williams 1957.

Paleogeography: W. W. Davis 1917, Stuart

Weller 1926b.

Paleogeographic map: P. E. Potter 1963b,

Schuchert 1923, Swann 1964.

Pre-Chester isopach, lithofacies, and paleo-
geologic map: Sloss 1960.

Pre-Pennsylvanian faulting: Desborough 1958,

1961b, G. E. Ekblaw 1925c.

Ratio of cherty limestone to limestone: Sloss

1960.

Ratio of oolitic limestone to limestone: Sloss

1960.

Mississippian System—cont.

- Sandstone petrology: P. E. Potter 1962a.
 Shale petrology: Grim 1957.
 Structure map: A. H. Bell 1937a, 1937e, Hager 1938, Lowenstam 1948b, Mylius 1927, J. N. Payne 1940.
- Mississippian - Pennsylvanian unconformity: Ostrom 1961a, Siever 1951a.
- Missourian (Missouri) Series (Pa.): C. L. Cooper 1946, 1947a, W. V. Searight 1961.
- Missouri-Illinois, composite section: J. M. Weller 1939a.
- Mix Dike: Bain 1905a, J. C. Bradbury 1962b, Stuart Weller 1920b.
- Moccasin Springs Limestone (Sil.): J. E. Lamar 1959, Lowenstam 1949b, Pryor 1962a, J. M. Weller 1952.
 Isopach map: Lowenstam 1950.
- Modesto Formation (Pa.): Kosanke 1960, P. E. Potter 1963c, Reinertsen 1964, Wier 1961.
- Mohawkian Series (Ord.): Savage 1910a, Workman 1950b.
- Mokena Quadrangle: Bretz 1943, 1955.
- Molding sand (see Sand and gravel)
- Momence Sandstone Member (Camb.): Buschbach 1964.
- Monee Moraine: Frye 1965b, Leighton 1953.
- Monk's Mound: Crook 1917.
- Monmouth deep wells: Workman 1926.
- Monroe City Syncline: Stuart Weller 1939b.

Monroe County

- Barite: S. M. McClure 1947b.
- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952, Moulton 1926f.
- Building stone: Conover 1884.
- Caves: Bretz 1961.
- Clay and shale
 General: J. E. Lamar 1934, Parmelee 1921.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Petrology: Grim 1957.
 Refractory clay: J. E. Lamar 1956b.
 Resources: Parham 1963a.

Coal

- Mining and production: Annual coal reports.
- Reserves: G. H. Cady 1952b.
- Strippable reserves: W. H. Smith 1958.
- Drill records: Cohee 1941b, Ross Hanson 1950, 1958.
- Dupo area guide leaflet: Ill. GS 1963-F.
- Earthquakes: Heinrich 1950, S. M. McClure 1940.
- Feldspar: Willman 1942a.
- Fluorspar: S. M. McClure 1947b.
- Geologic sections (described outcrops)
 Dennis Hollow (Miss.): Harris 1961, Leighton 1939, Rexroad 1965a, Willman 1949.
 Dry Fork East (Miss.): Rexroad 1957.
 Fountain Creek (Miss.): Leighton 1939.
 Valmeyer Quarry (Ord.): Leighton 1939, Templeton 1963, Willman 1949.
- Ground water
 General: Horberg 1950a, Leverett 1899a, Selkregg 1957, E. W. Shaw 1921.
 Analyses: Ross Hanson 1950, 1958.
- Limestone and dolomite
 General: Krey 1925, J. E. Lamar 1934.

Monroe County—cont.

- Limestone and dolomite—cont.
 Cement materials: J. E. Lamar 1956b.
 Mineralogy: Grim 1937a.
 Resources: J. W. Baxter 1960b, J. C. Bradbury 1963.
- Loess: Leighton 1950b, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, J. C. Bradbury 1963, Ill. GS 1920a, E. W. Shaw 1921, J. M. Weller 1940b, Stuart Weller 1939b.
 Mineral industries: Ill. GS 1961.
 Structure: A. H. Bell 1961c, Moulton 1929a, Mylius 1921b, E. W. Shaw 1921.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
 General: J. E. Lamar 1922, Mylius 1921a.
 Possibilities: Ill. GS 1920a, Mylius 1921b.
 Prospecting: Mylius 1920b.
 Underground gas storage: A. H. Bell 1961c, 1962b, Peterson 1956.
 Waterloo Pool: A. H. Bell 1939f, Cohee 1941b, Moulton 1926f.
- Physiography: Cozzens 1940, R. F. Flint 1941, Leighton 1948b, MacClintock 1929, E. W. Shaw 1921.
- Quadrangle studies
 Baldwin: Stuart Weller 1939b.
 Crystal City: Stuart Weller 1939b.
 Kimmiswick: Stuart Weller 1939b.
 New Athens: E. W. Shaw 1921, Stuart Weller 1939b.
 Renault: Stuart Weller 1939b.
 Waterloo: Stuart Weller 1939b.
- Sand, mineralogy: Willman 1942a.
- Sandstone: P. E. Potter 1963a.
- Stratigraphy
 General: Harris 1961, J. E. Lamar 1922, Leighton 1939, Mylius 1921b, Selkregg 1957, E. W. Shaw 1921, Stuart Weller 1939b, Willman 1949.
 Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.
 Cambrian: A. H. Bell 1964.
 Ordovician: A. H. Bell 1964, J. H. Bradley 1930, Gregor 1936, Templeton 1963, Stuart Weller 1907d.
 Silurian: Lowenstam 1949b.
- Mississippian: J. W. Baxter 1960a, 1960b, J. C. Bradbury 1963, Butts 1929, Collinson 1955a, Coryell 1939a, Kissling 1961, McFarlan 1942, A. K. Miller 1942, Mylius 1921b, Rexroad 1962, H. G. Schenck 1939, A. H. Sutton 1932, 1934a, 1934b, 1938, 1939, 1940, Swann 1958, 1963, 1964, Tippi 1942, E. O. Ulrich 1917, J. M. Weller 1940b, Stuart Weller 1908, 1909b, 1916b, 1920a, 1928, 1939b, Workman 1956, Zeller 1953.
- Pennsylvanian: Parham 1963a, H. G. Schenck 1939, W. H. Smith 1958.
- Pleistocene: Leighton 1961.
- Structure: Broadhead 1889, J. E. Lamar 1922, Moulton 1926f, 1929a, Stuart Weller 1939b.
- Valmeyer area guide leaflet: Ill. GS 1961-F.
- Worthen Survey report (v. 5): Worthen 1873(1).

- Monte Sano Group (Miss.): Swann 1963, E. O. Ulrich 1917.
- Montgomery County**
- Bedrock topography: Horberg 1950a, Wallace Lee 1926.
- Brines: Meents 1952.
- Clay and shale: Bleining 1912, J. E. Lamar 1934, Wallace Lee 1926.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- In coal mines: Stull 1917.
- Mineralogy: Smoot 1960a, W. A. White 1960b.
- Coal**
- General: Fraser 1925, Ill. GS 1913, F. H. Kay 1915a.
- Analyses: Abernethy 1961, Aresco 1953-1965, Ashley 1902, G. H. Cady 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, J. A. Holmes 1906, Wallace Lee 1926, L. C. McCabe 1934a, E. W. Parker 1906b, Parr 1904, 1906b, 1915a, 1916, N. H. Snyder 1953, Zubovic 1964.
- Ash fusibility: Abernethy 1961.
- Beryllium in: Stadnichenko 1961.
- Chlorine in: Abernethy 1965, Gluskoter 1964.
- Free-swelling index: Abernethy 1961.
- Grindability: Abernethy 1961.
- Losses: C. A. Allen 1925.
- Mined-out areas: Ill. GS 1959b maps 18, 19, 22, 23.
- Mineral matter: Abernethy 1965.
- Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e, H. M. Cooper 1942b.
- Minor elements: Zubovic 1964.
- P, Cl, Na, and K in: Abernethy 1965.
- Petrology: L. C. McCabe 1934a.
- Physical tests: J. A. Holmes 1906.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1952b, Siever 1950.
- Subsidence: L. E. Young 1916b.
- Drill records:** W. S. Blatchley 1906, Ross Hanson 1958, 1961, F. H. Kay 1915a, Wallace Lee 1915, 1917, 1926, Saxby 1957, Sharpenberg 1963, Warthin 1944, Worthen 1883(1), 1890(2).
- Geologic sections (described outcrops)**
- East Fork Shoal Creek (Pa.): Kosanke 1960.
- Hillsboro (Pleis.): Wallace Lee 1926, MacClintock 1929.
- Litchfield (Pleis.): Wallace Lee 1926, MacClintock 1929.
- Nokomis Stone Co. Quarry (Pa.): Kosanke 1960.
- Shoal Creek (Pa.): Wallace Lee 1926.
- Geophysical studies:** Pryor 1956c.
- Greenville area guide leaflet: Ill. GS 1962-F.
- Ground water**
- General: Horberg 1950a, Wallace Lee 1926, Leverett 1899a, Pryor 1956c, Searcy 1952, Selkregg 1957, Workman 1937c.
- Analyses: Bartow 1909b, Gluskoter 1965a, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
- Gypsum and anhydrite:** Saxby 1957.
- Limestone and dolomite**
- General: Krey 1925, J. E. Lamar 1934.
- Building stone: Wallace Lee 1926.
- Montgomery County—cont.
- Limestone and dolomite—cont.
- Cement materials: Bleining 1912, J. E. Lamar 1956b.
- Trace elements: Ostrom 1957c.
- Loess: Frye 1963c, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a, Wallace Lee 1926.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Wallace Lee 1926.
- Glacial: State geol. map, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Structure: A. H. Bell 1926e, 1928b, 1943c, R. S. Blatchley 1914a, F. H. Kay 1915a, Wallace Lee 1915, 1917, 1926, Moulton 1925d, J. N. Payne 1941, 1944, Siever 1950, Whiting 1965b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas**
- General: R. S. Blatchley 1914a, Wallace Lee 1915, 1926, J. D. Weeks 1892b.
- Development maps: Ill. GS 1965 maps 61, 62, 63, 68, 69, 70.
- Natural gas: Ashburner 1886, Bain 1908a.
- Physical properties: Armon 1964.
- Possibilities: A. H. Bell 1926e, 1941b, W. S. Blatchley 1906, Moulton 1925d, J. N. Payne 1944.
- Prospecting: Mylius 1920b.
- Pana area guide leaflet: Ill. GS 1960-E.
- Physiography: Wallace Lee 1926, Leighton 1948b, MacClintock 1929.
- Quadrangle studies, Mt. Olive: Wallace Lee 1915, 1926.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1961a, 1962c.
- Stratigraphy**
- General: Bleining 1912, R. S. Blatchley 1914a, W. S. Blatchley 1906, Wallace Lee 1915, 1926, Selkregg 1957.
- Silurian: Lowenstam 1949b, 1950, Whiting 1958, 1965b.
- Devonian: Meents 1965b, Schwalb 1955, Warthin 1944, Whiting 1958, 1965b.
- Mississippian: J. N. Payne 1944, Swann 1958, Workman 1956.
- Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1939c, Culver 1925a, S. E. Ekblaw 1934, F. H. Kay 1915a, Kosanke 1960, Wallace Lee 1915, 1917, 1926, J. N. Payne 1944, P. E. Potter 1961a, Worthen 1883(1).
- Pleistocene: Frye 1963c, 1965a, Leighton 1959, 1961, MacClintock 1929, 1933, Willman 1963.
- Structural materials: Jon A. Udden 1910b.
- Structure: A. H. Bell 1926e, 1941b, R. S. Blatchley 1914a, Meents 1965b, Moulton 1925d.
- Uranium: Ostrom 1955.
- Worthen Survey report (v. 6): Broadhead 1875.
- Montgomery Terrace: Fisk 1944, 1949.
- Moorman Syncline: A. H. Bell 1964, Cohee 1962, Swann 1958.
- Mooseheart Member (Camb.): Buschbach 1964.
- Moredock Member (Ord.): Templeton 1963.

Morgan County

Bedrock topography: Horberg 1945, 1950a, E. W. Shaw 1913.

Brines: Meents 1952.

Clay and shale, refractory clay: Lines 1917.

Coal

General: E. W. Shaw 1913.

Mined-out areas: Ill. GS 1959b maps 14, 19.

Mining: Annual coal reports, Andros 1915b.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Culver 1925a, J. N. Payne 1942.

Strippable reserves: W. H. Smith 1961.

Copper erratic: Crook 1929.

Drill records: A. H. Bell 1927a, Collingwood 1923a, 1933, Culver 1925a, Easton 1942, Ross Hanson 1958, Leverett 1899a, Johan A. Udden 1914, Worthen 1890(2).

Feldspar: Willman 1942a.

Geologic sections (described outcrops)

Chapin (Pleis.): Frye 1965a.

Coal Creek (Pleis.): MacClintock 1959.

Literberry (Pleis.): Frye 1963c, 1965a.

Waverly (Pleis.): Frye 1963c.

Ground water

General: Bergstrom 1957, Horberg 1950a, Leverett 1899a, Lohr 1953, E. W. Shaw 1913.

Analyses: Bartow 1909b, Ross Hanson 1958, A. W. Palmer 1897.

Limestone and dolomite: Krey 1925.

Loess: Frye 1963c, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1945, 1950a, E. W. Shaw 1913.

Drift thickness: State geol. map.

Geologic: State geol. map, E. W. Shaw 1913.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Workman 1956.

Structure: A. H. Bell 1927a, 1943c, 1961c, J. N. Payne 1942, E. W. Shaw 1913, W. H. Smith 1961, Whiting 1965b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

Jacksonville Pool: A. H. Bell 1927a, 1939f.

Natural gas: A. H. Bell 1935a.

Possibilities: R. S. Blatchley 1910a, Collingwood 1923a, Easton 1942.

Underground gas storage: A. H. Bell 1961c, 1962b, Peterson 1956.

Physiography: Leighton 1948b, MacClintock 1929, E. W. Shaw 1913.

Quadrangle studies, Tallula: E. W. Shaw 1913.

Sand, mineralogy: Willman 1942a.

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Stratigraphy

General: Bergstrom 1957, Collingwood 1923a, E. W. Shaw 1913.

Ordovician: Gutstadt 1958b.

Silurian: Whiting 1965b.

Devonian: Whiting 1965b, Workman 1944.

Mississippian: J. S. Williams 1957, Workman 1956.

Morgan County—cont.

Stratigraphy—cont.

Pennsylvanian: Culver 1925a, J. N. Payne 1942, W. H. Smith 1961, Wanless 1931b.

Pleistocene: Frye 1963c, 1965a, Leighton 1961, MacClintock 1929, Staplin 1963b, Willman 1963.

Recent: Stall 1959.

Worthen Survey report (v. 4): Bannister 1870.

Morphostratigraphic units: Frye 1962c, 1963c.

Morris Basin: C. O. Sauer 1916.

Morris (No. 2) Coal (Pa.): Wanless 1939, Worthen 1868(2).

Structure map: Culver 1922a.

Morris-Kankakee Anticline: G. H. Cady 1920b.

Morris Pool: Root 1928.

Morris Quadrangle: Culver 1922a.

Morris Syncline: Willman 1942b.

Morris, "Trenton" near: Bieber 1942.

Morrow Group (Pa.): C. L. Cooper 1946.

Mortimer Member (Ord.): Doyle 1965, Templeton 1952, 1963.

Morton Loess (Pleis.) (see Iowan Loess): Frye 1960b, 1963a, 1963b, 1963c, 1965a, 1965b, 1965c, Glass 1964, Leighton 1960, 1965, A. B. Leonard 1960.

Moultrie County

Bedrock topography: Horberg 1950a, Selkregg 1958.

Coal

Analyses: G. H. Cady 1935b, 1948a, Hawley 1923, Parr 1915a, 1916.

Mined-out areas: Ill. GS 1959b map 18.

Mining: Annual coal reports, Andros 1914e.

Production: Annual coal reports.

Reserves: G. H. Cady 1944, 1952b, DuBois 1951.

Subsidence: L. E. Young 1916b.

Drill records: Collingwood 1924b, Ross Hanson 1950, 1958.

Geophysical studies: R. B. Johnson 1954, P. S. McClure 1935.

Ground water

General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958, W. D. P. Warren 1927.

Analyses: Ross Hanson 1950, A. W. Palmer 1897.

Limestone and dolomite: Ostrom 1957a.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Horberg 1953, Schwalb 1953.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Workman 1956.

Structure: Collingwood 1924b, DuBois 1951, Meents 1954, Schwalb 1953, E. F. Taylor 1944b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

Development maps: Ill. GS 1965 maps 71, 72, 77, 78.

Gas in drift: Meents 1960.

Oil shale: Barrett 1922b.

Moultrie County—cont.

Oil and gas—cont.

Physical properties: Armon 1964.

Possibilities: Collingwood 1924b.

Sandstone: P. E. Potter 1962a, 1962c.

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Stratigraphy

General: Selkregg 1958.

Devonian: Schwab 1955.

Mississippian: Swann 1958, Workman 1956.

Pennsylvanian: G. H. Cady 1944, DuBois 1951, Ostrom 1957a.

Pleistocene: Frye 1965c, Horberg 1953, R. B. Johnson 1954, Leighton 1961.

Worthen Survey report (v. 6): Broadhead 1875.

Mt. Auburn Consolidated Pool: A. H. Bell 1959c, Whiting 1956.

Mt. Carmel Fault: G. H. Cady 1955, Lockett 1947.

Mt. Carmel-New Harmony Fault: S. K. Clark 1948.

Mt. Carmel Sandstone Member (Pa.): Andresen 1961, G. H. Cady 1955, Kosanke 1960, P. E. Potter 1962b, 1963a, Pryor 1956b, Siever 1959, Worthen 1875a(2).

Isopach map: P. E. Potter 1963a, Pryor 1956b.

Structure map: Pryor 1956b.

Mt. Olive Quadrangle: Wallace Lee 1915, 1917, 1926.

Mt. Rorah Coal Member (Pa.) (see Bald Hill Coal): Kosanke 1960.

Mt. Simon Sandstone (Camb.): A. H. Bell 1961c, 1964, Buschbach 1964, 1965, Calvert 1963, Cohee 1945b, 1948a, T. A. Dawson 1960, John Webster Foster 1956, Gutstadt 1958a, Hackett 1960a, Lochman 1956, Raasch 1950, Suter 1959, Templeton 1950, Thwaites 1923, 1927, Willman 1942b, Workman 1948, Zeisel 1962a.

Isopach map: A. H. Bell 1964, Buschbach 1964.

Structure map: A. H. Bell 1961c, Suter 1959, Zeisel 1962a.

Mt. Sterling Coal (Pa.): Culver 1925a.

Mt. Vernon Hill Country: Leighton 1948b.

Mt. Vernon Pool: Swann 1951b.

Mountain Glen Shale (Dev.) (see New Albany Sh.): Bassett 1925, Krey 1921, St. Clair 1917a, Savage 1920, J. M. Weller 1939e, 1940a, 1940b, 1940c, 1944b, Stuart Weller 1939a, Workman 1956.

Mountain Limestone (Miss.): Swann 1963, Worthen 1860a, 1860b.

Mud Creek Bedrock Valley: Horberg 1950a.

Mud Creek Fault: Templeton 1952.

"Mud Vein": F. H. Kay 1915b.

Murdock Syncline: Clegg 1959, 1965a, 1965b.

Murphy Pool: A. H. Bell 1928d, Rich 1916b, Squires 1943e.

Murphys Bluff Sandstone Member (Pa.): K. A. Payne 1937.

Murphysboro Coal Member, Murphysboro (No. 2) Coal (Pa.): Andros 1914b, Brokaw 1916, Butts 1925, G. H. Cady 1919a, 1926, 1942a, 1952b, Hinds 1919, Kosanke 1950, 1960, J. E. Lamar 1925a, Wallace Lee 1926, Savage 1921c, E. W. Shaw 1912b, 1913, 1921, W. H. Smith 1957, 1958, Wanless 1939, Winslow 1959, Worthen 1868(2).

Beryllium in: Stadnichenko 1961.

Murphysboro Coal Member—cont.

Flora: E. W. Shaw 1912b.

Isopach map: G. H. Cady 1935a.

Structure map: Hinds 1919, J. E. Lamar 1925a, E. W. Shaw 1910, 1912b, 1921.

Murphysboro Quadrangle: R. S. Blatchley 1910a, E. W. Shaw 1910, 1911b, 1912b.

Clay resources: E. W. Shaw 1911a.

Murray Bluff Sandstone Member (Pa.): J. W. Baxter 1963a, 1965a, Kosanke 1960, Siever 1959, J. M. Weller 1940a.

Museums: Crook 1911.

Musk-ox: Galbreath 1963.

N

Nachusa Formation (Ord.): A. H. Bell 1964, Buschbach 1964, Doyle 1965, Templeton 1952, 1963.

Naperville Esker: D. J. Fisher 1925a, Trowbridge 1912.

Naphthalene, wettability: Eissler 1962.

Nashville Anticline: E. W. Shaw 1912a, 1921.

Nashville coal-balls: G. H. Cady 1937b, Schopf 1937a.

Natural gas (see Oil and gas)

Natural resources (see Mineral resources)

Natural resources and geological surveys: Leighton 1951c.

Natural resources, Big Muddy basin: Leighton 1935a.

Nauvoo to southern Calhoun County

Cross-section: J. M. Weller 1941b.

Structure: Krey 1924.

Nebraskan Stage (Pleis.): A. H. Bell 1929c, Eevland 1952, John Webster Foster 1951a, Frye 1964a, 1965a, 1965c, Horberg 1953, 1956b, MacClintock 1933, 1959, Thornbury 1958, Wanless 1929b, 1955a, 1957a, Willman 1963.

Neda Oolite, Formation (Ord.): Buschbach 1964, Willman 1962, Workman 1950a, Zeisel 1962a.

Neeleyville Coal (Pa.): Worthen 1868(2).

Neelys Coal (Pa.): Culver 1925a.

Negli Creek Limestone Member (Mjss.): Swann 1963.

Nelson's Coal (Pa.): Worthen 1882c.

Neutron activation analysis: Czamanske 1963.

New Albany Group, Shale (Dev.-Miss.) (see Mountain Glen Sh.): J. W. Baxter 1965a, A. H. Bell 1935a, 1943c, J. C. Bradbury 1955b, Folk 1946, Keyes 1914, 1916b, 1942a, J. E. Lamar 1959, Ross 1964b, Swann 1958, J. M. Weller 1940a, 1940b, 1952, Workman 1956.

Isopach map: Workman 1956.

Isopach-lithofacies map: Sloss 1960.

Paleogeographic map: Schuchert 1955.

Structure map: A. H. Bell 1935a, 1939e, 1943c, 1955f, Swann 1958, J. M. Weller 1936b.

New Albany System: Owen 1846.

New Athens Quadrangle: E. W. Shaw 1921, Stuart Weller 1939b.

New Boston Bedrock Channel: Horberg 1950a.

New Burnside Anticline: Brokaw 1916, J. M. Weller 1940a.

New Burnside Coal Member (Pa.): Kosanke 1960, P. E. Potter 1958b, W. H. Smith 1957.

- New City Pool: Whiting 1956.
- New Design Group (Miss.): Swann 1963, J. M. Weller 1939f, 1940b.
- New Diggings Quadrangle: Mullens 1964.
- New Douglas Dome: A. H. Bell 1926e, 1928b.
- New Glarus Member (Ord.): Templeton 1952, 1963.
- New Harmony Fault: G. H. Cady 1955.
- New Harmony Pool: Cohee 1942a, C. H. Riggs 1945a, Squires 1950b.
- New Haven Coal Member (Pa.): Kosanke 1950, 1960.
- New Haven Limestone (Pa.) (see Shoal Creek Ls.): G. H. Cady 1916, 1921, 1939c, J. A. Harrison 1951, F. H. Kay 1915a, Kosanke 1960, Wanless 1939, Worthen 1875a(2).
- New Hebron Pool: Piersol 1940, Rich 1916a.
- New London Member (Ord.): Templeton 1963.
- New Madrid Earthquake (see Earthquakes)
- New Madrid Fault: Heyl 1961.
- New Richmond Sandstone (Ord.): C. B. Anderson 1919, Bain 1905b, A. H. Bell 1964, Buschbach 1964, 1965, G. H. Cady 1919b, G. H. Cox 1914, Grabau 1937, Knappen 1926, Ostrom 1964, P. E. Potter 1961b, E. H. Powers 1935b, Templeton 1952, Wanless 1957a, Willman 1942b, 1943a, 1951, Workman 1926, 1948.
- Isopach map: E. H. Powers 1935c, Willman 1942b, Workman 1948.
- Structure map: Willman 1942b.
- New Scotland Formation (Dev.): Bleininger 1912, Savage 1908.
- Newark Bedrock Valley: Horberg 1950a, Suter 1959.
- Newton Cyclothem (Pa.): C. L. Cooper 1946, Kosanke 1960, Newton 1937b, 1941.
- Newton Limestone (Pa.) (see Reisner Ls.): Grogan 1940, Kosanke 1960, Newton 1937b.
- Niagara Escarpment: Horberg 1950a.
- Niagara Limestone, Dolomite, Group (Sil.) (includes both Alexandrian and Niagaran): W. C. Alden 1902, Bain 1905b, Bannister 1868, 1870, Bartow 1909b, Bleininger 1912, Bowman 1907, F. H. Bradley 1870, Burchard 1907, G. H. Cady 1915a, Carman 1910, G. H. Cox 1910, 1914, J. W. Goldthwait 1909, Meek 1861c, Mylius 1919, E. W. Shaw 1916, James Shaw 1873, Trowbridge 1916, Johan A. Udden 1896, Stuart Weller 1899, 1907c, Whitney 1866, Worthen 1866a(2), 1868(2), 1870, 1873(2).
- Niagara Plain: Trowbridge 1913.
- "Niagaran" Lime: Moulton 1926a.
- Niagaran Series, Dolomite, Limestone (Sil.) (see also Niagara Ls.): C. B. Anderson 1919, Athy 1928, J. R. Ball 1952, Bretz 1939, Caldwell 1964, Cohee 1948b, Croneis 1939f, Cumings 1928, D. J. Fisher 1925a, James Hall 1874, F. H. Kay 1915b, J. E. Lamar 1955a, Lowenstam 1942, 1948b, 1949a, 1949b, 1950, 1956, Morse 1915, Mylius 1919, Ross 1962b, Savage 1910a, 1921b, Shaver 1962, Slocum 1907, Suter 1959, D. O. Taylor 1930, Thwaites 1923, Wanless 1929a, 1957a, Stuart Weller 1906b, 1907b, Whiting 1965b, Willman 1942b, 1950, 1962, Workman 1950b, Worthen 1862, 1871, Zeisel 1962a.
- Chert: Bretz 1939, Grubbs 1939, J. R. Schultz 1934, Willman 1943b.
- Niagaran Series—cont.
- Facies: L. B. Freeman 1951, Ingels 1963, Lowenstam 1949a, 1950, 1952, 1957.
- Fauna: Grubbs 1939, Lowenstam 1942, 1948a, 1949a, 1956, Meek 1868a, Savage 1935, Stuart Weller 1897b, 1900b, 1907c, A. N. Winchell 1866.
- Isopach maps: Lowenstam 1949b, Zeisel 1962a.
- Structure maps: Cohee 1948b, R. H. Howard 1964, Wanless 1929a, Zeisel 1962a.
- Oil-bearing limestone: Hunt 1871.
- Reefs: Bretz 1939, Cumings 1928, C. L. Fenton 1931, Craig Ferris 1964, R. H. Howard 1964, Ingels 1963, Lowenstam 1946, 1948b, 1949a, 1949b, 1952, Smoot 1958, Willman 1943b, 1962.
- Paleoecology: Lowenstam 1957.
- Nilwood Anticline: J. R. Ball 1952, Easton 1942.
- Nipissing Great Lakes: Atwood 1908, Bretz 1955, Hough 1953, 1958, 1962, Leverett 1915.
- Radiocarbon dates: R. F. Flint 1956.
- Noble Anticline: A. H. Bell 1938f.
- Noble Pool: Cohee 1939, Hager 1937, McIlvain 1938, Piersol 1940.
- Nokomis Dome: Moulton 1925d, J. N. Payne 1944.
- Noix Oolite Member (Sil.): Athy 1928, Keyes 1898, 1915, Krey 1924, Rubey 1952, Savage 1913a.
- Nokomis Sandstone Member (Ord.): Templeton 1963.
- Non-metallic minerals (see also Industrial minerals): J. E. Lamar 1931a.
- Normal Moraine: G. E. Ekblaw 1941, Frye 1965b, Leighton 1953, A. B. Leonard 1960.
- North Aden Pool: L. C. Case 1945.
- North Casey Pool: Mylius 1927.
- North Hill Group: Collinson 1961, Workman 1956.
- North Johnson Pool: Piersol 1940.
- North Tilden gas storage area: A. H. Bell 1961c, 1962b.
- Northeastern Illinois, glaciation: Chamberlin 1878, 1882b.
- Northeastern Illinois, soil characteristics: Wascher 1960.
- Northern Illinois, general stratigraphy: Johan A. Udden 1895.
- Northwestern Illinois
- Physiography: Hershey 1895b, 1896b, 1897e.
- Rock gorges: Hershey 1893a.
- Novaculite: Holbrook 1917a, J. E. Lamar 1953a, Leighton 1949b, Parmelee 1946.
- Research: Ill. GS 1935c, 1936d.
- No. 1 Coal (see Rock Island (No. 1) Coal)
- No. 1A Coal (Pa.): Wanless 1939.
- No. 2 Coal (see Colchester (No. 2) Coal)
- No. 2A Coal (see also Shawneetown Coal): J. A. Harrison 1951.
- No. 3 Coal (Pa.): Wallace Lee 1917, Worthen 1866a(2), 1870.
- No. 4 Coal (see Sumnum (No. 4) Coal)
- No. 5 Coal (see Springfield (No. 5) and Harrisburg (No. 5) Coals)
- No. 5A Coal (Pa.) (see also Briar Hill Coal): Kosanke 1950, Wanless 1939, 1955b.
- No. 6 Coal (see Herrin (No. 6) Coal)
- No. 7 Coal (see Danville (No. 7) Coal)
- No. 8 Coal (see Chapel (No. 8) Coal)
- No. 9 Coal (Pa.): G. H. Cady 1916, 1919a, Worthen 1866a(2).
- Nutwood Anticline: Collinson 1954, 1957.

- Nutwood Shale Member (Miss.): Collinson 1961, Workman 1956.
 Isopach map: Workman 1956.
 Nutwood-Fieldon Anticline: Collingwood 1933, Rubey 1952.

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- Oak Grove Limestone Member, Beds, Marine Horizon (Pa.): S. E. Ekblaw 1931, Kosanke 1960, Reinertsen 1964, Wanless 1931b, 1939, 1955a, 1955b, 1957a, J. M. Weller 1942c, Willman 1942b.
 Fauna: Wanless 1958.
 Oakdale Syncline: Willman 1942b.
 Oakland Anticlinal Belt: A. H. Bell 1938f, 1943c, Clegg 1959, 1965a, 1965b, Mylius 1920a, 1927, Wanless 1955b.
 Oakland Dome: Mylius 1923.
 Oakland Fault: Lockett 1947.
 Oakland-Newman Dome: Mylius 1923, 1927.
 Oakley Pool: Whiting 1956.
 Ochre and sienna: J. E. Lamar 1948, Hewitt Wilson 1933.
 Odell Anticline: Willman 1942b.
 Odin Pool: Leon Krause 1952.
 O'Fallon Dome: A. H. Bell 1941b.

Ogle County

- Bedrock topography: Caldwell 1963, Horberg 1950a, McGinnis 1963b.
 Building stone: Conover 1884.
 Clay and shale: J. E. Lamar 1934.
 Chemical analyses: W. A. White 1959a.
 Copper and gold: Knappen 1926.
 Drill records: Caldwell 1963, Ross Hanson 1950, 1961.
 Feldspar: Willman 1942a.
 Geologic sections (described outcrops)
 Byron North (Ord.): Templeton 1963.
 Cement Plant Quarry (Ord.): Knappen 1926.
 Daysville Northeast (Ord.): Templeton 1963.
 Elk Horn Creek (Ord.): Hershey 1894.
 Forreston (Pleis.): Shaffer 1956.
 Harmony Hill School (Ord.): Templeton 1952, 1963.
 Hazelhurst (Pleis.): Shaffer 1956.
 Mud Creek Fault (Ord.): Templeton 1952.
 Oak Ridge School (Ord.): Templeton 1963.
 Oregon (Ord.): Bleininger 1912, Templeton 1952.
 Oregon East (Camb., Ord.): Bevan 1926.
 Pine Creek (Ord.): Bleininger 1912.
 Prairie Star School (Camb.): Templeton 1952.
 Stratford (Pleis.): Shaffer 1956.
 Victory School (Ord.): Templeton 1952.
 Walgreen (Ord.): Templeton 1963.
 Geophysical studies: Beck 1965, McGinnis 1961a, 1963b.
 Ground water
 General: Bretz 1923, Caldwell 1963, Hackett 1956a, Horberg 1950a, Knappen 1926, Leverett 1899a, Thwaites 1927.

Ogle County—cont.

- Ground water—cont.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.
 Artesian waters: Knappen 1926.
 Limestone and dolomite
 General: Knappen 1926, Krey 1925, J. E. Lamar 1934, Willman 1943b.
 Cement materials: Bleininger 1912, Knappen 1926.
 Mineralogy: Grim 1937a.
 Loess: Frye 1962e, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a, Templeton 1952.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Bretz 1923, G. H. Cady 1920b, Caldwell 1963, Hershey 1894, Horberg 1953, Knappen 1926, McGinnis 1963b, Willman 1951.
 Mineral industries: Ill. GS 1961.
 Structure: Beck 1965, Horberg 1950a, Knappen 1926, J. E. Lamar 1928b, McGinnis 1963b, Templeton 1952, Thwaites 1927, Willman 1951.
 Mastodon: N. C. Anderson 1905, Bagg 1909.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Peat: Knappen 1926.
 Physiography: Bretz 1923, Leighton 1948b, Deette Rolfe 1929, Salisbury 1918.
 Potash: Knappen 1926.
 Quadrangle studies
 Dixon: Knappen 1926.
 Kings: Bretz 1923.
 Rochelle area guide leaflet: Ill. GS 1964-C.
 Sand and gravel: Knappen 1926.
 Mineralogy: Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b.
 Silica sand: Knappen 1926, J. E. Lamar 1928b.
 Sandstone: J. E. Lamar 1928b.
 Soil report 38
 Springs: Peale 1886.
 Stratigraphy
 General: Bevan 1925a, Bleininger 1912, Everett 1861, McGinnis 1963b, Deette Rolfe 1929.
 Precambrian: A. H. Bell 1964.
 Cambrian: A. H. Bell 1964, Bevan 1935, 1939, G. H. Cady 1920b, Templeton 1950, 1952, Willman 1951.
 Ordovician: Bevan 1926, Bretz 1923, G. H. Cady 1920b, Hershey 1894, J. E. Lamar 1928b, H. W. Scott 1932, Templeton 1952, 1963, Willman 1943b, 1951.
 Pleistocene: W. C. Alden 1909, Bretz 1923, Chamberlin 1885, R. F. Flint 1931, Frye 1965a, 1965c, Horberg 1953, Kemp-ton 1963, Leighton 1923a, 1961, Salisbury 1918, Shaffer 1954b, 1956, Templeton 1952, Willman 1963.
 Structure: G. H. Cady 1920b, Hershey 1894, Thwaites 1927, Willman 1951.
 Worthen Survey report (v. 5): James Shaw 1873.
 Oglesby Fault: D. A. Green 1957.
 Oglesby Member (Ord.): Templeton 1952, 1963.
 Oglesby Syncline: Willman 1942b.
 Ohara Limestone, Pay Zone (Miss.): Bain 1905a, Stuart Weller 1906b, 1907a.

Ohio River

Diversion: Finch 1964, Fowke 1925, 1933, Frye 1965c, Leighton 1949a, Pryor 1962a, L. L. Ray 1963a, Ross 1964b, J. M. Weller 1940a.

Mineralogy of sands: Willman 1942a.

Ohio River Valley

Alluvial fill: Finch 1964, Fisk 1944, E. W. Shaw 1915, E. H. Walker 1957.

Ohio River watershed: Pickels 1929.

Ohio Shale (Dev.) (see New Albany Sh.): Bain 1905a, Bleininger 1912.

Ohlman Dome, Anticline: R. S. Blatchley 1914a, F. H. Kay 1915a, Moulton 1925d, J. N. Payne 1944.

Oil and gas

(See also under county; pay-zones, pools, producing sands, and structures are indexed under their names; pools and structures also under county)

General: Bain 1908a, 1909b, A. H. Bell 1941d, 1943c, 1956c, R. S. Blatchley 1910a, 1912a, W. S. Blatchley 1906, Cohee 1940b, Collingwood 1921, Hake 1942, 1943, Heroy 1944, Ill. State Div. Indus. Planning and Dev. 1959, F. H. Kay 1917a, L. K. Lee 1939b, Mylius 1927, Rees 1943a, Risser 1961, Swann 1958, USGS 1934, Ver Wiebe 1949, 1952, R. R. Vincent 1955, J. M. Weller 1940b, H. A. Wheeler 1914.

Accumulation: Collingwood 1923c, Hance 1925.

Earth movements: Croneis 1930.

Facies control: Dickey 1955, Swann 1958.

Relation to clay minerals: Smoot 1960b.

Air views of oil installations: Squires 1948a.

Bacteria in oil field water: E. S. Bastin 1930.

Biehl Sand: Moulton 1927b.

Brine disposal: A. H. Bell 1957a, 1960c, T. A. Morgan 1949.

Carbon ratio theory: A. H. Bell 1936b, 1941e.

Carper Sand production: Oil and Gas J 1964, D. L. Stevenson 1964.

Clay mineralogy: Grim 1947c, 1950b, Parham 1963d, Smoot 1960b.

Core analyses: J. E. Lamar 1928f, Squires 1946.

Corrosion problems: Albright 1938.

Crawford Co. oil field farm map: Ill. GS 1929.

Crude oil

Chemical analyses: Armon 1960, W. S. Blatchley 1906, Mylius 1927, Rees 1939a, 1943a, H. M. Smith 1940.

Colloidal characteristics: B. R. Ray 1957.

Copper, nickel, vanadium: Nagashima 1957, Witherspoon 1957c.

Dehydration: Piersol 1934.

Demulsifying: Piersol 1933c.

In geodes: Spitznas 1949.

Old and new fields compared: Rees 1939a.

Physical properties: Armon 1964, Bain 1908h, Meents 1960.

Quality and properties: Egloff 1938, 1939, Grout 1906.

Temperature: W. L. Nelson 1946.

Trace elements: Nagashima 1957, Witherspoon 1957c, 1958.

Ultracentrifuge studies: Witherspoon 1958.

Viscosity: W. L. Nelson 1946.

Oil and gas—cont.

Developments: A. H. Bell 1930, 1931d, 1931e, 1932c, 1934b, 1935b, 1936a, 1937a, 1937b, 1937d, 1937e, 1938b, 1938d, 1938f, 1939d, 1939f, 1940a, 1940c, 1941a, 1941c, 1942a, 1942b, 1943a, 1943b, 1944a, 1944b, 1945a, 1945b, 1946a, 1946b, 1947a, 1947c, 1948a, 1948b, 1949a, 1949b, 1950a, 1950b, 1951a, 1952a, 1952b, 1953a, 1953b, 1954a, 1954b, 1954c, 1955a, 1955c, 1956a, 1956b, 1957b, 1957c, 1958a, 1958b, 1959a, 1959b, 1959c, 1960a, 1960d, 1961a, 1961b, 1962a, 1962c, 1963a, 1963b, R. S. Blatchley 1912b, 1912c, 1913a, G. L. Carpenter 1965, C. R. Clark 1927, Collingwood 1923b, Hance 1921a, 1924, F. H. Kay 1917b, Knappen 1928, McIlvain 1938, Moulton 1925c, 1926c, 1926g, 1926h, 1927c, 1927d, 1929b, 1929c, 1938, Newcombe 1931, Spoor 1926, Van Den Berg 1963, 1964, Theron Wasson 1933, H. A. Wheeler 1909, 1912, L. L. Whiting 1964, 1965a.

Summary of activities: Oil Scouts Association 1938-1965.

Development maps (see also under counties): Ill. GS 1965.

Devonian lime production: Bignell 1938a.

Drill records (see under counties)

Drilling: R. S. Blatchley 1909, DeLaat 1940, McIlvain 1937, 1938, Mylius 1940, Simons 1938a.

Acid treatment: A. H. Bell 1934d, Squires 1936, 1944b.

Casing setting: Squires 1942b.

Core bits (cable tools): Moulton 1926d.

Deep drilling: Neil Williams 1946.

Hydraulic fracturing: A. H. Bell 1955b, Cleary 1958a, 1958b, 1959, Parkison 1957.

Rotary drilling: DeLaat 1944, Mylius 1944.

Sand coring: A. H. Bell 1931c.

Through coal mine: Howell 1948.

Drilling and production: Whiting 1957.

Drilling mud: J. E. Lamar 1931c, Englehardt 1953.

Drilling reports: Ill. GS 1936-1965.

Drilling statistics: (1917-1965) Ill. Dept. Mines and Minerals B.

DuQuoin area: Jon A. Udden 1909.

Eastern Interior Basin: Swann 1955, Wanless 1955b.

Economics (see also Mineral economics): Barrett 1919, A. H. Bell 1938c, 1939a, Ellsworth 1940, F. H. Kay 1917c, Leighton 1949b, Oil Scouts Assn. 1938-1965, Pogue 1939, Risser 1960, Voskuil 1936b, 1937b, 1938b, 1939c, 1944a, 1944f, 1963.

After the war: Voskuil 1944e.

Competition: Voskuil 1934b.

Conservation: DeWolf 1912a, Peterson 1943, Poe 1945.

Decline and ultimate production of wells: Beal 1919.

Energy market: Risser 1960, Voskuil 1938c.

Industry: Voskuil 1963.

Industry map: A. H. Bell 1937c, 1945c, 1949c, 1955d, Meents 1961.

International relations: Voskuil 1941d, 1944a.

New fields in Southern Illinois: Carroll 1941.

Oil and gas—cont.

Economics—cont.

- Post-war issues: Voskuil 1945c.
- Revival of industry: Leighton 1937d.
- Social implications: Ellsworth 1940.
- Trend in fuel uses: Voskuil 1957b.
- Unitizing royalty interests: Squires 1944e.
- Valuation of oil properties: Beal 1919.
- What's ahead: Leighton 1933g.
- World War II: Voskuil 1942e.

- Engineering: Squires 1943c, 1944b.
- Automobile engine, use of: Squires 1943a.
- Fibre pipe for steel casing: Squires 1942a.
- Oil field tools: Squires 1947a.
- Rustless coupling: Squires 1947b.
- Rustless pipe: Squires 1945b.
- Safety cylinder in air-gas compression: Squires 1943c.

- Exploration (see also Possibilities): A. H. Bell 1938f, Cohee 1938a, Comstock 1889a, Theron Wasson 1937, J. M. Weller 1936b, 1937b, H. A. Wheeler 1911a, 1918.

Deepest Illinois test: Anon. 1960a.

Geodynamic prospecting: Pirson 1943.

Geologists' work: Leighton 1926c.

Oil prophets with honor: Leighton 1938a.

Petroleum geology: A. H. Bell 1931e.

Western Illinois: A. H. Bell 1928b.

- Exploratory drilling: Blanpied 1958, Carsey 1961, 1962, 1963, Dillon 1965, Lahee 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, Moody 1957, Newfarmer 1964.

- Fluid flow: Rose 1957a, 1957b, 1957c, 1958a, 1958c, 1960, Street 1959a, 1959b, 1961.

- Gas (natural gas): Ashburner 1886, A. H. Bell 1935a, R. S. Blatchley 1913a, Comstock 1889b, Mylius 1919, 1927, Rich 1916a, Worthen 1890(2).

Analyses: A. H. Bell 1935a, W. S. Blatchley 1906, G. H. Cox 1914, Meents 1958b, 1959, 1965a, Savage 1906.

Chemistry: Fieldner 1951.

Discoveries: Blanpied 1959.

In coal: A. H. Bell 1935a.

In coal mines: Jeffery 1894.

In drift: Bain 1908a, 1908h, I. O. Baker 1885, G. H. Cady 1919b, H. C. Freeman 1868, Hinds 1919, Knirk 1910, Meents 1958b, 1960, Nebel 1919, Savage 1916b, 1921a, 1921b, 1921c, Wasserburg 1963, Workman 1943, Worthen 1890(2).

In "oil rock": Bain 1907b.

In shales: A. H. Bell 1935a.

Production: Colby 1952, Peterson 1942a, J. D. Weeks 1892a.

Regulations: Peterson 1945a.

Resources: D. T. Day 1909a.

Statistics: USBM 1924-1965, USGS 1882-1923.

Underground gas storage: A. H. Bell 1961c, 1962b, Buschbach 1965, Hallden 1961, Peterson 1956, Schwalm 1961, Witherspoon 1962.

Gasification, underground coal: Squires 1952.

Habitat of oil: Swann 1958.

Heavy crude oil reservoirs: Dietzman 1965.

History of production: Barrett 1922a, A. H. Bell 1955g.

Horizons in northeastern Illinois: Grant 1922.

Humble granite wildcat: Anon. 1960a.

Oil and gas—cont.

Hydrogenation of coal: LeClaire 1941.

Illinois Basin fields: L. K. Lee 1939a.

Illinois Basin opening: A. H. Bell 1941d.

Illinois security law: DeWolf 1920d.

Interstate Oil Compact Commission, State reports on drilling, production, and secondary recovery: Interstate Oil Compact Commission 1947-1965.

Lawrence and Crawford Co. oil field farm map: Ill. GS 1934b.

Legal concepts: Summers 1938.

Limestone oil reservoirs: A. N. Murray 1930.

Maps, oil and gas field: Ill. GS 1921.

Occurrence, types in Pennsylvanian: Swann 1955.

Oil rock: G. H. Cox 1914, Templeton 1963, Willman 1946.

Oil shale: Armon 1960, Ashley 1917, Barrett 1922b, J. E. Lamar 1956a, 1965, Parr 1921, Rubey 1952, Reinhardt Thiessen 1921, Winchester 1919.

Origin: A. H. Bell 1934c, R. S. Blatchley 1910a, 1913a, W. S. Blatchley 1906, Collingwood 1923c, Siever 1951a, Swann 1951b, Witherspoon 1958.

Palynology, use of: Kosanke 1964.

Pay zones: Simons 1940.

Pennsylvanian production: Swann 1955.

Petroleum statistics: 1882-1923 USGS, 1924-1965 USBM, 1917-1965 Ill. Dept. Mines and Minerals B.

Pools (Pools described are listed under county and under pool names; see also Oil and gas development maps)

Pools and pipelines map: Anon. 1939a.

Pools, shallow: USBM 1965.

Possibilities (see also Exploration): Bays 1945a, A. H. Bell 1931e, 1932e, 1937a, 1937e, 1938a, 1938e, 1939c, 1941b, 1951b, W. A. Bell 1936, Bignell 1938b, R. S. Blatchley 1910a, 1914a, W. S. Blatchley 1906, Brokaw 1916, Brubeck 1953, Carter 1943, Collingwood 1923a, 1924b, 1933, Easley 1937, Easton 1942, 1944b, Craig Ferris 1964, Garland 1965, Gutstadt 1958a, Hager 1938, W. V. Howard 1936, 1939, Krey 1924, Leighton 1944f, Levorsen 1943, Lowenstam 1949b, Morse 1915, Moulton 1925a, 1925b, 1925d, 1926e, Mylius 1921c, 1923, 1927, Newton 1941, J. N. Payne 1940, 1944, Rich 1916a, Root 1928, St. Clair 1917d, T. P. Sanders 1936, Sargent 1964, Savage 1916b, 1921c, Swann 1951a, 1951b, 1955, Wanless 1957a, J. M. Weller 1936b, 1936c, 1940a, H. A. Wheeler 1910, Whitling 1965b, Willman 1942b, Workman 1940.

Classification maps: A. H. Bell 1955f, Swann 1951b.

Deep possibilities: A. H. Bell 1938e, 1939f, 1949d, 1964, Folk 1944, Swann 1951b.

Production of oil (see also Petroleum statistics): Anon. 1956a, Bain 1907a, 1908b, 1908d, 1908f, 1909a, A. H. Bell 1955g, R. S. Blatchley 1910b, 1911, 1912d, 1913b, 1914b, 1915, Boling 1957, Collingwood 1923c, Eich 1931, Ill. State Div. Indus. Planning and Dev. 1959, Oliphant 1905, Weeks 1892b.

Early production: Bain 1908h.

Oil and gas—cont.

Production of oil—cont.

Rate: A. H. Bell 1939a, Cutler 1924.
Regulation: William Bell 1938, T. A. Morgan 1949.

Trends: A. H. Bell 1938c, W. V. Howard 1939.

Practices: Duke 1944, Simons 1938b, 1939.

Problems: Damp 1938, 1939.

Productive formations: Hake 1942.

Reefs (see Silurian reefs)

Research: R. S. Blatchley 1912c, Ill. GS 1936c, Kerr 1934, Leighton 1934c.

Resources, reserves: D. T. Day 1909b, Leighton 1944d.

Estimations: A. H. Bell 1931b, Cutler 1924.

Measuring by injected gas: Squires 1949c.

Sands: Mylius 1927.

Porosity, saturation, permeability: Piersol 1940.

Secondary recovery (see also Waterflooding):

Anon. 1959, A. H. Bell 1942c, 1947b, 1956b, Davison 1960, Dietzman 1965, Flood 1936, Phillippi 1955, Squires 1947c, Torrey 1950a, 1950b, Walter 1957.

Air repressuring: Flood 1938.

Clay mineralogy: Smoot 1959.

Gas injection: Calhoun 1957, C. H. Riggs 1945a, C. T. Smith 1946.

Gas and water injection: Squires 1944c, 1947c.

Heat application: Walter 1957.

Repressuring: A. H. Bell 1932d, 1936c, 1942c, Peterson 1945b, Squires 1943d, 1945a, F. B. Taylor 1939.

Residual oil: Rose 1957c.

Silurian reefs (see also Silurian System, Niagaran reefs): R. H. Howard 1963a, Lowenstam 1946, 1948b, 1949b.

Relation to Ordovician structure: Smoot 1958.

Southeastern fields: Bain 1906a, 1907a, 1908d.

Stratigraphic traps: Morrissy 1957.

Stripper wells: Peterson 1942b, Voskuil 1934c.

Structure (see also under county and named structure): A. H. Bell 1943c, R. S. Blatchley 1912f, Collingwood 1923c, Moulton 1926b, Swann 1951a, 1958.

Diorama: Squires 1944d.

Faulted structures: H. A. Wheeler 1921.

Tectonic classification: Ver Wiebe 1929.

Synthetic liquid fuels: F. H. Reed 1948a.

"Trenton" production: Cohee 1941a, 1941b.

Underground conditions: W. A. Bell 1936.

Underground storage of liquid petroleum: A. H. Bell 1956d.

Water (oil field): E. S. Bastin 1926b, L. C. Case 1945.

Connate water resistivity: Wyllie 1949.

Saltwater disposal: Gibbon 1945.

Water drive: Baucum 1946.

Water control: Tough 1919.

Waterflooding: Barger 1950, A. H. Bell 1932a, 1932b, 1934a, 1936c, 1942c, Bernard 1957, Bossler 1957, Botset 1957, Calhoun 1957, Cameron 1951, Cassin 1951, Holbert 1957, Kornfeld 1952, Leon Krause 1952, Parizek 1958, Parkinson 1957, L. C. Powell 1954, Pryor 1957, C. H. Riggs 1945b, Rose 1956, 1957c, 1958a, Simmons 1957, Squires

Oil and gas—cont.

Water flooding—cont.

1935, 1938a, 1938b, 1943b, 1943d, 1943e, 1944a, 1946, 1947a, 1949b, 1950a, 1950b, 1950c, 1950d, 1951, 1956, Taliaferro 1947, Torrey 1937, Vincent 1957, Watkins 1957, Witherspoon 1952, 1955a, 1955b, 1957a, 1957b.

Accidental water floods: Squires 1934, 1943d.

Brines for: Parizek 1958.

Effect of curtailment: Rose 1958b.

Exploration by gas injection: Squires 1948b.

Fluid injection research: Squires 1949b.

Fluid-fluid interfacial boundary condition: Rose 1960.

Injection profiling: Holbert 1957.

Input wells: Bossler 1957.

Microscopic flooding behavior: Rose 1958a.

Network models: Rose 1957d.

Sand consolidation effects: Rose 1957b.

Operations: A. H. Bell 1957c, 1958b, 1959b, 1959c, 1960d, Lawry 1964, 1965, Love 1955, Sherman 1961, 1962, 1963, Squires 1946, Witherspoon 1953a, 1953b, 1954.

Performance: Rose 1956.

Plugging input wells: Botset 1957.

Reactions interstitial and injected waters: Bernard 1957.

Treating injection waters: Watkins 1957.

Water re-used: Squires 1949a.

Wells

Areal type classification: E. F. Taylor 1942.

Completion practice: Bays 1944a, Vincent 1957.

Spacing: A. H. Bell 1947d, Phillippi 1955.

Wildcat drilling: Carter 1943, Lahee 1939, 1940, 1941, 1942, 1943.

Oil field water (see Brines)

Oil shale (see under Oil and gas)

Analyses: Armon 1960.

Uranium content: Ostrom 1955, V. E. Swann 1960.

Okaw Group, Limestone (Miss.): J. C. Bradbury 1963, Leighton 1939, E. W. Shaw 1921, 1923, A. H. Sutton 1934b, Swann 1963, E. O. Ulrich 1917, J. M. Weller 1940b, Stuart Weller 1913, 1914, 1939b.

Distribution map: A. H. Sutton 1934b.

Okawville Quadrangle: E. W. Shaw 1921.

Old Ripley Anticline: A. H. Bell 1941b.

Olmstead: Grim 1933.

Olney Pool: Piersol 1940.

Omaha Dome: A. H. Bell 1939c, Heyl 1965, Pullen 1951, Swann 1951b.

Omaha Dome Intrusive: J. C. Bradbury 1962b.

Omaha Fault: G. H. Cady 1939e.

Omaha Pool: A. H. Bell 1959c, English 1948.

Omega Anticline: J. M. Weller 1936c.

Omega Limestone Member (Pa.): J. C. Bradbury 1965b, C. L. Cooper 1946, Grogan 1940, Kosanke 1960, J. E. Lamar 1934, Lowenstam 1951, Ostrom 1957c, Siever 1957a, Wanless 1955b, J. M. Weller 1936c, 1942c.

Structure map: J. M. Weller 1936c.

- O'Nan Coal Member (Pa.) (see Curlew Coal):
Kosanke 1960.
- Onarga Ridge: Leverett 1899a.
- Oneota Dolomite (Ord.): C. B. Anderson 1919,
Bain 1905b, A. H. Bell 1964, Buschbach
1964, 1965, G. H. Cady 1919b, Grabau
1937, Knappen 1926, Ostrom 1957b, E. H.
Powers 1935b, Templeton 1952, Wanless
1957a, Willman 1942b, 1943a, 1951, Work-
man 1926, 1948.
- Isopach map: Willman 1942b, Workman 1948.
- Onondagan Group, Limestone (Dev.): Bleininger
1912, Savage 1908, 1925a, Worthen 1862,
1868(2).
- Oolite: J. E. Lamar 1925c, Pettijohn 1964, Shrode
1947.
- Cerebroid: Carozzi 1963.
- Grain size analyses: Shrode 1949.
- Petrology: Graf 1950b.
- Opdyke Coal Member (Pa.): G. H. Cady 1952b,
Kosanke 1960.
- Optical fluorite: Pogue 1918.
- Orange Sands: Chamberlin 1891b, Salisbury 1891a,
1892.
- Orange Township Pool: Mylius 1927.
- Orchard Creek Shale (Ord.): J. R. Ball 1939,
1941, Gutstadt 1958b, J. E. Lamar 1948,
1959, Pryor 1962a, Savage 1909b, 1910a,
1917b, 1926, Templeton 1963, J. M. Weller
1939e, 1940a, 1940c.
- Facies map: Gutstadt 1958b.
- Fauna: Savage 1910a, E. O. Ulrich 1926.
- Isopach map: Gutstadt 1958b.

Ordovician System

Accepted nomenclature (see named units)

Cincinnatian Series

Richmondian Stage

Maquoketa Group (General)

Neda Oolite

Brainard Sh.

Fort Atkinson Ls.

Scales Sh.

Clermont Sh. M.

Maysvillian Stage

Elgin Sh. M.

Edenian Stage

Elgin Sh. M.

Cape Ls.

Maquoketa Group (Southwest)

Edenian Stage

Scales Sh.

Orchard Creek Sh. M.

Thebes Ss. M.

Ottawa Megagroup

Cape Ls.

Champlainian Series

Trentonian Stage

Galena Group

Dubuque Fm.

Kimmswick Subgroup

Wise Lake Fm.

Stewartville M.

Sinsinawa M.

Dunleith Fm. (North)

Wyota M.

Wall M.

Sherwood M.

Rivoli M.

Mortimer M.

Fairplay M.

Ordovician System—cont.

Champlainian Series—cont.

Galena Group—cont.

Dunleith Formation (North)—cont.

Eagle Point M.

Beecher M.

St. James M.

Buckhorn M.

Dunleith Fm. (South)

New London M.

Moredock M.

Eagle Point M.

Beecher M.

St. James M.

Buckhorn M.

Decorah Subgroup

Guttenberg Fm.

Glenhaven M.

Garnaville M.

Kings Lake Fm.

Tyson M.

Mincke M.

Spechts Ferry Fm.

Glencoe M.

Castlewood M.

Blackriveran Stage

Platteville Group

Plattin Subgroup

Quimbys Mill Fm.

Strawbridge M.

Shullsburg M.

Hazel Green M.

Nachusa Fm.

Everett M.

Elm M.

Eldena M.

Grand Detour Fm.

Forreston M.

Victory M.

Hely M.

Clement M.

Stillman M.

Walgreen M.

Dement M.

Mifflin Fm.

Briton M.

Hazelwood M.

Establishment M.

Brickeys M.

Blomeyer M.

Base of Plattin

Pecatonia Fm.

Oglesby M.

Medusa M.

New Glarus M.

Dane M.

Chana M.

Hennepin M.

Base of Ottawa (North)

Ancell Group (North)

Glenwood Fm.

Harmony Hill Sh. M.

Nokomis Ss. M. (Far North)

Loughridge Ss. M.

Daysville Dol. M.

Kingdom Ss. M.

St. Peter Ss.

Starved Rock M.

Tonti M.

Kress M.

Ordovician System—cont.

- Champlainian Series—cont.
 Anzell Group (South)
 Joachim Dol.
 Metz M.
 Matson M.
 Defiance M.
 Boles M.
 Augusta M.
 Abernathy M.
 Dutchtown Ls.
 Sharpsboro M.
 Gordonville M.
 Base of Ottawa (South)
 St. Peter Ss.
 Starved Rock M.
 Tonti M.
 Kress M.
Chazyan Stage
 Knox Megagroup
 Everton Group
Canadian Series
 Prairie du Chien Group
 Shakopee Dol.
 New Richmond Ss.
 Oneota Dol.
 Blodgett M.
 Arsenal M.
 Gunter Ss.
 General: State geol. map, Buschbach 1964, Cohee 1948a, Grabau 1937, Gutstadt 1958b, G. M. Kay 1935b, Knappen 1926, Krey 1924, Owen 1846, Ross 1963, Sardeson 1896, 1897a, Savage 1910a, Schuchert 1943, James Shaw 1873, Sloss 1960, Templeton 1952, 1963, Thurston 1923, Thwaites 1927, J. M. Weller 1940a, Stuart Weller 1906b, 1907a, Willman 1951, N. H. Winchell 1896, Workman 1935b, 1950b, Worthen 1866a(4).
 Facies map: Cohee 1948a, Gutstadt 1958b.
 Fauna: Bannister 1870, J. H. Bradley 1925, 1930, Culver 1922a, Gutschick 1954a, 1954b, Rubey 1952, Savage 1909b, 1910a, 1924b, 1925b, Templeton 1963, Trowbridge 1916, E. O. Ulrich 1890b, Willman 1942b, Worthen 1866b(2).
 Isopach map: Cohee 1948a, Gutstadt 1958b, Sloss 1960.
 Lithofacies map: Sloss 1960.
 Ordovician hill exhumed: D. J. Fisher 1938.
 Paleogeographic map: Grabau 1909, 1937, Schuchert 1923.
 Regional correlations: Templeton 1963, Trowbridge 1935a.
 Structure map: Gutstadt 1958b, Meents 1954.
 Ore bodies, effect on radio waves: Pullen 1953.
 Oregon Anticline, Dome: Bevan 1939, Templeton 1952, Willman 1951, Workman 1935b.
 Oregon Quadrangle: Bevan 1925a, 1935.
 Organic chemistry: Fieldner 1951, J. A. Miller 1957, Yohe 1940.
 Acetylamino-toluene: Yohe 1940.
 Benzoic acid 2-methoxy: Yohe 1950b.
 Oxidation of 2,6-di-*tert*-butyl-4-methylphenol: Yohe 1956, 1959.
 Succinamic acid: Yohe 1961b.
 Tetrazole derivatives: Maher 1958.
 Oriskany Group, Sandstone (Dev.): Bleininger 1912, Savage 1908, 1920, 1925c, J. M. Weller 1944a, Worthen 1866a(4), 1868(2).
 Fauna: Meek 1868a.

- Orrs Landing Dike: Bain 1905a, J. W. Baxter 1965a, J. C. Bradbury 1962b, Stuart Weller 1920b.
 Osage Group, Limestone (Miss.): Butts 1925, Bowman 1907, Fenneman 1910, 1911, Folk 1946, Keyes 1892b, Kissling 1961, Laudor 1948, R. C. Moore 1935, Rubey 1952, J. M. Weller 1939f, 1940b, 1952, Stuart Weller 1906b, 1907a, 1914, 1920b, Workman 1950b.
 Structure map: Collingwood 1933, Keyes 1892b, Rubey 1952.
 Oshawanian Series (Miss.): Keyes 1931b.
 Oswego Syncline: Willman 1942b.
 Ottawa Anticline: Willman 1942b.
 Ottawa Horst: D. A. Green 1957.
 Ottawa Megagroup (Ord.): A. H. Bell 1964, Buschbach 1964, Calvert 1963, Swann 1961.
 Isopach map: A. H. Bell 1964.
 Structure map: A. H. Bell 1964.
 Ottawa Quadrangle: Willman 1942b.
 Mineral economics: Voskuil 1942d.
 Ottawa silica sand (see Sand and gravel, Silica sand)
 Ottawa standard testing sand: J. E. Lamar 1928b.
 Ottawa Terrace: Willman 1942b.
 Otter Creek Syncline: Collinson 1954, 1957, Rubey 1952.
 Owen Survey: Owen 1840, 1844.
 Owen's classification of Upper Mississippi Valley rocks: Trowbridge 1935a.
 Owl Creek Discontinuity: H. E. Wheeler 1963.
 Owl Creek Formation (Cre.): Cushing 1964, Pryor 1960, 1962a, Ross 1963, L. W. Stephenson 1955.
 Oxygen isotope studies: Epstein 1963.
 Ozark Dome, Uplift: A. H. Bell 1964, Broadhead 1889, R. F. Flint 1941, Ruedemann 1910, Stearns 1962, J. M. Weller 1930a, 1957, C. W. Wilson 1939, Workman 1956.
 Ozark Peneplain: Horberg 1950a, Leighton 1948b, P. E. Potter 1955c.
 Ozark Plateaus Province: Bain 1905a, Leighton 1948b, E. W. Shaw 1912b.
 Ozark Shoal: Lowenstam 1949b, Swann 1963.

P

- Pachyderms: LeConte 1854a.
 Paducah Graben: Heyl 1965, Ross 1963, 1964b.
 Paducah Quadrangle: Heyl 1965, Ross 1964b, J. M. Weller 1940b.
 Paha Ridges, Pahas: Carman 1910, Leverett 1942b.
 Paine Dome: Easton 1944b.
 Paint Creek Group, Limestone, Shale (Miss.): J. C. Bradbury 1963, Butts 1929, C. L. Cooper 1941, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, J. E. Lamar 1925a, 1950a, 1959, E. W. Shaw 1921, 1923, Smoot 1960c, A. H. Sutton 1952, Swann 1948, 1963, Tippie 1942, E. O. Ulrich 1917, J. M. Weller 1939e, 1940a, 1940b, 1940c, 1952, Stuart Weller 1913, 1914, 1920a, 1920b, 1939a, 1939b, Workman 1940.
 Fauna: Easton 1945a, Croneis 1932a, McFarlan 1942, A. H. Sutton 1931, 1939, Zeller 1953.
 Paleogeographic map: Schuchert 1955.
 Palatine Moraine: Zeisel 1962a.

Paleobotany

- Paleobotany (Devonian-Mississippian)
 Black shale: Cross 1951.
- Paleobotany (Mississippian)
 Calcisphaera: J. W. Baxter 1960a.
 Chesterian: Foerste 1923, Lacey 1964, Worthen 1860b.
 Spores: Hoffmeister 1955b, Winslow 1959.
- Paleobotany (Ordovician)
 Cryptozoan: Willman 1951.
- Paleobotany (Pennsylvanian)
 General: H. N. Andrews 1961, C. A. Arnold 1947, G. H. Cady 1945, Crook 1911, Dahlgren 1933, Darrah 1937a, Delevoryas 1958, Fleener 1948, Jongmans 1937a, E. J. Morgan 1959, Noe' 1922a, 1922b, 1925b, 1931c, F. D. Reed 1938, Schopf 1941b, Ward 1887, C. D. White 1910, 1931, Wollin 1964.
 Carboniferous forest: Graham 1934, Noe' 1933.
 Coal correlation: Kosanke 1947, 1950, 1954b, Kremp 1955, Noe' 1930, Peppers 1964, Winslow 1959.
 Coal swamp reconstruction: Dahlgren 1933.
 Field book: Collinson 1960a.
 Floral zones and provinces: C. B. Read 1947.
- Angiosperm: Hoskins 1923, Noe' 1923d.
- Calamites: Hibbert 1965, Kosanke 1955, F. D. Reed 1949.
- Coal balls: H. N. Andrews 1942a, 1942b, 1942c, 1946, C. A. Arnold 1947, Balbach 1962, R. W. Baxter 1948, G. H. Cady 1937b, Delevoryas 1954b, Eggert 1962, W. D. Evans 1961, Feliciano 1924, M. C. Fisher 1939, Fry 1954, Roy Graham 1934, 1935, J. W. Hall 1954, Hoskins 1923, 1928b, 1930, 1934, Krick 1932, Lenz 1942, Mamay 1953, 1962, Moon 1939, Noe' 1923a, 1923b, 1923c, 1923d, 1925a, 1926, 1931a, 1931b, 1932, 1934a, 1934b, 1934c, 1935, 1936a, 1936b, Pannell 1942, F. D. Reed 1926, Schopf 1937a, 1938a, 1938b, 1938c, 1939, 1941a, 1948, 1950, Seward 1923, Stewart 1940, 1951b, Stutzer 1940, T. N. Taylor 1965, Wanless 1957a, G. R. Weiland 1924.
- Coal-ball staining: Kosanke 1945.
- Compression fossils (see also Mazon Creek fossils): Bode 1958, Collinson 1960a, Dahlgren 1933, Darrah 1936, Jongmans 1937b, Lesquereux 1858, 1866b, 1870, Noe' 1925c, 1931b, Schopf 1941b.
- Cordaites: L. M. Cohen 1959, Lesquereux 1878.
- Cycadofilicean roots: Hoskins 1931.
- Fern: H. N. Andrews 1948, Darrah 1938a, 1941, Delevoryas 1954a, Eggert 1959, 1963, Ewart 1961, Jongmans 1937b, Hoskins 1933, Mamay 1957, E. J. Morgan 1954, Phillips 1965.
- Fossil tree in Des Plaines Valley: Schoolcraft 1822.
- Fossil wood: Miner 1936.
- Fructifications: H. N. Andrews 1942d, C. A. Arnold 1958, Balbach 1962, 1965, Delevoryas 1964, Ewart 1961, Kosanke 1955, Krick 1932, Phillips 1965.
- Fungi: H. N. Andrews 1943.
- Gymnosperm seeds: Noe' 1936a.
- Identification key: Noe' 1938.

Paleobotany (Pennsylvanian)—cont.

- Iron sulphide plant pseudomorphs: Schwartz 1927.
- Isoetes roots: Stewart 1947.
- Lepidodendron: Fairchild 1879.
- Lepidophyte: C. A. Arnold 1938.
- Lesquereux's types: Janssen 1940a.
- Lycopods: Balbach 1962, 1965, Darrah 1938b, Felix 1954, Fry 1954, Schopf 1941c.
- Fructification: Abbott 1963, Chaloner 1956, Schopf 1937b.
- Spores: O. J. Henbest 1936.
- Mazon Creek fossils (see also Mazon Creek fossils): H. N. Andrews 1961, C. A. Arnold 1938, 1947, Bode 1958, Collinson 1960a, Condit 1951, Dahlgren 1933, Darrah 1937a, 1937c, Janssen 1939, 1940b, 1945, 1946, Jongmans 1937b, Kosanke 1955, Langford 1958, 1963, Lesquereux 1866b, 1870, Noe' 1922a, 1925c, Peola 1907, Pike 1880, Sellards 1902a, 1902b, G. R. Weiland 1924, C. D. White 1897.
- Microsporangia fructification: Delevoryas 1964.
- Palynology (see also spores): G. H. Cady 1945.
- Plant miniatures: Janssen 1945.
- Plant structures: Hoskins 1926, 1928a.
- Plant structure in coal: McCabe 1932, Schopf 1936a.
- Pteridosperm: Darrah 1937c, Delevoryas 1954b.
- Resins: C. D. White 1914.
- Resin rodlets: Kosanke 1957.
- Roots: H. N. Andrews 1943, N. J. Gillette 1937, Stewart 1947.
- Scale tree: Evers 1951.
- Scouring rushes: H. N. Andrews 1951, C. A. Arnold 1958.
- Seeds: J. W. Hall 1954, Neely 1951, Noe' 1936a, F. D. Reed 1939, Schopf 1937b, Stewart 1951b, T. N. Taylor 1963, 1965.
- Seed ferns: H. N. Andrews 1945, C. A. Arnold 1937, R. W. Baxter 1949, Delevoryas 1954b, 1956, 1964, Eggert 1960, Phillips 1964, Schopf 1939, Steidtmann 1937, 1944, Stewart 1951a, 1954, 1958, T. N. Taylor 1962, 1964, 1965.
- Sigillaria: Delevoryas 1957.
- Sphenopsida: Eggert 1962.
- Spores: H. N. Andrews 1963, Balbach 1962, Bharadwaj 1960, Darrah 1937b, J. W. Dawson 1886, Delevoryas 1964, Fry 1954, Guennel 1963, O. J. Henbest 1934, 1935, Hoffmeister 1955a, Kosanke 1947, 1950, 1952, 1954b, 1955, 1959, 1964, Kremp 1957-1965, L. C. McCabe 1932, Mamay 1957, Mylius 1927, Peppers 1964, F. D. Reed 1936, 1941a, Schopf 1936a, 1936b, 1938d, 1941a, 1944, 1948, Sellards 1902a, Winslow 1959.
- Megaspores: Schopf 1941a, Winslow 1959.
- Spore catalog: Hoffmeister 1961.
- Spores and pollen: Kremp 1955.
- Stems: Delevoryas 1956, E. J. Morgan 1959.
- Leaf stem: E. J. Morgan 1954.
- Stem apex: Delevoryas 1958.
- Stigmatic appendages: Stewart 1947.
- Tree fern: E. J. Morgan 1952, 1959.

Paleobotany (Pleistocene)

General: Culver 1922a, Penhallow 1891, Voss 1933.

Fungi in wood: Tehon 1938.

Lake Chicago flora: F. C. Baker 1912.

Late Pleistocene flora: Galbreath 1947.

Mankato Terrace flora: Kaeiser 1958.

Plant remains in drift: N. H. Winchell 1876.

Pollen: Artist 1936, Darrah 1937b, G. D. Fuller 1939, Griffin 1952, Voss 1934, 1937, 1939.

Illinoian: J. G. Smith 1964.

Interglacial and postglacial: G. D. Fuller 1939.

Postglacial forests: Voss 1934.

Recent bog floras: Waterman 1923.

Spores in till: G. M. Dawson 1885, H. A. Johnson 1884.

Paleocene Series, System (Ter.): C. L. Cooper 1944, Cushing 1964, Pryor 1962a, 1962b, Ross 1963.

Paleoclimate

Cretaceous: Pryor 1960.

Mississippian: Swann 1964.

Pennsylvanian: Noe' 1931b, Wanless 1936, 1950, 1965, J. M. Weller 1957, C. D. White 1931.

Pleistocene: Eveland 1952, Frye 1958b, 1962a, 1963b, Horberg 1955, Leonard 1960.

Tertiary: P. E. Potter 1955c.

Paleocurrents: P. E. Potter 1958a, 1961b, 1963a, 1963b, Swann 1963, 1964.

Paleoecology

Devonian: Collinson 1955b, G. A. Cooper 1957.

Mississippian: P. E. Cloud 1948, J. S. Williams 1957.

Pennsylvanian: R. G. Johnson 1962, Wanless 1958, J. M. Weller 1957.

Pleistocene: A. B. Leonard 1960.

Silurian: Ingels 1963, Lowenstam 1948a, 1948c, 1956, 1957.

Paleogeographic maps (see also stratigraphic units)

General: Schuchert 1923, Willis 1909.

Cambrian: Siever 1956b.

Cretaceous: Marcher 1962.

Silurian: Cumings 1928, Lowenstam 1957.

Paleogeography

General: Schuchert 1923, Siever 1953, 1956b, E. O. Ulrich 1902.

Cretaceous: Pryor 1960.

Ordovician: Berkey 1906.

Pennsylvanian: Wanless 1955b, 1957c, J. M. Weller 1957.

Paleogeologic maps: Levorsen 1933.

Paleozoic and Mesozoic: Eardley 1949.

Pennsylvanian: G. M. Kay 1951, Wanless 1957c.

Pre-Chattanooga: Sloss 1960.

Pre-Devonian: Workman 1944.

Pre-New Albany: Whiting 1956.

Pre-Osage: Workman 1956.

Pre-Pennsylvanian: L. K. Lee 1939b, Levorsen 1931, Ostrom 1961a, P. E. Potter 1956c, 1965, Siever 1951a, Swann 1958, Wanless 1955b.

Sub-Cretaceous: Ross 1963.

Sub-Upper and Middle Devonian: State geol. map.

Sub-Pennsylvanian: State geol. map, J. M. Weller 1945a, Workman 1940.

Paleogeologic maps—cont.

Sub-St. Peter: State geol. map, Buschbach 1964.

Paleontology

(See also Biostratigraphy, Paleobotany, and fauna and flora under stratigraphic units)

General: Collinson 1954, 1956a, Condit 1957a, Crook 1911, Keyes 1894a, 1894b, S. A. Miller 1894a, 1895b, 1896a, 1896d, 1897, K. A. Payne 1937.

Animal trails: Pettijohn 1964.

Coal balls (see Paleobotany)

Color preservation: Keyes 1890.

Fossil collecting: Collinson 1956a, Shaver 1959, Stuart Weller 1926b.

Fucoids: Templeton 1963, Johan A. Udden 1898a.

Guide for beginners: Collinson 1956a.

Gurley collection: Stuart Weller 1900a.

Incertae sedis: Grubbs 1939.

Microfossils in loess and till: H. A. Johnson 1884, R. L. Jones 1963a.

Micropaleontology: J. W. Baxter 1960b, C. L. Cooper 1948, Rhoads 1962.

Silicification: Bassler 1909.

Paleontology (Invertebrate)

General (mostly faunal lists)

Paleozoic: E. O. Ulrich 1890d, Verneuil 1847a, 1847b, Whitney 1866.

Cambrian: Raasch 1951, Templeton 1952, Willman 1951.

Ordovician: Bassler 1950, J. H. Bradley 1925, 1930, Bretz 1923, G. H. Cady 1919b, G. A. Cooper 1956, Culver 1922a, H. C. Freeman 1868, Knappen 1926, Meek 1865a, 1868a, 1870, Mylius 1927, Rubey 1952, Savage 1908, 1909b, 1910a, 1924b, E. W. Shaw 1916, Templeton 1952, 1963, Trowbridge 1916, Worthen 1875a(3).

Silurian: Charles Armstrong 1962, Athy 1928, Bassler 1950, Collinson 1954, D. J. Fisher 1925a, Foerste 1925, J. W. Goldthwait 1909, James Hall 1848, Ingels 1963, Lowenstam 1942, 1946, 1956, 1957, Meek 1865a, 1868a, 1870, Rubey 1952, Savage 1908, 1909b, 1910a, 1912, 1913a, 1913c, 1914b, 1916a, 1917b, 1926, E. W. Shaw 1916, Toomey 1964, E. O. Ulrich 1926, Stuart Weller 1925, Willman 1950, A. N. Winchell 1866, Worthen 1871, 1875a(3).

Devonian: Bassett 1925, Bassler 1950, Collinson 1958d, G. A. Cooper 1938, Eastman 1902d, W. E. Ekblaw 1912, Meek 1865a, 1868a, Mylius 1927, Orr 1964, Rubey 1952, Savage 1908, 1913b, 1920, 1921d, 1925c, Schuchert 1900, Stuart Weller 1897a, 1899, 1920b, 1928, Worthen 1868(2), 1871.

Carboniferous: James Hall 1857b.

Mississippian: Bassler 1950, J. W. Baxter 1960b, Butts, 1917a, 1925, Collinson 1954, 1958b, 1964b, C. L. Cooper 1941, Coryell 1939a, W. W. Davis 1917, Eastman 1902d, Gurley 1884, James Hall 1864, Hinds 1919, J. E. Lamar 1925a, Meek 1861a, 1862, 1865a, 1866a, 1866b, 1868a, 1869a, 1869b, 1870, 1873, R. C. Moore 1929, Newberry 1866, 1870a, Prout 1866, Rexroad 1958b, 1961c, Rubey 1952, St. John 1883, Savage 1921c, Stainbrook 1950,

Paleontology (Invertebrate)—cont.

General—cont.

Mississippian—cont.

Swallow 1868, E. O. Ulrich 1917, Van Tuyl [1925], Wachsmuth 1883, J. M. Weller 1940b, Stuart Weller 1905, 1908, 1909a, 1920a, 1920b, 1926a, 1926b, J. S. Williams 1943, Worthen 1866a(3), 1868(2), 1870, 1875a(3), 1882b, Zeller 1953.

Pennsylvanian (see also Paleobotany): J. R.

Ball 1943, 1952, Bassler 1950, Butts 1925, G. H. Cady 1908, 1916, 1919b, C. L. Cooper 1946, Eastman 1902d, Henry Engelmann 1868, H. C. Freeman 1868, Gurley 1883, Jelliff 1926, R. G. Johnson 1962, J. E. Lamar 1925a, Mamay 1962, Meek 1861a, 1862, 1865a, 1866a, 1866b, 1868a, 1869a, 1870, 1871, 1873, 1874, Moodie 1916, Mylius 1927, Newberry 1866, 1870a, Norwood 1858, K. A. Payne 1937, Rubey 1952, St. John 1883, Savage 1921a, 1921b, 1921c, 1928, Scudder 1868c, E. W. Shaw 1913, 1923, R. P. Stevens 1858a, 1858b, Jon A. Udden 1907, 1908, Johan A. Udden 1912b, Wanless 1929a, 1958, C. A. White 1879, Willman 1942b, G. M. Wilson 1942, Worthen 1866a(2), 1868(2), 1875a(3), 1882a, 1882b, 1882c.

Cretaceous: Anon. 1894a, J. E. Lamar 1930b.

Tertiary: C. L. Cooper 1944.

Pleistocene: F. C. Baker 1912, 1915, 1922a, 1930d, 1936, J. R. Ball 1929a, 1952, Chamberlin 1885, Eveland 1952, D. J. Fisher 1925a, Hay 1920, 1923, Hershey 1897b, Horberg 1956b, A. B. Leonard 1951, 1957a, 1960, Leverett 1899a, MacClintock 1929, Rubey 1952, Savage 1921b, E. W. Shaw 1912b, 1915, 1916, Staplin 1963b, Trowbridge 1916, Wanless 1929a.

Ammonites: A. K. Miller 1951, J. P. Smith 1903.

Anaptychus: Collinson 1958c.

Arachnids: Petrunkevitch 1913, 1955.

Archaeostracans: Worthen 1890(3).

Arthropods: Fritsch 1907, Melander 1903, Packard 1890, Savage 1913b, Scudder 1882b, 1884b, 1886a, 1890c.

Beetles: Wickham 1917.

Blastoids: Butts 1917a, R. O. Fay 1962, 1963, Galloway 1957, Macurda 1962, 1965, Meek 1869c, S. A. Miller 1894a, Shumard 1858, E. O. Ulrich 1917, Wachsmuth 1883, 1890, J. M. Weller 1952, Stuart Weller 1909b, 1920b, Worthen 1875a(3).

Brachiopods: Bretz 1939, K. S. W. Campbell 1959, P. E. Cloud 1948, G. A. Cooper 1938, 1945, 1956, Fenton 1922, Foerste 1909, Girty 1908, 1938, 1939, Gregor 1936, Grinnell 1964, Grubbs 1939, James Hall 1891, McChesney 1860a, 1860b, 1861, 1865, 1868, Meek 1861a, 1862, 1866b, 1868a, 1870, 1873, S. A. Miller 1894a, R. C. Moore 1929, Norwood 1855a, 1855b, 1855c, Savage 1913c, 1916a, 1917b, 1921d, Stehli 1962, R. P. Stevens 1858b, A. H. Sutton 1931, 1938, 1942, Swallow 1868, Trowbridge 1916, E. O. Ulrich 1917, J. M. Weller 1932, 1933, 1952, Stuart Weller 1909b, 1910, 1911, 1914, 1916a, 1920b, C. A. White 1865, A. N. Winchell 1866, Worthen 1875a(3), 1883(2), 1890(3).

Paleontology (Invertebrate)—cont.

Bryozoans: Bretz 1939, Elias 1964, Grubbs 1939, James Hall 1857a, J. F. James 1894, 1895, McFarlan 1942, Meek 1866b, 1868a, Perry 1962, Prout 1858, 1859, 1860, 1866, Savage 1913c, Trowbridge 1916, E. O. Ulrich 1885, 1888a, 1890c, 1890d, 1905, J. M. Weller 1952, Stuart Weller 1909b, 1920b, C. A. White 1879, A. N. Winchell 1866.

Calathium: Toomey 1964.

Cephalopods: Bretz 1939, Collinson 1955a, 1956b, 1958a, 1958c, G. A. Cooper 1938, Flower 1939, 1964, Foerste 1925, 1926, 1928, 1930a, 1930b, Krinsley 1960, McChesney 1860a, 1860b, 1861, 1868, Meek 1861a, 1865a, 1866b, 1868a, 1870, 1873, A. K. Miller 1942, 1951, S. A. Miller 1882a, 1897, R. C. Moore 1929, Savage 1913c, 1921d, Swallow 1868, E. O. Ulrich 1944, Verneuil 1947c, Stuart Weller 1909b, C. A. White 1879, A. N. Winchell 1866, Worthen 1875a(3), 1890(3).

Chitons: Meek 1873.

Chitinozoa: Collinson 1955b, 1958d.

Cirripeds: Meek 1866b.

Cockroaches: Scudder 1895, Sellards 1903, 1904.

Conodonts: R. H. Benson 1958, C. L. Cooper 1947a, 1947b, DuBois 1941, Mehl 1962, Rexroad 1957, 1958b, 1961b, 1965a, 1965b, A. J. Scott 1961a.

Abundance and distribution in Upper Mississippi Valley: Collinson 1959.

Collection and preparation: Collinson 1963, 1964a.

Devonian: Collinson 1962, Orr 1964, A. J. Scott 1961b.

Homeomorphs: Rexroad 1958a.

Intraspecific variability: A. J. Scott 1959.

Mass production techniques: Collinson 1963.

Mississippian: Collinson 1958b, 1962, Rexroad 1961a, 1961c, 1962, 1963.

Pennsylvanian: DuBois 1943, Rhodes 1952,

Conularids: Meek 1873, S. A. Miller 1894a, Roy 1935b, Savage 1917b, Worthen 1890(3).

Coprolites: Johan A. Udden 1898a.

Corals: Bassler 1937, 1950, Bretz 1939, Butts 1917a, Easton 1944a, 1945b, 1951, Grove 1935, Grubbs 1939, James Hall 1883a, 1883b, Heritsch 1933, Lowenstam 1950, McChesney 1860a, 1868, McCutcheon 1961, Meek 1868a, 1873, S. A. Miller 1894a, Savage 1913c, 1921d, C. R. Stauffer 1952, Toomey 1964, J. M. Weller 1952, Stuart Weller 1909a, 1916b, 1920b, A. N. Winchell 1866, Worthen 1875a(3), 1890(3).

Crinoids: Bretz 1939, Butts 1917a, Grubbs 1939, Gutschick 1965, Horowitz 1961, Kirk 1938, 1939, 1940, 1942, 1943, 1944, 1946, McChesney 1860a, 1860b, 1868, Meek 1861b, 1862, 1865b, 1865c, 1865d, 1865g, 1866a, 1866b, 1868a, 1868c, 1869a, 1869b, 1870, 1873, 1874, S. A. Miller 1880a, 1880b, 1881b, 1881c, 1882a, 1894a, 1894c, 1896b, 1897, Owen 1852, Savage 1913c, Slocum 1907, Springer 1925, 1926, A. H. Sutton

Paleontology (Invertebrate)—cont.

Crinoids—cont.

1931, 1934a, 1939, 1940, E. O. Ulrich 1917, Wachsmuth 1878, 1882, 1883, 1890, J. M. Weller 1930b, 1947, 1952, Stuart Weller 1900b, 1902, 1909b, 1916a, 1916b, A. N. Winchell 1866, Worthen 1860a, 1875a(3), 1882b, 1883(2), 1884, 1890(3), Yandell 1851.

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- Peneplains: Horberg 1946, 1950a, Rubey 1952, Trowbridge 1921.
- Pennsylvanian coals (see Coal)

Pennsylvanian System

Accepted nomenclature (see named units)
(North and West)

Missourian Series

McLeansboro Group
Bond Fm.

Little Vermilion Cyc.
Little Vermilion Ls. M.
LaSalle Cyc.
LaSalle Ls. M.

Modesto Fm.

Hall Cyc.
Hall Ls. M.
Hicks Cyc.

Trivoli Cyc.
Cramer Ls. M.
Chapel (No. 8) Coal M.

DesMoinesian Series

Trivoli Ss. M.

Gimlet Cyc.
Exline Ls. M.
Lonsdale Ls. M.
Gimlet Ss. M.

Sparland Cyc.
Farmington Sh. M.

Kewanee Group

Carbondale Fm.
Danville (No. 7) Coal M.
Copperas Creek Ss. M.

Jamestown Cyc.
Pokeberry Ls. M.

Brereton Cyc.
Lawson Sh. M.
Brereton Ls. M.
Herrin (No. 6) Coal M.
Big Creek Sh. M.
Vermilionville Ss. M.

St. David Cyc.
Canton Sh. M.
St. David Ls. M.
Springfield (No. 5) Coal M.

Pennsylvanian System—cont.

(North and West)—cont.

DesMoinesian Series—cont.

Summum Cyc.
Covel Conglomerate M.
Hanover Ls. M.
Summum (No. 4) Coal M.
Kerton Creek Coal M.
Pleasantview Ss. M.

Liverpool Cyc.
Lowell Cyc.
Purington Sh. M.
Oak Grove Ls. M.
Lowell Coal M.
Jake Creek Ss. M.
Tonica Cyc.
Francis Creek Sh. M.
Colchester (No. 2) Coal M.

Spoon Fm.

Cheltenham Clay (and lower clays)
Browning Ss. M.

Abingdon Cyc.
Abingdon Coal M.
Isabel Ss. M.

Greenbush Cyc.
Greenbush Coal M.

Wiley Cyc.
Wiley Coal M.

Seahorne Cyc.
Seahorne Ls. M.

DeLong Cyc.
DeLong Coal M.

Brush Cyc.
Brush Coal M.

Hermon Cyc.
Hermon Coal M.

Seville Cyc.
Seville Ls. M.
Rock Island (No. 1) Coal M.

Atokan Series

McCormick Group
Abbott Fm.

Bernadotte Ss. M.
Pope Creek Cyc.
Pope Creek Coal M.

Tarter Cyc.
Tarter Coal M.

Babylon Cyc.
Manley Coal M.
Babylon Ss.

(Southwest)

Missourian Series

McLeansboro Group
Bond Fm.

Millersville Ls. M.
Witt Cyc.

Coffeen Ls. M.
Witt Coal M.

Flat Creek Cyc.
Flat Creek Coal M.

Bunje Cyc.
Bunje Ls. M.

Sorento Cyc.
Sorento Ls. M.

McWain Ss. M.
Shoal Creek Cyc.
Shoal Creek Ls. M.

Modesto Fm.

New Haven Coal M.
Macoupin Cyc.
Macoupin Ls. M.

Pennsylvanian System—cont.

(Southwest)—cont.

Missourian Series—cont.

Modesto Fm.—cont.

- Womac Coal M.
- Inglefield Ss. M.
- Burroughs Ls. M.
- Carlinville Cyc.
- Carlinville Ls. M.
- Trivoli Cyc.
- Chapel (No. 8) Coal M.

DesMoinesian Series

- Trivoli Ss. M.
- Scottville Ls. M.
- Athensville Coal M.
- Rock Branch Coal M.
- Cutler Cyc.
- Piasa Ls. M.

Kewanee Group

Carbondale Fm.

- Danville (No. 7) Coal M.
- Galum Ls. M.
- Bankston Cyc.
- Bankston Fork Ls. M.
- Anvil Rock Ss. M.
- Jamestown Cyc.
- Conant Ls. M.
- Jamestown Coal M.
- Brereton Cyc.
- Brereton Ls.
- Herrin (No. 6) Coal M.
- Briar Hill Cyc.
- Briar Hill (No. 5A) Coal M.
- St. David Cyc.
- St. David Ls. M.
- Springfield (No. 5) Coal M.
- Summum Cyc.
- Hanover Ls. M.
- Summum (No. 4) Coal M.
- Roodhouse Coal M.
- Colchester (No. 2) Coal M.

Spoon Fm.

- Cheltenham Clay (includes lower clays)
- DeKoven Coal M.
- Davis Coal M.
- Seahorne Ls. M.
- Vergennes Ss. M.
- Murphysboro Coal M.
- Litchfield Coal M.
- Assumption Coal M.

Atokan Series

McCormick Group

- Abbott Fm.
- Pounds Cyc.

Morrowan Series

- Caseyville Fm.
- Pounds Ss. M.
- Battery Rock Cyc.
- Drury Sh. M.
- Battery Rock Ss. M.
- Lusk Cyc.
- Wayside Ss. M.

(Southeast)

Virgilian Series

McLeansboro Group

- Mattoon Fm.
- Newton Cyc.
- Reisner Ls. M.
- Woodbury Cyc.
- Woodbury Ls. M.

Pennsylvanian System—cont.

(Southeast)—cont.

Virgilian Series—cont.

Mattoon Fm.—cont.

- Gila Cyc.
- Gila Ls. M.
- Greenup Cyc.
- Greenup Ls. M.
- Bogota Cyc.
- Bogota Ls. M.
- Effingham Ls. M.
- Shumway Cyc.
- Shumway Ls. M.

Missourian Series

Omega Cyc.

- Omega Ls. M.
- Bonpas Ls. M.
- Calhoun Coal M.
- Trowbridge Coal M.
- Opdyke Coal M.
- Shelbyville Coal M.
- McCleary's Bluff Coal M.
- Friendsville Coal M.
- Dix Ls. M.

Bond Fm.

- Millersville Ls. M.
- Flannigan Cyc.
- Flannigan Coal M.
- Mt. Carmel Ss. M.
- Shoal Creek Cyc.
- Shoal Creek Ls. M.

Modesto Fm.

- New Haven Coal M.
- Trivoli Cyc.
- Chapel (No. 8) Coal M.

DesMoinesian Series

- Trivoli Ss. M.
- Gimlet Cyc.
- West Franklin Ls. M.
- Lake Creek Coal M.
- Pond Creek Coal M.
- DeGraff Coal M.
- Cutler Cyc.
- Piasa Ls. M.

Kewanee Group

Carbondale Fm.

- Danville (No. 7) Coal M.
- Bankston Cyc.
- Allenby Coal M.
- Bankston Fork Ls. M.
- Anvil Rock Ss. M.
- Jamestown Cyc.
- Conant Ls. M.
- Jamestown Coal M.
- Brereton Cyc.
- Brereton Ls. M.
- Herrin (No. 6) Coal M.
- Vermilionville Ss. M.
- Briar Hill Cyc.
- Briar Hill (No. 5A) Coal M.
- St. David Cyc.
- St. David Ls. M.
- Harrisburg (No. 5) Coal M.
- Summum Cyc.
- Summum (No. 4) Coal M.
- Shawneetown Coal M.
- Colchester (No. 2) Coal M.

Spoon Fm.

- Palzo Ss. M.
- DeKoven Cyc.
- DeKoven Coal M.

Pennsylvanian System—cont.
(Southeast)—cont.

DesMoinesian Series—cont.
Spoon Fm.—cont.

- Colbert Cyc.
- Davis Coal M.
- Stonefort Cyc.
- Stonefort Ls. M.
- Wise Ridge Coal M.
- Mt. Rorah Coal M.
- Creal Springs Ls. M.
- Granger Ss. M.
- Macedonia Cyc.
- O'Nan Coal M.
- Curlew Ls. M.
- New Burnside Coal M.
- Bidwell Coal M.

Atokan Series

- McCormick Group
- Abbott Fm.
- Murray Bluff Ss. M.
- Delwood Cyc.
- Delwood Coal M.
- Finnie Ss. M.
- Grindstaff Cyc.
- Willis Coal M.
- Grindstaff Ss. M.
- Pounds Cyc.
- Reynoldsburg Coal M.

Morrowan Series

- Caseyville Fm.
- Pounds Ss. M.
- Battery Rock Cyc.
- Gentry Coal M.
- Sellers Ls. M.
- Battery Rock Ss. M.
- Lusk Cyc.
- Lusk Sh. M.

(East)

Missourian Series

- McLeansboro Group
- Mattoon Fm.
- Merom Ss. M.
- Cohn Cyc.
- Cohn Coal M.
- Bond Fm.
- Livingston Ls. M.
- Reel Ls. M.
- Mt. Carmel Ss. M.
- Shoal Creek Cyc.
- Shoal Creek Ls. M.
- Modesto Fm.
- Trivoli Cyc.
- Chapel (No. 8) Coal M.

DesMoinesian Series

- Gimlet Cyc.
- West Franklin Ls. M.
- Sparland Cyc.
- Kewanee Group
- Carbondale Fm.
- Danville (No. 7) Coal M.
- Brereton Cyc.
- Herrin (No. 6) Coal M.
- St. David Cyc.
- Harrisburg (No. 5) Coal M.
- Summum Cyc.
- Summum (No. 4) Coal M.
- Shawneetown Coal M.
- Colchester (No. 2) Coal M.
- Spoon Fm.
- Seeleyville Coal M.

Pennsylvanian System—cont.
(East)—cont.

Atokan Series

- McCormick Group
- Abbott Fm.

Morrowan Series

- Caseyville Fm.

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Pennsylvanian System—cont.

Correlations—cont.

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Definitions of units: Kosanke 1960, Wanless 1939.

Differentiation from Mississippian sediments: Atherton 1960.

Fauna: E. C. Case 1900, Collinson 1958c, Eastman 1902a, Jelliff 1923, R. G. Johnson 1962, Knight 1931, Meek 1868a, Melander 1903, Rhodes 1952, St. John 1875, H. W. Scott 1941, 1944b, Sturgeon 1964, M. L. Thompson 1959, Wanless 1958, 1963b, J. M. Weller 1929b, 1930b, 1930c, 1930e, 1931d, Willman 1942b.

Microfauna: C. L. Cooper 1947a, Dunbar 1942, M. L. Thompson 1959, 1964.

Flora (see Paleobotany, Mazon Creek fossils)
Coal swamp reconstruction: Dahlgren 1933.

Floral-faunal associations: Mamay 1953.

Megaspores: Schopf 1936b, 1938d, Winslow 1959.

Spores (see also under Paleobotany): Hoffmeister 1955a, Kosanke 1947, 1950, 1954b, Peppers 1964, Schopf 1944, Winslow 1959.

Igneous pebbles in limestone: G. H. Cady 1919b, Savage 1928.

Key beds: J. W. Alexander 1943, Kosanke 1960, Sims 1944, Wanless 1955b.

Limestones: J. E. Lamar 1929a, 1957a, Siever 1957a, Wanless 1947b, 1957a, Willman 1942b.

Trace elements: Ostrom 1957c.

Maps

Clastic ratio: Wanless 1955b.

Earliest sediment (worm's eye-view): Wanless 1955b, 1963b.

Environmental: Wanless 1965.

Isopach: Brownfield 1954, Wanless 1955b.

Isopach-lithofacies: Sloss 1960.

Paleogeographic: Schuchert 1923, Wanless 1957c.

Pre-Pennsylvanian geologic: State geol. map, Levorsen 1960, Siever 1951a, Wanless 1955b.

Sand-shale ratio: Wanless 1955b.

Structure: A. H. Bell 1937a, 1937d, 1937e, G. M. Kay 1951, M. H. Smith 1941, Wanless 1955b, 1957a, 1957c, J. M. Weller 1936b, 1936c, 1937b.

Oil and gas in: Swann 1955.

Pre-Pennsylvanian (sub-Absaroka) unconformity

Filling in caves: G. E. Ekblaw 1925b.

Overlap: Levorsen 1931, Savage 1927, Wanless 1932b, J. M. Weller 1931b.

Pennsylvanian System—cont.

Pre-Pennsylvanian unconformity—cont.

Post-Chester faultings: G. E. Ekblaw 1925c, P. E. Potter 1957.

Surface: L. G. Henbest 1928b, Ostrom 1961a, P. E. Potter 1965, Siever 1951a, M. H. Smith 1941, Wanless 1955b, Willman 1942b.

Sandstones: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1954, 1956a, 1961a, 1962b, 1962c, 1963a, 1965, Rich 1916a, 1916b, Siever 1957b, 1959, Wanless 1952.

Saybrook core: Hugh Murray 1893.

Sediments, basal: Poor 1925, P. E. Potter 1956a, Siever 1956b.

Sediments, source: P. E. Potter 1956a, 1961b, Siever 1956b.

Shales: Glass 1956, Grim 1957, Krumbein 1956b, Wanless 1957a, Weaver 1958, Willman 1942b.

Structure of base: J. M. Weller 1937b.

Subsurface methods: E. F. Taylor 1944a.

Type localities: Kosanke 1960, Wanless 1956.

Variability, stratigraphic: Kosanke 1960, P. E. Potter 1955a.

Variations, regional: Wanless 1947b.

Pennsylvanian Lowland: Horberg 1950a.

Pennsylvanian Upland: Horberg 1950a.

Pentremital Limestone (Miss.): James Hall 1858.

Peoria County

Bedrock topography: Horberg 1950a, 1950b, Johan A. Udden 1912b, W. H. Walker 1965, Wanless 1957a.

Brines: Meents 1952.

Clay and shale

General: Bleining 1912, J. E. Lamar 1934, Johan A. Udden 1912b.

Bonding clay: Grogan 1945.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: W. A. White 1960b.

Refractory clay: J. E. Lamar 1956b.

Coal

General: G. H. Cady 1921, Ill. GS 1913, Lesquereux 1866a, Johan A. Udden 1908b, 1912b.

Analyses: Abernethy 1961, Aresco 1953-1965, Ashley 1902, G. H. Cady 1921, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, Lindgren 1908, L. C. McCabe 1935, Parr 1904, 1906b, 1915a, 1916.

Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.

Chlorine in: Abernethy 1965, Gluskoter 1964.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Losses: C. A. Allen 1925.

Mined-out areas: Ill. GS 1959b maps 6, 7, 11.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1915c, G. H. Cady 1921, H. M. Cooper 1942b, C. S. Richardson 1855, Johan A. Udden 1908b.

P, Cl, Na, and K in: Abernethy 1965.

Peoria County—cont.

Coal—cont.

- Preparation: Boley 1949, L. C. McCabe 1935, 1939a, Mitchell 1937.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, DeWolf 1908b.
 Strippable reserves: G. H. Cady 1937c, W. H. Smith 1963.
 Subsidence: L. E. Young 1916b.
 Copper erratic: Crook 1929.
 Drill records: G. H. Cady 1921, Ross Hanson 1950, 1958, 1961, Horberg 1950b, Ill. State Water Sur. 1940, Johan A. Udden 1908a, 1912b, Wanless 1957a.
 Farmington area guide leaflet: Ill. GS 1963-B.
 Feldspar: Willman 1942a.
 Geologic sections (described outcrops)
 Copperas Creek (Pa.): Wanless 1955a, 1957a.
 Copperas Creek (Pleis.): Wanless 1957a.
 Farmington East (Pa.): Savage 1921a.
 Jubilee College (Pleis.): Frye 1965a.
 Kickapoo Creek (Pa.): Johan A. Udden 1912b.
 Kickapoo Creek (Pleis.): Wanless 1957a.
 LaMarsh Creek (Pa.): Johan A. Udden 1912b, Wanless 1957a.
 Largent Creek (Pa.): Wanless 1957a.
 Mapleton (Pa.): Johan A. Udden 1912b.
 Princeville (Pa.): Bleininger 1912, J. E. Lamar 1934.
 Swords Quarry (Maxwell) (Pa.): Bleininger 1912.
 Tindall School (Pleis.): Willman 1963.
 Ground water
 General: Bergstrom 1956a, Boruff 1929, Horberg 1950a, 1950b, Howson 1947, Ill. State Water Sur. 1940, T. E. Larson 1949, Leverett 1899a, Suter 1944, 1947, 1960b, Johan A. Udden 1912b, W. H. Walker 1965, Walton 1962a.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897, Johan A. Udden 1908a.
 Artesian wells: Johan A. Udden 1908a.
 Hydrology and chemistry: Horberg 1950b.
 Landslides: G. E. Ekblaw 1932a.
 Limestone and dolomite
 General: Krey 1925, J. E. Lamar 1934.
 Building stone: Johan A. Udden 1912b.
 Cement materials: Bleininger 1912, J. E. Lamar 1956b.
 Trace elements: Ostrom 1957c.
 Loess: Frye 1962e, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Barrows 1910, Horberg 1950a, 1950b, W. H. Walker 1965, Wanless 1957a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Barrows 1910, Horberg 1950b, 1953, W. H. Walker 1965, Wanless 1957a.
 Glacial: State geol. map, R. C. Anderson 1965, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Wanless 1957a.
 Structure: Buschbach 1963, G. H. Cady 1921, Meents 1954, Johan A. Udden 1908b, 1912b, Wanless 1957a, Whiting 1965b.

Peoria County—cont.

- Mastodon: N. C. Anderson 1905.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Gas in drift: Meents 1960.
 Physiography: Barrows 1910, Leighton 1948b, Johan A. Udden 1912b, W. H. Walker 1965, Wanless 1957a.
 Quadrangle studies
 Glasford: Wanless 1957a, 1958.
 Peoria: Johan A. Udden 1912b.
 Sand and gravel
 General: R. C. Anderson 1965, Johan A. Udden 1912b.
 Mineralogy: Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b.
 Sandstone: J. C. Bradbury 1962a.
 Soil report 19
 Stratigraphy
 General: Barrows 1910, Bergstrom 1956a, Bleininger 1912, Buschbach 1963, Chapman 1887, Horberg 1950b, Johan A. Udden 1908a, 1912b, W. H. Walker 1965, Wanless 1957a.
 Ordovician: Gutstadt 1958b.
 Silurian: Lowenstam 1949b, Whiting 1965b.
 Devonian: Whiting 1965b.
 Mississippian: Wanless 1957a.
 Pennsylvanian: J. C. Bradbury 1962a, G. H. Cady 1921, Lesquereux 1866a, W. H. Smith 1963, Johan A. Udden 1912b, Wanless 1931a, 1931b, 1932b, 1957a, 1958, J. M. Weller 1942c, Worthen 1882c.
 Pleistocene: R. C. Anderson 1965, Barrows 1910, Frye 1958b, 1965a, Horberg 1950b, 1953, Leighton 1923a, 1926b, Leverett 1899a, 1921, Johan A. Udden 1912b, Wanless 1957a, Willman 1963.
 Recent: F. C. Baker 1918, Barrows 1910, Johan A. Udden 1912b.
 Structure: Newsam 1893b, Johann A. Udden 1912b, Wanless 1957a.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 5): Worthen 1873(1).
 Peoria Lake, deposits: J. D. Wilson 1883.
 Peoria (Peorian) Loess (Pleis.) (see also Peorian Interglacial Stage): F. C. Baker 1929, J. R. Ball 1952, Beavers 1957, Doyle 1965, Fehrenbacher 1965a, 1965b, Frye 1958b, 1960b, 1962e, 1963a, 1963b, 1963c, 1965a, 1965b, 1965c, Horberg 1956b, Ives 1964, P. R. Johnson 1959, R. L. Jones 1963b, 1964, Krumbein 1937, Leighton 1925a, 1926b, 1928, 1931b, 1932h, 1949a, 1950b, 1958a, 1960, 1965, A. B. Leonard 1960, MacClintock 1959, Pryor 1962a, B. W. Ray 1962, L. L. Ray 1963b, Ross 1964b, E. W. Shaw 1921, 1923, G.-D. Smith 1942, Wanless 1955a, 1957a, Willman 1941a.
 Fauna: F. C. Baker 1920a, 1920b, 1928b, 1931b, 1932, A. B. Leonard 1951, 1960, Wanless 1957a.
 Peoria Quadrangle: Johan A. Udden 1912b.
 Peoria region (see also Peoria, Tazewell, and Woodford Counties): Bannister 1870, Barrows 1910, Bergstrom 1956a, G. H. Cady 1921, G. E. Ekblaw 1932a, Frye 1958b,

Peoria region—cont.

1962e, 1965a, 1965b, Glass 1964, H. A. Green 1870, Horberg 1950a, 1950b, 1953, Leighton 1926b, 1931b, 1961, A. B. Leonard 1960, Selkregg 1958, W. H. Smith 1963, Suter 1960a, Johan A. Udden 1908a, 1908b, 1912b, Wanless 1957a, Worthen 1873(1).

Peorian Interglacial Stage, Epoch, Soil (Pleis.): Barrows 1910, Cable 1921, 1929, G. F. Kay 1933, Leighton 1925a, 1931b, Leverett 1898a, 1899a, Johan A. Udden 1912b, Wanless 1928, 1929a.

Periglacial (Permafrost) features: Brunnschweiler 1962, Frye 1958b, Horberg 1949, 1953, Sharp 1942, H. T. U. Smith 1962.

Permian bone bed (Pa.): E. C. Case 1900, 1908.

Permian System: Cope 1884, Norwood 1858, Stuart Weller 1906b, 1907a, Willman 1942b, Worthen 1866a(2).

Perry County

Bedrock topography: Horberg 1950a.

Brines: Meents 1952, Worthen 1883(1).

Clay and shale

General: E. W. Shaw 1911a.

Bonding clay: Grogan 1945.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: Atherton 1960, Smoot 1960a, W. A. White 1960b.

Petrology: Grim 1957.

Coal

General: G. H. Cady 1938, 1940b, D. J. Fisher 1925b, J. A. Harrison 1956, Ill. GS 1913, F. H. Kay 1915a, Lesquereux 1866a, Savage 1910b, 1911a, E. W. Shaw 1910, Jon A. Udden 1909, J. M. Weller 1939b.

Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1927, 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Lindgren 1908, L. C. McCabe 1934a, Ovitiz 1918, B. C. Parks 1956, Parr 1904, 1906b, 1915a, 1916, 1931, Savage 1910b, E. W. Shaw 1910, N. H. Snyder 1953, Zubovic 1964.

Ash analyses: Rees 1964.

Ash fusibility: Abernethy 1961.

Beryllium in: Stadnichenko 1961.

Chlorine in: Gluskoter 1964.

Coke analyses: Ovitiz 1918.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Losses: C. A. Allen 1925.

Low sulfur coal: G. H. Cady 1919d, 1919e.

Methane in: Darton 1915.

Mine subsidence: C. A. Herbert 1927.

Mined-out areas: Ill. GS 1959b map 29.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1914d, 1914e, H. M. Cooper 1942b, Darton 1915, Savage 1910b.

Minor elements: Zubovic 1964.

Petrology: L. C. McCabe 1934a.

Production: Annual coal reports.

Reserves: Anon. 1875, G. H. Cady 1944, 1952b, DeWolf 1908b, Jon A. Udden 1909.

Strippable reserves: G. H. Cady 1927, Culver 1925b, W. H. Smith 1958.

Subsidence: L. E. Young 1916b.

Perry County—cont.

Drill records: A. H. Bell 1931a, 1938a, 1940b, R. S. Blatchley 1910a, Ross Hanson 1950, F. H. Kay 1915a, Leverett 1899a, E. W. Shaw 1912b, Jon A. Udden 1909, Johan A. Udden 1914, Worthen 1890(2).

Fossil plant localities: Collinson 1960a.

Geologic sections (described outcrops)

DuQuoin Southwest (Pa.): J. E. Lamar 1934.

Pinckneyville South (Pa.): J. E. Lamar 1934.

Geophysical studies: Pryor 1956c.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961.

Limestone and dolomite: Krey 1925, J. E. Lamar 1934, 1956b.

Loess: G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, E. W. Shaw 1912b, J. M. Weller 1940b.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Siever 1951a.

Structure: Bain 1908g, A. H. Bell 1931a, 1940b, 1943c, R. S. Blatchley 1910a, G. H. Cady 1938, 1940b, Darton 1915, D. J. Fisher 1925b, F. H. Kay 1915a, Pye 1944, Root 1928, Savage 1910b, E. W. Shaw 1912a, 1912b, Siever 1951a.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Root 1928, Jon A. Udden 1909.

Development maps: Ill. GS 1965 maps 24, 25.

Possibilities: A. H. Bell 1931a, 1938a, 1940b, R. S. Blatchley 1910a, Jon A. Udden 1909.

Physiography: R. F. Flint 1941, Leighton 1948b, MacClintock 1929, Savage 1910b, E. W. Shaw 1912b.

Quadrangle studies

Herrin: Savage 1910b, 1911a, 1911b, E. W. Shaw 1912b.

Murphysboro: E. W. Shaw 1912b.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962a, 1962c.

Stratigraphy

General: A. H. Bell 1931a, R. S. Blatchley 1910a, E. W. Shaw 1911a, 1912b.

Ordovician: Gutstadt 1958b.

Mississippian: P. L. Dana 1941, Root 1928, Swann 1958, Siever 1951a, J. M. Weller 1940b.

Pennsylvanian: Andresen 1961, A. H. Bell 1931a, J. C. Bradbury 1962a, G. H. Cady 1944, D. J. Fisher 1925b, L. G. Henbest 1928b, M. E. Hopkins 1958, F. H. Kay 1915a, Lesquereux 1866a, Savage 1910b, 1911a, 1911b, E. W. Shaw 1910, Siever 1951a, J. M. Weller 1942c.

Pleistocene: Frye 1965c, Leighton 1961, E. W. Shaw 1911c.

Perry County—cont.

- Structure: A. H. Bell 1931a, 1940b, G. H. Cady 1938, Root 1928, Savage 1910b, 1911a, 1911b.
 Worthen Survey report (v. 3): Worthen 1868(2).
- Peru Anticline: Willman 1942b.
 Peru Beds (Pleis.): C. O. Sauer 1916.
 Pesotum Bedrock Valley: Horberg 1950a.
 Peters Creek Fault: J. W. Baxter 1963a, 1965a, Brecke 1964a, J. S. Brown 1954, Currier 1937b, 1944, Grogan 1949b, Heyl 1961, 1965, Hubbert 1944, J. M. Weller 1952, Stuart Weller 1920b.
 Petersburg Basin: Workman 1956.
 Petersburg Coal (Pa.): Wanless 1939.
 Petersburg Formation (Pa.): DeWolf 1910, Savage 1910b.
 Petersburg Silt, Loess: Frye 1963b, 1963c, 1965b, W. H. Johnson 1964, Willman 1963.
 Petro Sand, Pay Zone: A. H. Bell 1926a, 1927b, Moulton 1929d.
 Petrography, methods: Cohee 1937, Emrich 1963b, Paul Herbert 1942, Parham 1963d, C. W. Spencer 1960.
 Petroleum (see Oil and gas)
 Phase relations, halide systems: Deadmore 1960a.
 Phenols, comparative studies: Yohe 1953.
 Philadelphia School Dike: J. W. Baxter 1965a.
 Philosophy, geological: Leighton 1931c.
 Phosphate, phosphatic nodules: Rubey 1952, Templeton 1963, Trowbridge 1916, Wanless 1957a, Stuart Weller 1907b, Willman 1942b.
 Photo-luminescence, fluorite: Gunnell 1933.
 Physics and research: Piersol 1946.
 Physiography (see also under counties)
 General: Anon. 1841, Bier 1956, Condit 1959, Cozzens 1940, Fenneman 1938, John Wells Foster 1869, Hutchins 1778, Leverett 1896, Lobeck 1950, McGee 1879, Ridgley 1921, Thornburn 1963, J. E. Todd 1892, Wanless 1957a, Willman 1942b, Worthen 1866a(1).
 Classification: Horberg 1950a, Leighton 1948b, MacClintock 1929.
 Climate and hillslopes: Frye 1959a.
 Chicago region: Bretz 1943, Fryxell 1927, J. W. Goldthwait 1909, Rudd 1956, Salisbury 1899, Trowbridge 1912.
 Diagram: Bier 1956, Lobeck 1950, Raisz 1957.
 Driftless Area: Trowbridge 1921.
 Early descriptions: S. R. Brown 1817, W. M. Davis 1895b, Emerson 1912, Hart 1912, Worthen 1866a(1).
 Karst topography (see Sink holes)
 Ozark Province: Cozzens 1939, 1940.
 Preglacial erosion effect: Hershey 1896b.
 Profile of land forms: Glock 1932.
 Relief model: Lawrence Martin 1910.
 Sink holes, karst topography: Anon. 1841, Bowman 1907, Bretz 1923, 1940, 1961, Fenneman 1910, D. J. Fisher 1925a, Knappen 1926, J. E. Lamar 1928c, Rubey 1952, Trowbridge 1916, Stuart Weller 1920b.
 Southern Illinois: Bonnell 1917, J. E. Lamar 1925a, Stuart Weller 1920b.
 Starved Rock State Park: G. H. Cady 1918b, Willman 1942b.
 Valley-side erosion: Harris 1958.
 Wabash Valley: Fidler 1948.
 Phytoliths: R. L. Jones 1963a.

- Piankasha Sequence (Dev.): H. E. Wheeler 1963.
 Piasa Limestone Member (Pa.) (see Cutler Ls.): J. R. Ball 1952, J. W. Baxter 1965b, G. H. Cady 1939c, Clegg 1961, Culver 1925a, Kosanke 1960, Siever 1957a, Wanless 1939, J. M. Weller 1930d, 1942c.

Piatt County

- Bedrock topography: Horberg 1945, 1950a, Selkregg 1958.
 Brines: Meents 1952.
 Coal: G. H. Cady 1952b.
 Drill records: Collingwood 1922, 1924b, Ross Hanson 1950, 1958.
 Geophysical studies: R. B. Johnson 1954.
 Ground water
 General: John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Schicht 1961, Selkregg 1958.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1960, A. W. Palmer 1897.
 Loess: G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Heigold 1964, Horberg 1945, 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1953, Schwalb 1953.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: Collingwood 1924b, Heigold 1964, R. H. Howard 1963b, 1964, Schwalb 1953.
 Mastodon: N. C. Anderson 1905.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Development maps: Ill. GS 1965 maps 89, 90, 96.
 Possibilities: Collingwood 1924b.
 Soil report 47
 Springs: Peale 1886.
 Stratigraphy
 General: A. H. Bell 1964, Selkregg 1958, Swann 1958, Workman 1950b.
 Mississippian: Swann 1958.
 Pleistocene: Frye 1965c, Horberg 1953, R. B. Johnson 1954, Leverett 1899a.
 Structure: State geol. map, Meents 1954, Swann 1958.
 Worthen Survey report (v. 6): Broadhead 1875.

- Pickeringite (alum): Willman 1942b.
 Pierce Fault: J. M. Weller 1952.
 Piersol press: Piersol 1948.

Pike County

- Bedrock topography: Horberg 1950a.
 Brines: Meents 1952.
 Building stone: Conover 1884.
 Caves: Bretz 1961.
 Clay and shale
 General: J. E. Lamar 1934, Parmelee 1921.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: Frye 1964a.
 Petrology: Grim 1957.
 Refractory clay: J. E. Lamar 1931d, Lines 1917, Parmelee 1921.

Pike County—cont.

Clay and shale—cont.

Resources: Jackman 1965a, Parham 1963a, W. A. White 1959b, 1964a.

Coal: Culver 1925a.

Mining and production: Annual coal reports.

Reserves: Culver 1925a.

Strippable reserves: Reinertsen 1964.

Driftless Area: Salisbury 1891b.

Drill records: W. S. Blatchley 1906, M. L. Fuller 1906, Ross Hanson 1950, 1958, 1961, Krey 1924, Leverett 1899a, Meents 1958a, Savage 1906, Workman 1948.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Geologic sections (described outcrops)

Aberdeen School (Pa., Cre.): Frye 1964a.

Atlas South (Dev., Miss.): Collinson 1961.

Baylis (Pleis.): Horberg 1956b.

Bedford (Pa.): Parmelee 1921.

Brewster Branch (Dev., Miss.): Collinson 1961.

Brown Branch (Dev., Miss.): Collinson 1961.

Independence School (Miss., Pleis.): Frye 1964a, 1965b.

Jimtown Branch (Dev., Miss.): Collinson 1961.

Kinderhook (Miss.): Bleininger 1912,

C. L. Cooper 1948, J. M. Weller 1941b.

Nebo (Pleis.): Frye 1965b.

McCraney North (Dev., Miss.): Collinson 1961, 1964b.

Pearl Prairie (Pleis.): Frye 1965b.

Perry Northeast (Pleis.): Frye 1965a.

Six Mile Creek (Pleis.): J. E. Lamar 1931d.

Woodland School East (Pleis.): Frye 1964a.

Ground water

General: Bergstrom 1957, Horberg 1950a, Leverett 1899a, Schicht 1961, R. C. Scott 1962.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961.

Igneous rocks: Grogan 1949a.

Limestone and dolomite

General: Krey 1925, J. E. Lamar 1934.

Mineralogy: Goldsmith 1958b, Grim 1937a.

Loess: Frye 1962e, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Coryell 1919, J. M. Weller 1940b.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Structure: A. H. Bell 1926d, 1943c, Coryell 1919, R. H. Howard 1961, Krey 1924, Reinertsen 1964, Whiting 1965b.

Mastodon: Bagg 1909.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: A. H. Bell 1939f, W. S. Blatchley 1906, Coryell 1919, Savage 1906.

Development maps: Ill. GS 1965 map F.

Fishhook Pool: Meents 1958a.

Natural gas: A. H. Bell 1935a.

Pike County—cont.

Oil and gas—cont.

Possibilities: A. H. Bell 1926d, Krey 1924.

Physiography: Glock 1932, Leighton 1948b.

Pittsfield area guide leaflet: Ill. GS 1962-B.

Sand and gravel: R. E. Hunter 1965, Salisbury 1891a, Willman 1942a.

Soil report 11

Springs: Peale 1886.

Stratigraphy

General: Bergstrom 1957, W. S. Blatchley 1906, Coryell 1919, R. H. Howard 1961, Krey 1924, Savage 1906.

Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c, Grogan 1949a.

Cambrian: A. H. Bell 1964, Workman 1948.

Ordovician: A. H. Bell 1964, Gutstadt 1958b, Workman 1948.

Silurian: Savage 1913a, 1913c, 1914b, 1926, Whiting 1965b.

Devonian: Collinson 1961, A. J. Scott 1961a, Whiting 1965b.

Mississippian: Collinson 1961, 1964b, J. E. Conkin 1965, Frye 1938, Keyes 1900b, A. J. Scott 1961a, Stainbrook 1950, J. M. Weller 1940b, 1941b, J. S. Williams 1957.

Pennsylvanian: Culver 1925a, Parham 1963a, Reinertsen 1964, Wanless 1931b.

Cretaceous: Frye 1964a.

Tertiary: Salisbury 1892.

Pleistocene: Frye 1964a, 1965a, 1965b, Horberg 1956b, Leighton 1961, Leverett 1898b, 1899a, Staplin 1963b, Willman 1963.

Uranium: Ostrom 1955.

Worthen Survey report (v. 4): Worthen 1870.

Pike County Gas Field: A. H. Bell 1939f, W. S. Blatchley 1906.

Pinckneyville Anticline: A. H. Bell 1931a, 1938a.

Pine Creek Bedrock Valley: Horberg 1950a, Leverett 1899a.

Pitcher Lake Fault: J. A. Harrison 1951, Pryor 1956b.

Pittsfield Anticline: Cohee 1962.

Pittsfield-Hadley Anticline: A. H. Bell 1926d, Collingwood 1933, Coryell 1919, Krey 1924, J. S. Williams 1957.

Pittsfield-Hadley Gas Field: A. H. Bell 1935a.

Plainfield Gravel Plain: D. J. Fisher 1925a.

Plainview Syncline: Easton 1942, Wallace Lee 1926.

Platteville Group, Limestone, Dolomite, Formation (Ord.): Agnew 1956, Athy 1928, Bain 1905b, 1907b, A. H. Bell 1964, Bevan 1925b, J. C. Bradbury 1965a, Bretz 1923, Buschbach 1964, 1965, G. H. Cady 1919b, 1920b, Carozzi 1956, Cohee 1945a, G. A. Cooper 1956, G. H. Cox 1910, 1911, 1914, Culver 1922a, Dapples 1955, Decker 1952, Doyle 1965, DuBois 1945, Edson 1935, Elder 1937, D. J. Fisher 1925a, Grant 1908, Hackett 1960a, D. M. Henderson 1956, Horberg 1950b, G. M. Kay 1929, Knappen 1926, J. E. Lamar 1950a, Mullens 1964, Ross 1964b, Sardeson 1907, Savage 1921b, E. W. Shaw 1916, Shrock 1933, Templeton 1952, 1963, Thwaites 1927, Trowbridge 1916, Wanless 1929a, 1957a, 1957b, Willman 1942b, 1943a, 1943b, 1947, Zeisel 1962a.

Platteville Group—cont.

- Fauna: Knappen 1926, Rubey 1952, Templeton 1963, Trowbridge 1916, Willman 1942b.
 Isopach map: Buschbach 1964.
 Paleogeographic map: Schuchert 1955.
 Structure map: Hackett 1960a, Mullens 1964, Willman 1942b.

Plattin Subgroup, Limestone, Formation (Ord.): J. R. Ball 1952, Buschbach 1964, Collinson 1954, 1957, DuBois 1945, Grabau 1937, Grohskopf 1948, Krey 1924, Mylius 1927, Rubey 1952, Templeton 1963, J. M. Weller 1940a, 1952, Stuart Weller 1907b.

Pleasant Valley: Carman 1910.

Pleasantview Sandstone Member (Pa.): S. E. Ekblaw 1931, Kosanek 1960, Pettijohn 1964, Reinertsen 1964, Rusnak 1957, Siever 1959, Wanless 1929a, 1939, 1952, 1955a, 1955b, 1957a, Willman 1942b.

Pleistocene Series

Accepted nomenclature (see named units)

Recent Stage

Recent Soil

Wisconsinan Stage

Valderan Substage

Twocreekan Substage

Woodfordian Substage

Peoria Loess

Richland Loess

Lake Border Moraines

Zion City Mor.

Highland Park Mor.

Blodgett Mor.

Deerfield Mor.

Park Ridge Mor.

Tinley Mor.

Valparaiso Moraines

(North)

Fox Lake Mor.

Cary Mor.

West Chicago Mor.

(Central)

Palatine Mor.

Roselle Mor.

Keeneyville Mor.

Wheaton Mor.

West Chicago Mor.

(South)

Clarendon Mor.

Palatine Mor.

Zurich Mor.

Fox Lake Mor.

Monroe Mor.

West Chicago Mor.

Manhattan Mor.

Rockdale Mor.

Minooka Mor.

Iroquois Mor.

Marseilles Mor.

Huntley Mor.

Chatsworth Mor.

Farm Ridge Mor.

Cropsey Moraines

(North)

Gilberts Mor.

Elburn Mor.

Arlington Mor.

(South)

Inner Cropsey Mor.

Middle Cropsey Mor.

Outer Cropsey Mor.

Pleistocene Series—cont.

Wisconsinan Stage—cont.

Normal Mor.

Metamora Mor.

Bloomington Moraines

Marengo Mor.

Providence Mor.

Buda Mor.

Sheffield Mor.

Urbana Mor.

Champaign Mor.

West Ridge Mor.

Cerro Gordo Mor.

LeRoy Mor.

Shelbyville Moraines

White Rock Mor.

Morton Loess

Farmdalian Substage

Farmdale Silt

Altonian Substage

Roxana Silt, Loess

Winnebago Drift

Lemont Drift

Sangamonian Stage

Sangamon Soil

*Illinoian Stage**Buffalo Hart Substage*

Buffalo Hart Mor.

Roby Silt

Jacksonville Substage

Jacksonville Mor.

Liman Substage

Mendon Mor.

Petersburg Silt

Loveland Silt, Loess (Illinoian)

Yarmouthian Stage

Yarmouth Soil

Kansan Stage

Sankoty Sand

Mahomet Sand

Aftonian Stage

Afton Soil

Nebraskan Stage

General: W. C. Alden 1932, Atwood 1908, F. C. Baker 1920b, Bretz 1923, 1955, Chamberlin 1887, 1888(?), 1891a, 1893a, 1894, 1895, 1906, Crook 1926, Culver 1922a, Eveland 1952, D. J. Fisher 1925a, R. F. Flint 1931, 1947, 1957, Frye 1960a, 1961a, 1962a, 1962e, 1963a, 1963c, 1964a, 1965a, 1965b, 1965c, Fultz 1895, Guthrie 1895, Hershey 1895a, Nathaniel Holmes 1868, Horberg 1953, 1956b, W. H. Johnson 1964, F. H. Kay 1915b, Kempton 1963, Knappen 1926, J. E. Lamar 1925a, 1951, Leighton 1932a, 1950b, 1953, 1961, 1965, Leverett 1890, 1897, 1898b, 1898c, 1899a, 1921, 1929c, 1930, McAdams 1883, MacClintock 1929, 1930, Salisbury 1894, Savage 1921c, Thornburn 1963, Thwaites 1950, Trowbridge 1912, Johan A. Udden 1908b, Wanless 1928, 1929a, 1957a, Whittlesey 1851, Willman 1942b, 1958a, Workman 1950b, Worthen 1890(1).

Age criteria: Timothy Alden 1909.

Correlation of pre-Illinoian drifts: MacClintock 1933.

Classification: Chamberlin 1878, 1882b, 1895, Frye 1958c, 1960, 1962c, 1963a, 1965c, G. F. Kay 1931, 1933, Leighton 1931b, 1958b, 1960, Leverett 1899a, 1929b, 1933, Willman 1958b.

Pleistocene Series—cont.

- Englacial drift: Chamberlin 1893b.
 Deep-sea temperatures and glacial-interglacial episodes: Frye 1962a.
 Fauna (see under Paleontology)
 Flora (see under Paleobotany)
 Fluvial deposition: Frye 1961b.
 Forebulge, isostatic adjustments: Frye 1963d.
 Glacial boundary: J. E. Lamar 1925a, Leverett 1899a, MacClintock 1929, Rubey 1952, Trowbridge 1916, G. F. Wright 1884, 1890.
 Glacial deposits (see Till)
 Glacial lakes
 Lake Algonquin: W. C. Alden 1918, Atwood 1908, Bretz 1939, J. W. Goldthwait 1906, Hough 1953, 1958, 1962, Leverett 1915.
 Lake Ancona: Willman 1942b.
 Lake Brussels: Leighton 1961.
 Lake Chicago: W. C. Alden 1902, 1904, 1918, Edmund Andrews 1870, Atwood 1908, F. C. Baker 1916, 1926, J. R. Ball 1929a, 1938b, Bretz 1939, 1951, 1955, 1959, 1964, Downing 1924, D. J. Fisher 1925a, R. F. Flint 1947, 1956, 1957, Frye 1965b, 1965c, J. W. Goldthwait 1906, 1908, 1909, 1910, Hough 1953, 1958, 1962, Leighton 1932a, Leverett 1889a, 1897, 1899a, 1913, 1915, Lewis 1898, Penhallow 1891, Salisbury 1899, J. W. Spencer 1946, Frank Taylor 1913, Thwaites 1950, Upham 1892, D. E. Willard 1893, A. N. Winchell 1897, G. F. Wright 1918, Zumberge 1955.
 Lake Chicago, incipient stages: G. E. Ekblaw 1931b.
 Lake Chicago life: F. C. Baker 1910, 1912, 1930a.
 Lake Chicago outlet: W. C. Alden 1902, Barrows 1910, W. M. Davis 1894, D. J. Fisher 1925a, Guthrie 1890, Leverett 1896, 1899a, Suter 1959.
 Lake Chicago, radiocarbon dating: Antevs 1957, Bretz 1959, 1964, Horberg 1955a, Hough 1958.
 Lake Cordova: Leighton 1965, Shaffer 1954a.
 Lake Craborchard: J. E. Lamar 1925b.
 Lake Illinois: D. J. Fisher 1925a, Frye 1965a, 1965b, Leighton 1949a, 1953, Wanless 1957a, Willman 1942b.
 Lake Kankakee: G. E. Ekblaw 1925a, Leverett 1899a.
 Lake Kickapoo: Willman 1942b.
 Lake Lisbon: Willman 1942b.
 Lake McKee: Frye 1965a.
 Lake Maumee: Leverett 1915.
 Lake Milan: Glass 1964, Shaffer 1954a.
 Lake Morris: Culver 1922a, D. J. Fisher 1925a, J. W. Goldthwait 1909, Willman 1942b.
 Lake Muddy: E. W. Shaw 1911c, 1915.
 Lake Nippissing: Bretz 1939, 1955, Gates 1910, J. W. Goldthwait 1910, Hough 1958.
 Lake Ottawa: Leighton 1953, Willman 1942b.
 Lake Peconica: Hershey 1896a.
 Lake Pontiac: Willman 1942b.
 Lake Savanna: Leighton 1965, Shaffer 1954a.
 Lake Watseka: Leighton 1953, Willman 1942b.
 Lake Wauconda: W. E. Powers 1940.

Pleistocene Series—cont.

- Glacial lakes—cont.
 Lake Wauponsee: Willman 1942b.
 Glacial lobes: Frye 1965c, Horberg 1956a, Leighton 1961.
 Glacial map: State geol. map, Antevs 1929, Chamberlin 1888, R. F. Flint 1945, 1959, Leighton 1961, Leverett 1899a.
 Northeastern Illinois: G. E. Ekblaw 1941, Suter 1959.
 Glacial topography: Barrows 1910, J. W. Goldthwait 1909, Trowbridge 1912.
 Heavy minerals: Brophy 1959, Frye 1960c, 1962e, 1963c, 1964a, 1965a, J. E. Lamar 1937b, Manos 1961, Wascher 1960, Willman 1963.
 Interglacial climate: Upham 1895.
 Isopach map: Leighton 1965.
 Leaching of carbonates: R. F. Flint 1949.
 Morphostratigraphic units: Frye 1962c.
 Northern hemisphere glaciations: Leverett 1926, 1929b.
 Pre-morainic glacial movements: Swezey 1893.
 Research progress reports: Leighton 1928, 1930d, 1931e, 1932h, 1935d.
 Regional correlations: Morrison 1965.
 Sea level relations to glaciations: Frye 1961a.
 Seismic differentiation: R. B. Johnson 1954.
 Soil profiles: Brophy 1959, Frye 1960c, 1962e, 1963c, 1964a, Leighton 1930f, 1962.
 Southern Illinois: Fisk 1949.

- Pleistocene-Tertiary relations: Chamberlin 1891b.
 Pliocene Series (Ter.): Horberg 1950c, Leighton 1950b, Parmelee 1921, P. E. Potter 1955c, Pryor 1962a, Ross 1963, Rubey 1952, J. M. Weller 1940a.
 Pliocene-Pleistocene boundary: Chamberlin 1891b, Leighton 1949a.
 Plum River Valley: Leverett 1899a.
 Plymouth Pool: R. S. Blatchley 1914c, R. H. Howard 1961.
 Pocahontas Anticline: F. H. Kay 1915a.
 Pokeberry Cyclothem (Pa.) (see Jamestown Cyc.): Kosanke 1960, Wanless 1957a.
 Fauna: Wanless 1958.
 Pokeberry Limestone Member (Pa.): C. L. Cooper 1946, Kosanke 1960, Wanless 1939, 1957a.
 Polo Basin: Templeton 1952.
 Pomona Fault: Desborough 1961b.
 Pomona Quadrangle: Desborough 1958, 1961b, 1961d.
 Pond Creek Coal Member (Pa.) (see Second Cutler Rider Coal): Kosanke 1960.
 Pontiac-Fairbury area: J. E. Lamar 1929a.
 Pontiac Limestone (Pa.): J. E. Lamar 1929a, 1934, Ostrom 1957c.
 Popcorn Sandstone Bed (Miss.): Swann 1963.

Pope County

- Barite: J. C. Bradbury 1959a.
 Bedrock topography: Horberg 1950a.
 Building stone: Conover 1884.
 Carrier Mills area guide leaflet: Ill. GS 1965-A.
 Caves: Bretz 1961.
 Clay and shale
 General: Bleininger 1912, J. E. Lamar 1934, 1942a, 1948, 1959.
 Chemical analyses: W. A. White 1959a.
 Petrology: Grim 1957, P. E. Potter 1958b.

Pope County—cont.

Clay and shale—cont.

Refractory clay: J. E. Lamar 1956b, Purdy 1907.

Resources: Ross 1964b.

Coal

Mining and production: Annual coal reports.

Strippable reserves: Culver 1925b, W. H. Smith 1957.

Drill records: Ross 1963, 1964b, J. M. Weller 1940a.

Feldspar: R. E. Hunter 1965.

Fluorspar: Bain 1904a, 1905a, E. S. Bastin 1931b, Bishop 1947a, 1949, Currier 1937b, Finger 1960, Fohs 1910, Harwood 1903, Hatmaker 1938, E. O. Ulrich 1903, J. M. Weller 1952, Stuart Weller 1920b.

Fossil plant localities: Collinson 1960a.

Geologic sections (described outcrops)

Birds Point (Miss.): Stuart Weller 1920b.

Glendale (Miss.): J. E. Lamar 1948.

I. C. Railroad Tunnel North (Pa.): Kosanke 1960.

I. C. Railroad Tunnel South (Miss., Pa.): Kosanke 1960.

McCormick, Illinois Central Tunnel (Pa.): J. E. Lamar 1948.

Rosebud (Miss., Cre.): Parmelee 1921.

Geophysical studies: R. B. Johnson 1957, McGinnis 1964, Pullen 1953.

Golconda area guide leaflet: Ill. GS 1962-A.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956a, Ross 1964b.

Igneous rocks: Bain 1904a, 1905a, J. C. Bradbury 1962b, Clegg 1956, McGinnis 1964, Tolman 1939, E. O. Ulrich 1903, J. M. Weller 1940a, 1945b, 1952.

Lead and zinc: Bishop 1947a, Fohs 1910, E. O. Ulrich 1903, Stuart Weller 1920b.

Limestone and dolomite

General: Krey 1925, J. E. Lamar 1934, 1959.

Cement materials: Bleining 1912, J. E. Lamar 1956b, 1959.

Mineralogy: Grim 1937a.

Resources: Ross 1964b.

Loess: Fehrenbacher 1965b, Leighton 1950b, Ross 1964b.

Mammoth, near Golconda: Crook 1926.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Bain 1905a, C. L. Cooper 1944, J. E. Lamar 1948, P. E. Potter 1957, Ross 1964b, F. G. Snyder 1965, E. O. Ulrich 1905, J. M. Weller 1940b, 1952, Stuart Weller 1920b, 1939a.

Mineral industries: Ill. GS 1961.

Paleogeologic: L. B. Freeman 1944a, Ostrom 1961a, Ross 1963.

Structure: Butts 1917b, Ross 1963, J. M. Weller 1940a, Stuart Weller 1920b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas possibilities: Brokaw 1916, Butts 1917b, Ross 1964b, J. M. Weller 1940a, Stuart Weller 1920b.

Physiography: Bain 1905a, R. F. Flint 1941, Leighton 1948b, Stuart Weller 1920b.

Pope County—cont.

Quadrangle studies

Brownfield: Stuart Weller 1939a.

Paducah: Ross 1964b.

Smithland: Ross 1964b.

Sand and gravel

Mineralogy: R. E. Hunter 1965, J. E. Lamar 1951.

Molding sand: Littlefield 1925a, 1925b.

Resources: Ross 1964b.

Sandstone: Biggs 1955, J. C. Bradbury 1962a, P. E. Potter 1963a, Siever 1956b.

Springs: Peale 1886.

Stratigraphy

General: Bain 1904a, 1905a, Bleining 1912, Butts 1917b, Henry Engelmann 1866, Ross 1963, 1964b, E. O. Ulrich 1905, J. M. Weller 1940a, Stuart Weller 1920b, 1921a, 1921b, 1926c.

Cretaceous: J. E. Lamar 1930b, Pryor 1961a, Purdy 1907, Ross 1963, 1964b, J. M. Weller 1940a.

Devonian: Stuart Weller 1920b.

Mississippian: Atherton 1947, Bain 1905a, Brokaw 1916, Butts 1917a, Coryell 1939a, Foerste 1923, Gutschick 1965, McFarlan 1942, P. E. Potter 1958a, Ross 1964b, A. H. Sutton 1934a, 1940, 1952, Swann 1948, 1958, 1963, Tippie 1945, E. O. Ulrich 1917, J. M. Weller 1939d, 1940a, 1940b, Stuart Weller 1920a, 1920b, 1939a, Worthen 1860b, Zeller 1953.

Pennsylvanian: Brokaw 1916, J. C. Bradbury 1962a, Kosanke 1960, P. E. Potter 1957, W. H. Smith 1957, M. L. Thompson 1959, J. M. Weller 1940a, Stuart Weller 1920b.

Pleistocene: J. M. Weller 1940a.

Tertiary: C. L. Cooper 1944, J. E. Lamar 1951, Pryor 1961a, Purdy 1907, Ross 1963, 1964b, J. M. Weller 1940a.

Structure: Bain 1904a, 1905a, Brokaw 1916, P. E. Potter 1957, Ross 1963, Stonehouse 1955, J. M. Weller 1952.

Uranium: Ostrom 1955.

Worthen Survey report (v. 1): Henry Engelmann 1866.

Pope Creek Coal Member (Pa.): Kosanke 1950, 1960, Wanless 1939, 1952, 1957a, Winslow 1959.

Pope Creek Cyclothem (Pa.): Kosanke 1960, Wanless 1929a, 1931a, 1957a.

Pope Creek Sandstone (Pa.): Kosanke 1960, Wanless 1957a.

Pope Megagroup (Miss.): J. W. Baxter 1963a, P. E. Potter 1962a, Swann 1961, 1963.

Distribution map: P. E. Potter 1962a.

Pore doublet theory: Rose 1958a.

Port Byron Dolomite (Sil.): Lowenstam 1948a, Savage 1926, 1935, A. H. Sutton 1935, J. M. Weller 1935c, Willman 1943b.

Paleogeographic map: Schuchert 1955.

Portage Syncline: Willman 1947.

Porter's Creek Formation, Clay, Shale (Ter.): Amero 1951, C. L. Cooper 1944, Glenn 1906, Grim 1935a, 1950c, Grohskopf 1955, J. E. Lamar 1928e, 1930b, 1948, 1955c, 1959, Nutting 1935, Pryor 1962a, Purdy 1907, Ross 1963, J. M. Weller 1940a.

Distribution map: J. E. Lamar 1930b.

- Porter's Creek Formation—cont.
 Paleogeographic map: Schuchert 1955.
 Structure map: Cushing 1964, Grim 1950c.
 Portland cement (see Limestone and dolomite)
 Posten School Structure: Mylius 1921b.
 Potash: Knappen 1926, Krey 1921, J. E. Lamar 1938d, 1956d, Parr 1921, Schroyer 1922.
 Potato Hill Syncline: Butts 1917b, Stuart Weller 1920b.
 Potosi Dolomite (Camb.): A. H. Bell 1964, Buschbach 1964, 1965, Doyle 1965, Thwaites 1927, Workman 1948.
 Isopach map: Buschbach 1964, Workman 1948.
 Potsdam Megagroup, Sandstone, Group (Camb.): W. C. Alden 1902, C. B. Anderson 1919, Bartow 1909b, Bretz 1923, Buschbach 1964, G. H. Cox 1910, 1914, J. W. Goldthwait 1909, Savage 1921b, 1921c, Swann 1961, Johan A. Udden 1896, Stuart Weller 1906b, 1907a.
 Pottsville Formation (Pa.): Ashley 1907, Athy 1928, R. S. Blatchley 1913a, 1914a, Brokaw 1916, G. H. Cady 1915a, 1916, 1917, 1919a, 1919b, 1921, 1926, Coryell 1919, Culver 1922a, 1925a, Currier 1922, DeWolf 1910, Hinds 1914, 1917, 1919, Ill. GS 1913, F. H. Kay 1915a, 1915b, J. E. Lamar 1925a, Wallace Lee 1915, 1926, Morse 1915, Nebel 1919, Rich 1916a, 1916b, Root 1928, Rubey 1952, St. Clair 1917b, 1917d, Savage 1910b, 1915, 1921a, 1921b, 1921c, 1927, E. W. Shaw 1910, 1912b, 1913, 1921, 1923, Tough 1919, Johan A. Udden 1915, Wanless 1929a, 1931b, 1939, Stuart Weller 1920b, L. E. Young 1916b.
 Fauna: Savage 1924a.
 Flora: C. D. White 1907, 1908, 1910.
 Pottsville Sand, Pay Zone: Bain 1908h.
 Pounds Cyclothem (Pa.): Kosanke 1960, J. M. Weller 1940a.
 Pounds Sandstone Member (Pa.): J. W. Baxter 1963a, 1965a, Desborough 1959a, 1961b, 1961d, Harris 1961, Kosanke 1960, P. E. Potter 1956a, 1965, Siever 1956b, 1959, Wanless 1955b, J. M. Weller 1940a, 1952.
 Pozzolans: W. A. White 1961b.
 Prairie, origin: Hay 1878, Lesquereux 1866a.
 Prairie du Chien Group, Series, Dolomite (Ord.): Athy 1928, Bretz 1923, Buschbach 1964, G. H. Cady 1919b, G. H. Cox 1914, D. J. Fisher 1925a, John Webster Foster 1956, Grabau 1937, Hershey 1894, Knappen 1926, E. H. Powers 1935b, 1935c, Savage 1921b, C. O. Sauer 1916, Suter 1959, Templeton 1952, Thwaites 1927, Workman 1950b, Zeisel 1962a.
 Isopach map: Buschbach 1964, E. H. Powers 1935a.
 Prairie Terrace: Fisk 1944, 1949.
 Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c, Buschbach 1964, 1965, Calvert 1963, Grogan 1949a, Hackett 1960a, J. R. Henderson 1958, Kottowski 1953, D. B. McLaughlin 1954, Moss 1936, Rubey 1952, Rudman 1960, 1965, Thwaites 1923, Workman 1935b, 1948, 1950b.
 Structure map: Beck 1965, A. H. Bell 1964, J. C. Bradbury 1965c, Buschbach 1964, Cohee 1945b, 1948a, J. R. Henderson 1958, Howell 1935b, Rudman 1965, Workman 1948.
 Pre-glacial gravel: Salisbury 1895.
 Pre-glacial soils: Johan A. Udden 1898d.
 Pre-glacial valleys (see Bedrock topography)
 Pre-Illinoian till: Wallace Lee 1926, Leighton 1928, 1935d, 1961, MacClintock 1926, 1929, 1933, Johan A. Udden 1915, Wanless 1957a.
 Princeton Bedrock Valley: Horberg 1950a, MacClintock 1959.
 Princeton Limestone (Miss.): Bain 1904a.
 Prospect Hill Siltstone (Miss.): Collinson 1961, 1964b, J. M. Weller 1940b, 1941b, Workman 1956.
 Isopach map: Workman 1956.
 Prosser Member, Dolomite (Ord.): DuBois 1945, Willman 1943b, 1947.
 Providence Moraine: MacClintock 1959.
 Proviso Siltstone Member (Camb.): Buschbach 1964.
Pulaski County
 Bedrock topography: Horberg 1950a.
 Caves: Bretz 1961.
 Clay and shale
 General: J. E. Lamar 1934, 1948, 1959, Parmelee 1921, 1922, Pryor 1962a, Shrode 1953.
 Bonding clay: Grim 1940f, Grogan 1945.
 Chemical analyses: W. A. White 1959a.
 Fuller's earth: Amero 1951, Grim 1933, 1950c, J. E. Lamar 1928e, Nutting 1943.
 Refractory clay: Parmelee 1921, Purdy 1907.
 Resources: Jackman 1965a, W. A. White 1964a.
 Drill records: Fisk 1944, Glenn 1906, Ross Hanson 1950, 1958, J. M. Weller 1940a.
 Feldspar: Willman 1942a.
 Geologic sections (described outcrops)
 Cache River Bluff (Cre., Ter., Pleis.): Pryor 1962a.
 Caledonia Landing (Ter.): J. E. Lamar 1948, Parmelee 1921, Purdy 1907.
 Chalk Bank (Ter.): Parmelee 1921.
 Grand Chain Landing (Cre.): J. E. Lamar 1948.
 Grand Chain (Cre., Ter., Pleis.): Parmelee 1921.
 Douglas Landing (Cre.): J. E. Lamar 1948.
 Levings (Cre.): Pryor 1962a.
 Mounds (Ter.): J. E. Lamar 1948.
 Olmstead (Ter.): J. E. Lamar 1948, Schroyer 1922, L. W. Stephenson 1955.
 Post Creek (Miss., Cre., Pleis.): Pryor 1962a.
 Pulaski (Cre.): J. E. Lamar 1948, Purdy 1907.
 Ullin (Pleis.): J. E. Lamar 1948.
 Villa Ridge (Ter., Pleis.): J. E. Lamar 1948.
 Ground water
 General: Glenn 1906, Leverett 1899a, Horberg 1950a, Pryor 1956a, R. C. Scott 1962, E. M. Shepard 1905.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961.
 Limestone and dolomite
 General: Krey 1925, J. E. Lamar 1934, 1959.
 Agricultural limestone: Van Horn 1907.
 Cement materials: Bleining 1912, J. E. Lamar 1956b, 1959.

Pulaski County—cont.

- Loess: Fehrenbacher 1965b, Pryor 1962a.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, C. L. Cooper 1944, J. E. Lamar 1928e, 1948, Pryor 1962a, J. M. Weller 1940b, Stuart Weller 1939a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Ross 1963.
 Structure: State geol. map, Pryor 1962a, Ross 1963, J. M. Weller 1940a.
 Mineral industries: J. E. Lamar 1928d.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 New Madrid earthquake: E. M. Shepard 1905.
 Ochre and sienna: J. E. Lamar 1948, Hewitt Wilson 1933.
 Oil and gas possibilities: Sargent 1964, J. M. Weller 1940a.
 Physiography: R. F. Flint 1941, Leighton 1948b, Pryor 1962a.
 Quadrangle studies
 Cairo: Pryor 1962a.
 Dongola: Stuart Weller 1939a.
 Vienna: Stuart Weller 1939a.
 LaCenter: Pryor 1962a.
 Sand and gravel
 Greensand: Schroyer 1922.
 Mineralogy and petrology: G. W. Andrews 1958, J. E. Lamar 1951, Pryor 1962a, Shrode 1953, Willman 1942a.
 Molding sand: Littlefield 1925a, 1925b.
 Silica: J. E. Lamar 1953a, Pryor 1962a.
 Springs: Peale 1886.
 Stratigraphy
 General: Bleininger 1912, Pryor 1962a, Ross 1963, Shrode 1953, J. M. Weller 1940a, Stuart Weller 1926c.
 Ordovician: Pryor 1962a.
 Silurian: Pryor 1962a.
 Devonian: J. M. Weller 1944b.
 Mississippian: Swann 1958, 1963, J. M. Weller 1940a, 1940b, Stuart Weller 1939a, Workman 1956.
 Cretaceous: Fisk 1944, J. E. Lamar 1930b, G. E. Murray 1961, Parmelee 1921, Pryor 1960, 1961a, 1962a, Purdy 1907, Ross 1963, J. M. Weller 1940a.
 Tertiary: W. B. Clark 1891, C. L. Cooper 1944, J. E. Lamar 1930b, 1951, McGee 1891, G. E. Murray 1961, Parmelee 1921, Pryor 1961a, 1962a, Purdy 1907, Ross 1963, J. M. Weller 1940a.
 Pleistocene: Fisk 1944, Leighton 1950b, L. L. Ray 1964, J. M. Weller 1940a.
 Structure: Ross 1963, Swann 1958.
 Worthen Survey report (v. 1): Henry Engelmann 1866.

Purinton Shale Member (Pa.): S. E. Ekblaw 1931, Kosanke 1960, Krumbein 1933a, Wanless 1931b, 1955a, 1957a.

Putnam County

- Bedrock topography: Horberg 1950a, Selkregg 1958, Willman 1940.
 Clay and shale: G. H. Cady 1912b, 1919b.

Putnam County—cont.

- Coal
 General: G. H. Cady 1915a, Ill. GS 1913.
 Analyses: G. H. Cady 1912b, 1919b, Parr 1916.
 Mined-out areas: Ill. GS 1959b map 7.
 Mining: Annual coal reports, Andros 1914a, C. O. Sauer 1916.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b.
 Subsidence: L. E. Young 1916b.
 Drill records: G. H. Cady 1915a, Ross Hanson 1950, Johan A. Udden 1914, Willman 1942b.
 Feldspar: R. E. Hunter 1965, Willman 1942a.
 Geologic sections (described outcrops)
 Clear Creek (Pleis.): Horberg 1953.
 Ground water
 General: G. H. Cady 1919b, John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Selkregg 1958.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1961.
 Artesian waters: G. H. Cady 1912b.
 Limestone and dolomite, cement materials: G. H. Cady 1912b, 1919b.
 Loess: Frye 1962e, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Barrows 1910, G. H. Cady 1919b, Horberg 1950a, Meents 1958b.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Barrows 1910, G. H. Cady 1919b, Horberg 1953, C. O. Sauer 1916.
 Glacial: State geol. map, G. E. Ekblaw 1941, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Willman 1942b.
 Structure: State geol. map, G. H. Cady 1915a, 1919b, Willman 1942b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas: G. H. Cady 1919b.
 Gas in drift: Meents 1958b, 1960.
 Physiography: Barrows 1910, G. H. Cady 1912b, 1919b, Leighton 1948b, C. O. Sauer 1916.
 Quadrangle studies
 Hennepin: G. H. Cady 1912b, 1919b.
 LaSalle: G. H. Cady 1912b, 1919b.
 Sand and gravel
 General: G. H. Cady 1912b, 1919b, J. E. Lamar 1934.
 Mineralogy: R. E. Hunter 1965, Willman 1942a.
 Sandstone: G. H. Cady 1919b.
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 Springs: G. H. Cady 1919b.
 Stratigraphy
 General: Barrows 1910, G. H. Cady 1912b, 1919b, C. O. Sauer 1916, Selkregg 1958.
 Ordovician: G. H. Cady 1919b.
 Pennsylvanian: G. H. Cady 1915a, 1919b.
 Pleistocene: Barrows 1910, G. H. Cady 1915a, 1919b, Frye 1965c, Horberg 1953, Leverett 1921, Meents 1958b, C. O. Sauer 1916, Willman 1963.
 Recent: Barrows 1910.

Putnam County—cont.

Structure: G. H. Cady 1912b, 1919b, Horberg 1950a.

Worthen Survey report (v. 5): James Shaw 1873.

Pyrite and marcasite (see also under Coal): Born 1934, J. C. Bradbury 1959b, G. H. Cox 1914, Julien 1902, J. E. Lamar 1965, Willman 1942b, 1946.

In coal: C. G. Ball 1935a, G. H. Cady 1919f, 1920a, 1922, 1935a, Holbrook 1917b, Gilbert Thiessen 1934c, Voskuil 1951c.

Pyromorphite: Grogan 1946.

Q

Quadrangle studies (see under county, quadrangle name)

Quarry Creek Limestone (Pa.): Worthen 1875a(2).
Quaternary System (see also Pleistocene): Broadhead 1870, Frye 1958c, Leighton 1958b, Worthen 1866a(1).

Isopach map: State geol. map.

Quebecan Substage (Pleis.): Leighton 1933a.

Quimby's Mill Limestone, Dolomite (Ord.): Agnew 1956, Doyle 1965, Mullens 1964, Templeton 1952, 1963.

Quincy region

Glacial history: Leighton 1937b.

Mineral resources: J. E. Lamar 1937a.

R

Racine Dolomite (Sil.): Lowenstam 1948a, Norton 1895, Pinsak 1964, Savage 1926, A. H. Sutton 1935, Willman 1943b, 1950, 1962.

Paleogeographic map: Schuchert 1955.

Radio wave transmission: Pullen 1950, 1953.

Radioactivity: J. S. Brown 1954, T. E. Larson 1960, Patterson 1954, Clarence Scholl 1917.

Radiocarbon dating: Antevs 1957, J. R. Arnold 1951, Bretz 1955, R. F. Flint 1955, 1956, Frye 1960b, 1962e, 1963b, 1963c, 1965a, 1965b, 1965c, Horberg 1955a, Hough 1958, Ives 1964, Kempton 1963, Leighton 1958a, A. B. Leonard 1960, Libby 1951, 1952a, 1952b, 1954a, 1954b, Rubin 1955, 1956, 1958, 1960, 1961, 1963, Suess 1954.

Radiocarbon dates from snail shells: Rubin 1963.

Radium²²⁶ (natural) in ground water: Emrich 1963a.

Ralls Ford Shale (Pa.) (see Rolls Ford Shale)

Randolph County

Bedrock topography: Horberg 1950a.

Building stone: Conover 1884.

Caves: Bretz 1961.

Chester area guide leaflet: Ill. GS 1964-F.

Clay and shale

General: Bleininger 1912, J. E. Lamar 1934.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: W. A. White 1960b.

Refractory clay: J. E. Lamar 1956b.

Randolph County—cont.

Coal

General: G. H. Cady 1940b, Ill. GS 1913, F. H. Kay 1915a.

Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1927, 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Lindgren 1908, L. C. McCabe 1934a, Parr 1904, 1906b, 1915a, 1916, 1931, N. H. Snyder 1953.

Ash analyses: Rees 1964.

Ash fusibility: Abernethy 1961.

Chlorine in: Abernethy 1965, Gluskoter 1964.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Losses: C. A. Allen 1925.

Mined-out areas: Ill. GS 1959b map 29.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e.

P, Cl, Na, and K in: Abernethy 1965.

Petrology: L. C. McCabe 1934a.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, DeWolf 1908b.

Strippable reserves: G. H. Cady 1927, Culver 1925b, W. H. Smith 1958.

Subsidence: L. E. Young 1916b.

Drill records: A. H. Bell 1940b, R. F. Blatchley 1911, R. S. Blatchley 1910a, W. S. Blatchley 1906, Gutstadt 1958b, Ross Hanson 1950, 1961, F. H. Kay 1915a.

Earthquakes: M. L. Fuller 1912, Shaler 1869.

Feldspar: Willman 1942a.

Fossil cougar: Leidy 1889.

Geologic sections (described outcrops)

Baldwin (Miss.): J. C. Bradbury 1963.

Chester (Miss.): Nickles 1891.

Chester East (Miss.): Rexroad 1957.

Clifton School East (Miss.): Rexroad 1957.

Coles Mill (Miss.): Harris 1961, Leighton 1939, Rexroad 1957, 1958b, E. O. Ulrich 1917.

Collins (Miss.): J. C. Bradbury 1963.

Ellis Grove (Miss.): J. C. Bradbury 1963.

Ford W.P.A. Quarry (Miss.): Rexroad 1957.

Marigold (Miss.): J. C. Bradbury 1963.

Marigold Northwest (Miss.): Rexroad 1957.

Marlin School (Miss.): Rexroad 1957.

Marys River (Miss.): Harris 1961, Rexroad 1957, Willman 1949.

Marys River (Pleis.): Leighton 1949a.

Menard State Penitentiary (Miss.): Bleininger 1912, Harris 1961, Leighton 1939, Willman 1949.

Modoc (Miss.): J. C. Bradbury 1963, Leighton 1939.

Modoc East (Miss.): Rexroad 1957.

Modoc South (Miss.): Rexroad 1957.

Poland West (Miss.): Rexroad 1957.

Prairie du Rocher (Miss.): Harris 1961.

Reily Lake (Miss.): J. C. Bradbury 1963.

Reily Lake North (Miss.): Rexroad 1957, 1958b.

Roots (Miss.): J. C. Bradbury 1963.

Roots West (Miss.): Rexroad 1957.

Ruma (Miss.): J. C. Bradbury 1963.

Randolph County—cont.

Geologic sections—cont.

Schuline, Sparta Southwest (Pleis.): MacClintock 1926, 1929, Willman 1963.

Geophysical studies: Pryor 1956c.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c.

Analyses: Bartow 1909b, Gluskoter 1965a, Ross Hanson 1950, 1961.

Limestone and dolomite

General: Krey 1925, J. E. Lamar 1934.

Agricultural limestone: Van Horn 1907.

Cement materials: Bleiningner 1912, J. E. Lamar 1956b.

Mineralogy: Grim 1937a.

Resources: J. W. Baxter 1960b, J. C. Bradbury 1963.

Loess: Frye 1962e, Leighton 1950a, G. F. Wright 1890.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, J. C. Bradbury 1963, J. M. Weller 1940b, Stuart Weller 1939b.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Structure: A. H. Bell 1929a, 1940b, 1961c, R. S. Blatchley 1910a, G. H. Cady 1940b, F. H. Kay 1915a, Moulton 1926e, Root 1928, E. W. Shaw 1912a.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Meteorite: Crook 1930.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Grout 1906, Root 1928.

Development maps: Ill. GS 1965 map 26.

Natural gas: Bain 1908a, Weeks 1892a.

Possibilities: A. H. Bell 1940b, R. S. Blatchley 1910a, W. S. Blatchley 1906, Moulton 1926e.

Sparta Pool: A. H. Bell 1940b.

Underground gas storage: A. H. Bell 1961c.

Physiography: Cozzens 1940, R. F. Flint 1941, Leighton 1948b, MacClintock 1929.

Quadrangle studies

Baldwin: Stuart Weller 1939b.

Campbell Hill: Stuart Weller 1939b.

Chester: Stuart Weller 1939b.

Renault: Stuart Weller 1939b.

Sand and gravel

Mineralogy: Willman 1942a.

Molding sand: Littlefield 1925a, 1925b.

Sandstone: Biggs 1955, J. C. Bradbury 1962a, Mast 1963, P. E. Potter 1962a, 1962c, 1963a, Siever 1953, 1956b.

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Sparta area guide leaflet: Ill. GS 1961-A.

Stratigraphy

General: R. S. Blatchley 1910a, W. S. Blatchley 1906, Bleiningner 1912, Harris 1961, Leighton 1939, Stuart Weller 1939b.

Orodovician: Gutstadt 1958b.

Silurian: Lowenstam 1949b.

Devonian: Workman 1944.

Mississippian: J. W. Baxter 1960b, J. C. Bradbury 1963, Butts 1917a, 1929, Coryell

Randolph County—cont.

Stratigraphy—cont.

Mississippian—cont.

1939a, Croneis 1932a, P. L. Dana 1941, James Hall 1857b, Keyes 1922b, 1936, McFarlan 1942, Nickles 1891, Rexroad 1965b, Romer 1934, Root 1928, Shumard 1860, A. H. Sutton 1932, 1934a, 1934b, 1940, Swallow 1868, Swann 1958, 1963, 1964, Tippie 1942, E. O. Ulrich 1917, J. M. Weller 1940b, Stuart Weller 1913, 1920a, 1928, 1939b, Willman 1949, Workman 1956, Zeller 1953.

Pennsylvanian: J. C. Bradbury 1962a, L. G. Henbest 1928b, F. H. Kay 1915a, Romer 1934, Wanless 1947b, J. M. Weller 1930a, 1936a, 1942c.

Pleistocene: Frye 1965c, Leverett 1899a, MacClintock 1926, 1929, 1933, Willman 1963, G. F. Wright 1890.

Structure: A. H. Bell 1929a, 1940b, F. H. Kay 1916a, Moulton 1926e, Root 1928, Stonehouse 1955, Stuart Weller 1915, 1939b.

Tilden meteorite: Wylie 1927.

Uranium: Ostrom 1955.

Worthen Survey report (v. 1): Worthen 1866a(5).

Ransom Syncline: Willman 1942b.

Rare earths: J. C. Bradbury 1960a, 1962b, Trace 1960.

Rattlesnake Ferry Fault Zone: Desborough 1958, 1961c, Heyl 1965, J. M. Weller 1940c.

Recent Stage, Alluvium (Pleis.) (see also rivers, lakes, reservoirs): J. R. Ball 1952, Bretz 1955, Frye 1960b, J. P. Todd 1938, Wanless 1957a, Willman 1942b.

Bogs: Waterman 1923.

Dunes: Gates 1910.

Radiocarbon dates: Rubin 1960.

Heavy minerals: J. E. Lamar 1937b.

Rectorite: W. F. Bradley 1950a.

Reefs (see Niagaran reefs, Silurian reefs)

Reel Limestone Member (Pa.): G. H. Cady 1955, Kosanke 1960, Pryor 1956b, Worthen 1875a(2).

Isopach map: Pryor 1956b.

Structure map: Pryor 1956b.

Reelsville Limestone Member (Miss.): Swann 1963.

Reisner Limestone Member (Pa.) (see Newton Ls.): Kosanke 1960.

Relic dunes: Gates 1910.

Renault Limestone (Miss.): Atherton 1947, J. W. Baxter 1963a, 1965a, J. C. Bradbury 1963, Brecke 1962, Butts 1929, C. L. Cooper 1941, Coryell 1939a, Croneis 1939e, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, J. E. Lamar 1925a, 1959, Moulton 1929a, J. M. Parks 1953, Pinsak 1957, P. E. Potter 1958a, E. W. Shaw 1921, 1923, Smoot 1960c, A. H. Sutton 1951, 1952, Swann 1956, 1963, Tippie 1942, 1943, E. O. Ulrich 1917, J. M. Weller 1939e, 1940a, 1940b, 1940c, 1952, Stuart Weller 1913, 1914, 1920b, 1939a, 1939b, Workman 1940.

Fauna: Croneis 1932a, Geis 1936, McFarlan 1942, A. H. Sutton 1939, Zeller 1953.

Paleogeographic map: Schuchert 1955.

Structure map: J. M. Weller 1952.

- Renault Quadrangle: Stuart Weller 1939b.
 Reno Anticline: A. H. Bell 1941b.
 Repton Quadrangle: J. W. Baxter 1963a.
 Reynoldsburg Coal Member (Pa.): G. H. Cady 1952b, Kosanke 1950, 1960, W. H. Smith 1957, J. M. Weller 1940a, Winslow 1959.
 Ribeyre Island Pool: Swann 1951b.
- Richland County**
 Bedrock topography: Horberg 1950a.
 Brines: Meents 1952.
 Clay and shale
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: Smoot 1960a, W. A. White 1960b.
 Coal
 General: Siever 1951b.
 Analyses: G. H. Cady 1944.
 Coal balls: Feliciano 1924, M. C. Fisher 1939, Mamay 1953, Noe' 1934b.
 Mined-out areas: Ill. GS 1959b map 25.
 Mining and production: Annual coal reports.
 Reserves: G. H. Cady 1944, 1952b, Siever 1951b.
 Strippable reserves: Culver 1925b.
 Drill records: R. S. Blatchley 1910a, Ross Hanson 1950, 1958, Worthen 1883(1).
 Geologic sections (described outcrops)
 Bonpas Creek (Pa.): Kosanke 1960.
 Martinsville Dome Vicinity (Pa.): Newton 1937b.
 Geophysical studies: Pryor 1956c.
 Ground water
 General: Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961.
 Limestone and dolomite: Graf 1950b, Grogan 1940.
 Loess: Fehrenbacher 1965b.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Newton 1937b.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: L. K. Lee 1939b, Siever 1951a.
 Structure: A. H. Bell 1943c, Easton 1943, Siever 1951a, 1951b, Swann 1951b.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 General: Theron Wasson 1938.
 Development maps: Ill. GS 1965 maps 40, 41, 54.
 Physical properties: Armon 1964.
 Possibilities: Easton 1943.
 Sand properties: Piersol 1940.
 Waterflooding: Pryor 1957, Squires 1950a.
 Physiography: Leighton 1948b, MacClintock 1929.
 Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962a, 1962c, 1963a.
 Stratigraphy
 General: A. H. Bell 1964, R. S. Blatchley 1910a, Selkregg 1957.
- Richland County—cont.
 Stratigraphy—cont.
 Mississippian: Coryell 1939a, L. K. Lee 1939b, Siever 1951a, Swann 1951b, 1956, 1958.
 Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, Kosanke 1960, Newton 1937b, Siever 1951a, 1951b, Wanless 1955b, J. M. Weller 1942c, Worthen 1883(1).
 Structure: Easton 1943, L. K. Lee 1939b, Swann 1951b.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 6): Worthen 1875b(2).
- Richland Loess (Pleis.) (see Tazewell Loess): Frye 1960a, 1962e, 1963b, 1963c, 1965a, 1965b, 1965c, A. B. Leonard 1951, 1960.
 Richmond Limestone, Group (Ord.): Bleining 1912, Bowman 1907, D. J. Fisher 1925a, 1938, C. O. Sauer 1916, Savage 1908, Thwaites 1923, Stuart Weller 1907d, 1916a.
 Richmondian Stage (Ord.): Savage 1924b, 1925b, Templeton 1963.
 Rickenburg Pool: Root 1928.
 Ridenhower Formation (Miss.): J. W. Baxter 1963a, 1965a, Butts 1917a, Ross 1964b, Swann 1948, 1956, 1963, E. O. Ulrich 1917.
 Ridge Fault: J. W. Baxter 1965a.
 Ridgely Sand: Mylius 1927.
 Ridgeway Fault: G. H. Cady 1939e, J. A. Harrison 1951, Pryor 1956b, Pullen 1951.
 Ridgeway-Omaha Monocline, Fault: G. H. Cady 1919a, 1939e.
 Ripley Formation (Cre.) (see McNairy Fm.): Boswell 1965, Cushing 1964, Glenn 1906, J. E. Lamar 1930b, Parmelee 1921, Purdy 1907.
 Distribution map: J. E. Lamar 1930b.
 Isopach map: Boswell 1965.
 Structure map: Boswell 1965.
 Ripley Syncline: Wanless 1957a.
 Ripple marks (see under Sedimentary structures)
 River Forest Quadrangle: Bretz 1943, 1955.
 River Ticona: Bretz 1955, Horberg 1950a, Willman 1940, 1942b.
 Riverside Quadrangle: W. C. Alden 1902.
 Rivoli Member (Ord.): Doyle 1965, Templeton 1952, 1963.
 Road-building materials: Voskuil 1944a.
 Robeson Hills: Fidar 1948.
 Robinson Dike: J. W. Baxter 1965a, J. C. Bradbury 1962b.
 Robinson Pool: Bain 1908h, Squires 1946.
 Robinson Sand, Pay Zone: R. S. Blatchley 1912e, 1913a, Piersol 1940, Rich 1916a, Squires 1943e.
 Isopach map: Squires 1943e.
 Structure map: R. S. Blatchley 1913a, Squires 1943e.
 Roby Pool: Whiting 1956.
 Roby Silt: W. H. Johnson 1964.
 Rocher Limestone Member (Miss.): J. W. Baxter 1960b.
 Rock Branch Coal Member (Pa.) (see also Scottsville Coal): Kosanke 1960.
 Rock Creek Bedrock Valley: Horberg 1950a.
 Rock Creek Fault: J. M. Weller 1952, Stuart Weller 1920b.

- Rock Creek Graben: J. W. Baxter 1963a, 1965a, Heyl 1965, McGinnis 1964, Ross 1963, 1964b, J. M. Weller 1952.
- Rock Creek Limestone (Pa.): G. H. Cady 1921, E. W. Shaw 1913, Wanless 1939, Worthen 1873(1).
- Fauna: E. W. Shaw 1913.
- Rock Island (No. 1) Coal (Pa.): Andros 1915a, 1915b, Bement 1909, G. H. Cady 1921, 1937c, 1942a, 1952b, Culver 1925a, F. H. Kay 1915a, Kosanke 1950, 1960, Wallace Lee 1917, Reinertsen 1964, Savage 1921a, 1921b, 1921c, W. H. Smith 1963, Wanless 1929a, 1932b, 1939, 1952, 1955a, 1957a, 1961, J. M. Weller 1939b, Winslow 1959, Worthen 1882c, L. E. Young 1916b.
- Beryllium in: Stadnichenko 1961.
- Isopach map: G. H. Cady 1935a.
- Structure map: Wanless 1929a.
- Rock Island County**
- Bedrock topography: Carman 1910, Horberg 1950a.
- Building stone: Conover 1884.
- Caves: Bretz 1961.
- Chert: J. E. Lamar 1934.
- Clay and shale
- General: Bleining 1912, J. E. Lamar 1934, Parmelee 1921, 1922, Savage 1921b.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- In coal mines: Stull 1917.
- Mineralogy: Parham 1961, C. W. Rolfe 1908, W. A. White 1960b.
- Petrology: C. W. Rolfe 1908.
- Refractory clay: Lines 1917, Purdy 1907.
- Coal
- General: Culver 1925a.
- Analyses: G. H. Cady 1935b, 1948a, Parr 1916, Savage 1921b.
- Mined-out areas: Ill. GS 1959b maps 3, 4.
- Mining: Annual coal reports, Andros 1915b, Savage 1921b.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1952b, Culver 1925a.
- Subsidence: L. E. Young 1916b.
- Drill records: Bartow 1909b, Ross Hanson 1950, 1958, 1961, Savage 1921b, Johan A. Udden 1896, 1898c, 1914, Wanless 1929a.
- Feldspar: R. E. Hunter 1965, Willman 1942a.
- Geologic sections (described outcrops)
- Andalusia-Illinois City (Pa.): Savage 1921b.
- Black Hawk State Park (Dev., Miss.): Savage 1921b.
- Cady Quarry (Dev.): W. E. Ekblaw 1912.
- Camp Creek (Pa.): Savage 1921b.
- Carbon Cliff (Pa.): Purdy 1907.
- Coal Creek (Pa.): Savage 1921b.
- Copperas Creek (Pleis.): Savage 1921b.
- Fancy Creek (Dev.): W. E. Ekblaw 1912.
- Jimtown School (Pa., Pleis.): Savage 1921b.
- Loud Thunder State Park (Pleis.): Horberg 1956b.
- Milan Quarry (Dev., Pleis.): Collinson 1958d, Horberg 1956b.
- Mill Creek (Pleis.): Horberg 1956b.
- Moline Airport (Pleis.): Leighton 1949a.
- Rock Island County—cont.
- Geologic sections—cont.
- Rock Island (Dev.): James Hall 1858, Johan A. Udden 1897.
- Sears (Pa., Pleis.): Savage 1921b.
- Ground water
- General: Bergstrom 1956a, Horberg 1950a, Leverett 1899a, Lohr 1953, Savage 1921b, Thwaites 1927.
- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
- Artesian wells: W. H. Pratt 1882.
- Limestone and dolomite
- General: Krey 1925, J. E. Lamar 1934, Savage 1921b, Willman 1943b.
- Cement materials: Bleining 1912, J. E. Lamar 1956b, Savage 1921b.
- Mineralogy: Grim 1937a.
- Loess: Carman 1910, Frye 1962e, Leighton 1950a, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Carman 1910, Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Carman 1910, Savage 1921b.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Savage 1921b, Shaffer 1954a, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Structure: State geol. map, Buschbach 1965, Horberg 1950a, Thwaites 1927.
- Mastodon: N. C. Anderson 1905, Bagg 1909.
- Milan-Rock Island area guide leaflet: Ill. GS 1960-D.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Mississippi River sediments: Péwé 1944.
- Oil and gas possibilities: Savage 1921b.
- Physiography: Carman 1910, Leighton 1948b, Savage 1921b.
- Quadrangle studies
- Edgington: Savage 1921b.
- Milan: Savage 1921b.
- Sand and gravel
- General: Savage 1921b, Johan A. Udden 1898b.
- Dune sand: Carman 1910.
- Mineralogy: R. E. Hunter 1965, Willman 1942a.
- Molding sand: Littlefield 1925a, 1925b, Willman 1939b.
- Sandstone: J. C. Bradbury 1962a, Siever 1956b.
- Soil report 31
- Springs: Peale 1886.
- Stratigraphy
- General: Bergstrom 1956a, Bleining 1912, Buschbach 1965, Carman 1910, James Hall 1858, Savage 1921b, Tiffany 1885, Johan A. Udden 1896.
- Cambrian: Buschbach 1964, Savage 1921b.
- Ordovician: Agnew 1955b, Buschbach 1965, Gutstadt 1958b, Savage 1921b.
- Silurian: Lowenstam 1949b, 1950, Norton 1895, Savage 1921b, 1926, A. H. Sutton 1935, Willman 1943b, Worthen 1862.
- Devonian: Eastman 1908, W. E. Ekblaw 1912, Savage 1920, 1921b, 1921d, Stainbrook 1944, Johan A. Udden 1897, 1898a, Warthin 1944.

Rock Island County—cont.

Stratigraphy—cont.

Pennsylvanian: Barris 1883, J. C. Bradbury 1962a, Culver 1924, 1925a, O'Brien 1963b, Parham 1961, Savage 1921b, 1927, Wanless 1931b, 1932b, J. M. Weller 1930e, 1931d, 1942c.

Pleistocene: W. C. Alden 1917, F. C. Baker 1928b, Horberg 1956b, Leighton 1923a, Leverett 1899a, 1942b, Savage 1921b, Shaffer 1954a, Staplin 1963b, Johan A. Udden 1898d, Willman 1963.

Structural materials: Jon A. Udden 1910b.

Structure: Horberg 1950a, Savage 1921b, Thwaites 1927.

Uranium: Ostrom 1955.

Worthen Survey report (v. 5): Worthen 1873(2).

Rock Island region, Pennsylvanian overlap: Wanless 1932b.

Rock products, resources: Leighton 1944d.

Rock River Bedrock Valley: Horberg 1953, Workman 1937b.

Rock River Hill Country: Leighton 1948b.

Rock River Valley: W. C. Alden 1909, 1918, Bretz 1923, Everett 1861, John Webster Foster 1956, Hackett 1960a, Knappen 1926, Leighton 1923a, McGinnis 1963b, Deette Rolfe 1929, Shaffer 1954a, Swezey 1893, Templeton 1952.

Rock River watershed: Pickels 1929.

Rock wool: Fryling 1935, 1937, Ill. GS 1935c, 1936d, J. E. Lamar 1934, Leighton 1934e, 1936c, Machin 1940, F. H. Reed 1934.

Rockdale Moraine: Athy 1928, D. J. Fisher 1925a.

Rockford region (see Rock River Valley, Winnebago Co): Bretz 1923, Frye 1965a, Hackett 1960a, Horberg 1950a, Kempton 1963, Leighton 1963, J. N. Payne 1938, Salisbury 1918, Shaffer 1956, Willman 1943b, Workman 1937b.

Rockford Limestone (Miss.): J. M. Weller 1940b.

Rocks and minerals of Illinois: G. E. Ekblaw 1931c, Ill. GS 1959a.

Rocks, common rock types: Condit 1957b.

Roland Pool: Swann 1951b.

Rolls (Ralls) Ford Shale (Pa.): Savage 1915, E. W. Shaw 1913, Wanless 1939.

Rome Formation (Camb.): Calvert 1963.

Roodhouse Coal Member (Pa.): Kosanke 1960.

Roodhouse Quadrangle, Pleistocene stratigraphy: Leighton 1928.

Rose Creek Fault: J. S. Brown 1954, J. M. Weller 1952.

Roselle Moraine: Zeisel 1962a.

Rosiclare Dike: Bain 1905a, J. W. Baxter 1965a, Stuart Weller 1920b.

Rosiclare District (see Fluorspar District)

Rosiclare Fault: J. W. Baxter 1965a, J. M. Weller 1952, Stuart Weller 1920b.

Rosiclare Quadrangle: J. W. Baxter 1965a.

Rosiclare Sandstone Member (Miss.): Bain 1905a, J. W. Baxter 1963a, 1965a, Brecke 1962, Currier 1944, Folk 1946, Harris 1961, L. K. Lee 1939b, J. N. Payne 1940, Swann 1948, 1963, Tippie 1945, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1906b, 1907b, 1920b, 1939a.

Structure map: Brecke 1962, Currier 1944.

Roubidoux Formation (Ord.): Workman 1948.

Rough Creek Fault Zone, Rough Creek-Shawneetown Fault (see also Shawneetown Fault): A. H. Bell 1938f, 1964, S. K. Clark 1948, Cohee 1962, Hager 1949, Heyl 1961, Moss 1936, Oesterling 1952, W. L. Russell 1938, Swann 1951a, Wanless 1955b, Workman 1950b.

Roxana Silt, Loess (Pleis.) (see Farmdale Loess): Fehrenbacher 1965a, 1965b, Frye 1960b, 1962e, 1963b, 1963c, 1965a, 1965b, 1965c, R. L. Jones 1964, A. B. Leonard 1960, Pryor 1962a, Ross 1964b.

Artifact in: Munson 1965.

Radiocarbon dates: Rubin 1960, 1963.

Rubber, synthetic

Raw material for: C. M. Thompson 1942.

Ruma Formation (Miss.) (see Cypress Ss.): Leighton 1939, E. O. Ulrich 1917, J. M. Weller 1940b, Stuart Weller 1913, 1914, 1939b.

Rushville Coal (Pa.): Bement 1929, Culver 1925a.

Rushville Northwest Pool: R. H. Howard 1961.

Russellville Dome: Cohee 1939.

Russellville Pool: Peterson 1942a.

S

Saccharoidal Sandstone (St. Peter Ss.): Broadhead 1904.

Sag Bridge Quadrangle: Bretz 1943, 1955.

Saginaw Lobe: Willman 1963, Zumberge 1960.

St. Clair County

Bedrock topography: Bergstrom 1956b, Horberg 1950a.

Brines: E. S. Bastin 1926a, Meents 1952.

Building stone: Conover 1884.

Caves: Bretz 1961, Fenneman 1910.

Clay and shale

General: Fenneman 1910, 1911, J. E. Lamar 1934.

Bonding clay: Grim 1940f.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: Atherton 1960, W. A. White 1960b.

Petrology: Grim 1957.

Resources: Jackman 1965a, Parham 1963a.

Coal

General: G. H. Cady 1940b, Fenneman 1910, 1911, Ill. GS 1913, F. H. Kay 1915a, J. N. Payne 1941, Johan A. Udden 1915, Worthen 1866a(5).

Analyses: Abernethy 1961, Aresco 1953-1965, Ashley 1902, G. H. Cady 1927, 1934, 1935b, 1948a, Fenneman 1911, Fieldner 1942b, Hawley 1923, Helfinstine 1946, J. A. Holmes 1908, L. C. McCabe 1934a, 1935, E. W. Parker 1906b, Parr 1904, 1906b, 1915a, 1916, E. W. Shaw 1921, N. H. Snyder 1953, Johan A. Udden 1908c, 1915.

Ash analyses: Rees 1964.

Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.

Chlorine in: Abernethy 1965, Gluskoter 1964.

Coke: Weeks 1884.

St. Clair County—cont.

Coal—cont.

- Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.
 Losses: C. A. Allen 1925.
 Mined-out areas: Ill. GS 1959b maps 27, 29.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e.
 P, Cl, Na, and K in: Abernethy 1965.
 Petrology: L. C. McCabe 1934a.
 Physical tests: J. A. Holmes 1908, E. W. Parker 1906a.
 Preparation: Boley 1949, L. C. McCabe 1934a, 1935, 1939a, Mitchell 1937.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, DeWolf 1908b.
 Strippable reserves: G. H. Cady 1927, Culver 1925b, W. H. Smith 1958.
 Subsidence: L. E. Young 1916b.

- Drill records: A. H. Bell 1929b, 1940b, Bergstrom 1956b, R. S. Blatchley 1910a, Cohee 1941b, Fenneman 1907, Ross Hanson 1950, 1958, 1961, F. H. Kay 1915a, Leverett 1899a, Meents 1959, Schicht 1965, Searcy 1952, E. W. Shaw 1921, E. M. Shepard 1907, Johan A. Udden 1915, Worthen 1883(1).
 Dupo area guide leaflet: Ill. GS 1963-F.
 Earthquakes: Heinrich 1950.
 Feldspar: R. E. Hunter 1965, Willman 1942a.

Geologic sections (described outcrops)

- Belleville (Pa.): Johan A. Udden 1915.
 Columbia South (Pa.): Parmelee 1921.
 Dupo Quarry (Miss.): Rexroad 1965a.
 Floraville (Miss.): Rexroad 1957.
 Freeburg (Pa.): J. E. Lamar 1934.
 French Village (Pleis.): Frye 1962e, 1963c.
 Hecker (Miss.): J. C. Bradbury 1963.

Ground water

- General: Bergstrom 1956b, Bowman 1907, Bruin 1953, Fenneman 1910, 1911, Horberg 1950a, Kazmann 1958, Leverett 1899a, Lohr 1953, Schicht 1965, Searcy 1952, Selkregg 1957, E. W. Shaw 1921, Johan A. Udden 1915, Walton 1965.

- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, A. W. Palmer 1897.

Karst topography: Bowman 1907.

Limestone and dolomite

- General: Fenneman 1911, Krey 1925, J. E. Lamar 1934.
 Building stone: Fenneman 1910, Johan A. Udden 1915.

- Cement materials: Bleininger 1912, J. E. Lamar 1956b.

- Mineralogy: Grim 1937a.

- Resources: J. W. Baxter 1960b, J. C. Bradbury 1963.

- Loess: Bowman 1907, Fenneman 1910, Frye 1962e, Leighton 1950b, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

- Bedrock topography: Bergstrom 1956b, Horberg 1950a, Johan A. Udden 1915.

- Drift thickness: State geol. map.

- Geologic: State geol. map, Bergstrom 1956b, J. C. Bradbury 1963, E. W. Shaw 1921, Johan A. Udden 1915, J. M. Weller 1940b, Stuart Weller 1939b.

St. Clair County—cont.

Maps—cont.

- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

- Mineral industries: Ill. GS 1961.

- Paleogeologic: Workman 1956.

- Structure: A. H. Bell 1929a, 1929b, 1940b, 1943c, 1961c, G. H. Cady 1940b, F. H. Kay 1915a, Meents 1959, Moulton 1925d, J. N. Payne 1941, E. W. Shaw 1912a, 1921, Squires 1943e, Johan A. Udden 1908c, 1915.

- Meteorite: Crook 1930.

- Mineral economics: Risser 1962b.

- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

- General: Johan A. Udden 1915.

- Development maps: Ill. GS 1965 maps 31, 45.

Pools

- Dupo: A. H. Bell 1929b, 1939f, Cohee 1941b, Newcombe 1931, Squires 1943e, Willman 1949.

- Freeburg: Meents 1959.

- Waterloo: A. H. Bell 1929b.

- Possibilities: A. H. Bell 1929a, Fenneman 1911, Moulton 1925d.

- Sand properties: Piersol 1940.

- Secondary recovery: Squires 1943e.

- Underground gas storage: A. H. Bell 1961c, 1962b.

- Physiography: Bowman 1907, Fenneman 1907, 1910, R. F. Flint 1941, Leighton 1948b, MacClintock 1929, E. W. Shaw 1921, Johan A. Udden 1915.

Quadrangle studies

- Baldwin: Stuart Weller 1939b.

- Belleville: Johan A. Udden 1915.

- Breese: Johan A. Udden 1915.

- New Athens: E. W. Shaw 1921, Stuart Weller 1939b.

- Okawville: E. W. Shaw 1921.

- St. Louis: Fenneman 1911.

- Waterloo: Stuart Weller 1939b.

- Radiocarbon dates: Horberg 1955a, Rubin 1956.

Sand and gravel

- General: Fenneman 1910, 1911.

- Mineralogy: R. E. Hunter 1965, Willman 1942a.

- Molding sand: Littlefield 1925a, 1925b.

- Sandstone: J. C. Bradbury 1962a, P. E. Potter 1961a, 1962a, Siever 1956b.

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- Springs: Bowman 1907.

Stratigraphy

- General: A. H. Bell 1929b, Bergstrom 1956b, R. S. Blatchley 1910a, Bleininger 1912, Bowman 1907, Fenneman 1907, 1910, 1911, Meents 1959, Selkregg 1957, E. W. Shaw 1921, Swann 1958, Johan A. Udden 1915, Stuart Weller 1939b.

- Ordovician: A. H. Bell 1964, Gutstadt 1958b.

- Silurian: Lowenstam 1949b.

- Devonian: Workman 1944.

- Mississippian: J. W. Baxter 1960b, J. C. Bradbury 1963, Croneis 1932a, Fenneman 1911, Lalicker 1948, McFarlan 1942, A. H. Sutton 1934a, 1934b, 1939, 1940, Swann 1958, 1965, J. M. Weller 1940b, Stuart

- St. Clair County—cont.
Stratigraphy—cont.
Mississippian—cont.
Weller 1908, 1920a, 1928, 1939b, Workman 1956.
Pennsylvanian: J. C. Bradbury 1962a, L. G. Henbest 1928b, F. H. Kay 1915a, Lesquereux 1866a, Parham 1963a, P. E. Potter 1961a, E. W. Shaw 1912a, W. H. Smith 1958, Johan A. Udden 1908c, 1915, Wanless 1934, 1947b, J. M. Weller 1930a, 1942c, Worthen 1883(1).
Pleistocene: Fenneman 1911, Frye 1965c, Leighton 1959, 1961.
Structural materials: Jon A. Udden 1910b.
Structure: A. H. Bell 1929a, 1929b, 1940b, Broadhead 1889, Moulton 1925d, Johan A. Udden 1915, Stuart Weller 1939b.
Uranium: Ostrom 1955.
Valmeyer area guide leaflet: Ill. GS 1961-F.
Worthen Survey report (v. 1): Worthen 1866a(5).
- St. Clair Limestone (Sil.): J. E. Lamar 1959, Lowenstam 1949b, Pryor 1962a, Ross 1964b, J. M. Weller 1952.
- St. Croixan Series (see also Croixan): Workman 1950b.
- St. David Anticline: Wanless 1957a.
- St. David Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, P. E. Potter 1963a, Wanless 1931a, 1957a, Willman 1942b.
Fauna: Wanless 1958.
Isopach map: P. E. Potter 1963a, Wanless 1963a.
Sandstone, isopach map: P. E. Potter 1962c.
- St. David Limestone Member (Pa.) (see Absher Ls.): Kosanke 1960, Reinertsen 1964, Siever 1957a, Wanless 1939, 1955a, 1955b, 1957a, J. M. Weller 1942c.
- St. Francisville, drilling near: A. H. Bell 1928d.
- St. Francisville Pool: Rich 1916b, Squires 1943e.
- Ste. Genevieve Limestone (Miss.): Bain 1905a, J. R. Ball 1952, J. W. Baxter 1963a, 1963b, 1965a, 1965b, R. S. Blatchley 1913a, 1914a, Bleiningner 1912, Butts 1925, Collingwood 1933, Collinson 1954, 1958e, Coryell 1939a, Currier 1944, English 1948, Kahle 1965, Keyes 1892b, Krey 1924, J. E. Lamar 1925a, 1925c, 1950a, 1955a, 1959, L. K. Lee 1939b, McGinnis 1961b, R. C. Moore 1935, Mylius 1919, 1927, J. N. Payne 1940, Pettijohn 1964, Pinsak 1957, P. E. Potter 1963c, Rich 1916a, 1916b, Ross 1964b, E. W. Shaw 1921, Shrode 1947, 1949, Shumard 1860, Swann 1956, 1963, E. O. Ulrich 1917, J. M. Weller 1939e, 1940a, 1940b, 1940c, 1952, Stuart Weller 1906b, 1907a, 1914, 1920b, 1939a, 1939b, Whiting 1959, J. S. Williams 1957, Workman 1937a, Worthen 1860a.
Cerebroid oolites: Carozzi 1963.
Fauna: Rexroad 1963, Stuart Weller 1916b.
Isopach map: Swann 1958.
Paleogeographic map: Schuchert 1955.
Structure map: S. K. Clark 1948, Hager 1937, Lowenstam 1946, Whiting 1959.
- Ste. Genevieve Fault Zone: S. K. Clark 1948, Cohee 1962, Heyl 1965, McGinnis 1961b, Swann 1951a, 1958.
- Ste. Genevieve-Chester contact: A. H. Sutton 1951.
- St. Jacobs Pool: A. H. Bell 1961c, Lowenstam 1948b, Spitznagel 1942, Sterrett 1942.
- St. Jacobs, underground gas storage: A. H. Bell 1962b.
- St. James Anticline: Newton 1941, D. L. Stevenson 1964.
- St. James Member (Ord.): Doyle 1965, Templeton 1952, 1963.
- St. James Pool: Newton 1941, D. L. Stevenson 1964.
- St. Lawrence Formation (Camb.): C. B. Anderson 1919.
- St. Louis area, Pleistocene geology: Willman 1958a.
- St. Louis Depression: W. V. Searight 1961.
- St. Louis district, oil and gas: H. A. Wheeler 1909.
- St. Louis Limestone (Miss.): Bain 1905a, J. R. Ball 1952, Bannister 1870, Barton 1918, J. W. Baxter 1963a, 1965a, 1965b, A. H. Bell 1932e, R. S. Blatchley 1913a, Bleiningner 1912, Butts 1925, Collingwood 1933, Collinson 1954, 1957, 1958e, 1964b, Coryell 1919, Currier 1922, 1944, George Engelmann 1847, Henry Engelmann 1866, English 1948, Fenneman 1910, 1911, Folk 1946, Gordon 1890, 1895, H. A. Green 1870, James Hall 1857b, 1859, Harris 1961, Harvey 1964, Hinds 1919, R. H. Howard 1961, Keyes 1892b, 1923b, Krey 1924, Krumbein 1951, Lalicker 1948, J. E. Lamar 1950a, 1959, Morse 1915, Mylius 1927, Nebel 1919, J. N. Payne 1940, Pinsak 1957, Pryor 1962a, Rich 1916a, 1916b, Rubey 1952, Savage 1921c, Saxby 1957, E. W. Shaw 1921, Spreng 1961, Van Tuyl [1925], Wanless 1957a, J. M. Weller 1939e, 1940a, 1940b, 1940c, 1941b, 1952, Stuart Weller 1906b, 1907b, 1908, 1914, 1920b, 1939a, 1939b, J. S. Williams 1957, Worthen 1866a(3), 1868(2), 1870, 1873(1).
Fauna: Meek 1873, Rexroad 1963, Worthen 1883(2).
Isopach map: Saxby 1957.
Paleogeographic map: Schuchert 1955.
Structure map: Spitznagel 1942.
- St. Louis Quadrangle: Fenneman 1910, 1911, Heyl 1965.
- St. Paul Pool: D. L. Stevenson 1964.
- St. Peter Sandstone: Agnew 1956, W. C. Alden 1902, C. B. Anderson 1919, Athy 1928, Bain 1905b, Bannister 1870, Barrows 1910, Bartow 1909b, A. H. Bell 1961c, 1964, Berkey 1906, Bevan 1925b, 1939, R. S. Blatchley 1914a, Bleiningner 1912, Bowman 1907, Bretz 1923, Broadhead 1904, Buschbach 1961, 1964, 1965, G. H. Cady 1915a, 1918b, 1919b, 1920b, Collinson 1954, G. H. Cox 1914, Culver 1922a, Dapples 1955, Doyle 1965, Dake 1921, Edson 1935, Fenneman 1911, D. J. Fisher 1925a, John Webster Foster 1956, Freeman 1868, J. W. Goldthwait 1909, Grabau 1937, Hackett 1960a, Hershey 1894, Horberg 1950b, Keyes 1917a, Knappen 1926, Krey 1924, J. E. Lamar 1927b, 1928b, Leverett 1896, Ostrom 1964, J. J. Porter 1962, P. E. Potter 1963c, Deette Rolfe 1929, Rubey 1952, Sardeson 1926, C. O. Sauer 1916, Savage 1921b, 1921c, James Shaw 1873, Schrock 1933, Templeton 1952, 1963, Thiel 1935, Thwaites 1923, 1927, Trowbridge 1917,

St. Peter Sandstone—cont.

Johan A. Udden 1896, Wanless 1929a, 1957a, Whitney 1866, Willman 1942b, 1943a, J. M. Weller 1940a, 1952, Stuart Weller 1906b, 1907b, Workman 1948, Worthen 1866a(4), 1870, Zeisel 1962a.

Distribution map: Berkey 1906, Dapples 1948, Thiel 1935.

Isopach map: A. H. Bell 1964, Buschbach 1964, Dapples 1948, J. E. Lamar 1928b, 1935c, Sloss 1960, Willman 1942b.

Lithofacies map: Sloss 1960.

Mineralogy and petrology: Ernst 1964, J. E. Lamar 1928b, Thiel 1935, Wadell 1935, Willman 1942b.

Paleogeographic map: Schuchert 1955.

Pre-St. Peter unconformity: Buschbach 1964, G. H. Cady 1919b, 1920b, G. E. Ekblaw 1930b, Willman 1942b, 1943a.

Sand-shale ratio: Sloss 1960.

Sedimentary structures: J. E. Lamar 1927d.

Structure map: Athy 1928, A. H. Bell 1961c, Buschbach 1964, G. H. Cady 1919b, 1920b, Culver 1922a, G. E. Ekblaw 1930a, John Webster Foster 1956, Howell 1935a, 1935c, J. E. Lamar 1928b, Swann 1951a, Wanless 1929a, Willman 1942b, Workman 1948.

Total clastic thickness map: Sloss 1960.

Water wells in: Carney 1897.

St. Peter Silica Sand (see Sand and gravel, silica sand)

Salem Anticline: Brownfield 1954, Cohee 1939.

Salem Limestone: J. R. Ball 1952, J. W. Baxter 1960b, 1963a, 1965a, 1965b, A. H. Bell 1927a, 1932e, Bleininger 1912, Collingwood 1923a, 1933, Collinson 1954, 1957, 1958e, 1964b, Coryell 1919, Currier 1922, Folk 1946, Harris 1961, Harvey 1964, R. H. Howard 1961, Keyes 1933c, J. E. Lamar 1934, 1950a, 1955a, 1959, R. C. Moore 1935, Mylius 1921b, Nebel 1919, J. N. Payne 1940, Pinsak 1957, Ross 1964b, Savage 1921c, Van Tuyl 1912b, [1925], Wanless 1957a, J. M. Weller 1934, 1940a, 1940b, 1941b, 1952, Stuart Weller 1908, 1914, 1939a, 1939b.

Distribution map: J. W. Baxter 1960b.

Fauna: J. W. Baxter 1960a, Rexroad 1965a, Stuart Weller 1908.

Paleogeographic map: Schuchert 1955.

Structure map: Collingwood 1923a, Meents 1965a, Morse 1915, Mylius 1921b.

Salem Oil Field: H. H. Arnold 1939, Cohee 1939, Love 1955.

Salem Plateau Section (Physiography): Horberg 1950a, Leighton 1948b.

Salem-Louden Anticlinal Belt: A. H. Bell 1943c, S. K. Clarke 1948.

Salem Pool: H. H. Arnold 1939, A. H. Bell 1940a, Cohee 1941a, 1941b, Hunzicker 1949, Piersol 1940, Squires 1951, Jerry Thorp 1940, Ver Wiebe 1949, Witherspoon 1957c.

Saline County

Barite: J. C. Bradbury 1959a.

Bedrock topography: Horberg 1950a.

Boulder near Carrier Mills: Bonnell 1922.

Brines: Meents 1952.

Carrier Mills area guide leaflet: Ill. GS 1965-A.

Caves: Bretz 1961.

Chert: Butts 1925.

Saline County—cont.

Clay and shale

General: W. H. Smith 1965.

Bonding clay: Grogan 1945.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: Smoot 1960a, W. A. White 1960b.

Petrology: Grim 1957, P. E. Potter 1958b.

Resources: Parham 1963a.

Coal

General: Butts 1925, G. H. Cady 1919a, 1925, DeWolf 1907a, 1908a, Ill. GS 1913.

Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1919a, 1927, 1934, 1935b, 1948a, DeWolf 1907a, 1907b, 1908a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, J. A. Holmes 1908, Lindgren 1908, L. C. McCabe 1935, C. E. Marshall 1958, Parr 1904, 1906b, 1915a, 1916, N. H. Snyder 1953, Zubovic 1964.

Ash analyses: Rees 1964.

Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.

Beryllium in: Stadnichenko 1961.

Chlorine in: Abernethy 1965, Gluskoter 1964.

Coal balls: W. D. Evans 1961, Feliciano 1924.

Coke: C. E. Marshall 1958.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Losses: C. A. Allen 1925.

Methane in: Darton 1915.

Mined-out areas: Ill. GS 1959b maps 30, 32.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1914c, G. H. Cady 1919a, H. M. Cooper 1942b, Darton 1915, DeWolf 1907b.

Minor elements: Zubovic 1964.

P, Cl, Na, and K in: Abernethy 1965.

Petrology: C. E. Marshall 1958.

Physical tests: J. A. Holmes 1908.

Preparation: Boley 1949, L. C. McCabe 1935, 1939a, Mitchell 1937.

Production: Annual coal reports.

Reserves: G. H. Cady 1944, 1952b, DeWolf 1908b.

Strippable reserves: G. H. Cady 1927, Culver 1925b, L. G. Henbest 1929, W. H. Smith 1957.

Subsidence: L. E. Young 1916b.

Drill records: A. H. Bell 1939c, G. H. Cady 1919a, Worthen 1890(2).

Fluorspar: Fohs 1910.

Fossil plant localities: Collinson 1960a.

Geologic sections (described outcrops)

Cave Hill (Miss.): Butts 1925, G. M. Wilson 1959.

Horseshoe (Miss.): G. M. Wilson 1959.

Strip Mine High Wall (Pa.): Kosanke 1960.

Geophysical studies: McGinnis 1964.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956a.

Analyses: Bartow 1909b, Ross Hanson 1961.

Harrisburg area guide leaflet, Ill. GS 1960-F.

Saline County—cont.

Igneous rocks: J. C. Bradbury 1962b, G. H. Cady 1919a, Clegg 1956, L. G. Henbest 1929, McGinnis 1964, Oesterling 1952, Sidney Powers 1932, J. M. Weller 1940a, Stuart Weller 1927.

Lead and zinc: Fohs 1910.

Limestone and dolomite: Butts 1925, Krey 1925, J. E. Lamar 1956b, J. M. Parks 1953.

Loess: Fehrenbacher 1965b.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Butts 1925, G. H. Cady 1926, E. O. Ulrich 1905, J. M. Weller 1940b, 1952.

Glacial: State geol. map, R. F. Flint

1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Ostrom 1961a, P. E. Potter 1965, Siever 1951a.

Structure: A. H. Bell 1943c, Butts 1917b, 1925, G. H. Cady 1919a, 1925, 1939e, Darton 1915, DeWolf 1907a, 1907b, 1908a, Siever 1951a, Swann 1951b.

Marion area guide leaflet: Ill. GS 1963-A.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Grout 1906.

Development maps: Ill. GS 1965 maps 18, 19.

Pools

Dale Consolidated: A. H. Bell 1959c.

Eldorado: A. H. Bell 1957c, J. M. Weller 1952.

Possibilities: A. H. Bell 1939c, W. S. Blatchley 1906, Brokaw 1916, Butts 1917b, 1925.

Physiography: Butts 1925, R. F. Flint 1941, Leighton 1948b, MacClintock 1929.

Quadrangle studies, Equality: Butts 1925.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1958b, 1962a, 1962c, 1963a, 1965.

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Springs: Peale 1886.

Stratigraphy

General: A. H. Bell 1964, R. S. Blatchley 1910a, Butts 1917b, 1925, Swann 1958, E. O. Ulrich 1905, Stuart Weller 1926c.

Mississippian: Atherton 1947, Brokaw 1916, Butts 1925, Gutschick 1965, Hoffmeister 1955b, P. E. Potter 1958a, 1965, Rexroad 1961a, Siever 1951a, Swann 1951b, 1958, 1963, J. M. Weller 1940b.

Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, Brokaw 1916, Butts 1925, G. H. Cady 1919a, 1926, 1944, DeWolf 1907a, 1907b, 1908a, L. G. Henbest 1928a, 1928b, M. E. Hopkins 1958, Kosanke 1960, Parham 1963a, P. E. Potter 1965, Siever 1951a, W. H. Smith 1957, M. L. Thompson 1959, W. H. Walker 1965, Worthen 1882c.

Pleistocene: G. H. Cady 1919a, Frye 1965c, Leighton 1961, G. F. Wright 1890.

Structure: G. H. Cady 1939e, S. K. Clark 1948, DeWolf 1907b, Stonehouse 1955, Swann 1951b.

Uranium: Ostrom 1955, Vine 1962.

Saline County—cont.

Worthen Survey report (v. 6): E. T. Cox 1875.

Saline formation waters: Graf 1965.

Saline Mines Quadrangle: J. M. Baxter 1963a.

Saline River Fault: Butts 1925.

Saline River watershed: Pickels 1929.

Salt: Barrett 1922a, E. T. Cox 1875, Willman 1942b.

Salt Creek watershed: Pickels 1929.

Saltpetre: Worthen 1868(2).

Sample Sandstone Member (Miss.): P. E. Potter 1958a, Swann 1963.

Samsville Anticline: Easton 1943.

Sand and gravel

(See also under county)

General: Bergstrom 1958c, DeWolf 1920c, G. E. Ekblaw 1964, Ill. State Div. Indus. Planning and Dev. 1959, J. E. Lamar 1928d, 1931a, 1938d, 1960a, 1965, Leighton 1920, Risser 1961.

Aquifers: Bergstrom 1958c.

Chemical analyses: J. E. Lamar 1934, 1956d, Schroyer 1922, Shrode 1953, Willman 1942a.

Chert (flint) gravel: Fisk 1949, Frye 1964a, J. E. Lamar 1929c, 1930a, 1953a, Leighton 1949b, P. E. Potter 1955b, Pryor 1962a, Ross 1964b, Rubey 1952, J. M. Weller 1940c.

Concrete aggregate: Burchard 1907.

Dune sand: Athy 1928, Bretz 1955, Carman 1910, Culver 1922a, M. L. Fuller 1904, Gates 1910, Knappen 1926, E. W. Shaw 1913, James Thorp 1952, Trowbridge 1916, Johan A. Udden 1898b, W. H. Walker 1965, Wanless 1957a, Willman 1942b.

Economics (see also Mineral economics): Risser 1959b.

Glass sand: Burchard 1906, Fettke 1926, J. E. Lamar 1928b, Leighton 1934e, Voskuil 1944a.

Grain size analyses: R. C. Anderson 1960, 1962, 1964, 1965, Athy 1928, J. R. Ball 1952, Bergstrom 1956b, Block 1960, John Webster Foster 1951a, Grim 1940d, J. E. Lamar 1934, 1938d, 1951, 1953a, 1956d, Larsen 1965b, Littlefield 1925a, 1925b, Lugn 1927, Lund 1965a, 1965b, P. E. Potter 1955b, Rubey 1952, Shrode 1953, Johan A. Udden 1898b, Jon A. Udden 1910b, Wanless 1929a, Willman 1939b, 1942a, 1942b.

Greensand: J. E. Lamar 1965, Schroyer 1922.

Mineral analyses: G. W. Andrews 1958, R. E. Hunter 1965, J. E. Lamar 1937b, Pettijohn 1931, P. E. Potter 1955b, Pryor 1962a, Rubey 1952, Shrode 1953, 1954b, Willman 1942a.

Molding sand: Berkelhamer 1944, Grim 1940b, 1940d, 1945b, 1945c, Grogan 1945, Ill. State Div. Indus. Planning and Dev. 1959, Littlefield 1925a, 1925b, Willman 1939b, 1942b.

Orange sands (see also Lafayette Gravel): Chamberlin 1891b, Salisbury 1891a.

Origin: J. E. Lamar 1958, MacClintock 1930.

Ottawa sand (see Silica sand)

Pebble counts: R. C. Anderson 1960, 1962, 1964, 1965, Block 1960.

Sand and gravel—cont.

- Physical tests: Deadmore 1962b, Littlefield 1925a, Rubey 1952, Willman 1942b.
 Potash: J. E. Lamar 1956d.
 Production statistics: Ill. Dept. Mines & Minerals, B 1917-1965.
 Resistivity prospecting for: Dobrovolny 1953.
 Resources (see also under counties): R. C. Anderson 1962, G. E. Ekblaw 1932b, 1960, 1962a, 1962b, 1964, Ill. State Div. Indus. Planning and Dev. 1959, J. E. Lamar 1953a, Leighton 1944d, Littlefield 1925a, Wanless 1929a, 1957a, Willman 1942b, Worthen 1880, Zeisel 1962a.
 Rock wool: J. E. Lamar 1934.
 Sewage filters: J. E. Lamar 1930a.
 Silica sand: Buzzard 1923, Deadmore 1962b, Fettke 1926, J. E. Lamar 1927b, 1928b, 1965, Parr 1912, Voskuil 1942d, Weigel 1927, Willman 1942b.
 Stabilized roads: Lieberman 1938.
 Statistics: USBM 1924-1965, USGS 1882-1923.
 Steel molding sand: J. E. Lamar 1928b.
 Surface texture of sand: J. J. Porter 1962.
 Trace elements: J. E. Lamar 1956d.
 Variance analyses: Krumbein 1953a.

- Sandoval Bedrock Valley: Horberg 1950a.
 Sandoval Dome, Anticline: A. H. Bell 1927b, Moulton 1929d, St. Clair 1917c, E. W. Shaw 1923, J. M. Weller 1936c.
 Sandoval-DuQuoin Anticline: H. A. Wheeler 1911a.
 Sandoval Fault: Beck 1965.
 Sandoval Pool: A. H. Bell 1927b, 1934a, W. F. Hoover 1944, Moulton 1929d, Spitznagel 1939a, Squires 1943e, 1946.
 Sandstone (see also under county and named sandstones)
 General: J. E. Lamar 1928b, 1965, P. E. Potter 1963a, 1963b, Siever 1957b.
 Building stone: J. E. Lamar 1955a, Wanless 1957a.
 Channels, Channel sandstones: Andresen 1961, G. H. Cady 1921, 1938, Desborough 1961d, DuBois 1951, S. E. Ekblaw 1931, Friedman 1960, M. E. Hopkins 1958, Mueller 1957, J. N. Payne 1944, P. E. Potter 1961a, 1962a, 1962b, 1962c, 1963a, 1965, Siever 1950, Wanless 1929a, 1952, 1955b, 1957a, Willman 1942b.
 Chemical analyses: Biggs 1955, J. C. Bradbury 1962a, J. E. Lamar 1928b, Thiel 1935, Willman 1942b.
 Chemistry: Siever 1959.
 Clay mineralogy: Glass 1956, 1958, M. E. Hopkins 1958, Ostrom 1961a, Parham 1963d, P. E. Potter 1958b, Smoot 1960a, 1960b, 1960c.
 Cross-bedding (see Sedimentary structures)
 Economics (see Mineral economics)
 Elastic properties: Cleary 1959.
 Grain-size analyses: Andresen 1961, Biggs 1955, J. C. Bradbury 1962a, Buschbach 1964, M. E. Hopkins 1958, J. E. Lamar 1927d, 1928b, P. E. Potter 1963a, Pryor 1960, Pye 1944, Thiel 1935, Wadell 1935, Willman 1942b.
 Rapid analysis: Emrich 1963b, Pye 1943.
 Visual estimates: Emrich 1963b, Swann 1959.

Sandstone—cont.

- Mineralogy and petrology (see also Clay mineralogy): Andresen 1961, Atherton 1960, Biggs 1955, J. C. Bradbury 1962a, Dapples 1953, M. E. Hopkins 1958, J. E. Lamar 1928b, Mast 1963, Parham 1963d, P. E. Potter 1955d, 1958b, 1961b, 1962a, 1962c, 1963a, 1963c, Pryor 1960, 1961b, Pye 1944, Rubey 1933, Rusnak 1957, Siever 1949, 1953, 1956b, 1957b, 1959, Smoot 1960a, Swann 1959, Templeton 1950, Thiel 1935, Wadell 1935, Wanless 1955b, Willman 1942b, 1943a.
 Paleozoic source areas: P. E. Potter 1956a, 1956b, 1958b, 1961b, 1962a, 1962b, 1962c, 1963a, Pryor 1961b, Siever 1955.
 Permeability: Mast 1963, P. E. Potter 1963c, Smoot 1960a, Engelhardt 1954.
 Physical tests: J. C. Bradbury 1962a, Pye 1944.
 Quartzitic: J. E. Lamar 1938d, Parmelee 1946.
 Sand shape fabrics: Mast 1963, P. E. Potter 1963c.
 Sand-body shape classification: P. E. Potter 1962a, 1962c, 1963a.
 Silica cementation: Siever 1959.
 Statistics: W. C. Day 1892.
 Uses (general): Biggs 1955, J. E. Lamar 1928b.
 Variability: P. E. Potter 1955a.
 Sandwich Fault Zone: Buschbach 1964, Cohee 1962, D. A. Green 1957, McGinnis 1961b, Ostrom 1957b, Suter 1959, Templeton 1952, Willman 1942b, 1943a, 1951.
 Sangamon Arch: Whiting 1965b.
- Sangamon County**
 Bedrock topography: Horberg 1945, 1950a, Selkregg 1958, E. W. Shaw 1913.
 Brines: Meents 1952.
 Clay and shale
 General: Crook 1912a, J. E. Lamar 1934, Savage 1915.
 Bonding clay: Grim 1940f.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 In coal mines: Stull 1917.
 Mineralogy: C. W. Rolfe 1908, W. A. White 1960b.
 Petrology: Grim 1957, C. W. Rolfe 1908.
 Refractory clay: J. E. Lamar 1956b.
- Coal**
 General: G. H. Cady 1921, Ill. GS 1913, J. N. Payne 1942, 1944, Savage 1915, E. W. Shaw 1913.
 Analyses: Abernethy 1961, Aresco 1953-1965, Ashley 1902, G. H. Cady 1921, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, J. A. Holmes 1906, 1908, Lindgren 1908, L. C. McCabe 1935, B. C. Parks 1956, Parr 1904, 1906b, 1915a, 1916, Savage 1915, E. W. Shaw 1913, N. H. Snyder 1953, W. F. Wheeler 1908a, Zubovic 1964.
 Ash analyses: Rees 1964.
 Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.
 Beryllium in: Stadnichenko 1961.
 Chlorine in: Abernethy 1965, Gluskoter 1964.
 Free-swelling index: Abernethy 1961.
 Grindability: Abernethy 1961.

Sangamon County—cont.

Coal—cont.

- Horsebacks: Clegg 1961, W. B. Roe 1935, Savage 1909a, 1915.
 Losses: C. A. Allen 1925.
 Mined-out areas: Ill. GS 1959b maps 14, 15, 19.
 Mineral matter: Abernethy 1965.
 Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e, 1915c, G. H. Cady 1921, H. M. Cooper 1942b, Savage 1915.
 Minor elements: Zubovic 1964.
 P, Cl, Na, and K in: Abernethy 1965.
 Physical tests: J. A. Holmes 1906, 1908.
 Preparation: Boley 1949, L. C. McCabe 1935, 1939a, Mitchell 1937.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b, Clegg 1961, DeWolf 1908b, J. N. Payne 1942.
 Subsidence: L. E. Young 1916b.
 Copper erratic: Crook 1929.
 Drill records: R. S. Blatchley 1910a, G. H. Cady 1921, Collingwood 1922, Crook 1912b, Ross Hanson 1950, 1958, Saxby 1957, E. W. Shaw 1913, Johan A. Udden 1914, Worthen 1883(1).
 Edinburg area guide leaflet: Ill. GS 1964-E.
 Geologic sections (described outcrops)
 Allis-Chalmers (Pleis.): W. H. Johnson 1964.
 Bice School (Pleis.): W. H. Johnson 1964.
 Carpenters Bridge (Pa.): E. W. Shaw 1913.
 Clear Lake Township (Pa.): E. W. Shaw 1913.
 Crow's Mill (Pa.): E. W. Shaw 1913.
 Fancy Creek (Pa.): E. W. Shaw 1913.
 Georgetown School (Pleis.): W. H. Johnson 1964.
 Masters Bros. Brick Plant (Pa.): E. W. Shaw 1913.
 New City (Pleis.): Frye 1962e, 1963c, 1965b.
 Pleasant Plains (Pleis.): Leighton 1949a.
 Roby (Pleis.): W. H. Johnson 1964.
 Rochester Accretion-ogley (Pleis.): Frye 1960c, 1963c, 1965b.
 Rochester West (Pleis.): Frye 1965b.
 Rolls (Ralls) Ford (Pa.): E. W. Shaw 1913.
 Sherman (Pleis.): W. H. Johnson 1964.
 Sugar Creek (Pa.): E. W. Shaw 1913.
 Ground water
 General: Crook 1912a, John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Lohr 1953, Savage 1907, Selkregg 1958, E. W. Shaw 1913.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, A. W. Palmer 1897.
 Gypsum and anhydrite: Saxby 1957.
 Lake Springfield dam: G. E. Ekblaw 1940b.
 Lake Springfield sediment: Stall 1952b.
 Limestone and dolomite: Crook 1912a, 1912b, Krey 1925.
 Loess: Frye 1962e, 1963c, Leighton 1950b, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1945, 1950a, E. W. Shaw 1913.
 Drift thickness: State geol. map.
 Geologic: State geol. map, E. W. Shaw 1913.

Sangamon County—cont.

Maps—cont.

- Glacial: State geol. map, R. F. Flint 1959, Frye 1965c, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: Whiting 1956, Workman 1956.
 Structure: G. H. Cady 1921, Clegg 1961, Collingwood 1924b, Meents 1954, J. N. Payne 1942, 1944, Savage 1915, E. W. Shaw 1913, Whiting 1956, 1965b.
 Mastodon: N. C. Anderson 1905, Bagg 1909.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Oil and gas
 Development maps: Ill. GS 1965 maps 80, 81, 87.
 Oil shale: Barrett 1922b.
 Physical properties: Armon 1964.
 Pools
 Glenarm: Whiting 1956.
 New City: Whiting 1956.
 Roby: Whiting 1956.
 Possibilities: Collingwood 1924b, Easton 1942, J. N. Payne 1944.
 Production: Whiting 1956.
 Physiography: Glock 1932, Leighton 1948b, MacClintock 1929, E. W. Shaw 1913.
 Quadrangle studies
 Springfield: Savage 1915, E. W. Shaw 1913.
 Tallula: E. W. Shaw 1913.
 Sand and gravel
 Molding sand: Littlefield 1925a, 1925b.
 Sandstone: J. C. Bradbury 1962a, P. E. Potter 1961a.
 Soil report 4
 Stratigraphy
 General: Crook 1912a, Savage 1907, Selkregg 1958, E. W. Shaw 1913, Swann 1958, Whiting 1956.
 Silurian: Lowenstam 1949b, 1950, Whiting 1958, 1965b.
 Devonian: Whiting 1958, 1965b.
 Mississippian: J. N. Payne 1944, Swann 1958, Workman 1956.
 Pennsylvanian: J. C. Bradbury 1962a, G. H. Cady 1921, Clegg 1961, Crook 1912a, Lesquereux 1866a, McCutcheon 1961, J. N. Payne 1942, 1944, P. E. Potter 1961a, Savage 1909a, Sturgeon 1964, Wanless 1931b, J. M. Weller 1935a, Worthen 1883(1).
 Pleistocene: Frye 1963c, 1965b, W. H. Johnson 1964, Leverett 1898b, 1899a, Willman 1963.
 Recent: Stall 1959.
 Structure: G. H. Cady 1921.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 5): Worthen 1873(1).
 Sangamon (age) peat, fossil beetles: Wickham 1917.
 Sangamon (age) plain: John Webster Foster 1951a, Horberg 1953.
 Sangamon River watershed: Pickels 1929.
 Sangamon Soil (Pleis.): M. R. Campbell 1900, G. E. Ekblaw 1940b, John Webster Foster 1951a, Frye 1958b, 1963c, M. L. Fuller 1904, Horberg 1945, 1953, 1956b, W. H. Johnson 1964, Leighton 1925a, Leverett

Sangamon Soil—cont.

1898b, 1899a, Savage 1921b, 1921c, 1931,
E. W. Shaw 1913, 1923, Willman 1958a.

Structure map: Horberg 1945.

Sangamon Valley history: Leighton 1921a.

Sangamonian, Sangamon Stage (Pleis.): Barrows
1910, Cable 1929, G. H. Cady 1919b,
M. L. Fuller 1904, Frye 1965c, Horberg
1950b, Leighton 1925a, 1926b, Leverett
1898b, 1899b, MacClintock 1959, Wan-
less 1928, 1929a, 1957a, Willman 1942b.

Sanitary engineering: J. E. Lamar 1928c.

Sankoty Sand (Pleis.): Horberg 1950b, 1953,
W. H. Walker 1965.

Distribution map: Horberg 1953.

Saratoga Anticlinal Nose: J. M. Weller 1940a.

Sauk Sequence: Sloss 1949, 1963, Swann 1961,
H. E. Wheeler 1963.

Savanna Anticline, Savanna-Sabula Anticline: G. H.
Cady 1920b, Cohee 1962, Templeton
1952, J. M. Weller 1935c, Willman 1950.

Savanna area: Carman 1910.

Rock falls (landslides): G. E. Ekblaw 1930a.

Saverton Shale (Dev.): Collinson 1954, 1958e,
1961, 1964b, R. C. Moore 1929, J. M.
Weller 1940b, J. S. Williams 1957, Work-
man 1956.

Fauna: A. J. Scott 1959.

Isopach map: Workman 1956.

Saybrook core: Anon. 1888, Hugh Murray 1893.

Scales Shale (Ord.): J. C. Bradbury 1965a,
Buschbach 1964, 1965, Templeton 1963.

Schoonmaker Coal (Pa.): F. H. Bradley 1870.

Schuyler Arch: Workman 1956.

Schuyler County

Beardstown area guide leaflet: Ill. GS 1965-B.

Bedrock topography: Horberg 1950a, W. H.
Walker 1965, Wanless 1957a.

Brines: Meents 1952.

Clay and shale

General: Bleininger 1912, Hinds 1917,
J. E. Lamar 1934, Parmelee 1921.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: W. A. White 1960b.

Petrology: Grim 1957.

Refractory clay: J. E. Lamar 1956b, Lines
1917.

Resources: Jackman 1965a, W. A. White
1963, 1964a.

Coal

General: G. H. Cady 1921, Culver 1925a,
Hinds 1917, 1919.

Analyses: Aresco 1953-1965, G. H. Cady
1921, 1935b, 1948a, Hawley 1923, Hinds
1917, Parr 1916, Reinertsen 1964.

Chlorine in: Abernethy 1965, Gluskoter
1964.

Mined-out areas: Ill. GS 1959b maps 12,
13, 14.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, Andros
1915b, 1915c.

P, Cl, Na, and K in: Abernethy 1965.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b.

Strippable reserves: G. H. Cady 1937c,
Culver 1925b, Reinertsen 1964.

Subsidence: L. E. Young 1916b.

Drill records: M. L. Fuller 1906, Ross Han-
son 1950, Hinds 1919, Johan A. Udden
1912a, 1914, Wanless 1957a.

Schuyler County—cont.

Geologic sections (described outcrops)

Center Ridge (Pa.): Hinds 1919.

Crooked Creek (Brooklyn) (Miss.):
Bleininger 1912.

Elm Creek (Miss., Pa.): Wanless 1957a.

Frederick (Miss., Pleis.): Parmelee 1921,
Wanless 1957a.

Frederick South (Pleis.): Frye 1963c,
R. L. Jones 1964, A. B. Leonard 1960.

Macomb (Pa.): Hinds 1919, Parmelee
1921.

Macomb (Pleis.): Hinds 1919.

Mill Creek (Miss., Pa.): Wanless 1957a.

Rushville (Pa.): Bleininger 1912.

Rushville Southeast (Pleis.): Frye 1960b.

Rushville (4.5 West) (Pleis.): Willman
1963.

Rushville (2.4 West) (Pleis.): Willman
1963.

Rushville (0.1 West) (Pleis.): Willman
1963.

Scott Mill (Miss.): Bleininger 1912.

Ground water

General: Bergstrom 1957, Hinds 1919,
Horberg 1950a, Leverett 1899a, W. H.
Walker 1965.

Analyses: Bartow 1909b, Ross Hanson
1950.

Iron ore: Hinds 1919.

Limestone and dolomite

General: Hinds 1917, Krey 1925, J. E.
Lamar 1934.

Cement materials: Bleininger 1912, Hinds
1917, 1919, J. E. Lamar 1956b.

Resources: Harvey 1964.

Loess: Frye 1962e, 1963c, Leighton 1950a,
G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Hinds 1919, Hor-
berg 1950a, W. H. Walker 1965, Wanless
1957a.

Drift thickness: State geol. map.

Geologic: State geol. map, W. H. Walker
1965, Wanless 1957a, J. M. Weller 1940b.

Glacial: State geol. map, R. F. Flint 1959,
Leighton 1961, Leverett 1899a, Wanless
1957a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Wanless 1957a, Workman
1944, 1956.

Structure: G. H. Cady 1921, Hinds 1914,
1917, 1919, R. H. Howard 1961, Morse
1915, Reinertsen 1964, Wanless 1957a,
Whiting 1965b.

Mineral production (see USBM Minerals Year-
book, Ill. GS Illinois Mineral Industry)

Oil and gas

General: F. H. Kay 1916b.

Development maps: Ill. GS 1965, maps
M, J, I.

Oil shale: Barrett 1922b.

Possibilities: Hinds 1914, Morse 1915.

Rushville NW Pool: R. H. Howard 1961.

Physiography: Hinds 1919, Leighton 1948b,
W. H. Walker 1965, Wanless 1957a.

Quadrangle studies

Beardstown: Wanless 1957a, 1958.

Colchester: Hinds 1917, 1919.

Macomb: Hinds 1917, 1919.

Vermont: Wanless 1957a.

Schuyler County—cont.

- Sand and gravel
 - General: Hinds 1917.
 - Glass sand: Hinds 1919.
- Sandstone: Hinds 1917, 1919, Siever 1956b.
- Sandstone channels: S. E. Ekblaw 1931.
- Soil report 56
- Springs: Peale 1886.
- Stratigraphy
 - General: Bergstrom 1957, Bleininger 1912, Hinds 1919, R. H. Howard 1961, Morse 1915, W. H. Walker 1965, Wanless 1957a.
 - Ordovician: Gutstadt 1958b, Wanless 1957a.
 - Silurian: Lowenstam 1949b, Whiting 1965b.
 - Devonian: Whiting 1965b, Workman 1944.
 - Mississippian: Harvey 1964, Hinds 1917, Morse 1915, Wanless 1957a, J. M. Weller 1940b, J. S. Williams 1957, Workman 1956.
 - Pennsylvanian: G. H. Cady 1921, Culver 1925a, S. E. Ekblaw 1931, Hinds 1914, 1917, Reinertsen 1964, Wanless 1931a, 1931b, 1957a, 1958, J. M. Weller 1942c, W. A. White 1963.
 - Pleistocene: G. H. Cady 1921, Frye 1960b, 1963c, Leighton 1965, A. B. Leonard 1960, Wanless 1957a, Willman 1963.
- Structure: Wanless 1957a.
- Uranium: Ostrom 1955.
- Worthen Survey report (v. 4): Worthen 1870.

Sciota Anticline: Wanless 1957a.

Scott County

- Bedrock topography: A. H. Bell 1929c, Horberg 1950a.
- Clay and shale
 - General: Parmelee 1921, 1922.
 - Ceramic tests: W. A. White 1960a.
 - Chemical analyses: W. A. White 1959a.
 - Refractory clay: Lines 1917, Parmelee 1921.
 - Resources: Parham 1963a.
- Coal
 - General: Culver 1925a, J. N. Payne 1942.
 - Analyses: Parr 1916.
 - Mined-out areas: Ill. GS 1959b map 19.
 - Mining: Annual coal reports, Andros 1915b.
 - Production: Annual coal reports.
 - Reserves: G. H. Cady 1952b, Culver 1925a, J. N. Payne 1942.
 - Strippable reserves: W. H. Smith 1961.
 - Subsidence: L. E. Young 1916b.
- Drill records: Collingwood 1933, Ross Hanson 1950, Worthen 1883(1).
- Geologic sections (described outcrops)
 - Browns Mound (Pleis.): R. L. Jones 1964, A. B. Leonard 1960.
 - Exeter (Miss., Pa.): Parmelee 1921.
 - Little Sandy Creek (Pleis.): MacClintock 1929.
 - Manchester (Pleis.): MacClintock 1929.
 - Mauvaise Terre Creek (Pleis.): Frye 1965a.
 - Winchester (Pleis.): A. H. Bell 1929c.

Scott County—cont.

- Ground water
 - General: Bergstrom 1957, Horberg 1950a, Leverett 1899a.
 - Analyses: Bartow 1909b, Ross Hanson 1950, 1961.
- Limestone and dolomite: Krey 1925, J. E. Lamar 1934, 1956b.
- Loess: Frye 1962e, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
 - Bedrock topography: A. H. Bell 1929c, Horberg 1950a.
 - Drift thickness: State geol. map.
 - Geologic: State geol. map, J. M. Weller 1940b.
 - Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 - Mineral industries: Ill. GS 1961.
 - Structure: State geol. map, Meents 1954, J. N. Payne 1942, W. H. Smith 1961, Whiting 1965b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas, gas in drift: Meents 1960.
- Paleobotany: C. D. White 1914.
- Physiography: Leighton 1948b, MacClintock 1929.
- Sandstone: J. C. Bradbury 1962a.
- Stratigraphy
 - General: Bergstrom 1957.
 - Silurian: Whiting 1965b.
 - Devonian: Whiting 1965b, Workman 1944.
 - Mississippian: Beachler 1892, J. M. Weller 1940b, J. S. Williams 1957, Workman 1956.
 - Pennsylvanian: J. C. Bradbury 1962a, Culver 1925a, Eastman 1902c, Parham 1963a, J. N. Payne 1942, W. H. Smith 1961, Wanless 1931b, Worthen 1883(1).
 - Pleistocene: F. C. Baker 1931b, A. H. Bell 1929c, Frye 1965c, Leighton 1961, 1965, A. B. Leonard 1960, MacClintock 1929, 1933, Robertson 1938, Willman 1963.
 - Recent: Stall 1959.
- Worthen Survey report (v. 3): Worthen 1868(2).
- Scottsburg Limestone Member (Miss.): J. W. Baxter 1963a, 1965a, Rexroad 1965b, Swann 1963.
- Scottville Coal (Pa.) (see Rock Branch Coal): Kosanke 1950, 1960, J. N. Payne 1942.
- Scottville Cyclothem (Pa.): J. R. Ball 1952.
- Scottville Limestone Member (Pa.): J. R. Ball 1952, J. W. Baxter 1965b, Kosanke 1960, J. N. Payne 1942.
- Sea balls: Croneis 1939f.
- Seahorne Coal (Pa.): W. H. Smith 1958, Wanless 1939, 1957a, 1961.
- Map of basin: Wanless 1961.
- Seahorne Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, Wanless 1931a, 1957a.
- Fauna: Wanless 1958.
- Seahorne Limestone Member (Pa.): J. W. Baxter 1965b, Kosanke 1960, Lowenstam 1948b, Reinertsen 1964, W. H. Smith 1961, 1963, Wanless 1931b, 1932b, 1939, 1947b, 1955a, 1955b, 1957a, J. M. Weller 1942c.
- Structure map: Lowenstam 1948b.
- Seahorne Limestone, underclay below (Pa.): O'Brien 1963b.

- Seahorne Sandstone Member (Pa.): Wanless 1957a.
- Seatonville Syncline: Willman 1942b.
- Second Cutler Rider Coal (Pa.) (see Pond Creek Coal): Kosanke 1950, 1960.
- Second Vein Coal (Pa.) (see Herrin (No. 6) Coal): Bement 1909, Wanless 1939.
- Security law: DeWolf 1920d.
- Sedalia Limestone, Dolomite (Miss.): Collinson 1954, 1957, 1958e, Rubey 1952, J. M. Weller 1940b, J. S. Williams 1957.
- Sedimentary structures
- General: Pettijohn 1964, P. E. Potter 1958b, 1962a, 1963a, 1963b, 1963c.
- Animal trails and borings: Pettijohn 1964, P. E. Potter 1962a, J. M. Weller 1940b.
- Beach cusps: C. E. Needham 1929.
- Breccia: P. E. Potter 1957.
- Compaction: Mueller 1957, Terzaghi 1940.
- Cross-bedding: S. E. Ekblaw 1931, Harris 1961, M. E. Hopkins 1958, J. E. Lamar 1927d, 1928b, Mast 1963, J. S. Olson 1954, Pettijohn 1964, P. E. Potter 1954, 1955b, 1955d, 1956a, 1958b, 1962a, 1962b, 1963b, 1963c, Pryor 1960.
- Flute casts: Pettijohn 1964, P. E. Potter 1958b, 1963a.
- Load casts: Pettijohn 1964, P. E. Potter 1958b, 1963a.
- Reefs: Ingels 1963, Lowenstam 1950, 1957, Pettijohn 1964, Willman 1943b, 1962.
- Ripple marks: J. E. Lamar 1927d, Pettijohn 1964, P. E. Potter 1958b, 1962a, 1963a.
- Sandstone balls: Pettijohn 1964, P. E. Potter 1963a.
- Sedimentation**
- General
- Paleozoic cycles: Ostrom 1964.
- Cambrian: Buschbach 1964.
- Ordovician: Buschbach 1964, Carozzi 1956, Dapples 1955, Templeton 1963.
- Silurian: Lowenstam 1949a, 1949b, 1950, 1952.
- Devonian: Lowenstam 1949b.
- Mississippian: Atherton 1960, Cohee 1942a, P. E. Potter 1955a, 1958a, 1963a, 1963b, Pryor 1961b, Pye 1944, Siever 1953, 1955, Smoot 1960c, Swann 1963, 1964, 1965, J. M. Weller 1940b.
- Pennsylvanian: Andresen 1961, Atherton 1960, G. H. Cady 1946, Glass 1958, J. S. Olson 1954, Parham 1963c, P. E. Potter 1954, 1955a, 1955d, 1956a, 1956b, 1958b, 1962b, 1963a, 1965, Savage 1930b, Siever 1951a, 1956b, Wanless 1955b, 1957c, 1963a, 1965, J. M. Weller 1930a, 1931a, 1931c, 1935b, 1961, C. M. Young 1935.
- Cretaceous: J. E. Lamar 1930b, Pryor 1960, 1961b.
- Tertiary: J. E. Lamar 1930b, P. E. Potter 1955c, Rubey 1952.
- Pleistocene: Horberg 1955b, 1956b, Krumbein 1937.
- Recent
- In Carbondale reservoir: B. O. Larson 1951a.
- In Lake Bracken: V. H. Jones 1937a, B. O. Larson 1951b.
- In Lake Calhoun: Glymph 1937, Stall 1952a.
- In Lake Carthage: Stall 1953.
- Sedimentation—cont.
- Recent—cont.
- In Lake Chautauqua: Stall 1951a.
- In Lake Deatur: C. B. Brown 1947.
- In Lake Springfield: Stall 1952b.
- In Mississippi River: Lugn 1927, Rubey 1932, 1952.
- In Money Creek: Stall 1958.
- In reservoirs: Stall 1959.
- In Spring Lake: Stall 1949, 1951b.
- In West Frankfort reservoir: V. H. Jones 1937b, Stall 1951c.
- Basin analysis: P. E. Potter 1963b.
- Beach sand: Krumbein 1950, 1953b, 1959.
- Carbonate rocks: Graf 1960a, 1960b.
- Clays and shales: Krumbein 1947, Weaver 1958, W. A. White 1961a.
- Marine and fresh-water: P. E. Potter 1963d.
- Red and green: Grim 1951a.
- Colloid phenomena: W. A. White 1961a.
- Cyclical (see under Pennsylvanian System)
- Deltaic: P. E. Potter 1963a, Swann 1963, 1964, 1965, Wanless 1963a, Willman 1942b.
- Depth of water: Wanless 1957b.
- Diagenesis: Dapples 1959, Grim 1955.
- Differential compaction: Mueller 1957.
- Directional structures: P. E. Potter 1958b, 1963b.
- Evaporites: Krumbein 1951.
- Fossil orientation: Krinsley 1960.
- Grain size
- Heavy minerals: Rubey 1933.
- Mechanical analyses: Krumbein 1932.
- Multivariate analysis: Krumbein 1956a.
- Porosity relation: W. F. Cloud 1941.
- Sample spacing: Krumbein 1954.
- Sedimentary parameters, rapid methods: Emrich 1963b, Pye 1943, Swann 1959.
- Lithotopes: Ostrom 1964.
- Regression analysis: Krumbein 1959.
- Sand-shale ratios: Mueller 1957, Wanless 1955b.
- Sandstone: Dapples 1953, P. E. Potter 1958b, 1963a, Siever 1953.
- Sedimentary model: P. E. Potter 1963b.
- Silica cementation: Siever 1959.
- Statistical methods: J. S. Olson 1954, P. E. Potter 1954.
- Seeleyville Coal Member (Pa.) (see Indiana No. III Coal): Clegg 1965b, Kosanke 1960.
- Structure map: Meents 1965a.
- Seignelay Till: Keyes 1932.
- Seismic studies (see Geophysics)
- Sellers Limestone Member (Pa.): J. W. Baxter 1963a, Kosanke 1960, Wallace Lee 1916, Wanless 1939.
- Sequences (unconformity-bounded units)
- Accepted nomenclature (see named units)
- Sub-Cretaceous unconformity
- Absaroka Sequence
- Sub-Pennsylvanian unconformity
- Kaskaskia Sequence
- Sub-Middle Devonian unconformity
- Tippicanoe Sequence
- Sub-St. Peter unconformity
- Sauk Sequence
- Sub-Cambrian unconformity
- General: Sloss 1963, Swann 1961, H. E. Wheeler 1963.
- Serena Terrace: Willman 1942b.
- Seville Anticline: Wanless 1957a.
- Seville Coal (Pa.): Savage 1927, Wanless 1947b.

- Seville Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, Wanless 1931a, 1931b, 1957a.
- Fauna: C. L. Cooper 1946, Dunbar 1942, Wanless 1958, J. M. Weller 1936a.
- Seville Limestone Member (Pa.): C. L. Cooper 1946, Kosanke 1960, Ostrom 1957c, Wanless 1939, 1955a, 1955b, 1957a, J. M. Weller 1931d, 1942c.
- Sewage effluent in waterflooding: Simmons 1957.
- Sexton Creek Limestone (Sil.): J. R. Ball 1952, Collingwood 1933, Krey 1924, J. E. Lamar 1959, Lowenstam 1946, 1948b, Pryor 1962a, Ross 1964b, Savage 1908, 1909b, 1910a, 1913a, 1914b, 1913c, 1916a, 1926, J. M. Weller 1939e, 1940a, 1940c.
- Fauna: Savage 1910a, 1913c.
- Shakopee Dolomite (Ord.): C. B. Anderson 1919, Bain 1905b, A. H. Bell 1964, Buschbach 1964, 1965, G. H. Cady 1919b, G. H. Cox 1914, Keyes 1941b, Knappen 1926, J. E. Lamar 1934, Ostrom 1957b, E. H. Powers 1935b, Templeton 1952, Thwaites 1923, Wanless 1957a, Willman 1942b, 1943a, 1951, Workman 1926, 1948.
- Isopach map: Willman 1942b, Workman 1948.
- Shale (see Clay and shale)
- "Shallow" Sand: R. S. Blatchley 1913a.
- Shamrock Limestone Member (Pa.): C. E. Needham 1931.
- Sharpsboro Member (Ord.): Templeton 1963.
- Shattuc Dome: Brownfield 1954.
- Shattuc Terrace: St. Clair 1917c.
- Shaw Point Limestone (Pa.): C. L. Cooper 1946, J. M. Weller 1945a.
- Shawnee Group (Pa.): C. L. Cooper 1946.
- Shawnee Hills Section (Physiography): Horberg 1950a, Leighton 1948b.
- Shawneetown Coal Member (Pa.): Kosanke 1960.
- Shawneetown Fault (see also Rough Creek Fault Zone): A. H. Bell 1949d, Brecke 1964b, Butts 1925, G. H. Cady 1926, 1939e, J. H. Gardner 1915, Ill. GS 1913, McGinnis 1961b, 1964, Pullen 1951, 1953, J. M. Weller 1940a, 1952, G. M. Wilson 1959.
- Sheffield Coal (Pa.): Culver 1925a.
- Sheffield Moraine: MacClintock 1959.
- Sheffield Shale (Pa.) (see Lawson Sh.): Kosanke 1960, MacClintock 1959, Wanless 1939, 1957a.
- Shelby Coal (Pa.): Worthen 1882a.
- Shelby County**
- Bedrock topography: Horberg 1950a.
- Brines: Meents 1952.
- Clay and shale
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: Smoot 1960a, W. A. White 1960b.
- Resources: W. A. White 1964a.
- Coal**
- General: DuBois 1951, J. N. Payne 1944.
- Analyses: Ashley 1902, G. H. Cady 1935b, 1948a, Hawley 1923, F. H. Kay 1915a, Parr 1906b, 1916.
- Ash analyses: Rees 1964.
- Mined-out areas: Ill. GS 1959b maps 17, 18.
- Mining: Annual coal reports, Andros 1914e, H. M. Cooper 1942b.
- Shelby County—cont.**
- Coal—cont.**
- Production: Annual coal reports.
- Reserves: G. H. Cady 1944, 1952b, DuBois 1951.
- Strippable reserves: G. H. Cady 1937c.
- Subsidence: L. E. Young 1916b.
- Drill records: Ross Hanson 1950, 1958, 1961, Johan A. Udden 1914, Warthin 1944.
- Geologic sections (described outcrops)
- Oconee (Pleis.): Leighton 1930f, 1949a, MacClintock 1929.
- Opossum Creek (Pleis.): MacClintock 1929.
- Geophysical studies: Hackett 1956b, Pryor 1956c.
- Ground water**
- General: Horberg 1950a, Leverett 1899a, Pryor 1956c, Selkregg 1957.
- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
- Limestone and dolomite: Krey 1925.
- Loess: Fehrenbacher 1965b, Frye 1962e, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Horberg 1953.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Workman 1956.
- Structure: A. H. Bell 1943c, Collingwood 1924b, DuBois 1951, Meents 1954, Newton 1941, J. N. Payne 1944, E. F. Taylor 1944b, Whiting 1965b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Neoga area guide leaflet: Ill. GS 1962-E.
- Oil and gas**
- Development maps: Ill. GS 1965 maps 59, 60, 61, 70, 71, 72, 78, 79.
- Gas in drift: Meents 1960.
- Physical properties: Armon 1964.
- Possibilities: R. S. Blatchley 1910a, Collingwood 1924b, Newton 1941, J. N. Payne 1944.
- Pana area guide leaflet: Ill. GS 1960-E.
- Physiography: Leighton 1948b, MacClintock 1929.
- Sand and gravel**
- Molding sand: Littlefield 1925a, 1925b.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, P. E. Potter 1962a, 1962c.
- Shelbyville area guide leaflet: Ill. GS 1965-E.
- Soil report 66
- Stratigraphy**
- General: Selkregg 1957.
- Silurian: Lowenstam 1949b, Whiting 1965b.
- Devonian: Schwalb 1955, Warthin 1944, Whiting 1965b, Workman 1944.
- Mississippian: J. N. Payne 1944, Swann 1958, Workman 1956.
- Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1939c, 1944, DuBois 1951, F. H. Kay 1915a, Newton 1941, J. N. Payne 1944, J. M. Weller 1942c.
- Pleistocene: Frye 1965c, Hackett 1956b, Horberg 1953, W. H. Johnson 1964, Leighton 1930f, 1959, 1961, Leverett 1898b,

- Shelby County—cont.
 Stratigraphy—cont.
 Pleistocene—cont.
 MacClintock 1929, 1933, McGee 1890, Willman 1963.
 Structure: A. H. Bell 1964, Swann 1958.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 6): Broadhead 1875.
- Shelby Fault: J. S. Brown 1954, J. M. Weller 1952.
- Shelbyville Anticline: Newton 1941.
- Shelbyville Coal Member (Pa.): Broadhead 1875, G. H. Cady 1937c, F. H. Kay 1915a, Kosanke 1950, 1960, Wanless 1939.
- Shelbyville Moraine: Barrows 1910, G. H. Cady 1921, Fidler 1936, 1948, R. F. Flint 1949, John Webster Foster 1951b, Frye 1965a, 1965c, Glass 1964, Hackett 1960a, Hubbard 1904b, Leighton 1925a, 1953, 1958a, 1961, Leverett 1898a, 1899a, MacClintock 1959, Rubin 1960, Shaffer 1954a, 1956, Willman 1942b, 1963.
- Sherwood Member (Ord.): Doyle 1965, Templeton 1952, 1963.
- Shetlerville Fault: Atherton 1947, J. M. Weller 1952, Stuart Weller 1920b.
- Shetlerville Member, Limestone (Miss.): Atherton 1947, J. W. Baxter 1963a, 1965a, Coryell 1939a, Swann 1948, 1963, J. M. Weller 1952, Stuart Weller 1920b.
- Fauna: Geis 1936, Rexroad 1962, A. H. Sutton 1952.
- Shipman Anticline: Easton 1942.
- Shipping coal mines map: G. H. Cady 1947b, Simon 1961.
- Shoal Creek Bedrock Valley: Horberg 1950a.
- Shoal Creek Coal (Pa.) (see New Haven Coal): Kosanke 1950.
- Shoal Creek Cyclothem (Pa.): J. R. Ball 1943, 1952, S. E. Ekblaw 1934, Kosanke 1960, Newton 1937b, Wanless 1931b.
- Shoal Creek Limestone Member: J. R. Ball 1952, J. W. Baxter 1965b, J. C. Bradbury 1965b, Broadhead 1875, Brownfield 1954, G. H. Cady 1919a, 1939c, Clegg 1959, 1961, 1965b, C. L. Cooper 1946, DuBois 1951, 1955, S. E. Ekblaw 1934, Henry Engelmann 1868, Folk 1946, M. W. Fuller 1934, F. H. Kay 1915a, Kosanke 1960, Wallace Lee 1915, 1926, Lowenstam 1951, Newton 1937b, Ostrom 1957c, J. N. Payne 1942, 1944, P. E. Potter 1956c, Pryor 1956b, Pullen 1951, Rolley 1951, E. W. Shaw 1921, 1923, Siever 1951b, Sims 1944, Smoot 1958, Johan A. Udden 1915, Jon A. Udden 1908, Wanless 1939, 1955b, Wier 1961, F. E. Williams 1955, Workman 1950b, Worthen 1882c.
- Fauna: Wallace Lee 1926.
- Isopach map: Pryor 1956b.
- Structure map: Brownfield 1954, DuBois 1955, Folk 1946, Pryor 1956b, Sims 1944, Smoot 1958, F. E. Williams 1955.
- Shoal Creek Syncline: Wallace Lee 1926.
- Shullsburg Member (Ord.): Templeton 1952, 1963.
- Shullsburg Quadrangle (Ord.): Mullens 1964.
- Shumway Coal (Pa.): Wanless 1939.
- Shumway Cyclothem (Pa.): C. L. Cooper 1946, Kosanke 1960, Newton 1941.
- Shumway Limestone Member: Grogan 1940, Kosanke 1960, Siever 1957a, Wanless 1955b, J. M. Weller 1942c.
- Siderite, Ironstone: J. R. Ball 1952, J. E. Lamar 1938d, Siever 1957a, Wanless 1929a, 1957a, Willman 1942b.
- Sigel Anticline: Newton 1941.
- Siggins Dome: Mylius 1927.
- Siggins Pool: Bain 1908h, W. S. Blatchley 1906, J. E. Lamar 1928f, Mylius 1923, 1927, Phillippi 1955, Squires 1946, 1950b, 1950d.
- Silica, cementation of sediments: Siever 1959.
- Silica, Tripoli, Amorphous silica
 General: Ernest 1908, Holbrook 1917a, J. E. Lamar 1928d, 1953a, 1965, Leighton 1949b, Pryor 1962a, Weigel 1927.
 Chemical analyses: Bain 1907d, Holbrook 1917a, J. E. Lamar 1953a.
 Decolorization: Machin 1937.
 Physical tests: W. A. White 1961b.
 Pottery material: Parmelee 1932.
 Production statistics: Ill. Dept. Mines & Minerals, B 1917-1965.
 Refractories: Parmelee 1946.
 Research trends: Ill. GS 1936d.
 Sand-lime brick: Ernest 1908, W. S. Williams 1910.
- Silica in diagenesis: Dapples 1959.
- Silica sand (see Sand and gravel)
- Silicates
 Colloid properties: W. F. Bradley 1948.
 Infrared absorption: Serratos 1958a.
 Melts: Fryling 1937, Machin 1940, 1945, 1948, 1952, 1954.
 Structure: W. F. Bradley 1955a, 1959a.
 Systems: Tooley 1937.
- Silicification of Devonian strata: J. M. Weller 1944b.
- Siloam Anticline: Easton 1944b.
- Siloam Pool: R. H. Howard 1961.
- ### Silurian System
- Accepted nomenclature (see named units)
- Cayugan Series*
 Moccasin Springs Fm. (upper part)
- Niagaran Series*
 Hunton Megagroup (cont.)
 (North)
 Port Byron Fm. (Northwest)
 Racine Fm.
 Waukesha Fm.
 Joliet Fm.
 (South)
 Bainbridge Group
 Moccasin Springs Fm.
 St. Clair Fm.
- Alexandrian Series*
 Kankakee Dol. (North)
 Sexton Creek Ls. (South)
 Edgewood Dol.
 Noix Oolite M.
- General: State geol. map, Amsden 1955, Athy 1928, J. R. Ball 1939, 1940b, 1941, Bannister 1870, Collinson 1955b, D. J. Fisher 1925a, R. F. Flint 1926, L. B. Freeman 1951, James Hall 1859, Krey 1924, J. E. Lamar 1934, Lowenstam 1946, 1948a, 1948b, 1949b, Mylius 1927, Owen 1846, Ross 1963, Savage 1910a, 1913a, 1914b, 1926, Schuchert 1943, A. H. Sutton 1935, Johan A. Udden 1908a, Wanless 1957a, J. M. Weller 1940a, 1940c, Stuart Weller

Silurian System—cont.

General—cont.

1906b, 1907a, Willman 1943b, 1947, 1962, Workman 1935a, 1950b, Worthen 1866a(4).

Distribution map: Lowenstam 1949b, 1950, Swann 1951a.

Electric-log cross section: Whiting 1958.

Facies map: Amsden 1955.

Fauna: Charles Armstrong 1962, J. R. Ball 1929b, Dunn 1942, Grubbs 1939, Ingels 1963, Lowenstam 1942, 1948a, 1956, 1957, Meek 1866c, A. K. Miller 1944, Savage 1912, 1913c, 1926, 1935, Stuart Weller 1900b, 1907c.

Isopach map: Amsden 1955, G. M. Kay 1951, Lowenstam 1948b, 1949b, Sloss 1960, Suter 1959, Whiting 1965b, Willman 1942b, 1962, Zeisel 1962a.

Isopach map of nonclastics: Sloss 1960.

Lithofacies map: Sloss 1960.

Lithofacies map of nonclastics: Sloss 1960.

Northwestern Illinois: E. O. Ulrich 1924.

Paleoecology: Lowenstam 1957.

Paleogeographic map: Schuchert 1923.

Reefs (see also Niagaran reefs): Grabau 1940, Guennel 1963, R. H. Howard 1963b, Lowenstam 1950, 1956, Pettijohn 1964, Willman 1950, 1962.

Bibliography: Pugh 1950.

Regional correlations: C. K. Swartz 1942, Trowbridge 1935a.

Sea balls: Croneis 1939f.

Structure map: Lowenstam 1946, 1948b, Meents 1958a, Whiting 1956.

Silurian Upland: Horberg 1950a.

Silurian-Devonian isopach map: L. B. Freeman 1951.

Silver, production statistics: Barrett 1922a, USBM 1924-1965, USGS 1882-1923.

Silver Creek Bedrock Valley: Horberg 1950a.

Silveria Formation (Pleis.): Hershey 1896c, Leverett 1899a.

Sims Pool: L. C. Case 1945.

Sink holes (see under Physiography)

Sinsinawa Member (Ord.): Doyle 1965, Templeton 1952, 1963.

Skillet Fork Valley: Horberg 1950a.

Skillet Fork watershed: Pickels 1929.

Slate: J. E. Lamar 1938d.

Sloans Valley Formation (Miss.): St. Clair 1917d.

Smallpox Creek Syncline: J. C. Bradbury 1956.

Smithland Quadrangle: Ross 1964b, J. M. Weller 1940b.

Smithland Surface: Leighton 1949a, P. E. Potter 1955c.

Smithsonite: J. C. Bradbury 1959b.

Soil mechanics: G. E. Ekblaw 1940a, Grim 1948a, 1949, Peck 1954, Thornburn 1963.

Soils, Buried soils (modern soils not included)

General: G. E. Ekblaw 1940a, Frye 1960a, 1960c, 1963c, 1964a, 1965a, 1965c, Horberg 1953, 1955b, Leighton 1930d, 1930f, 1931e, 1932h, 1935d, 1937e, 1950b, 1962, Simonson 1954.

Chemical analyses: Leighton 1962, C. V. Shepard 1938.

Clay mineralogy: Frye 1960c, 1963c, 1965a, 1965b, Grim 1940a.

Grain-size analyses: Brophy 1959, Frye 1960c, Leverett 1899a.

Soils—cont.

Heavy minerals: J. A. Brophy 1959, Frye 1960e, 1963c.

In highway construction: G. E. Ekblaw 1936, 1940a.

Soil-stratigraphic classification: G. M. Richmond 1957, Willman 1958b.

Stratigraphic units (see Afton, Little Bear, Recent, Sangamon, and Yarmouth Soils)

Wisconsinan: Frye 1960b, 1962e, 1963b, 1963c, 1965c.

Soils and subsoils, Columbian Exposition: Anon. 1894b.

Solon Member (Dev.): Collinson 1958d.

Somerset Member (Pa.): Savage 1927.

Somerville Formation: M. L. Fuller 1904.

Sonora Sandstone, Limestone, Formation (Miss.): Collinson 1964b, Harvey 1964, R. H. Howard 1964, Keyes 1933c, Van Tuyl [1925].

Soperville Coal (Pa.): Culver 1925a.

Sorento Cyclothem: Kosanke 1960.

Sorento Dome, Anticline: A. H. Bell 1926e, 1928b, 1941b, R. S. Blatchley 1914a, F. H. Kay 1915a, Wallace Lee 1915, 1926.

Sorento Limestone Member (Pa.): Kosanke 1960.

South Johnson Dome: Mylius 1927.

South Johnson Pool: A. H. Bell 1934a, Cassin 1951, Mylius 1923, Squires 1951.

South Litchfield Dome: Wallace Lee 1915.

Southeastern Illinois Oil Field: A. H. Bell 1939f.

Southern Illinois (see also counties)

Chemical resources: Neckers 1937.

Clay and shale: J. E. Lamar 1948.

Geologic making: Stuart Weller 1927.

Geology and oil possibilities: J. M. Weller 1940a.

Limestone: J. E. Lamar 1959.

Mineral resources: J. E. Lamar 1928d, Leighton 1949b.

Sands and silts: Shrode 1952.

Siliceous materials: Lamar 1953a.

Southern Lincoln County Syncline: Krey 1924.

Soward Intrusion, Plug: Bain 1905a, J. C. Bradbury 1962b, Stuart Weller 1920b.

Spanish Needle Creek Dome: Easton 1942, F. H. Kay 1916b, Wallace Lee 1915, 1926.

Spanish Needle Creek Gas Field: A. H. Bell 1935a.

Spar Mountain Sandstone Member (Miss.): J. W. Baxter 1963a, A. H. Sutton 1951, Swann 1963, Tippie 1945, J. M. Weller 1952, Whiting 1959.

Isopach map: Whiting 1959.

Sparks Hill Plug: J. C. Bradbury 1962b, Stuart Weller 1920b, G. M. Wilson 1959.

Sparland (No. 7) Coal (Pa.) (see Danville (No. 7) Coal): Kosanke 1960, MacClintock 1959, Wanless 1957a, Willman 1942b.

Isopach map: Willman 1942b.

Sparland Cyclothem (Pa.): Kosanke 1960, MacClintock 1959, Wanless 1931a, 1931b, 1957a, J. M. Weller 1936c, Willman 1942b.

Fauna: J. R. Ball 1952, Wanless 1958, J. M. Weller 1935a.

Sparta area: Moulton 1926e.

Sparta Pool: A. H. Bell 1940b.

Sparta Shelf: Meents 1965b.

Sparta Syncline: Moulton 1926e.

Spechts Ferry Shale (Ord.): DuBois 1945, Mullens 1964, Templeton 1952, 1963, Willman 1947.

Spechts Ferry Shale—cont.

- Fauna: Perry 1962, Templeton 1963.
 Spectrochemical analysis: Goldsmith 1962.
 Speleology (see Caves)
- Spergen Limestone (Miss.) (see also Salem Limestone): Bleining 1912, Butts 1925, Fenneman 1910, 1911, Hinds 1919, Keyes 1933c, Krey 1924, Mylius 1927, Rubey 1952, E. W. Shaw 1921, Van Tuyl [1925], Stuart Weller 1906b, 1907b, J. S. Williams 1957.
- Fauna: Hinds 1919.
 Structure map: Moulton 1929a.
- Sphalerite (see Lead and zinc)
- Spiller Coal (Pa.): Worthen 1875a(2).
- Spirit leveling: S. S. Gannett 1910, R. B. Marshall 1911, 1914a, 1918, Scheflow 1906, USGS 1942.
- Spoon Formation (Pa.): Desborough 1961b, Kosanke 1960, P. E. Potter 1963c, Reinertsen 1964, W. H. Smith 1961, 1963.
 Structure map: Meents 1965a.
- Spoon River: Wanless 1957a.
- Spoon River Valley, land reclamation: J. A. Harman 1916.
- Spoon River watershed: Pickels 1929.
- Spores (see Paleobotany)
- Spring Lake Coal (Pa.): G. H. Cady 1948a.
- Spring Valley Anticline: Willman 1942b.
- Spring Valley Limestone (Pa.): G. H. Cady 1921.
- Springfield area (see also Sangamon County)
 Drainage: J. C. Jones 1908.
 Oil production: Whiting 1956.
- Springfield (No. 5) Coal Member (Pa.) (see also Harrisburg (No. 5) Coal): Andros 1915a, G. H. Cady 1915a, 1919b, 1921, 1937c, Clegg 1961, Collingwood 1924b, Culver 1925b, DuBois 1951, F. H. Kay 1915a, Kosanke 1950, 1960, Wallace Lee 1917, 1926, Reinertsen 1964, W. B. Roe 1935, Savage 1909a, 1915, 1921a, 1921c, E. W. Shaw 1913, W. H. Smith 1961, 1963, Johan A. Udden 1908b, 1912b, Wanless 1932b, 1939, 1955a, 1957a, 1961, Winslow 1959, Worthen 1882c, 1883, L. E. Young 1916b.
 Basin map: Wanless 1961.
 Isopach map: G. H. Cady 1935a, Clegg 1961.
 Structure map: G. H. Cady 1921, Clegg 1961, Collingswood 1924b, Moulton 1925d, Reinertsen 1964, Savage 1915, 1921a, E. W. Shaw 1913, Johan A. Udden 1912b, Wanless 1957a.
- Springfield Plain: Leighton 1948b.
- Springfield Quadrangle: Savage 1907, 1915, E. W. Shaw 1913.
- Springs: Athy 1928, J. R. Ball 1952, Bartow 1909a, 1909b, Leverett 1905, Peale 1886, R. B. Riggs 1890, Trowbridge 1916, USGS 1890, Wanless 1957a, Willman 1942b.
- Springville Shale (Miss.): J. W. Baxter 1965a, R. H. Benson 1958, Collinson 1958b, Krey 1921, J. E. Lamar 1948, 1953a, 1959, Ross 1964b, Savage 1920, J. M. Weller 1939e, 1940a, 1940b, 1940c, Stuart Weller 1939a, Willman 1949.
- Star Union Syncline: Willman 1942b.

Stark County

- Bedrock topography: Horberg 1950a, 1950b.

Stark County—cont.

- Clay and shale
 General: Bleining 1912, J. E. Lamar 1934.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: W. A. White 1960b.
- Coal
 Analyses: Aresco 1953-1965, G. H. Cady 1935b, 1948a, Parr 1916.
 Chlorine in: Abernethy 1965, Gluskoter 1964.
 Mineral matter: Abernethy 1965.
 Mined-out areas: Ill. GS 1959b map 6.
 Mining: Annual coal reports, H. M. Cooper 1942b.
 P, Cl, Na, and K in: Abernethy 1965.
 Production: Annual coal reports.
 Reserves: G. H. Cady 1952b.
 Strippable reserves: W. H. Smith 1963.
 Drill records: Ross Hanson 1950.
 Geologic sections (described outcrops)
 Bradford (Pleis.): Leighton 1949a.
 Stark County (Pa.): Bleining 1912.
- Ground water
 General: Bergstrom 1956a, Horberg 1950a, 1950b, Leverett 1899a.
 Analyses: Bartow 1909b, Ross Hanson 1950, A. W. Palmer 1897.
 Hydrology and chemistry: Horberg 1950b.
 Limestone and dolomite: Bleining 1912, Krey 1925, J. E. Lamar 1934.
 Loess: G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a, 1950b.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Horberg 1950b.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: Meents 1954, Whiting 1965b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
 Gas in drift: Meents 1960.
- Soil report 64
- Stratigraphy
 General: Bergstrom 1956a, Bleining 1912, Horberg 1950b.
 Ordovician: Hershey 1893b, MacClintock 1959.
 Silurian: Lowenstam 1949b, Whiting 1965b.
 Devonian: Whiting 1965b.
 Pennsylvanian: Culver 1924, W. H. Smith 1963.
 Pleistocene: Frye 1965c, Horberg 1950b, 1953, Leighton 1923a.
 Structure: Horberg 1950a.
 Worthen Survey report (v. 4): H. A. Green 1870.
- Starrs Cave Limestone (Miss.): Collinson 1961, Workman 1956.
 Isopach map: Workman 1956.
- Starved Rock Sandstone Member (Ord.): Buschbach 1965, Templeton 1963.
- Starved Rock State Park: G. H. Cady 1918b, 1919b, Frye 1965a, 1965b, H. A. Green 1870, C. U. Shepard 1838, G. O. Sauer 1916, Willman 1942b.

- State geological surveys: Leighton 1932i, 1934d.
 State Pond Member (Miss.): Collinson 1958b.
 Staunton Dome: A. H. Bell 1941b, R. S. Blatchley 1914a, F. H. Kay 1915a, Wallace Lee 1915, 1926, Mylius 1919.
 Staunton Gas Pool: A. H. Bell 1935a, Mylius 1919.
 Stavanger Syncline: Willman 1942b.
 Steele Fault: J. W. Baxter 1965a, J. M. Weller 1952.
 Steger Quadrangle: Bretz 1943, 1955.
 Stein Sand: A. H. Bell 1927b, Moulton 1929d.
- Stephenson County**
- Bedrock topography: Horberg 1950a.
 Building stone: Conover 1884.
 Clay and shale
 General: Doyle 1965, J. E. Lamar 1934.
 Chemical analyses: W. A. White 1959a.
 Drill records: Ross Hanson 1950, 1958.
 Geologic sections (described outcrops)
 Buena Vista (Ord.): Doyle 1965, Templeton 1963.
 Bunker Hill (Pleis.): Shaffer 1956.
 Cedar Creek (Ord.): Doyle 1965.
 Freeport (Ord.): Doyle 1965.
 Orangeville (Ord.): Doyle 1965.
 Pearl City (Sil.): J. E. Lamar 1934.
 Richland Creek (Ord.): Doyle 1965.
 Rock City (Ord.): Bieber 1947.
 Waddams Grove (Ord., Sil.): J. E. Lamar 1934.
 Winslow (Ord.): Bleining 1912.
 Yellow Creek (Ord.): Doyle 1965, Hershey 1896a.
 Gold-bearing formation: Hershey 1899b.
 Ground water
 General: Doyle 1965, Hackett 1956a, Horberg 1950a, Leverett 1899a, Lohr 1953, Thwaites 1927.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.
 Lead and zinc: G. H. Cox 1914, Whitney 1866, Willman 1946.
 Lena area guide leaflet: Ill. GS 1961-D.
 Limestone and dolomite: Bleining 1912, Doyle 1965, Krey 1925, J. E. Lamar 1934, Willman 1943b.
 Loess: Doyle 1965, Frye 1962e, Shaffer 1956, G. D. Smith 1942.
 Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, Doyle 1965, J. E. Lamar 1934, Whitney 1866.
 Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Structure: Doyle 1965, Horberg 1950a.
 Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
 Physiography: G. H. Cox 1914, Leighton 1948b.
 Quadrangle studies, Freeport: Doyle 1965.
 Sand and gravel: Doyle 1965.
 Stratigraphy
 General: Bleining 1912, G. H. Cox 1914.
 Cambrian: Doyle 1965.
 Ordovician: Bieber 1947, Doyle 1965, Hershey 1893b, Templeton 1963, Willman 1943b.
- Stephenson County—cont.
 Stratigraphy—cont.
 Silurian: Willman 1943b.
 Pleistocene: W. C. Alden 1909, F. C. Baker 1922a, Chamberlin 1885, Doyle 1965, Hershey 1896a, 1896c, 1897a, 1897b, 1897d, Leighton 1923a, 1961, Leverett 1899a, Shaffer 1954b, 1956, Willman 1963.
 Structure: Doyle 1965, Horberg 1950a.
 Worthen Survey report (v. 5): James Shaw 1873, Whitney 1866.
 Stephenson-Ogle County Line Syncline: G. H. Cady 1920b.
 Stewardson Anticline: Newton 1941.
 Stewardson Pool: Newton 1941.
 Stewart Fault: Brecke 1964a, J. M. Weller 1952.
 Stewartville Member, Formation (Ord.): Doyle 1965, DuBois 1945, G. M. Kay 1935a, Templeton 1952, 1963, Willman 1943b, 1947.
 "Stigmarian" Sandstone (Pa.): Savage 1921c, Wanless 1929a.
 Stillman Member (Ord.): Templeton 1952, 1963.
 Stone (see Limestone and dolomite)
 Statistics: USBM 1924-1965, USGS 1882-1923.
 Stone Church Fault: J. M. Weller 1952.
 Stonefort Anticline: Heyl 1965, J. M. Weller 1940a.
 Stonefort Coal (Pa.) (see Wise Ridge Coal): Kosanke 1950, 1960, Wanless 1939, 1961, J. M. Weller 1940a, Winslow 1959.
 Map of basin: Wanless 1961.
 Stonefort Cyclothem (Pa.): Glass 1958, Kosanke 1960, J. M. Weller 1940a.
 Stonefort Limestone Member (Pa.): G. H. Cady 1955, J. A. Harrison 1951, L. G. Henbest 1928a, Kosanke 1960, P. E. Potter 1956c, Siever 1957a, Wanless 1939, 1955b, J. M. Weller 1940a, 1942c.
 Fauna: L. G. Henbest 1928a.
 Stones River Limestone (Ord.): Bowman 1907, J. M. Weller 1940a.
 Stony Island Reef: W. C. Alden 1902, Lowenstam 1950, 1957.
 Storms Pool: Peterson 1942a, Swann 1951b.
 Stratigraphic nomenclature (Accepted nomenclature is listed under the systems; see also the State geologic map, Sequences, and the following general publications.)
 Cambrian: Buschbach 1964.
 Ordovician: Buschbach 1964, Templeton 1963.
 Silurian: Lowenstam 1949a, Willman 1962.
 Devonian: Collinson 1961, Weller 1944a.
 Mississippian: Collinson 1961, Swann 1963, Weller 1940a.
 Pennsylvanian: Kosanke 1960.
 Cretaceous: Frye 1964a, Pryor 1962a.
 Tertiary: Pryor 1962a.
 Pleistocene: Frye 1960b, 1965c, Leighton 1961.
 Stratigraphic traps, bibliography: Pugh 1951.
 Stratigraphy (see also under county and named stratigraphic units)
 General: State geol. map.
 Early investigations: G. W. White 1962.
 Policy and practice: Frye 1958c, 1958d, 1960b, 1962c, Kosanke 1960, Leighton 1958b, Maxey 1963, 1964b, G. M. Richmond 1957, Swann 1961, 1963, Templeton 1963, J. M. Weller 1930a, Willman 1958b.
 Strawbridge Member (Ord.): Templeton 1952, 1963.

Stream improvement: Bain 1908.
 Streator (No. 7) Coal (Pa.): Ashley 1902, G. H. Cady 1919b, H. C. Freeman 1868, Wanless 1939, Willman 1942b.
 Distribution map: G. H. Cady 1919b.
 Streator Quadrangle: Willman 1942b.
 Strontianite: Grave 1949.
 Strontium-calcium ratios: Chilingar 1956.
 Structural materials: Jon A. Udden 1910b.

Structure

(See also under county and named structures)
 General: State geol. map, Ballard 1938, A. H. Bell 1943c, 1964, Cohee 1939, Eardley 1951a, Giles 1939, Lobeck 1941, Meents 1954, Swann 1951b, 1958, Wanless 1955b.
 Diorama: Squires 1944d.
 Dip direction indicator: Pryor 1958.
 Duplication of names: A. H. Bell 1960b.
 Faulting: State geol. map, Bastin 1931b, J. W. Baxter 1963a, 1965a, J. S. Brown 1954, Butts 1925, G. H. Cady 1925, 1939e, 1940b, 1955, S. K. Clark 1948, Collinson 1954, 1958e, Desborough 1961b, Emrich 1962, J. H. Gardner 1915, D. A. Green 1957, J. A. Harrison 1951, Heyl 1965, J. E. Lamar 1925a, Newsam 1893b, Pryor 1956b, 1962a, Pullen 1951, Ross 1963, 1964b, Rubey 1952, W. H. Smith 1957, Stonehouse 1955, Swann 1951b, Wanless 1955b, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1920b, 1939a, H. A. Wheeler 1921, Willman 1951, Hiram Young 1892.
 Maps (see under county and stratigraphic units)
 Regional: A. H. Bell 1964, Cohee 1962, Heyl 1965, Wanless 1955b.
 Tectonic divisions: Eardley 1951b.
 Stubblefield Anticline: R. S. Blatchley 1914a, Moulton 1925d.
 Stylolites: Frye 1938, Paul Herbert 1965.
 Sub-Babylon Coal (Pa.): Kosanke 1950, 1960.
 Subsolidus relations: Goldsmith 1960.
 Subsurface studies
 Examination of well samples: Johan A. Udden 1914.
 Use of microscope: J. E. Lamar 1923, Workman 1931a.
 Sugar Creek Bedrock Valley: Horberg 1950a.
 Sugar Creek Syncline: J. R. Ball 1952.
 Sugar Hill Dome: St. Clair 1917b.
 Sugar River Basin: W. C. Alden 1918.
 Sulfur economics: Voskuil 1951c.
 Sulfur in coal (see under Coal)
 Sulfur in coke: Gilbert Thiessen 1935.
 Sulphur Springs Terrace: Willman 1942b.
 Summum Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, Wanless 1931a, 1957a, Willman 1942b.
 Fauna: Wanless 1958.
 Isopach map: Wanless 1963a.
 Summum (No. 4) Coal Member (Pa.): G. H. Cady 1952b, 1955, Clegg 1959, 1961, 1965b, DuBois 1951, J. A. Harrison 1951, Kosanke 1950, 1960, Wallace Lee 1917, Lowenstam 1951, P. E. Potter 1956c, Pullen 1951, Reinertsen 1964, Rolley 1951, H. L. Smith 1951, W. H. Smith 1961, 1963, Wanless 1932b, 1939, 1952, 1955b, 1957a, 1961, F. E. Williams 1955, Willman 1942b, Winslow 1959.
 Basin map: Wanless 1961.
 Isopach map: G. H. Cady 1935a.

Summum (No. 4) Coal—cont.

Structure map: DuBois 1951.
 Swansea Anticline: A. H. Bell 1941b.
 Swearingen Gas Pool: Rich 1916a.
 Sweetland Creek Shale (Dev.): Collingwood 1933, Krey 1924, Mylius 1927, Savage 1920, 1921b, Reinhardt Thiessen 1921, Johan A. Udden 1908a, 1912a, Wanless 1929a, J. M. Weller 1940b, Workman 1926, 1956.
 Structure map: Moulton 1926a, 1929d.
 Sycamore Fault: J. M. Weller 1952.
 Sycamore Quadrangle: Caldwell 1938, 1963, 1964.
 Sylamore Sandstone (Dev.): Collinson 1954, 1957, 1958b, 1958e, Workman 1956.
 Distribution map: Workman 1956.
 Fauna: Collinson 1961.
 Synaeresis cracks: W. A. White 1964b.

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Table Grove Syncline: Wanless 1957a.
 Tabulating drilling data: M. A. Parker 1946.
 Tallula Quadrangle: E. W. Shaw 1913.
 Tallula Syncline: E. W. Shaw 1913.
 Tamaroa Sequence (Dev.-Miss.): H. E. Wheeler 1963.
 Tar Springs Sandstone (Miss.): J. W. Baxter 1963a, 1965a, Butts 1917a, 1925, Coryell 1939a, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, Harris 1961, Howell 1948, J. E. Lamar 1925a, Pettijohn 1964, P. E. Potter 1958a, 1963a, 1963c, Ross 1964b, Siever 1953, Smoot 1960c, A. H. Sutton 1934b, 1952, Swann 1963, J. M. Weller 1936c, 1940a, 1940b, 1940c, 1952, Stuart Weller 1920a, 1920b, 1939a, Willman 1949, Workman 1940.
 Isopach map: Pryor 1957.
 Paleogeographic map: Schuchert 1955.
 Petrography: Swann 1959.
 Structure map: English 1948, Squires 1950b, 1951.
 Tarter Coal Member (Pa.): Kosanke 1950, 1960, Wanless 1939, 1957a, Winslow 1959.
 Tarter Cyclothem (Pa.): Kosanke 1960, Wanless 1957a.
 Tarter Sandstone Member (Pa.): Kosanke 1960, Wanless 1957a.
 Taylorville area structure map: A. H. Bell 1929d.
 Taylorville water supply: Workman 1930.
Tazewell County
 Bedrock topography: Horberg 1945, 1950a, 1950b, Selkregg 1958, Johan A. Udden 1912b, W. H. Walker 1965.
 Brines: Meents 1952.
 Clay and shale
 General: J. E. Lamar 1934, Johan A. Udden 1912b.
 Bonding clay: Grim 1940f.
 Ceramic tests: W. A. White 1960a.
 Chemical analyses: W. A. White 1959a.
 Mineralogy: C. W. Rolfe 1908, W. A. White 1960b.
 Petrology: Grim 1957, C. W. Rolfe 1908.
 Coal
 General: G. H. Cady 1921, Johan A. Udden 1912b.

Tazewell County—cont.

Coal—cont.

- Analyses: G. H. Cady 1921, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Lindgren 1908, Parr 1915a, 1916.
- Ash analyses: Rees 1964.
- Fractures in coal: Johan A. Udden 1908b.
- Losses: C. A. Allen 1925.
- Mined-out areas: Ill. GS 1959b map 11.
- Mining: Annual coal reports, C. A. Allen 1925, Andros 1915c, G. H. Cady 1921, H. M. Cooper 1942b, Johan A. Udden 1908b.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1952b.
- Strippable reserves: W. H. Smith 1963.
- Subsidence: L. E. Young 1916b.
- Drill records: G. H. Cady 1921, Ross Hanson 1950, 1958, 1961, Horberg 1950b, 1953, Ill. State Water Sur. 1940, Leverett 1899a, Johan A. Udden 1908a, 1912b.
- Geophysical studies: McGinnis 1961a.
- Feldspar: Willman 1942a.
- Geologic sections (described outcrops)
- East Peoria (Pleis.): Horberg 1953.
- Farm Creek (Pleis.): Horberg 1953, G. F. Kay 1928, Leighton 1925a, 1926b, 1931b, 1932a, Leverett 1899a, 1929a, 1929d, Thornbury 1940, Voss 1933.
- Farmdale (Farm Creek) Railroad-cut: DeHeinzelin 1958, Frye 1960b, Leighton 1953, G. M. Wilson 1960.
- Fondulac Dam (Pleis.): Leighton 1953.
- Lick Creek (Pa.): Johan A. Udden 1912b.
- Mackinaw (Pleis.): Horberg 1953.
- Washington (Pleis.): Leverett 1899a.
- Ground water
- General: John Webster Foster 1954, Horberg 1950a, 1950b, Ill. State Water Sur. 1940, T. E. Larson 1949, Leverett 1899a, Lohr 1953, Selkregg 1958, Johan A. Udden 1912b, W. H. Walker 1965, Walton 1962a.
- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897, Johan A. Udden 1908a.
- Artesian waters: Johan A. Udden 1908a.
- Hydrology and chemistry: Horberg 1950b.
- Limestone and dolomite: Krey 1925, Johan A. Udden 1912b.
- Loess: Frye 1962e, Leighton 1950b, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Barrows 1910, Heigold 1964, Horberg 1945, 1950a, 1950b, W. H. Walker 1965.
- Drift thickness: State geol. map.
- Geologic: State geol. map, Barrows 1910, Horberg 1950b, 1953, W. H. Walker 1965, Wanless 1957a.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Wanless 1957a.
- Structure: G. H. Cady 1921, Heigold 1964, R. H. Howard 1964, Johan A. Udden 1912b, Wanless 1957a, Whiting 1965b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas, gas in drift: Meents 1960.
- Peat: Soper 1922.

Tazewell County—cont.

- Physiography: Barrows 1910, Leighton 1948b, Johan A. Udden 1912b, W. H. Walker 1965, Wanless 1957a.
- Quadrangle studies
- Glasford: Wanless 1957a, 1958.
- Peoria: Johan A. Udden 1912b.
- Radiocarbon dates: J. R. Arnold 1951, R. F. Flint 1955, Horberg 1955a, Libby 1951, 1952b, Rubin 1955, 1958, 1960, Suess 1954.
- Sand and gravel
- General: Johan A. Udden 1912b.
- Mineralogy: Willman 1942a.
- Molding sand: Littlefield 1925a, 1925b.
- Soil report 14
- Springs: Peale 1886.
- Stratigraphy
- General: Barrows 1910, Horberg 1950b, Selkregg 1958, Johan A. Udden 1908a, 1912b, W. H. Walker 1965, Wanless 1957a.
- Silurian: Lowenstam 1950, Whiting 1965b.
- Devonian: Whiting 1965b.
- Mississippian: Romer 1934, Wanless 1957a.
- Pennsylvanian: G. H. Cady 1921, Romer 1934, W. H. Smith 1963, Johan A. Udden 1912b, Wanless 1957a, 1958.
- Pleistocene: F. C. Baker 1922a, 1928b, 1931b, Barrows 1910, G. H. Cady 1921, Frye 1960b, 1965b, 1965c, Horberg 1950b, 1953, Leighton 1925a, 1926b, 1931b, Leverett 1898a, 1899a, Staplin 1963b, Thornbury 1940, Johan A. Udden 1912b, Voss 1933, Wanless 1957a, Wascher 1938, Willman 1963.
- Recent: Barrows 1910, Johan A. Udden 1912b.
- Structure: Johan A. Udden 1912b, Wanless 1957a.
- Uranium: Ostrom 1955.
- Worthen Survey report (v. 4): Bannister 1870.

Tazewell drift, bogs on: Voss 1937.

Tazewell Loess (Pleis.) (see Richland Loess) Evedland 1952, Frye 1960b, Leighton 1933a, 1953, 1958a, 1965, MacClintock 1959, Wanless 1957a, Willman 1942b.

Tazewell Substage (Pleis.): Bretz 1955, R. F. Flint 1949, John Webster Foster 1956, Frye 1960b, Keyes 1933a, 1938c, Leighton 1933a, 1953, 1958a, Leverett 1933, MacClintock 1959, Shaffer 1954a, Wanless 1957a, Willman 1942b, Zumberge 1960.

Teays Valley (see Mahomet Bedrock Valley)

Tectonic divisions: Eardley 1951b.

Tectonic map of U.S.: Cohee 1962.

Tectonic maps: Eardley 1951a, P. B. King 1951.

Tennessean System (Miss.): Stuart Weller 1906b, 1907a.

Tertiary System

Accepted nomenclature (see named units)

Pliocene Series

Embayment Megagroup (see also Cretaceous)

"Lafayette" Gravel

Grover Gravel

Eocene Series

Wilcox Fm.

Paleocene Series

Midway Group

Porters Creek Fm.

Clayton Fm.

Tertiary System—cont.

- General: Butts 1925, Chamberlin 1891b, Henry Engelman 1866, Horberg 1950b, J. E. Lamar 1930b, Leighton 1949a, 1950b, Pryor 1961a, 1962a, Purdy 1907, Ross 1963, 1964b, Rubey 1952, Salisbury 1895, Wanless 1957a, J. M. Weller 1940a, Stuart Weller 1906b, 1907a, 1907b, Willman 1942b, Worthen 1866a(2).
- Structure map: Grohskopf 1955.
- Thebes Anticline: Pryor 1962a, J. M. Weller 1939e, 1940a, 1940c.
- Thebes Gorge, Gap: Fisk 1944, Pryor 1962a, L. L. Ray 1964.
- Thebes Quadrangle: Pryor 1962a.
- Thebes Sandstone Member (Ord.): DuBois 1945, Pryor 1962a, Savage 1909b, 1910a, 1917b, J. M. Weller 1940a, 1940c, Worthen 1868(2).
- Fauna: Savage 1910a.
- Third Cutler Rider Coal (Pa.) (see Lake Creek Coal): Kosanke 1950, 1960
- Third Vein Coal (Pa.) (see Colchester (No. 2) Coal): Bement 1906, Ede 1900, Wanless 1939.
- Thorn Group (Sil.): Lowenstam 1949b.
- Thornton Reef: Bretz 1939, Ingels 1963, Lowenstam 1950, 1956, Savage 1926, Toomey 1964, Willman 1950, 1962.
- Threemile Creek Fault: J. W. Baxter 1965a, J. M. Weller 1952, Stuart Weller 1920b.
- Ti Valley Series (Pa.): C. L. Cooper 1946, 1947a.
- Ticona Bedrock Valley: Bretz 1955, Horberg 1950a, 1953, Willman 1940, 1942b.
- Tilden Anticline: A. H. Bell 1929a.
- Tilden Meteorite: Crook 1930.
- Till, Glacial till (see also Drift, Pleistocene, and named moraines)
- Carbonate content: Frye 1960c, 1964a, Graf 1960a, Wascher 1938, 1960, Willman 1963.
- Chemical analyses: J. E. Lamar 1934, Leighton 1962, W. A. White 1960b, Willman 1963.
- Fabric: P. W. Harrison 1957.
- Grain-size analyses: J. A. Brophy 1959, Frye 1960c, W. H. Johnson 1964, Kempton 1963, Krumbein 1933b, 1953a, Larsen 1965b, Leighton 1962, Lund 1965a, 1965b, Shaffer 1956, R. S. Stauffer 1937, Wascher 1938, 1960.
- Mineralogy and petrology: J. A. Brophy 1959, Frye 1960c, 1963c, 1964a, 1965a, 1965b, J. W. Goldthwait 1909, Horberg 1955b, W. H. Johnson 1964, Kempton 1963, Krumbein 1933b, R. S. Stauffer 1937, Trowbridge 1912, Wanless 1957a, Wascher 1938, 1960, Willman 1942b, 1963.
- Pebble counts: R. C. Anderson 1955, Eveland 1952, D. J. Fisher 1925a, Frye 1960c, Horberg 1955b, 1956b, Krumbein 1933b, 1956a, J. E. Lamar 1925a, MacClintock 1929, 1959, Savage 1921b, Wanless 1929a, 1957a, Wascher 1960.
- Plasticity: Deere 1957.
- Till Plains Section (Physiography): Horberg 1950a, Leighton 1948b, MacClintock 1929, Wanless 1957a.
- Tinley Moraine: Bretz 1939, 1951, 1955, P. W. Harrison 1957, Zumberge 1960.
- Tinley Park Quadrangle: Bretz 1943, 1955.
- Tioga Bentonite Bed (Dev.): Meents 1965b.
- Tippecanoe Sequence (Ord.): Sloss 1949, 1963, Swann 1961, H. E. Wheeler 1963.
- Tiskilwa drift-gas area: Meents 1958b.
- Toleston Stage, Beach (Lake Chicago): W. C. Alden 1902, 1904, 1918, Atwood 1908, F. C. Baker 1912, Bretz 1939, 1951, 1955, 1964, D. J. Fisher 1925a, J. W. Goldthwait 1909, Hough 1953, 1958, Leverett 1899a, 1915, Rubin 1960, G. F. Wright 1918.
- Tonica Cyclothem (Pa.): Kosanke 1960.
- Tonti Sandstone Member (Ord.): Buschbach 1965, Templeton 1963.
- Topographic mapping: DeWolf 1923, Herron 1910, 1926, W. D. Jones 1941, Leighton 1930e, 1936b, McCrary 1908, Patton 1930, H. M. Wilson 1907.
- Spirit leveling: S. S. Gannett 1910, R. B. Marshall 1911, 1914a, 1918, USGS 1942.
- Triangulation and primary traverse: Birdseye 1923, R. B. Marshall 1912, 1914b, 1916, USGS 1901-1918.
- Topographic maps (see Illinois State Geological Survey List of Publications)
- Toronto Formation (Pleis.): Leverett 1898a, 1899a.
- Troy-Brussels Syncline: Collinson 1954.
- Tovey Pool: Whiting 1956.
- Tower Rock Fault: J. W. Baxter 1963a.
- Trace elements: J. C. Bradbury 1960a, 1962b, Graf 1960c, 1962b, J. E. Lamar 1956c, 1956d, Ostrom 1957c, P. E. Potter 1963d.
- Trace metals in petroleum: Nagashima 1957, Witherspoon 1957c.
- Tracey Sand: A. H. Bell 1928d, R. S. Blatchley 1909, 1912e, 1913a, Rich 1916b.
- Structure map: R. S. Blatchley 1913a.
- Tradewater Formation, Group (Pa.): Butts 1925, G. H. Cady 1926, 1942a, 1952b, 1955, English 1948, Kosanke 1947, 1950, 1960, Lowenstam 1951, MacClintock 1959, P. E. Potter 1956a, 1956c, Pullen 1951, Siever 1956b, H. L. Smith 1951, W. H. Smith 1957, 1958, Wanless 1939, 1955b, 1957a, J. M. Weller 1940a, 1952, Stuart Weller 1920b, Willman 1942b, Winslow 1959.
- Fauna: C. L. Cooper 1946, Dunbar 1942, L. G. Henbest 1928a, Wanless 1958.
- Flora: Kosanke 1950, Winslow 1959.
- Isopach map: Wanless 1955b, Willman 1942b.
- Travertine (see also Tufa)
- Building stone: J. E. Lamar 1955a.
- Trempealeau Dolomite (Camb.) (see Potosi Dol.): Buschbach 1964, John Webster Foster 1956, Hackett 1960a, Lochman 1956, Ostrom 1957b, Suter 1959, Templeton 1952, Thwaites 1923, Wanless 1957a, Willman 1942b, 1951, Workman 1926, 1948, Zeisel 1962a.
- Paleogeographic map: Schuchert 1955.
- Trempealeau and Franconia Formations, isopach map: Edwards 1935.
- Trempealeuan Stage: Buschbach 1964.
- Trenton, "Trenton", Lime, Sand, Pay Zone: Bays 1945a, B. B. Cox 1927, Lowenstam 1948b, Mylius 1920a, 1921c, 1927, Spitznagel 1942, Sterrett 1942.
- Production: Cohee 1941b.
- Trenton Limestone, Trenton-Galena Limestone, Group (Ord.): W. C. Alden 1902, Bannister 1870, Barrows 1910, Bartow 1909b, A. H. Bell 1961c, Bleining 1912, Bowman 1907, F. H. Bradley 1870, Calvert 1963, Cohee 1941a, J. W. Goldthwait 1909, D. A. Green 1957, Gutstadt 1958a, James Hall 1851, F. H. Kay 1915b, Meek 1868a, Mylius

Trenton Limestone—cont.

1919, Sardeson 1907, Savage 1907, James Shaw 1873, Thwaites 1923, Johan A. Udden 1896, 1908a, Stuart Weller 1906b, 1907a, Whitney 1866, Worthen 1866a, 1868(2), 1870, 1873(1).

Distribution map: Sardeson 1907.

Structure map: A. H. Bell 1961c, Cohee 1948a, D. A. Green 1957, Meents 1954, Mylius 1927.

Trenton Oil Field: DeWolf 1920e.

Trentonian Stage (Ord.): Templeton 1963.

Paleogeographic map: Grabau 1909.

Triangulation and primary traverse (see Topographic mapping)

Tribune Limestone (Miss.): Bain 1905a, R. S. Blatchley 1913a, Bleininger 1912, Stuart Weller 1906b, 1907a.

Tripoli (see Silica)

Trivoli (No. 8) Coal (Pa.) (see Chapel Coal): Kosanke 1950, 1960, MacClintock 1959, J. N. Payne 1944, Wanless 1939, 1957a.

Trivoli Cyclothem (Pa.): J. R. Ball 1943, 1952, Glass 1958, Kosanke 1960, MacClintock 1959, Newton 1937b, Peppers 1964, Wanless 1931a, 1931b, 1947b, 1956, 1957a, J. M. Weller 1936c.

Fauna: Wanless 1958.

Trivoli Limestone (Pa.) (see Cramer Ls.): Kosanke 1960, MacClintock 1959, Siever 1957a, Wanless 1957a.

Trivoli Sandstone Member (Pa.): Andresen 1961, DuBois 1951, Henry Engelmann 1868, Kosanke 1960, P. E. Potter 1962c, Pryor 1956b, Siever 1949, 1959, Wanless 1957a.

Isopach map: Andresen 1961, P. E. Potter 1962c, Pryor 1956b.

Structure map: Pryor 1956b.

Trowbridge Anticline: Newton 1941.

Trowbridge Coal Member (Pa.): G. H. Cady 1937c, 1948a, 1952b, Kosanke 1950, 1960.

Troy Bedrock Valley: W. C. Alden 1918, Hackett 1960a, Horberg 1950a, 1953, Kempton 1963, McGinnis 1963b, Suter 1959.

Troy Grove gas storage area: A. H. Bell 1961c, 1962b.

Troy-Brussels Syncline: Collinson 1957, Rubey 1952.

Tufa and travertine: Decker 1912, J. E. Lamar 1965, Rubey 1952.

Tullahoma Formation (Miss.): Bain 1905a, Stuart Weller 1906b, 1907a.

Turner Cyclothem (See Trivoli Cyclothem) (Pa.): C. L. Cooper 1946, Kosanke 1960, Wanless 1947b.

Turner Limestone (see Cramer Limestone) (Pa.): C. L. Cooper 1946, Kosanke 1960.

Tuscaloosa Gravel, Formation (Cre.): Marcher 1962, Pryor 1962a, Ross 1963, 1964b.

Tuscola underground liquid petroleum storage: A. H. Bell 1956d.

Tuscola Anticline, Dome: A. H. Bell 1943c, Clegg 1965a, 1965b, Schwalb 1953.

Tuscola Fault: D. A. Green 1957.

Tuscola Quadrangle, Pleistocene deposits: R. B. Johnson 1954.

Tutelo Sequence (Sil.-Dev.): H. E. Wheeler 1963.

Twin Springs Fault: Rubey 1952.

Two Creeks Interglacial (Intraglacial) Stage: Hough 1953, Leighton 1960.

Twocreekan Substage (Pleis.): Frye 1960b, 1963a, 1963b, 1965c.

Tygett Sandstone Member (Miss.): Swann 1963.
Tyson Member (Ord.): Templeton 1963.

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Ulsterian Group (Dev.): J. M. Weller 1944a.
Ultracentrifuge studies on petroleum: Witherspoon 1958.

Underclay (see Clay and shale)

Underclay, heavy minerals in: Parham 1959a.

Underclays, differentiation: O'Brien 1963b.

Underground gas storage (see Oil and gas)

Union County

Alto Pass area guide leaflet: Ill. GS 1965-F.

Bedrock topography: Horberg 1950a.

Building stone: Conover 1884.

Caves: Bretz 1961, Harris 1952.

Chert: J. E. Lamar 1934.

Clay and shale

General: Bleininger 1912, Krey 1921, J. E.

Lamar 1925a, 1934, 1948, 1959, O'Brien

1964a, Parmelee 1921, 1922, Parr 1921.

Bonding clay: Grogan 1945.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Kaolin: Grim 1934c, Piersol 1933a.

Mineralogy: Ries 1922, W. A. White 1960b.

Petrology: Grim 1957.

Refractory clay: J. E. Lamar 1956b, Par-

melee 1921, Purdy 1907, St. Clair 1917a,

J. M. Weller 1940a.

Coal: J. E. Lamar 1925a.

Drill records: Ross Hanson 1950, 1958, J. M.

Weller 1940a.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Fluorspar: J. C. Bradbury 1957a.

Ganister: J. E. Lamar 1953a.

Geologic sections (described outcrops)

Aldrich (Dev.): Weller 1939e.

Alto Pass (Pleis.): F. C. Baker 1928b.

Anna Quarries (Miss.): Bleininger 1912,

Swann 1956.

Bald Knob (Dev.): Savage 1908, 1925c.

Bradshaw Creek (Miss.): J. E. Lamar

1925a.

Cache Creek (Miss.): J. E. Lamar 1925a.

Cedar Grove Church (Miss., Pa.): J. E.

Lamar 1925a.

Cobden North (Miss., Pa.): J. E. Lamar

1925a.

Darty Creek (Dev., Miss.): R. H. Ben-

son 1958, Collinson 1958b, J. M. Weller

1939e.

Hoffner (Miss.): Swann 1956.

Hospital North Farm (Miss.): Swann

1956.

Interstate 57 (Miss., Pa.): Harris 1961.

Jonesboro West (Pleis.): Leighton 1950b.

Kaolin Station (Cre.): Parmelee 1921.

Korndahl Station (Miss.): Bleininger

1912.

Kornthal Church (Dev., Miss.): Collinson

1958b, Willman 1949.

Lingle Creek (Dev.): Orr 1964.

Little Saline (Dev.): Savage 1925c.

Mountain Glen (Dev.): Orr 1964.

State Pond (Dev., Miss.): R. H. Benson

1958, Collinson 1958b.

Swan Creek (Miss.): Swann 1956, J. M.

Weller 1939e.

Union County—cont.

- Geophysical studies: Pullen 1953.
- Ground water
 General: Horberg 1950a, J. E. Lamar 1925a, Leverett 1899a, Pryor 1956a, Workman 1928.
 Analyses: Bartow 1909b, Ross Hanson 1950, 1958.
- Jonesboro area guide leaflet: Ill. GS 1964-A.
- Lake deposits: E. W. Shaw 1915.
- Lead and zinc: J. C. Bradbury 1957a.
- Limestone and dolomite
 General: Krey 1925, J. E. Lamar 1925a, 1934, 1959, J. M. Parks 1953.
 Agricultural limestone: Van Horn 1907.
 Building stone: J. E. Lamar 1925a.
 Cement materials: Bleininger 1912, J. E. Lamar 1956b, 1959.
 Mineralogy: Graf 1950b, Grim 1937a.
- Loess: Fehrenbacher 1965b, Leighton 1950b, G. D. Smith 1942.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map, C. L. Cooper 1944, J. E. Lamar 1925a, 1934, 1948, J. M. Weller 1940b, 1940c, Stuart Weller 1939a.
 Mineral industries: Ill. GS 1961.
 Structure: J. E. Lamar 1925a, J. M. Weller 1940a.
- Mineral industries: J. E. Lamar 1928d.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Novaculite: J. E. Lamar 1953a.
- Ocher and sienna: J. E. Lamar 1948, Hewitt Wilson 1933.
- Oil and gas
 Oil shale: Barrett 1922b.
 Possibilities: J. E. Lamar 1925a, St. Clair 1917d, J. M. Weller 1940a.
- Physiography: Cozzens 1940, R. F. Flint 1941, J. E. Lamar 1925a, Leighton 1948b.
- Potash: Krey 1921, Parr 1921.
- Quadrangle studies
 Alto Pass: J. M. Weller 1940c.
 Carbondale: J. E. Lamar 1925a.
 Dongola: Stuart Weller 1939a.
 Jonesboro: J. M. Weller 1940c.
- Radiocarbon dates: Rubin 1960.
- Sand and gravel
 General: J. E. Lamar 1925a.
 Mineralogy: R. E. Hunter 1965, Willman 1942a.
 Silica sand: J. E. Lamar 1953a.
- Sandstone: Biggs 1955, P. E. Potter 1958b, 1963a, Siever 1956b.
- Silica (Tripoli): Bain 1907d, Holbrook 1917a, J. E. Lamar 1953a, Parmelee 1932, Weigel 1927.
- Springs: Peale 1886.
- Stratigraphy
 General: Bleininger 1912, Desborough 1959b, Harris 1961, Meek 1861c, Swann 1956, J. M. Weller 1939e, 1940a, Stuart Weller 1926c, Willman 1949, Workman 1928.
 Ordovician: J. M. Weller 1940c.
 Silurian: J. R. Ball 1940b, Savage 1913c, J. M. Weller 1940c.
 Devonian: Bassett 1925, Bassler 1937, G. A. Cooper 1942b, 1945, Krey 1921, Orr 1964, Roy 1933, Savage 1908, 1920, 1925c,

Union County—cont.

- Stratigraphy—cont.
 Warthin 1944, J. M. Weller 1940a, 1940c, 1944b, Stuart Weller 1928, Workman 1944.
 Mississippian: R. H. Benson 1958, Collinson 1958b, Coryell 1939a, Harris 1952, J. E. Lamar 1925a, P. E. Potter 1958a, Rexroad 1965b, St. Clair 1917d, A. H. Sutton 1940, Swann 1956, 1958, 1963, Tippie 1945, J. M. Weller 1940a, 1940b, 1940c, Stuart Weller 1908, 1920a, 1928, 1939a, Workman 1956.
 Pennsylvanian: Desborough 1959a, J. E. Lamar 1925a, Poor 1925, St. Clair 1917d, J. M. Weller 1940a.
 Cretaceous: J. M. Weller 1940c.
 Tertiary: C. L. Cooper 1944, J. E. Lamar 1930b.
 Pleistocene: F. C. Baker 1928b, Kaeiser 1958, J. E. Lamar 1925a.
 Structure: Desborough 1959b, 1961c, G. E. Ekblaw 1925c, St. Clair 1917d, Stonehouse 1955, J. M. Weller 1940c.
 Sulfide mineralization: Desborough 1959b.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 3): Worthen 1868(2).
- Union Township Pool: Mylius 1927.
- Unionville Sandstone (Pa.): James Shaw 1873.
- Upper Bogota Black Shale (Pa.): Newton 1937b, Wanless 1939.
- Upper Bogota Cyclothem (Pa.): Newton 1937b, 1941.
 Structure map: Newton 1941.
- Upper DeLong Coal (Pa.) (see DeLong Coal): Kosanke 1960, Wanless 1939, 1955b.
- Upper DeLong Cyclothem (Pa.) (see DeLong Cyc.): Kosanke 1960.
- Upper Illinois Valley, geography and history: C. O. Sauer 1916.
- Upper LaSalle Limestone (Pa.): Wanless 1939.
- Upper Liverpool Cyclothem (Pa.): Wanless 1931a, 1957a.
- Upper Livingston Limestone (Pa.) (see Livingston Ls.): Kosanke 1960, J. M. Weller 1942c.
- Upper Macoupin Cycle, Cyclothem (Pa.): J. R. Ball 1943, Kosanke 1960.
- Upper Mississippi Embayment: Pryor 1960.
- Upper Mississippi Valley loess: Leighton 1950b.
- Upper Partlow Sand: Mylius 1927, Piersol 1940.
 Structure map: Mylius 1927.
- Upper Scottville Coal (Pa.) (see Athensville Coal): Kosanke 1950, 1960.
- Upper Siggins Sand, Pay Zone: Mylius 1927.
- Upper Willis Coal (Pa.): Butts 1925.
- Uranium: J. C. Bradbury 1955b, Huddle 1954, J. E. Lamar 1965, Ostrom 1955, V. E. Swanson 1960, Vine 1962.
- Urbana Moraine: R. C. Anderson 1960, Eveland 1952, John Webster Foster 1951a.
- Utica Clay (Pa.): G. H. Cady 1919b, Hershey 1893b, Kosanke 1960, Parmelee 1921, Wanless 1939, Willman 1942b.

V

- Valderan (Valders) Substage (Pleis.): Frye 1960b, 1963a, 1965c, Leighton 1957a, 1958a, 1960, 1965, Willman 1963, H. E. Wright 1964.
- Valmeyer Anticline: Mylius 1921b, J. M. Weller 1939e, Stuart Weller 1939b, Willman 1949.

- Valmeyeran Series (Miss.): State geol. map, Collinson 1958e, 1959, Henry Engelmann 1863, R. C. Moore 1933, Rexroad 1963, Swann 1963, Whiting 1959, Workman 1956.
- Valparaiso Moraine: W. C. Alden 1902, 1904, Bretz 1939, 1955, Chamberlin 1882b, D. J. Fisher 1925a, Frye 1965b, J. W. Goldthwait 1909, P. W. Harrison 1957, Krumbain 1933b, Leverett 1897, 1899a, W. E. Powers 1940, Salisbury 1899, Willman 1942b, Zumberge 1960.
- Vanadium efflorescence: Deadmore 1957, J. E. Lamar 1957b, Machin 1957.
- Van Buren Formation (Ord.): Workman 1948.
- Vandalia Arch: Workman 1956.
- Varved clays: Antevs 1957, Wanless 1938, 1955a.
- Venedy Dome: E. W. Shaw 1912a.
- Vergennes Sandstone Member (Pa.): Butts 1925, G. H. Cady 1917, 1926, Desborough 1961b, Hinds 1919, Kosanke 1960, J. E. Lamar 1925a, E. W. Shaw 1912b, Wanless 1939.
- Vermicular Sandstone (Miss.): J. M. Weller 1940b.
- Vermiculite: W. F. Bradley 1958, 1960.
- Vermilion County**
- Bedrock topography: M. R. Campbell 1900, Horberg 1945, 1950a, Selkregg 1958.
- Clay and shale
- General: M. R. Campbell 1900, J. E. Lamar 1934, W. A. White 1958a.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: C. W. Rolfe 1908, W. A. White 1960b.
- Petrology: Grim 1938b, 1957, C. W. Rolfe 1908, W. A. White 1964b.
- Refractory clay: J. E. Lamar 1956b.
- Coal
- General: M. R. Campbell 1900, Ill. GS 1913, F. H. Kay 1915b.
- Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, 1948, Lindgren 1908, L. C. McCabe 1935, Parr 1904, 1906b, 1915a, 1916, 1931, N. H. Snyder 1953, Zubovic 1964.
- Ash analyses: Rees 1964.
- Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.
- Beryllium in: Stadnichenko 1961.
- Chlorine in: Abernethy 1965, Gluskoter 1964.
- Coal balls: Feliciano 1924.
- Free-swelling index: Abernethy 1961.
- Grindability: Abernethy 1961.
- Losses: C. A. Allen 1925.
- Mined-out areas: Ill. GS 1959b map 16.
- Mineral matter: Abernethy 1965.
- Mining: Annual coal reports, C. A. Allen 1925, Andros 1914f, H. M. Cooper 1942b, Parsons 1907, R. W. Raymond, 1896.
- Minor elements: Zubovic 1964.
- P, Cl, Na, and K in: Abernethy 1965.
- Preparation: Boley 1949, L. C. McCabe 1935, 1939a, Mitchell 1937.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1952b, DeWolf 1908b.
- Squeezes in mines: Freer 1892.
- Strippable reserves: Culver 1925b.
- Subsidence: L. E. Young 1916b.
- Vermilion County—cont.
- Drill records: R. S. Blatchley 1910a, M. R. Campbell 1900, Ross Hanson 1950, 1958, F. H. Kay 1915b, Leverett 1899a, Warthin 1944, Worthen 1883(1).
- Fossil plant localities: Collinson 1960a.
- Geologic sections (described outcrops)
- Collinson Creek (Pleis.): Eveland 1952.
- Drainage Ditch (Pleis.): G. E. Ekblaw 1955, Eveland 1952, Leighton 1953.
- Fairmount Quarry (Pa., Pleis.): Eveland 1952.
- Fairview Collieries Mine (Pa., Pleis.): Eveland 1952.
- Fithian (Pa.): O'Brien 1963a, Peppers 1964.
- Glenburn (Pleis.): Eveland 1952.
- Hawbuck Creek (Pleis.): Eveland 1952.
- Hungry Hollow (Pleis.): G. E. Ekblaw 1955, Eveland 1952, Leighton 1953.
- Lick Creek (Pleis.): Eveland 1952.
- Little Vermilion River (Pleis.): Eveland 1952.
- Salt Fork (Pleis.): Eveland 1952.
- Georgetown area guide leaflet: Ill. GS 1961-E.
- Ground water
- General: M. R. Campbell 1900, John Webster Foster 1954, Horberg 1950a, Leverett 1899a, Lohr 1953, Selkregg 1958.
- Analyses: Bartow 1909a, Ross Hanson 1950, 1958, A. W. Palmer 1897.
- Limestone and dolomite
- General: Krey 1925.
- Mineralogy and petrology: Ostrom 1957a.
- Trace elements: Ostrom 1957c.
- Loess: Fehrenbacher 1965b, Frye 1962e.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Eveland 1952, Horberg 1945, 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, M. R. Campbell 1900, Horberg 1953, Schwalb 1953, Wier 1961.
- Glacial: State geol. map, Eveland 1952, Flint 1959, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Structure: F. H. Kay 1915b, Meents 1954, Schwalb 1953.
- Mastodon: N. C. Anderson 1905, Bagg 1909, John Wells Foster 1857.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
- Gas in drift: Meents 1960.
- Possibilities: Mylius 1923, 1927.
- Prospecting: Ill. GS 1919a, Mylius 1920a.
- Physiography: M. R. Campbell 1900, Eveland 1952, Leighton 1948b.
- Potash: Schroyer 1922.
- Quadrangle studies, Danville: M. R. Campbell 1900.
- Radiocarbon dates: J. R. Arnold 1951, Ives 1964, Libby 1952b, Rubin 1956, 1961.
- Sand and gravel
- General: M. R. Campbell 1900.
- Molding sand: Littlefield 1925a.
- Sandstone: J. C. Bradbury 1962a.
- Soil report 62
- Stratigraphy
- General: A. H. Bell 1964, G. H. Cady 1920b, M. R. Campbell 1900, F. H. Kay 1915b, Mylius 1927, Selkregg 1958.

Vermilion County—cont.

Stratigraphy—cont.

- Ordovician: Mylius 1927, Workman 1950b.
 Devonian: Warthin 1944.
 Mississippian: Mylius 1927, Romer 1934, H. G. Schenck 1939, Swann 1958.
 Pennsylvanian: J. W. Alexander 1943, J. C. Bradbury 1962a, E. C. Case 1900, Deere 1957, F. H. Kay 1915b, Mylius 1927, O'Brien 1963a, E. C. Olson 1946, Ostrom 1957a, Romer 1934, H. G. Schenck 1939, Scudder 1878a, 1878c, W. A. White 1958a, G. M. Wilson 1942, Worthen 1883(1).
 Pleistocene: Deere 1957, G. E. Ekblaw 1955, Eveland 1952, Frye 1965c, Horberg 1953, Hubbard 1911, Krumbain 1933b, Leverett 1899a, Wayne 1965, Wegemann 1909, Willman 1963.
 Structural materials: Jon A. Udden 1910b.
 Structure: G. H. Cady 1920b, F. H. Kay 1915b, Schwalb 1953.
 Tufa: Decker 1912.
 Uranium: Ostrom 1955.
 Worthen Survey report (v. 4): F. H. Bradley 1870.

Vermilion River Valley: Eveland 1952.

Vermilion River watershed: Pickels 1929.

Vermilionville Sandstone Member (Pa.) (see Cuba Ss.): G. H. Cady 1915a, 1919b, Kosanke 1960, MacClintock 1959, P. E. Potter 1962c, 1963a, Wanless 1955b, Willman 1942b.

Isopach map: P. E. Potter 1963a.

Vermont Quadrangle: Wanless 1957a, 1958.

Pleistocene stratigraphy: Leighton 1935d.

Versailles Anticline: Wanless 1957a.

Vevay Park Dome: Mylius 1927.

Vevay Park Pool: Mylius 1923, 1927.

Victory Member (Ord.): Templeton 1952, 1963.

Vienna city reservoir: G. E. Ekblaw 1937a.

Vienna Limestone (Miss.): J. W. Baxter 1963a, 1965a, Butts 1925, C. L. Cooper 1941, Coryell 1939a, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, Harris 1961, Howell 1948, J. E. Lamar 1925a, 1959, Ross 1964b, A. H. Sutton 1934b, 1952, Swann 1963, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1920a, 1939a, Willman 1949, Workman 1940.

Fauna: McFarlan 1942, Zeller 1953.

Vienna Quadrangle: Stuart Weller 1939a.

Vincennes Quadrangle: Rich 1916b.

Vinegar Hill Syncline: J. C. Bradbury 1956, Willman 1947.

Virgilian Series, Virgil Series (Pa.): State geol. map, C. L. Cooper 1946, 1947a.

Vitricin: Kosanke 1954a.

W

Wabash County

Bedrock topography: Fidler 1943, Horberg 1950a.

Brines: E. S. Bastin 1930, Meents 1952.

Clay and shale

General: M. L. Fuller 1904, J. E. Lamar 1934.

Chemical analyses: W. A. White 1959a.

Petroleum mud fluids: J. E. Lamar 1931c.

Mineralogy: Smoot 1960a.

Wabash County—cont.

Coal

General: M. L. Fuller 1903, 1904.

Analyses: G. H. Cady 1948a, 1955, Helfinstine 1946.

Mined-out areas: Ill. GS 1959b map 25.

Mining and production: Annual coal reports.

Preparation: Boley 1949.

Reserves: G. H. Cady 1944, 1952b, 1955.

Strippable reserves: Culver 1925b.

Drill records: Bain 1908g, M. L. Fuller 1904, Ross Hanson 1950, 1958, 1961.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Geologic sections (described outcrops)

McCleary's Bluff (Pa.): Kosanke 1960.

Patton South (Pleis.): Frye 1962e.

Geophysical studies: Pryor 1956c.

Ground water

General: M. L. Fuller 1904, Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961.

Limestone and dolomite: Krey 1925.

Loess: Fehrenbacher 1965b, Frye 1962e.

Maps (see also type of map, stratigraphic units)

Bedrock topography: M. L. Fuller 1904, Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, M. L. Fuller 1904.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Siever 1951a.

Structure: A. H. Bell 1943c, G. H. Cady 1955, S. K. Clark 1948, Collingwood 1924a, Easton 1943, Moulton 1925b, 1925d, 1927a, Rich 1916b, Siever 1951a, Squires 1943e, Swann 1951b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

General: Cohee 1942a, M. L. Fuller 1904, Moulton 1927a, 1927b.

Development maps: Ill. GS 1965 maps 36, 37, 39, 40.

Developments: F. H. Kay 1916b, 1917b, Moulton 1926j, 1927b.

Mud-fluid materials: J. E. Lamar 1931c.

Pools

Allendale: Collingwood 1924a, Moulton 1925b, Rich 1915, 1916b, Squires 1938a, 1943e.

Griffin Pool: Spitznagel 1939b.

Possibilities: R. S. Blatchley 1910a, Collingwood 1924a, Easton 1943, Moulton 1925b, 1925d, 1927a, Rich 1915.

Sand properties: Piersol 1940.

Waterflooding: Pryor 1957, Squires 1938a, 1943e, 1946, 1950a.

Physiography: M. L. Fuller 1904, Glock 1932, Leighton 1948b, MacClintock 1929, Rich 1916b.

Quadrangle studies, Patoka: M. L. Fuller 1904.

Sand and gravel: Willman 1942a.

Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962a, 1962c, 1963a.

Soil reports 61, 83.

Stratigraphy

General: M. L. Fuller 1904, Rich 1915.

Devonian: Meents 1965b.

Wabash County—cont.
Stratigraphy—cont.

Mississippian: Moulton 1925b, Rich 1916b, Siever 1951a, Swann 1951b, 1958.
Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, 1955, M. L. Fuller 1904, M. E. Hopkins 1958, Kosanke 1960, Moulton 1925b, Rich 1916b, Siever 1951a.

Pleistocene: Fidler 1948.

Structure: S. K. Clark 1948, Easton 1943, M. L. Fuller 1904, Meents 1965b, Moulton 1925b, 1927a, Swann 1951b.

Worthen Survey report (v. 6): Worthen 1875b(2).

Wabash Formation (Pa.): M. L. Fuller 1904.

Wabash River, mineralogy of sands: Willman 1942a.

Wabash River Anticline: A. H. Bell 1943c, Swann 1951b.

Wabash River Valley, oil and gas: Cohee 1942a.

Wabash River watershed: Pickels 1929.

Wabash Valley Fault System: G. H. Cady 1939e, 1955, J. A. Harrison 1951, Heyl 1965, Pryor 1956b, Pullen 1951, W. H. Smith 1957, Wanless 1955b.

Wabash Valley history: Fidler 1936, 1948, Frye 1962e, Horberg 1950a, Leighton 1950b, Thornbury 1958, Wayne 1952, Willman 1963.

Wabash Valley Loess: Fehrenbacher 1965a, 1965b, Frye 1962e, Leighton 1950b, Sittler 1960.

Wabaunsee Group (Pa.): C. L. Cooper 1946.

Wad: J. C. Bradbury 1959b.

Walgreen Member (Ord.): Templeton 1952, 1963.

Walche Limestone Member (Miss.): J. W. Baxter 1963a, 1965a, Rexroad 1965b, Swann 1963.

Wallbridge Discontinuity: H. E. Wheeler 1963.

Wall Member (Ord.): Doyle 1965, Templeton 1952, 1963.

Wallace Branch Fault: J. M. Weller 1952, Stuart Weller 1920b.

Waltersburg Sandstone (Miss.): J. W. Baxter 1963a, 1965a, Coryell 1939a, Currier 1944, P. L. Dana 1941, English 1948, Folk 1946, Harris 1961, J. E. Lamar 1925a, P. E. Potter 1958a, 1962a, 1963a, Ross 1964b, Siever 1953, Smoot 1960c, A. H. Sutton 1934b, 1952, Swann 1951b, 1963, J. M. Weller 1940a, 1940b, 1940c, 1952, Stuart Weller 1920a, 1920b, 1939a, Workman 1940.

Isopach map: P. E. Potter 1962a, 1963a, Siever 1953, Swann 1951b.

Sand thickness: Swann 1964.

Wamac Dome: Brownfield 1954.

Wamac Pool: A. H. Bell 1926a, Moulton 1929d, H. A. Wheeler 1922.

Wapella area: Craig Ferris 1964.

Wapella East Dome: Heigold 1964.

Wapella East Pool: R. H. Howard 1963a, 1963b, 1964.

Wapsipicon Limestone (Dev.): J. R. Ball 1952, Buschbach 1965, Carman 1910, C. L. Cooper 1944, R. H. Howard 1961, Lowenstam 1946, 1948b, Savage 1920, 1921b, 1921d, Stainbrook 1944, Wanless 1929a, 1957a, J. M. Weller 1944a, Whiting 1965b, Workman 1935d, 1944.

Isopach map: Lowenstam 1948b, Whiting 1965b.

Ward Hunt Island, fusulinids: M. L. Thompson 1961.

Warren County

Bedrock topography: Horberg 1950a.

Clay and shale

General: Savage 1921a, 1921c, Wanless 1929a.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Petrology: Grim 1957.

Refractory clay: E. H. Lines 1917, Purdy 1907.

Resources: W. A. White 1963.

Coal

General: Culver 1925a, Savage 1921a, 1921c, Wanless 1929a.

Analyses: G. H. Cady 1935b, 1948a, Parr 1916, Savage 1921a, Wanless 1929a.

Mined-out areas: Ill. GS 1959b maps 5, 11.
Mining: Annual coal reports, Andros 1915b, Savage 1921a.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b, Culver 1925a.

Strippable reserves: Culver 1925b, Reinertsen 1964, W. H. Smith 1963.

Subsidence: L. E. Young 1916b.

Drill records: Culver 1925a, Ross Hanson 1950, Nebel 1919, Johan A. Udden 1914, Wanless 1929a, Workman 1926, 1948, Worthen 1890(2).

Feldspar: Willman 1942a.

Fossil plant localities: Collinson 1960a.

Geologic sections (described outcrops)

Cedar Creek (Pa., Pleis.): Savage 1921a, 1921c.

Henderson Creek (Pleis.): Horberg 1956b, Wanless 1929a.

Swan Creek (Pa.): Savage 1921c, Wanless 1957a.

Ground water

General: Bergstrom 1956a, Horberg 1950a, Leverett 1899a, Savage 1921a, 1921c, Wanless 1929a.

Analyses: Bartow 1909b, Ross Hanson 1950.

Limestone and dolomite

General: Krey 1925, Savage 1921c.

Building stone: Savage 1921a, Wanless 1929a.

Mineralogy: Grim 1937a.

Resources: Wanless 1929a.

Loess: G. D. Smith 1942, Wanless 1929a.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a, Wanless 1929a.

Drift thickness: State geol. map.

Geologic: Savage 1921a, Wanless 1929a, J. M. Weller 1940b.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a, Wanless 1929a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Wanless 1957a.

Structure: Moulton 1925d, Nebel 1919, Reinertsen 1964, Savage 1921a, 1921c, Wanless 1927, 1929a, 1957a, Whiting 1965b.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

Gas in drift: Meents 1960.

Possibilities: Moulton 1925d, Nebel 1919, Poor 1927, Savage 1921a, 1921c, Wanless 1927, 1929a.

Warren County—cont.

- Physiography: Leighton 1948b, Savage 1921c, Wanless 1929a.
- Quadrangle studies
- Alexis: Wanless 1929a.
- Avon: Savage 1921a.
- Good Hope: Nebel 1919, Savage 1921c.
- LaHarpe: Nebel 1919, Savage 1921c.
- Sand and gravel: Savage 1921a, 1921c, Wanless 1929a, Willman 1942a.
- Sandstone: Savage 1921c, Siever 1956b.
- Soil report 70
- Springs: Wanless 1929a.
- Stratigraphy
- General: Bergstrom 1956a, Nebel 1919, Savage 1921a, Wanless 1957a, Workman 1926.
- Cambrian: Workman 1948.
- Ordovician: Workman 1948.
- Silurian: Whiting 1965b.
- Devonian: Whiting 1965b.
- Mississippian: Savage 1921c, J. M. Weller 1940b, J. S. Williams 1957.
- Pennsylvanian: Culver 1924, 1925a, Reinertsen 1964, Savage 1921a, 1921c, W. H. Smith 1963, Wanless 1929a, Wanless 1932b, W. A. White 1963.
- Pleistocene: F. C. Baker 1928b, Horberg 1956b, Savage 1921c, Wanless 1928, 1929a.
- Structure: Moulton 1925d, Wanless 1929a, 1957a.
- Worthen Survey report (v. 4): H. A. Green 1870.

Warsaw Anticline: A. H. Bell 1932e.

Warsaw Shale, Limestone (Miss.): J. R. Ball 1952, A. H. Bell 1932e, Bleiningner 1912, Butts 1915, 1917a, 1925, Collingwood 1933, Collinson 1964b, Coryell 1919, Currier 1922, Fenneman 1910, 1911, Gordon 1895, James Hall 1857b, 1859, Harris 1961, Harvey 1964, J. B. Hayes 1964, Hinds 1919, R. H. Howard 1961, Keyes 1892b, 1933c, Krey 1924, J. E. Lamar 1959, Laudon 1948, R. C. Moore 1935, Morse 1915, Nebel 1919, Robertson 1940, 1942, 1944, 1951, Rubey 1952, E. W. Shaw 1921, Swann 1965, Van Tuyl 1912a, [1925], Wanless 1957a, J. M. Weller 1934, 1940a, 1940b, 1941b, 1952, Stuart Weller 1906b, 1907a, 1907b, 1914, 1920b, 1939a, 1939b, Wherry 1918, J. S. Williams 1957, Willman 1949.

Fauna: Hinds 1919, Rexroad 1965a, Van Tuyl [1925].

Geodes: Collinson 1964b, Perkins 1871, Robertson 1940, 1942, 1944, 1951.

Paleogeographic map: Schuchert 1955.

Warsaw-Keokuk Formation (Miss.), structure map: A. H. Bell 1932e.

Warsaw-Salem Limestone (Miss.): Spreng 1961, J. M. Weller 1939e, 1940c.

Washington County

Bedrock topography: Horberg 1950a.

Brines: Meents 1952.

Clay and shale

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: Smoot 1960a.

Coal

General: G. H. Cady 1938, 1940b, Ill. GS 1913, F. H. Kay 1915a, E. W. Shaw 1923.

Washington County—cont.

Coal—cont.

Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, L. C. McCabe 1934a, B. C. Parks 1956, Parr 1916, Piersol 1935.

Ash fusibility: Abernethy 1961.

Coal balls: G. H. Cady 1937b.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Losses: C. A. Allen 1925.

Mined-out areas: Ill. GS 1959b maps 26, 27, 29.

Mineral matter: Abernethy 1965.

Mining: Annual coal reports, C. A. Allen 1925, Andros 1914e, H. M. Cooper 1942b, E. W. Shaw 1923.

P, Cl, Na, and K in: Abernethy 1965.

Petrology: L. C. McCabe 1934a.

Preparation: Boley 1949, L. C. McCabe 1934a.

Production: Annual coal reports.

Reserves: G. H. Cady 1944, 1952b, Siever 1950.

Subsidence: L. E. Young 1916b.

Drill records: A. H. Bell 1940b, F. H. Kay 1915a, Johan A. Udden 1914, Worthen 1883(1).

Faults: G. H. Cady 1938.

Geophysical studies: Pryor 1956c.

Ground water

General: Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c, E. W. Shaw 1921.

Analyses: Bartow 1909b, Ross Hanson 1950.

Limestone and dolomite

General: Krey 1925.

Mineralogy: Grim 1937a.

Loess: Frye 1962e, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, E. W. Shaw 1921, 1923.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Siever 1951a.

Structure: A. H. Bell 1927b, 1940b, 1943c, 1961c, Brownfield 1954, G. H. Cady 1938, 1940b, F. H. Kay 1915a, Moulton 1925d, J. N. Payne 1941, Pye 1944, E. W. Shaw 1912a, 1921, 1923, Siever 1950, 1951a.

Mastodon: N. C. Anderson 1905, Bagg 1909.

Meteorite: Crook 1930.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas

Development maps: Ill. GS 1965 maps 31, 32, 33, 43, 44.

Pools

Centralia: A. H. Bell 1927b, Moulton 1929d.

Cordes: A. H. Bell 1940b.

Sandoval: A. H. Bell 1927b, Moulton 1929d.

Wamac: Moulton 1929d.

Possibilities: A. H. Bell 1938a, 1941b, Moulton 1925d.

Secondary recovery: Pryor 1957.

Underground gas storage: A. H. Bell 1961c, 1962b.

Washington County—cont.

- Physiography: Leighton 1948b, MacClintock 1929, E. W. Shaw 1921, 1923.
- Quadrangle studies
 Carlyle: E. W. Shaw 1923.
 Okawville: E. W. Shaw 1921.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962a, 1962c, Pye 1944.
- Soil report 58
- Springs: Peale 1886.
- Stratigraphy
 General: A. H. Bell 1927b, R. S. Blatchley 1910a, Brownfield 1954, Moulton 1929d, E. W. Shaw 1921, 1923.
 Devonian: Meents 1965b.
 Mississippian: Pye 1944, Siever 1951a, Swann 1958, 1965.
 Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, L. G. Henbest 1928b, M. E. Hopkins 1958, F. H. Kay 1915a, Schopf 1937a, E. W. Shaw 1912a, 1923, Siever 1951a, Jon A. Udden 1908, Worthen 1883(1).
 Pleistocene: Leighton 1961, Willman 1963.
 Structure: A. H. Bell 1927b, 1940b, Meents 1965b, Moulton 1925d, 1929d.
 Worthen Survey report (v. 3): Henry Engelmann 1868.
- Waterflooding (see Oil and gas)
- Waterloo Anticline: A. H. Bell 1929b, Cohee 1941b, Ill. GS 1920a, J. E. Lamar 1922.
- Waterloo gas storage area: A. H. Bell 1961c, 1962b, Peterson 1956.
- Waterloo Pool: A. H. Bell 1929b, 1939f, Cohee 1941a, 1941b, Moulton 1926f, Willman 1949.
- Waterloo Quadrangle: Stuart Weller 1939b.
- Waterloo-Dupo (Waterloo-Columbia) Anticline: Bergstrom 1956b, Culver 1920, Mylius 1921, J. M. Weller 1939b.
- Waterways, steel production potential: Voskuil 1959a.
- Watson Coal (Pa.): Kosanke 1950.
- Waucoma Limestone (Sil.): Savage 1914b, 1926.
- Waukesha Dolomite (Sil.): Lowenstam 1948a, Pinsak 1964, Savage 1926, A. H. Sutton 1935, J. M. Weller 1935c, Willman 1943b, 1950, 1962.
- Waupecan Sandstone (Pa.): Culver 1922a.
- Waverly Dome: A. H. Bell 1961c.
- Waverly gas storage area: A. H. Bell 1962b, Peterson 1956.
- Waverlyan Series (Miss.): A. H. Sutton 1939, Stuart Weller 1906b, 1907a.

Wayne County

- Bedrock topography: Horberg 1950a.
- Clay and shale
 Mineralogy: Atherton 1960, Smoot 1960a.
 Petrology: Grim 1957.
- Coal: DuBois 1955.
- Reserves: G. H. Cady 1944, 1952b, Siever 1950.
 Strippable reserves: Culver 1925b.
- Drill records: DuBois 1945, Ross Hanson 1958, J. M. Parks 1953.
- Geophysical logs: Wyllie 1949.
- Geophysical studies: Pryor 1956c.

Wayne County—cont.

- Ground water
 General: Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956c, R. C. Scott 1962.
 Analyses: Bartow 1909b, Ross Hanson 1958, A. W. Palmer 1897.
- Limestone and dolomite: J. M. Parks 1953.
- Loess: Fehrenbacher 1965b.
- Maps (see also type of map, stratigraphic units)
 Bedrock topography: Horberg 1950a.
 Drift thickness: State geol. map.
 Geologic: State geol. map.
 Glacial: State geol. map, Leighton 1961, Leverett 1899a.
 Mineral industries: Ill. GS 1961.
 Paleogeologic: L. K. Lee 1939b, Siever 1951a, Workman 1966.
 Structure: A. H. Bell 1943c, DuBois 1955, Easton 1944b, Siever 1950, 1951a, Sims 1944, Swann 1951b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
 General: Cohee 1942a, Theron Wasson 1938.
 Development maps: Ill. GS 1965 maps 34, 35, 36, 40, 41, 42.
- Pools
 Aden: Meents 1965b.
 Goldengate: Meents 1965b.
 Johnsonville: Squires 1946.
 North Aden: L. C. Case 1945.
 Sims: L. C. Case 1945.
 Possibilities: Easton 1944b.
- Waterflooding: Pryor 1957, Squires 1946, 1950a.
- Physiography: Leighton 1948b, MacClintock 1929.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962a, 1962c, 1963a.
- Soil report 49
- Springs: Peale 1886.
- Stratigraphy
 Ordovician: DuBois 1945.
 Silurian: Lowenstam 1949b.
 Devonian: Meents 1965b, Workman 1944.
 Mississippian: Coryell 1939a, L. K. Lee 1939b, Siever 1951a, Swann 1951b, 1958, 1964, Workman 1956.
 Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, DuBois 1955, M. E. Hopkins 1958, Siever 1951a, Sims 1944, J. M. Weller 1942c.
 Pleistocene: Frye 1965c, Leverett 1899a.
- Structure: A. H. Bell 1964, Easton 1944b, D. A. Green 1957, L. K. Lee 1939b, Meents 1965b, Swann 1951b.
- Worthen Survey report (v. 6): Worthen 1875b(2).
- Wayside Coal (Pa.): Kosanke 1950, 1960, Winslow 1959.
- Wayside Formation (Pa.): Siever 1956b, Wanless 1939.
- Wayside Sandstone Member (Pa.): Desborough 1961b, Kosanke 1960, J. E. Lamar 1925a, P. E. Potter 1956a, Siever 1959.
- Weathering (see Soils)
- Wedron Terrace: Willman 1942b.
- Weger Pool: Rich 1916a.
- Well Coal (Pa.): Butts 1925.

- Wells (see Drill records under county)
- West Baden Group (Miss.): J. W. Baxter 1963a, 1965a, Swann 1963.
- West Chicago Moraine: Frye 1965b, Leighton 1953, Suter 1959, Zeisel 1962a, Zumberge 1960.
- West Frankfort Quadrangle: R. S. Blatchley 1910a, G. H. Cady 1910.
- West Frankfort Reservoir, sedimentation: V. H. Jones 1937b.
- West Franklin Limestone Member (Pa.): G. H. Cady 1955, Clegg 1965b, DuBois 1951, Easton 1943, J. A. Harrison 1951, Kosanke 1960, Lowenstam 1951, P. E. Potter 1956c, Pryor 1956b, Pullen 1951, Rolley 1951, Shrock 1929, Siever 1951b, 1957a, Sims 1944, H. L. Smith 1951, Wanless 1939, Wier 1961, F. E. Williams 1955, Workman 1950b.
- Distribution map: Andresen 1961, DuBois 1951.
- Structure map: DuBois 1951, Easton 1943, J. A. Harrison 1951, Shrock 1929.
- West Green Fault Zone: Brecke 1962.
- West Ridge Moraine: R. C. Anderson 1960, John Webster Foster 1951a.
- Western Adams County Terrace: Krey 1924.
- Western Shelf: A. H. Bell 1964.
- Western Springs, water supply: Workman 1930.
- Westfield Dome: Clegg 1965a.
- Westfield Lime, Pay Zone: Mylius 1927.
- Westfield Pool: Cohee 1941a, 1941b, Mylius 1920a, 1927.
- Wheatland Esker: D. J. Fisher 1925a.
- Wheaton Moraine: Zeisel 1962a.
- Wheaton Morainal Country: Leighton 1948b.
- Wheaton Quadrangle: Trowbridge 1912.
- Wheeling Quadrangle: Bretz 1943, 1955.

White County

- Bedrock topography: Fidlar 1943, Horberg 1950a, Pryor 1956b.
- Brines: Meents 1952.
- Clay and shale
- General: M. L. Fuller 1904.
- Ceramic tests: W. A. White 1960a.
- Chemical analyses: W. A. White 1959a.
- Mineralogy: Atherton 1960, Smoot 1960a.
- Petrology: Grim 1957.
- Coal
- General: G. H. Cady 1939e, M. L. Fuller 1903, 1904, J. A. Harrison 1951.
- Analyses: G. H. Cady 1935b, 1948a, DeWolf 1908b, Hawley 1923, Lindgren 1908, Ovitz 1918.
- Coke analyses: Ovitz 1918.
- Mined-out areas: Ill. GS 1959b map 30.
- Mining: Annual coal reports, H. M. Cooper 1942b.
- Production: Annual coal reports.
- Reserves: G. H. Cady 1944, 1952b, J. A. Harrison 1951.
- Drill records: A. H. Bell 1939c, Pryor 1956b, Saxby 1957, Warthin 1944.
- Geophysical studies: Pryor 1956c, Pullen 1953.
- Ground water
- General: M. L. Fuller 1904, Horberg 1950a, Leverett 1899a, Pryor 1956a, 1956b, 1956c.
- Analyses: Bartow 1909b, Ross Hanson 1950, 1958, A. W. Palmer 1897.
- Gypsum and anhydrite: Saxby 1957.

White County—cont.

- Loess: Fehrenbacher 1965b, Hubricht 1962.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: M. L. Fuller 1904, Horberg 1950a, Pryor 1956b.
- Drift thickness: State geol. map.
- Geologic: State geol. map, M. L. Fuller 1904.
- Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a.
- Mineral industries: Ill. GS 1961.
- Paleogeologic: Siever 1951a, Workman 1956.
- Structure: A. H. Bell 1943c, G. H. Cady 1939e, J. A. Harrison 1951, McDermitt 1948, Pryor 1956b, Siever 1951a, Swann 1951b.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
- General: Cohee 1942a, M. L. Fuller 1904.
- Development maps: Ill. GS 1965 maps 19, 20, 21, 22, 35, 36.
- Pools
- Herald: McDermitt 1948.
- Herald East: Swann 1951b.
- Mink Island: Swann 1951b.
- New Harmony: C. H. Riggs 1945a.
- Ribeyre: Swann 1951b.
- Roland: Swann 1951b.
- Storms: Peterson 1942a, Swann 1951b.
- West Crossville: Morrissy 1957.
- Possibilities: A. H. Bell 1939c, R. S. Blatchley 1910a.
- Waterflooding: Pryor 1957, Squires 1950a, 1950d.
- Underground gas storage: A. H. Bell 1956d.
- Physiography: R. F. Flint 1941, M. L. Fuller 1904, Leighton 1948b, MacClintock 1929.
- Quadrangle studies, Patoka: M. L. Fuller 1904.
- Radiocarbon dates: Libby 1952a.
- Sand and gravel, molding sand: Littlefield 1925a, 1925b.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1962a, 1962c, 1963a, Siever 1953, 1956b.
- Stratigraphy
- General: A. H. Bell 1964, M. L. Fuller 1904, Workman 1950b.
- Devonian: Meents 1965b, Warthin 1944, Workman 1944.
- Mississippian: Atherton 1947, Pinsak 1957, Siever 1951a, Swann 1948, 1951b, 1958, 1963, Workman 1956.
- Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, G. H. Cady 1944, M. L. Fuller 1904, J. A. Harrison 1951, M. E. Hopkins 1958, Jillson 1930, Pryor 1956b, H. W. Scott 1944b, Siever 1951a.
- Pleistocene: Fidlar 1948, Pryor 1956b, G. F. Wright 1890.
- Structure: Cohee 1942a, M. L. Fuller 1904, J. A. Harrison 1951, Meents 1965b, Stonehouse 1955, Swann 1951b.
- Uranium: Ostrom 1955.
- Worthen Survey report (v. 6): Worthen 1875b(2).
- White Oak Anticline: E. W. Shaw 1912a, 1921.
- White Rock Moraine: G. E. Ekblaw 1941.

Whiteside County

Bedrock topography: Carman 1910, John Webster Foster 1956, Horberg 1950a.

Building stone: Conover 1884.

Clay and shale

General: J. E. Lamar 1934.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

Mineralogy: C. W. Rolfe 1908.

Petrology: C. W. Rolfe 1908.

Refractory clay: J. E. Lamar 1956b.

Drill records: Ross Hanson 1950, 1958, 1961.

Feldspar: Willman 1942a.

Geologic sections (described outcrops)

Deer Creek (Pleis.): Shaffer 1956.

Fulton Quarry (Pleis.): Frye 1962e.

Morrison (Sil.): Savage 1926.

Sterling (Ord., Sil.): Savage 1924b, 1925b.

Ustick (Sil.): Savage 1926.

Ground water

General: John Webster Foster 1956,

Hackett 1956a, Ross Hanson 1955, Hor-

berg 1950a, Leverett 1899a, Thwaites 1927.

Analyses: Bartow 1909b, Ross Hanson

1950, 1958, 1961, A. W. Palmer 1897.

Limestone and dolomite: Grim 1937a, Krey 1925, Willman 1943b.

Loess: Carman 1910, Frye 1962e, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Carman 1910, Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Carman 1910,

John Webster Foster 1956, Horberg 1953, Shaffer 1954a.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a, Shaffer 1956.

Mineral industries: Ill. GS 1961.

Paleogeologic: John Webster Foster 1956.

Structure: John Webster Foster 1956, Thwaites 1927.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Morrison area guide leaflet: Ill. GS 1964-D.

Peat: Soper 1922.

Physiography: Carman 1910, Leighton 1948b.

Sand and gravel

General: John Webster Foster 1956.

Dune sand: Carman 1910.

Mineralogy: Willman 1942a.

Molding sand: Littlefield 1925a, 1925b,

Willman 1939b.

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Springs: Peale 1886.

Stratigraphy

General: Carman 1910, Everett 1861,

John Webster Foster 1956, Thwaites 1923.

Cambrian: John Webster Foster 1956.

Ordovician: John Webster Foster 1956,

Gutstadt 1958b, Savage 1924b, 1925b.

Silurian: Savage 1926, Willman 1943b.

Pennsylvanian: Culver 1925a, Wanless

1947b.

Pleistocene: W. C. Alden 1909, 1918, F.

C. Baker 1922a, 1928b, Chamberlin 1885,

R. F. Flint 1931, John Webster Foster

1956, Horberg 1953, Leighton 1923a, 1961,

Leverett 1899a, 1942b, B. W. Ray 1962,

Shaffer 1954a, 1954b, 1956, Staplin 1963b.

Whiteside County—cont.

Structure: John Webster Foster 1956, Horberg 1950a, Thwaites 1927.

Worthen Survey report (v. 5): James Shaw 1873.

White-top: G. H. Cady 1921, Culver 1925a, W. H. Smith 1963, Johan A. Udden 1912b, Wanless 1952, 1957a.

Wilberton Pool: D. L. Stevenson 1964.

Wilbur Hills: Fidlar 1948.

Wilcox Formation (Ter.): Parmelee 1921, P. E. Potter 1961b, Pryor 1962a, Ross 1963, J. M. Weller 1940a.

Paleogeographic map: Schuchert 1955.

Wiley Coal Member (Pa.): Inman 1960, Kosanke 1950, 1960, W. H. Smith 1963, Wanless 1939, 1955a, 1957a, 1961, Winslow 1959.

Basin map: Wanless 1961.

Wiley Cyclothem (Pa.): J. R. Ball 1952, Kosanke 1960, Wanless 1931a, 1957a.

Will County

Bedrock topography: W. C. Alden 1902, J. W. Goldthwait 1909, Horberg 1943a, 1943b, 1950a, Suter 1959, Willman 1940.

Brines: Meents 1952.

Building stone: Conover 1884.

Clay and shale

General: Athy 1928, J. E. Lamar 1934.

Ceramic tests: W. A. White 1960a.

Coal

General: G. H. Cady 1915a, Dinsmore 1889, Ill. GS 1913, Jasper Johnson 1875, Rothwell 1891.

Analyses: Abernethy 1961, Aresco 1953-1965, G. H. Cady 1935b, 1948a, Feliciano 1924, Fieldner 1942b, Parr 1904, 1906b, 1916, Piersol 1936, N. H. Snyder 1953, Zubovic 1964.

Ash analyses: Rees 1964.

Ash fusibility: Abernethy 1961.

Beryllium in: Stadnichenko 1961.

Coal flora (see Mazon Creek fossils)

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Mined-out areas: Ill. GS 1959b map 18.

Mining: Annual coal reports, Andros

1914a, Athy 1928, Quintin Clark 1893,

H. M. Cooper 1942b.

Minor elements: Zubovic 1964.

Production: Annual coal reports.

Reserves: Athy 1928, G. H. Cady 1952b.

Strippable reserves: Culver 1925b.

Subsidence: L. E. Young 1916b.

Drainage: J. W. Goldthwait 1909.

Drill records: W. C. Alden 1902, C. B. Anderson 1919, Athy 1928, Bartow 1909b, Buschbach 1964, Buswell 1941, G. H. Cady 1915a, D. J. Fisher 1925a, Gobble 1942, Ross Hanson 1950, 1961, Leverett 1896, Prickett 1964, Johan A. Udden 1914, Walton 1965.

Feldspar: R. E. Hunter 1965, Willman 1942a.

Geologic sections (described outcrops)

Channahon (Sil.): Savage 1913c.

Cowan's Quarry (Ord., Sil.): Athy 1928,

Willman 1962.

Joliet Power Plant (Sil.): Savage 1926.

Lincoln Quarry (Sil.): Willman 1962.

National Stone Co. Quarry (Sil.): Savage 1926.

Will County—cont.

Geologic sections—cont.

Rock Run (Ord.): Savage 1924b, 1925b.
Schweitzer School West (Ord., Sil.): Willman 1962.

Warner Bridge West, State Park Campground (Ord., Sil.): Athy 1928, Savage 1913c, Willman 1962.

Wilmington (Ord.): Savage 1924b, 1925b.

Geophysical studies: Beck 1965.

Ground water

General: W. C. Alden 1902, C. B. Anderson 1919, Athy 1928, Bergstrom 1955, Buswell 1941, 1943, D. J. Fisher 1925a, Gobble 1942, Horberg 1943b, 1950a, Leverett 1899a, Lohr 1953, Prickett 1964, Suter 1959, Thwaites 1927, Walton 1960a, 1965.

Analyses: Bartow 1909b, Ross Hanson 1950, 1961, A. W. Palmer 1897.

Artesian waters: C. B. Anderson 1919.

Limestone and dolomite

General: W. C. Alden 1902, Athy 1928, D. J. Fisher 1925a, Krey 1925, J. E. Lamar 1934, Willman 1943b.

Cement materials: Burchard 1907, J. E. Lamar 1956b.

Loess: Frye 1962e.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Athy 1928, Horberg 1943b, 1950a, Suter 1959.

Drift thickness: State geol. map.

Geologic: State geol. map, W. C. Alden 1902, Athy 1928, D. J. Fisher 1925a, Suter 1959.

Glacial: State geol. map, R. F. Flint 1959, Leighton 1961, Leverett 1899a, Suter 1959.

Mineral industries: Ill. GS 1961.

Paleogeologic: Buschbach 1964.

Structure: Athy 1928, Beck 1965, Buschbach 1964, G. H. Cady 1915a, Suter 1959, Thwaites 1927.

Marl: Athy 1928, D. J. Fisher 1925a.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Oil and gas possibilities: D. J. Fisher 1925a.

Peat: D. J. Fisher 1925a.

Physiography: Athy 1928, Leighton 1948b, Rudd 1956.

Quadrangle studies

Brisbane: Bretz 1943, 1955.

DesPlaines: W. C. Alden 1902.

Frankfort: Bretz 1943, 1955.

Herscher: Athy 1928.

Joliet: D. J. Fisher 1925a.

Mokena: Bretz 1943, 1955.

Tinley Park: Bretz 1943, 1955.

Sand and gravel

General: W. C. Alden 1902, Athy 1928, D. J. Fisher 1925a, J. E. Lamar 1934.

Mineralogy and petrology: R. E. Hunter 1965, Willman 1942a.

Molding sand: Littlefield 1925a, 1925b, Willman 1939b.

Resources: G. E. Ekblaw 1964.

Sandstone: Siever 1956b.

Soil reports 35, 80

Solution features: Bretz 1940.

Stratigraphy

General: W. C. Alden 1902, C. B. Anderson 1919, D. J. Fisher 1925a, 1928, J. W. Goldthwait 1909, Suter 1959.

Will County—cont.

Stratigraphy—cont.

Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.

Cambrian: A. H. Bell 1964, Buschbach 1964.

Ordovician: Athy 1928, A. H. Bell 1964, Buschbach 1964, D. J. Fisher 1938, Gutstadt 1958b, Savage 1924b, 1925b, Stuart Weller 1916a, Workman 1950a.

Silurian: Athy 1928, Burchard 1907, Croneis 1932b, Dunn 1942, D. J. Fisher 1925a, Foerste 1925, Lowenstam 1948a, Ross 1962a, Savage 1913a, 1914b, 1926, Stuart Weller 1897b, Willman 1943b.

Mississippian: Romer 1934.

Pennsylvanian: Athy 1928, G. H. Cady 1915a, Dinsmore 1889, Romer 1934, Savage 1916a.

Pleistocene: Athy 1928, F. C. Baker 1922b, G. H. Cady 1915a, G. E. Ekblaw 1925a, D. J. Fisher 1925a, Frye 1965b, 1965c, J. W. Goldthwait 1909, Horberg 1943a, 1953, Krumbain 1933b, Leverett 1899a, Sharp 1942, Wascher 1938, Willman 1963, Zumberge 1960.

Structure: Buschbach 1964, D. J. Fisher 1925a, J. W. Goldthwait 1909, Suter 1959, Thwaites 1927.

Worthen Survey report (v. 4): F. H. Bradley 1870.

Williamson County

Bedrock topography: Horberg 1950a.

Brines: Meents 1952.

Carrier Mills area guide leaflet: Ill. GS 1965-A.

Clay and shale

General: J. E. Lamar 1925a.

Ceramic tests: W. A. White 1960a.

Chemical analyses: W. A. White 1959a.

In coal mines: Stull 1917.

Mineralogy: Atherton 1960.

Petrology: Grim 1957, P. E. Potter 1958b.

Resources: Parham 1963a.

Coal

General: G. H. Cady 1916, 1925, 1938, DeWolf 1908a, D. J. Fisher 1925b, Ill. GS 1913, J. E. Lamar 1925a, Savage 1910b, 1911a, 1911b, Shields 1949.

Analyses: Abernethy 1961, Aresco 1953-1965, Ashley 1902, E. T. Benson 1935, 1936, G. H. Cady 1910, 1916, 1919e, 1927, 1934, 1935b, 1948a, Fieldner 1942b, Hawley 1923, Helfinstine 1946, J. A. Holmes 1906, 1908, Lindgren 1908, L. C. McCabe 1934a, 1935, E. W. Parker 1906b, Parr 1904, 1906b, 1915a, 1916, Piersol 1936, Savage 1910b, 1914a, E. W. Shaw 1912b, N. H. Snyder 1953, W. F. Wheeler 1908a.

Ash analyses: Rees 1964.

Ash fusibility: Abernethy 1961, L. C. McCabe 1939a.

Chlorine in: Abernethy 1965, Gluskoter 1964.

Coke: Weeks 1884.

Free-swelling index: Abernethy 1961.

Grindability: Abernethy 1961.

Losses: C. A. Allen 1925.

Low sulfur coal: C. A. Allen 1925, G. H. Cady 1919c, 1919d, 1919e.

Metamorphism: Clegg 1955a.

Methane in: Darton 1915.

Williamson County—cont.

Coal—cont.

- Mined-out areas: Ill. GS 1959b maps 29, 30, 32.
- Mineral matter: Abernethy 1965.
- Mining: Annual coal reports, C. A. Allen 1925, Andros 1914d, G. H. Cady 1910, H. M. Cooper 1942b, Darton 1915, Doerr 1949, Savage 1910b.
- P, Cl, Na, and K in: Abernethy 1965.
- Petrology: L. C. McCabe 1934a.
- Physical tests: J. A. Holmes 1906, 1908, E. W. Parker 1906a.
- Preparation: Boley 1949, L. C. McCabe 1935, 1939a, Mitchell 1937.
- Production: Annual coal reports, Anon. 1909, DeWolf 1911.
- Reserves: G. H. Cady 1916, 1952b, DeWolf 1908b.
- Stripable reserves: G. H. Cady 1927, Culver 1925b, W. H. Smith 1957.
- Subsidence: L. E. Young 1916b.
- Drill records: Ross Hanson 1958.
- Geologic sections (described outcrops)
- Chamness (Pleis.): Willman 1963.
- Creal Springs Quarry (Pa.): Kosanke 1960.
- Interstate 57 (Pa.): Harris 1961.
- Marion Northwest (Pleis.): Frye 1962e.
- Wolf Creek (Pa., Pleis.): Frye 1962e.
- Geophysical studies: Pullen 1953.
- Ground water
- General: Horberg 1950a, J. E. Lamar 1925a, Leverett 1899a, Pryor 1956a.
- Analyses: Bartow 1909b, Gluskoter 1965a, Ross Hanson 1958.
- Igneous rocks: Clegg 1955a, 1956, Parham 1963b.
- Lake deposits: E. W. Shaw 1915.
- Limestone and dolomite
- General: Krey 1925, J. E. Lamar 1925a, 1934.
- Building stone: J. E. Lamar 1925a.
- Cement materials: J. E. Lamar 1956b.
- Mineralogy and petrology: Graf 1950b, P. E. Potter 1958b.
- Loess: Fehrenbacher 1965b, Frye 1962e.
- Maps (see also type of map, stratigraphic units)
- Bedrock topography: Horberg 1950a.
- Drift thickness: State geol. map.
- Geologic: State geol. map, J. E. Lamar 1925a, E. W. Shaw 1912b, J. M. Weller 1940b.
- Mineral industries: Ill. GS 1961.
- Structure: E. T. Benson 1935, R. S. Blatchley 1910a, G. H. Cady 1910, 1916, 1925, 1938, Darton 1915, DeWolf 1908a, 1911, D. J. Fisher 1925b, J. E. Lamar 1925a, Savage 1910b, 1911a, 1911b, E. W. Shaw 1912b.
- Marion area guide leaflet: Ill. GS 1963-A.
- Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)
- Oil and gas
- Development maps: Ill. GS 1965 maps 17, 18.
- Possibilities: A. H. Bell 1938a, W. S. Blatchley 1906, Brokaw 1916, J. E. Lamar 1925a, St. Clair 1917d.
- Physiography: G. H. Cady 1910, R. F. Flint 1941, J. E. Lamar 1925a, Leighton 1948b,

Williamson County—cont.

Physiography—cont.

- MacClintock 1929, Savage 1910b, E. W. Shaw 1912b.
- Quadrangle studies
- Carbondale: J. E. Lamar 1925a.
- Herrin: Savage 1910b, 1911a, 1911b, E. W. Shaw 1912b.
- West Frankfort: G. H. Cady 1910.
- Sand and gravel: J. E. Lamar 1925a.
- Sandstone: Andresen 1961, J. C. Bradbury 1962a, M. E. Hopkins 1958, P. E. Potter 1958b, 1962a, 1962c, Siever 1949, 1953, 1956b.
- Soil report 79
- Stratigraphy
- General: R. S. Blatchley 1910a, W. S. Blatchley 1906, DeWolf 1911, Harris 1961, E. W. Shaw 1912b, Stuart Weller 1926c.
- Mississippian: Brokaw 1916, J. E. Lamar 1925a, P. E. Potter 1958a, St. Clair 1917d, Swann 1958, J. M. Weller 1940b.
- Pennsylvanian: Andresen 1961, J. C. Bradbury 1962a, Brokaw 1916, G. H. Cady 1910, 1916, Desborough 1961a, DeWolf 1908a, 1911, D. J. Fisher 1925b, L. G. Henbest 1928a, M. E. Hopkins 1958, Kosanke 1960, J. E. Lamar 1925a, Parham 1963a, St. Clair 1917d, Savage 1910b, 1911a, 1911b, Shields 1949, Siever 1949, W. H. Smith 1957, J. M. Weller 1942c.
- Pleistocene: G. H. Cady 1916, J. E. Lamar 1925a, 1925b, Leighton 1961, Willman 1963, G. F. Wright 1890.
- Structure: E. T. Benson 1935, G. H. Cady 1916, 1938, S. K. Clark 1948, St. Clair 1917d, Savage 1910b, Stonehouse 1955.
- Uranium: Ostrom 1955, Vine 1962.
- Worthen Survey report (v. 6): Worthen 1875b(2).
- Williana Terrace: Fisk 1949.
- Willis Coal Member (Pa.): J. W. Baxter 1965a, Butts 1925, Kosanke 1950, 1960, W. H. Smith 1957, Wanless 1939, Winslow 1959.
- Willow River Dolomite (Ord.): E. H. Powers 1935b.
- Wilmington Coal (Pa.): Ashley 1902, Parr 1907a.
- Wilson Sand, Pay Zone: A. H. Bell 1926b, 1927b, Moulton 1929d.
- Winchester Quadrangle, Pleistocene stratigraphy: Leighton 1930d.
- Windrow Formation (Ter.): G. W. Andrews 1958, Horberg 1946.
- Wine Hill Dome: Root 1928.
- Winfield Dolomite (Ord.): Keyes 1898.
- Winkleman Fault: G. H. Cady 1926.
- Winnebago County**
- Bedrock topography: Hackett 1960a, Horberg 1950a, McGinnis 1963b.
- Belvidere area guide leaflet: Ill. GS 1963-C.
- Building stone: Conover 1884.
- Copper erratic: Crook 1929.
- Drill records: W. C. Alden 1918, C. B. Anderson 1919, Hackett 1960a, Ross Hanson 1958, Kempton 1963, Thwaites 1927.
- Environmental geology: Larsen 1965a.
- Feldspar: R. E. Hunter 1965, Willman 1942a.
- Geologic sections (described outcrops)
- Harrison (Ord.): Bieber 1947.
- Geophysical studies: McGinnis 1961a, 1963b.

Winnebago County—cont.

Ground water

General: C. B. Anderson 1919, Bretz 1923, Hackett 1956a, 1960a, Horberg 1950a, Leverett 1899a, Lohr 1953, J. N. Payne 1938, H. F. Smith 1948, 1950b, Thwaites 1927, Workman 1937b.

Analyses: Bartow 1909b, Ross Hanson 1950, 1958, 1961, A. W. Palmer 1897.

Artesian waters: C. B. Anderson 1919.

Limestone and dolomite: Grim 1937a, Krey 1925, J. E. Lamar 1934, Willman 1943b.

Loess: Frye 1962e, Shaffer 1956, G. D. Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Hackett 1960a, Horberg 1950a.

Drift thickness: State geol. map.

Geologic: State geol. map, Bretz 1923, McGinnis 1963b.

Mineral industries: Ill. GS 1961.

Structure: Hackett 1960a, J. E. Lamar 1928b, McGinnis 1963b, Thwaites 1927.

Mastodon: N. C. Anderson 1905, Bagg 1909, S. P. Lathrop 1851.

Mineral production (see USBM Minerals Yearbook, Ill. GS Illinois Mineral Industry)

Peat: Soper 1922.

Physiography: Bretz 1923, Hackett 1960a, Leighton 1948b, Deette Rolfe 1929, Salisbury 1918.

Quadrangle studies

Kings: Bretz 1923.

Sand and gravel

Mineralogy: R. E. Hunter 1965, Willman 1942a.

Molding sand: Littlefield 1925a, 1925b, Willman 1939b.

Silica sand: J. E. Lamar 1928b.

Sandstone: J. E. Lamar 1928b.

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Springs: Peale 1886.

Stratigraphy

General: C. B. Anderson 1919, Bevan 1925a, Hackett 1960a, McGinnis 1963b, J. N. Payne 1938, Deette Rolfe 1929.

Precambrian: A. H. Bell 1964, J. C. Bradbury 1965c.

Cambrian: Templeton 1950.

Ordovician: Bieber 1944, 1947, Bretz 1923, J. E. Lamar 1928b, Swezey 1882, Templeton 1963, Willman 1943b, N. H. Winchell 1896.

Pleistocene: W. C. Alden 1909, 1918, F. C. Baker 1931b, Bretz 1923, R. F. Flint 1931, Frye 1965a, 1965c, Kempton 1963, Leighton 1923a, 1961, 1963, Leverett 1899a, Salisbury 1918, Shaffer 1954b, 1956, Willman 1963.

Recent: F. C. Baker 1918.

Structure: Thwaites 1927.

Worthen Survey report (v. 5): James Shaw 1873.

Winnebago Drift (Pleis.): Doyle 1965, Frye 1960b, 1965a, 1965e, Kempton 1963, Willman 1963.

Winston Limestone (Sil.): Savage 1914b, 1926.

Wisconsin age bog: Tehon 1938.

Wisconsin Arch: Bieber 1949, Doyle 1965, D. A. Green 1957, Heyl 1959, Horberg 1950a, Moss 1936, Pirtle 1932, Willman 1951.

Wisconsin Driftless Section (see also Driftless Area): Leighton 1948b.

Wisconsinan (Wisconsin) Stage (Pleis.): W. C.

Alden 1918, Barrows 1910, Bretz 1923, 1939, 1955, G. H. Cady 1919b, M. R. Campbell 1900, Carman 1910, Culver 1922a, Doyle 1965, G. E. Ekblaw 1955, Eveland 1952, D. J. Fisher 1925a, R. F. Flint 1947, John Webster Foster 1951a, Frye 1958b, 1960b, 1962e, 1963c, 1965a, 1965b, 1965c, M. L. Fuller 1904, Glass 1964, J. W. Goldthwait 1909, Hackett 1960a, Horberg 1950b, 1953, 1956b, Kempton 1963, Knappen 1926, Leighton 1923a, 1925a, 1932a, 1950b, 1957a, 1965, A. B. Leonard 1960, Leverett 1897, 1898a, 1899a, MacClintock 1959, C. O. Sauer 1916, Shaffer 1954a, 1956, Suter 1959, Trowbridge 1912, Johan A. Udden 1912b, W. H. Walker 1965, Wanless 1957a, Wascher 1938, 1960, Willman 1942b, 1963, Zeisel 1962a, Zumbeerge 1960.

Classification: Chamberlin 1878, 1882b, 1895, R. F. Flint 1963, Frye 1960b, 1963a, 1963c, 1965c, Horberg 1955a, G. F. Kay 1933, Keyes 1933b, 1935, 1938c, 1938d, Leighton 1931b, 1933a, 1953, 1957a, 1958a, 1960, 1964, 1965, Leverett 1899a, 1933, Ruhe 1952, H. E. Wright 1964.

Wise Lake Formation (Ord.): Buschbach 1965, Doyle 1965, Templeton 1952, 1963.

Wise Ridge Coal Member (Pa.) (see Stonefort Coal): Kosanke 1960.

Witherite: Grawe 1949.

Witt Coal Member (Pa.): Kosanke 1960.

Witt Cyclothem (Pa.): Kosanke 1960.

Wittenberg shales (Dev.): Keyes 1941c.

Wittenberg Trough: Meents 1965b.

Wolrab Mill Fault: J. W. Baxter 1963a, 1965a, J. S. Brown 1954, J. M. Weller 1952, Stuart Weller 1920b.

Womac Coal Member (Pa.) (see Macoupin Coal): Kosanke 1960.

Woodbine Meteorite: W. F. Read 1963.

Woodbury Coal (Pa.): Kosanke 1950.

Woodbury Cyclothem (Pa.): Newton 1937b, 1941, Kosanke 1960.

Woodbury Limestone Member (Pa.): Kosanke 1960, Newton 1937b, Wanless 1939.

Woodford County

Bedrock topography: Horberg 1950a, 1950b, Selkregg 1958.

Clay and shale, in coal mines: Stull 1917.

Coal

General: G. H. Cady 1915a, Ill. GS 1913.

Analyses: G. H. Cady 1935b, 1948a, L. C.

McCabe 1935, B. C. Parks 1956, Parr 1916.

Ash fusibility: L. C. McCabe 1939a.

Mined-out areas: Ill. GS 1959b maps 7,

10.

Mining: Annual coal reports, Andros 1914a, 1915c, H. M. Cooper 1942b.

Preparation: L. C. McCabe 1935, 1939a, Mitchell 1937.

Production: Annual coal reports.

Reserves: G. H. Cady 1952b.

Subsidence: L. E. Young 1916b.

Drill records: Ross Hanson 1950, 1961, Leverett 1899a, Willman 1942b.

Geologic sections (described outcrops)

Danvers, Rock Creek (Pleis.): Frye 1962e, 1965b, Glass 1964, Horberg 1953.

Woodford County—cont.

Geologic sections—cont.

Richland Creek (Pleis.): Frye 1962e,
Glass 1964, Horberg 1953.

Secor (Panther Creek) (Pleis.): Frye
1965b, Leighton 1953.

Geophysical studies: Beck 1965.

Ground water

General: John Webster Foster 1954, Hor-
berg 1950a, 1950b, Leverett 1899a, Schicht
1961, Selkregg 1958, Walton 1965.

Analyses: Bartow 1909b, Ross Hanson
1950, 1961, A. W. Palmer 1897.

Hydrology and chemistry: Horberg 1950b.

Limestone and dolomite: Krey 1925.

Loess: Frye 1962e, Leighton 1950b, G. D.
Smith 1942.

Maps (see also type of map, stratigraphic units)

Bedrock topography: Barrows 1910, Hei-
gold 1964, Horberg 1950a, 1950b.

Drift thickness: State geol. map.

Geologic: State geol. map, Barrows 1910,
Horberg 1950b, 1953.

Glacial: State geol. map, R. F. Flint 1959,
Leighton 1961, Leverett 1899a.

Mineral industries: Ill. GS 1961.

Paleogeologic: Willman 1942b, Workman
1956.

Structure: Beck 1965, Heigold 1964, R. H.
Howard 1964, Whiting 1965b, Willman
1942b.

Mineral production (see USBM Minerals Year-
book, Ill. GS Illinois Mineral Industry)

Oil and gas, gas in drift: Meents 1960.

Physiography: Barrows 1910, Leighton 1948b.

Quadrangle studies, Peoria: Johan A. Udden
1912b.

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Stratigraphy

General: Barrows 1910, G. H. Cady
1920b, Horberg 1950b, Selkregg 1958.

Silurian: Whiting 1965b.

Devonian: Whiting 1965b.

Mississippian: Workman 1956.

Pennsylvanian: G. H. Cady 1915a.

Pleistocene: Barrows 1910, G. H. Cady
1915a, Frye 1958b, 1965b, 1965c, Horberg
1950b, 1953, McGee 1890, Wascher 1938,
Willman 1963.

Recent: Barrows 1910.

Worthen Survey report (v. 4): H. A. Green
1870.

Woodfordian Substage (Pleis.): Frye 1960b, 1962e,
1963c, 1965c, Glass 1964, Kempton 1963,
A. B. Leonard 1960, Willman 1963.

Woodlawn-Drivers Anticline: A. H. Bell 1938a.

Worthen paleontological collection: Janssen 1940a.

Worthen Survey reports (see Geological Survey of Illi-
nois and under county)

Wyoming Bedrock Valley: Horberg 1950a.

Wyota Member (Ord.): Templeton 1952, 1963.

X

Xenia Dome: J. M. Weller 1936c.

X-ray diffraction, in clay mineralogy: W. F. Brad-
ley 1938a.

Y

Yanaway Well No. 33 drill core: J. E. Lamar
1928f.

Yankeetown Chert, Sandstone, Shale (Miss.): J. W.

Baxter 1963a, 1965a, J. C. Bradbury 1963,

Butts 1929, P. E. Potter 1958a, Rexroad

1962, E. W. Shaw 1921, 1923, Swann 1948,

1956, 1963, Tippie 1942, E. O. Ulrich 1917,

J. M. Weller 1940b, Stuart Weller 1913,

1914, 1920a, 1928, 1939b.

Yarmouth Soil (Pleis.): G. H. Cady 1919b, John

Webster Foster 1951a, Frye 1958b, 1964a,

1965a, Hinds 1919, Horberg 1945, 1956b,

W. H. Johnson 1964, Wallace Lee 1926,

Leverett 1898c, 1899a, Savage 1921c, E. W.

Shaw 1913, Wanless 1957a.

Yarmouthian (Yarmouth) Stage (Pleis.): F. C.

Baker 1929, 1932, J. R. Ball 1952, Carman

1910, Frye 1962a, 1965c, Savage 1921b,

Wanless 1928, 1929a, 1957a.

York Dome: Mylius 1927.

York Pool: Mylius 1923, 1927.

York Sand: Mylius 1927.

Z

Zinc (see Lead and zinc)

Zion City Moraine: Bretz 1955, Suter 1959.

Zones (see Biostratigraphy, Faunal zones)

Zurich Moraine: Leighton 1953.

