

U.S. DEPARTMENT OF INTERIOR
U.S. GEOLOGICAL SURVEY

**BIBLIOGRAPHY PERTAINING TO THE OZARK MISSISSIPPI
VALLEY-TYPE METALLOGENIC PROVINCE, MISSOURI,
ARKANSAS, KANSAS, AND OKLAHOMA, USA COVERING 1785
TO FEBRUARY 1998**

by

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Open-File Report 98-238

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1998

Introduction

The Ozark region of the United States midcontinent is host for the largest Mississippi Valley-type (MVT) lead-zinc province in the world. The region includes the world-class districts of the Old Lead Belt, Viburnum Trend, and Tri-State districts and the smaller Northern Arkansas, Central Missouri, and Southeast Missouri barite districts. This report provides a list of references for a wide variety of topics on the ores that includes the geology, geochemistry, and environmental studies. The organization of the report is alphabetical by author, then by the year of publication and lastly alphabetical by title. This list of references is also available in digital form from the USGS Open-File 98-238 (to be added when we get the details of suggested formats)

Search Procedure

Research for the reference list was conducted through the use of several library search engines, and then compared with reference lists from previously written papers and books.

To start, a list of the Mississippi Valley-type districts of Missouri and key words relating to mining, MVT's, base metals, environmental issues, etc. were compiled. After compiling a list of districts and key words, they were entered into *GeoRef*, a multi-disc CD ROM library search engine distributed by the American Geological Institute. After compiling a list of citations in *GeoRef*, the researchers conducted the same operation on the water resources of the Missouri by using the *Water Resources Abstracts*, a CD ROM library search engine distributed by Cambridge Scientific Abstracts. Next the researchers searched for papers published by the United States Geological Survey using the key

words Rolla, Springfield and Harrison quadrangles. The search was conducted within *United States Geological Survey Publications*, a CD ROM library search engine distributed by the American Geological Institute.

After compiling a list of citations, the reference list was compared with the reference lists of many papers, books and other reference lists relating to the carbonate-hosted lead-zinc deposits of Missouri.

Acknowledgments

We would like to thank John Viets and Jim Barks of the US Geological Survey for their input into the preparation of this report.

Disclaimer

Any omission of information by the authors is unintentional.

References

American Geological Institute, 1998, GeoRef -- A multi-disc library search engine, *with display software by SilverPlatter Information*, 4 CD-ROM.

American Geological Institute, 1997, Publications of the United States Geological Survey - A single disc library search engine, *with display software by I-Mode Retrieval Systems*, 1 CD-ROM.

Cambridge Scientific Abstracts, 1997, Water Resources Abstracts -- A single disc library search engine, *with display software by SilverPlatter Information*, 1 CD-ROM.

- Adams, G. I., 1903, Origin of bedded breccias in northern Arkansas: *Science*, v. 17, p. 792-793.
- Adams, G. I., 1904, Zinc and lead deposits of northern Arkansas: *Transactions of the Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME)*, v. 34, p. 163-174.
- Adams, G. I., Purdue, A. H., Burchard, E. F., and Crane, W. R., 1904, Zinc and lead deposits of northern Arkansas: U. S. Geological Survey Professional Paper 0024, 118 p.
- Adams, G. I., 1905, Summary of the water supply of the Ozark region in northern Arkansas: U. S. Geological Survey Water-Supply Paper 0110, p. 179-182.
- Afzali, B., 1979, Heavy metal patterns in Big and Aux Vases river drainage, Rolla 1 degrees X 2 degrees quadrangle, Missouri: Master's, University of Missouri at Rolla, Rolla, MO.
- Ageton, R. V., 1931, Principal ore guides used in the Tri-State District: U. S. Department of the Interior, Geological Survey, Memorandum for the press P.N. 56947, 4 p.
- Ahler, B. A., and Gerdemann, P. E., 1993, Viburnum Trend exploration methods: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 1.
- Alcott, L. J., and Graf, J. L., 1984, Rare earth element distributions within limestones and dolostones of the Bonneterre Formation in the vicinity of the Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 16, no. 6, p. 427.
- Aleinikoff, J. N., Walter, M., Kunk, M. J., and Hearn, P. P., Jr., 1993, Do ages of authigenic K-feldspar date the formation of Mississippi Valley-type Pb-Zn deposits, central and southeastern United States?; Pb isotopic evidence: *Geology*, v. 21, no. 1, p. 73-76.
- Aley, T. J., Williams, J. H., and Massello, J. W., 1972, Groundwater contamination and sinkhole collapse induced by leaky impoundment's in soluble rock terrain, *in* Engineering Geology Series: Rolla, MO, Missouri Department of Natural Resources, Division of Geological Survey and Water Resources, v. 5, 32 p.
- Aley, T. J., 1975, A predictive hydrologic model for evaluating the effects of land use and management of the quantity and quality of water from Ozark springs: Protem, MO, Ozark Underground Laboratory, 236 p. with appendices.
- Aley, T. J., and Aley, C., 1987, Groundwater study, Ozark National Scenic River ways: Washington, DC, National Park Service, contact CX 6000-4-0083, v. 1-2.
- Allingham, J. W., 1966, Aeromagnetic anomalies in the Bonne Terre area of the southeast Missouri mining district: *Mining Geophysics*, v. 1, p. 36-53.
- Alusow, E. W., Proctor, P. D., and Sweeney, P. H., 1983, Primary-secondary structures and ore relationships, Magmont Mine, New Lead Belt, Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits: Rolla, MO, University of Missouri at Rolla, p. 373-384.
- Amstutz, G. C., Zimmermann, R. A., and Love, L. G. 1974, Copper deposit at Cornwall, Missouri; observations on the petrology, the sedimentary features and the sulfides (especially the framboidal pyrite): *Neues Jahrbuch fuer Mineralogie*, v. 7, p. 289-307.

- Anderson, G. M., 1969, A study of a lead mining waste water pollution problem: Master's, University of Missouri at Rolla, Rolla, MO, 77 p.
- Anderson, G. M., 1974, National need - An industry view of research: Proceedings of the First Annual National Science Foundation Trace Contaminants Conference, Oak Ridge, TN, 1973: Arlington, VA, National Science Foundation, p. 709-725.
- Anderson, G. M., 1975, Precipitation of Mississippi Valley-type ores: *Economic Geology*, v. 70, p. 937-942.
- Anderson, G. M., and Macqueen, 1982, Ore deposit models - 6, Mississippi Valley type lead-zinc deposits: *Geoscience Canada*, v. 9, p. 108-117.
- Anderson, G. M., 1983, Some geochemical aspects of sulfide precipitation in carbonate rocks, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 61-76.
- Anderson, G. M., and Garven, 1987, Sulfate-sulfide-carbonate associations in Mississippi Valley-type lead-zinc deposits: *Economic Geology*, v. 82, p. 482-488.
- Anderson, G. M., 1989, Organic maturation and the origin of MVT deposits: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 4.
- Anderson, G. M., 1991, Organic maturation and ore precipitation in southeast Missouri: *Economic Geology*, v. 86, no. 5, p. 909-926.
- Angino, E. E., Goebel, E. D., and Waugh, T. C., 1971, Lead isotopes and metallic sulphides as exploration guides in mid-continent Paleozoic rocks: *CIM Special Volume*, v. 11, p. 1-4.
- Angino, E. E., Goebel, E. D., and Waugh, T. C., 1971, Lead isotopes and metallic sulphides as exploration guides in mid-continent Paleozoic rocks, *in* Boyle, R. W., Third International Geochemical Exploration Symposium, Toronto, ON, Canada, 1970, Program and abstracts: Toronto, ON, Canada, Canadian Institute of Mining and Metallurgy, Geologic Division, 14 p.
- Anschutz Mining Corporation, 1981, The Madison Project: Denver, CO, 30 p.
- Appold, M. S., and Garven, G., 1995, Modeling the effects of fluid mixing and permeability heterogeneities on ore deposition in the Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 27, no. 6, p. 67.
- Arne, D. C., Duddy, I. R., Green, P. F., and Lambert, I. B., 1987, Application of apatite fission track analysis to problems of Mississippi Valley-type Pb-Zn ore genesis, *in* Abstracts from the Melbourne Universities Geology Conference 1987, Melbourne, Victoria, Australia: Melbourne Australia, Geological Society of Australia (Victoria Division), unpaginated.
- Arne, D. C., Duddy, I. R., and Green, P. F., 1989, Thermal histories of Mississippi Valley-type ore districts from apatite fission track analysis: International Geological Congress, Abstracts--Congres Geologique Internationale, Resumes, v. 28, no. 1, p. 54-55.
- Arne, D. C., Green, P. F., and Duddy, I. P., 1990, Thermochronologic constraints on the timing of Mississippi Valley-type ore formation from apatite fission track analysis, *in* Durrani, S. A., and Benton, E. V., eds.: Nuclear Tracks and Radiation Measurements, v. 17, no. 3, p. 319-323.

- Association of Missouri Geologists, 1963, Guidebook to the geology in the vicinity of Joplin, Missouri, including Westside-Webber Mine, Oklahoma, 10th Annual Field Trip, Sept. 1963: Columbia, MO, Association of Missouri Geologists, 50 p.
- Association of Missouri Geologists, 1979, Viburnum Trend -26th annual field trip guide, *in* Paarlberg, N., ed.: Columbia, MO, Association of Missouri Geologists, 76 p.
- Atkinson, R. D. N., Baskett, T. S., and Samson, F. B., 1985, Trace metal concentrations in wildlife in the Big River and Blake River drainage in southeast Missouri: Columbia, MO, U. S. Fish and Wildlife Service, Missouri Wildlife Cooperative Research Unit, 53 p.
- Bain, H. F., 1901, The origin of the Joplin ore deposits: *Engineering and Mining Journal*, v. 71, p. 557.
- Bain, H. F., 1902, The origin of ore deposits (discussion): *Transactions of the Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME)*, v. 31, p. 936-942.
- Bain, H. F., 1905, Structural features of the Joplin District [Missouri]: *Economic Geology*, v. 1, p. 172-174.
- Bain, H. F., 1916, Studies of Joplin ore deposits: *Mining Magazine*, v. 14, p. 206-212.
- Banner, J. L., Prosky, J. L., Hanson, G. N., and Meyers, N. J., 1984, Multiple episodes of dolomitization in the Burlington-Keokuk Limestone (Middle Mississippian); evidence from trace element and isotopic variations: *Abstracts with Programs - Geological Society of America*, v. 16, no. 6, p. 436.
- Banner, J. L., Wasserburg, G. J., and Dobson, P. F., 1988, Isotopic constraints on the evolution of saline groundwater's from central Missouri: *Abstracts - Society of Economic Paleontologists and Mineralogists Midyear Meeting*, v. 5, p. 4.
- Banner, J. L., Wasserburg, G. J., Dobson, P. F., Carpenter, A. B., and Moore, C. H., 1989, Isotopic and trace element constraints on the origin and evolution of saline groundwater's from central Missouri: *Geochimica et Cosmochimica Acta*, v. 53, no. 2, p. 383-398.
- Banner, J. L., Wasserburg, G. J., Chen, J. H., and Moore, C. H., 1990, (super) ^{234}U - (super) ^{238}U - (super) ^{230}Th - (super) ^{232}Th systematics in saline groundwater's from central Missouri: *Earth & Planetary Science Letters*, v. 101, no. 2-4, p. 296-312.
- Bardy, L. L., 1990, Field guide for the Kansas portion of the coal geology field trip and the Tri-State mining district, *in* Bostic, J. L., Bardy, L. L., and Friedman, S. A., eds., *Coal Geology of the Interior Coal Province, Western Region*: Reston, VA, Environment and Coal Association, p. 10-22.
- Barks, J. H., Wixson, B. G., and Bolter, E., 1971, Influence of lead-mining activity on surface-water quality in the Viburnum Trend of southeastern Missouri: *Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers*, v. 71-B-328, p. 16.
- Barks, J. H., 1977, Effects of abandoned lead and zinc mines and tailings piles on water quality in the Joplin area, Missouri, *in* Paper presented at the 1977 Society of Mining Engineers Fall Meeting and Exhibit, St. Louis, MO, 1977: Salt Lake City, UT, Society of Mining Engineers of AIME, no. 77-AG-308, p. 18.

Barks, J. H., 1977, Effects of abandoned lead and zinc mines and tailings piles on water quality in the Joplin area, Missouri: U. S. Geological Survey Water Resource Investigation 77-0075, 49 p.

Barks, J. H., 1978, Water quality in the Ozark National Scenic River ways, Missouri: U. S. Geological Survey Water Supply Paper 2048, 57 p.

Barks, J. H., Parker, R. S., Toler, L. G., Diaz, A. M., and Albert, C. D., 1978, Effects of mining on water quality: U. S. Geological Survey Professional Paper 1100, 286 p.

Barks, J. H., and Berkas, W. R., 1979, Water quality in the proposed Prosperity Reservoir area, Center Creek basin, Missouri: U. S. Geological Survey Water Resources Investigations 79-0022, 26 p.

Barton, P. B., 1967, Possible role of organic matter in the precipitation of the Mississippi Valley ores, *in* Brown, J. S., Genesis of stratiform lead-zinc-barite-fluorite deposits in carbonate rocks: Lancaster, PA, Society of Economic Geologists Monograph, no. 3, p. 371-377.

Bass, M. N., and Ferrara, G., 1969, Age of adularia and metamorphism, Ouachita Mountains, Arkansas: American Journal of Science, v. 267, no. 4, p. 491-498.

Bastin, E. S., Behre, C. H., Jr., Fowler, G. N., Giles, A. W., Kay, G. M., and Landes, K. K., 1939, Contributions to a knowledge of the lead and zinc deposits of the Mississippi Valley region: Special Paper - Geological Society of America, v. 24, p. 156.

Bastin, E. S., 1954, Paragenesis of the Tri-State jasperoid [Missouri-Kansas-Oklahoma]: Economic Geology, v. 46, no. 6, p. 652-657.

Bauer, R. M., and Shelton, K. L., 1987, Fluid inclusion studies of regionally extensive epigenetic dolomites, Bonneterre Dolomite, SE Missouri; evidence of multiple fluids during Pb-Zn ore mineralization: Abstracts with Programs-Geological Society of America, v. 21, p. 3.

Beales, F. W., Jowett, C. E., Pearce, G. W., and Wu, Y., 1976, Application of paleomagnetism to the study of Mississippi Valley-type ore deposits: EOS, Transactions of the American Geophysical Union, v. 57, no. 12, p. 903.

Beales, F. W., and Hardy, J. L., 1977, The problem of recognition of occult evaporites with special reference to southeast Missouri: Economic Geology, v. 72, no. 3, p. 487-490.

Beales, F. W., Jackson, K. C., Jowett, E. C., Pearce, G. W., and Wu, Y., 1980, Paleomagnetism applied to the study of timing in stratigraphy with special reference to ore and petroleum problems, *in* Strangway, D. W., ed.: Geological Association of Canada special paper, v. 20, p. 789-804.

Beales, F., and Jackson, C., 1982, Multiple genetic and diagenetic models help the unraveling of Mississippi Valley-type ore genesis: Abstracts of papers; International Congress on Sedimentology = Congres International de Sedimentologie, v. 11, p. 17.

Beaumont, D. F., 1953, Significance of clays in southeast Missouri lead ores: Doctoral, Teachers College, Columbia University, New York, NY, United States.

Benn, F. W., and Cornell, W. L., 1993, Removal of heavy metals from Missouri lead mill tailings by froth flotation: Separation Science and Technology, v. 28, no. 1-3, p. 733-746.

Bennet, R. E., Jr., 1974, Fluid inclusion study of sphalerite from the northern Arkansas zinc-lead district: Master's, University of Michigan, Ann Arbor, MI, United States

- Berkas, W. R., and Barks, J. H., 1980, Effects of the proposed Prosperity Reservoir on ground water and water quality in lower Center Creek basin, Missouri: U. S. Geological Survey Water Resources Investigations 80-0088, 29 p.
- Besser, J. M., and Rabeni, C. F., 1987, Bioavailability and toxicity of metals leached from lead-mine tailings to aquatic invertebrates: *Environmental Toxicology and Chemistry*, v. 6, p. 879-890.
- Bethke, C. M., 1985, Numerical model of compaction-driven groundwater flow and heat transfer and its application to the paleohydrology of intracratonic sedimentary basins: *Journal of Geophysical Research*, v. 80, no. B8, p. 6817-6828.
- Bethke, C. M., Harrison, W. J., Upson, C., and Altaner, S. P., 1988, Supercomputer analysis of sedimentary basins: *Science*, v. 239, no. 4837, p. 261-267.
- Bethke, C. M., and Marshak, S., 1990, Brine migrations across North America; the plate tectonics of groundwater: *Annual Review of Earth and Planetary Sciences*, v. 18, p. 228-315.
- Beveridge, T. R., and Geological Society Kansas (Mullenburg), 1959, Guide book 17th regional field conference, southeastern and south-central Missouri, September 17-18; repeat trip, September 24-25, 1954: Rolla, MO, Missouri Department of Natural Resources, Division of Geological Survey and Water Resources, v. 17, 63 p.
- Bhatia, D. M. S., and Hagni, R. D., 1978, Trace element geochemistry of sulfide minerals from the Magmont Mine, Viburnum Trend, southeast Missouri: *Abstracts with Programs - Geological Society of America*, v. 10, no. 7, p. 366.
- Bhatia, D. M. S., and Hagni, R. D., 1980, Laser probe determinations of trace element concentrations in sulfide minerals from the Magmont Mine, Viburnum Trend, southeast Missouri: *Transactions of the American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME)*, v. 268, p. 1847-1855.
- Bhatia, D. M. S., and Blackburn, W. H., 1986, Trace element variation in galena crystals, Mississippi Valley-type deposits: *Transactions of the American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME)*, v. 280, p. 1812-1817.
- Bhattacharyya, D. P., 1989, Depositional environment-controlled multiple dolomitization of the Warsaw-Salem fms. (Miss.), east-central Missouri; trace element and isotopic evidence: *Abstracts with Programs - Geological Society of America*, v. 21, no. 6, p. 78-79.
- Bjorlykke, A., and Sangster, D. F., 1981, An overview of sandstone-lead deposits and their relationship to red-bed copper and carbonate hosted lead-zinc deposit: *Economic Geology*, v. 75, p. 179-213.
- Bjorlykke, A., Sangster, D. F., and Fehn, U., 1991, Relationship between high heat-producing (HHP) granites and stratabound lead-zinc deposits, *in* Pagel, M., and Leroy, J. L., eds., *Source, transport and deposition of metals*: Rotterdam, Netherlands, A. A. Balkema, p. 257-260.
- Blair, G., 1982, Underground at Tri-State: *Lapidary Journal*, v. 35, no. 4, p. 834-838, 844, 846-860.
- Blair, K. P., and Berendsen, P., 1990, Subsurface structural geology of the Joplin Quadrangle, *in* Pratt, W. P., and Goldhaber, M. B., eds., *U. S. Geological Survey-Missouri Geological Survey*

symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Circular 1043, p. 2-3.

Blair, K. P., Berendsen, P., and Seeger, C. M., 1992, Structure-contour maps on the top of the Mississippian carbonates and on the top of the Upper Cambrian and Lower Ordovician Arbuckle Group, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 2125-C, 1 p.

Blasch, S. R., 1986, A fluid inclusion study of the Jumbo lead mine, Linn County Kansas: Master's, University of Missouri at Kansas City, Kansas City, MO, 118 p.

Blasch, S. R., and Coveney, R. M. R., 1988, Goethite-bearing brine inclusions, petroleum inclusions, and the conditions of ore deposition at the Jumbo Mine, Kansas: Abstracts with Programs-Geological Society of America, v. 19, no. 7, p. 590-591.

Blasch, S. R., and Coveney, R. M. R., 1988, Goethite-bearing brine inclusions, petroleum inclusions, and the conditions of ore deposition at the Jumbo Mine, Kansas: *Geochimica et Cosmochimica*, v. 52, p. 1007-1017.

Board, M. W. P., 1964, Water Quality of Big, Bourbeuse, and Meramec River basins: Jefferson City, MO, Missouri Water Pollution Board report, 65 p.

Board, M. W. P., 1970, Spring River pollution survey in the vicinity of Joplin, Missouri: Jefferson City, MO, Missouri Water Pollution Board unpublished report, 13 p.

Bogges, W. R., ed., 1977, Lead in the Environment: Arlington, VA, National Science Foundation report, NSF/RA-770214, 272 p.

Bolter, E., and Tibbs, N. H., 19??, Geochemical effects of mining pollution on the streams of southeast Missouri: Rolla, MO, Missouri Water Resource Research Center completion report, OWRR Project A-023-MO, no. 1.

Bolter, E., and Tibbs, N. H., 1970, The impact of lead-zinc mining on the quality and ecology of surface waters in southeast Missouri: Rolla, MO, Missouri Water Resources Research Center completion report, B-021, 76 p.

Bolter, E., and Tibbs, N. H., 1971, Water geochemistry of mining and milling retention in the 'New Lead Belt' of southeast Missouri: Rolla, MO, Missouri Water Resources Research Center completion report, A-032, 34 p.

Bolter, E., Jennett, J. C., and Wixson, B. G., 1972, Geochemical impact of lead-mining waste waters on streams in southeastern Missouri: Proceedings of the 27th Industrial Waste Conference, Lafayette, IN, 1972, Engineering Extension Series no. 141, p. 679-686.

Bolter, E. A., Butherus, D. L., and Tibbs, N. H., 1973, The impact of lead mining and smelting on the heavy metal content of soils in the "New Lead Belt" of southeast Missouri, Abstracts with Programs - Geological Society of America, v. 5, no. 4, p. 301.

Bolter, E. A., Tibbs, N. H., Gale, N. L., and Jennett, C. J., 1973, The influence of lead-zinc mining on the heavy metal content of streams in the "New Lead Belt" of Missouri; a five year case history: Abstracts with Programs - Geological Society of America, v. 5, no. 4, p. 302.

Bolter, E., 1974, Addition of heavy metals to the soils of the "New Lead Belt" of southeast Missouri: Abstracts with Programs - Geological Society of America, v. 6, no. 7, p. 661.

Bolter, E., Gale, N. L., Hemphill, D. D., Jennett, J. G., and Koirtyohann, S. R., 1977, The Missouri lead study: An interdisciplinary investigation of environmental pollution by lead and other heavy metals from industrial development in the New Lead Belt of south east Missouri, *in* Wixson, B. G., ed.: Arlington, VA, National Science Foundation final progress report, 543 p.

Bornstein, R. E., 1989, Long term geochemical effects of lead smelting within the New Lead Belt, southeast Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 84 p.

Bornstein, R. E., and Bolter, E., 1989, Geochemical long term effect of lead smelting operations on soil and leaf litter within the New Lead Belt, Missouri: Transactions of the Missouri Academy of Science, v. 23, p. 90.

Bornstein, R. E., and Bolter, E., 1991, Long-term effects of lead smelting in soils, *in* Beck, B. D., ed., Trace Substances in Environmental Health, 25th, Columbia, MO, 1991, Proceedings: University of Missouri at Columbia, p. 71-83.

Bowen, W. S., 1975, Relationship of stream sediment composition and lead mineralization, northern Arkansas: Abstracts with Programs - Geological Society of America, v. 7, no. 2, p. 149.

Boyd, W. W., 1912, The Joplin mining district [Missouri-Arkansas]: Transactions of the Canadian Mining Institute, v. 15, p. 617-630.

Bradley, M. F., 1986, Geology of the Magmont-West Mine (Cominco American Incorporated and Dresser Industries), Viburnum Trend, southeast Missouri, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G., et al., eds., Sediment-hosted Pb-Zn-Ba deposits of the midcontinent; pre-meeting field trip No. 1: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 95-108.

Bradley, M. F., and Krolak, T. E., 1989, The Magmont-West lead-zinc-copper mine (Cominco American Inc.-Dresser Minerals), Viburnum Trend, southeast Missouri, *in* Hagni, R. C., and Raymond, M, Jr., eds., Mississippi Valley-type mineralization of the Viburnum Trend, Missouri: Guidebook series of the Society of Economic Geologists, Lancaster, PA, Society of Economic Geologists, v. 5, p. 84-95.

Brahana, J. V., 1993, Conceptual model of hydrogeology in the Ozark plateaus region during Pennsylvanian time: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 9.

Brahana, J. V., Davis, R. K, Stanton, G. P., Doherty, E. H., and Bartholmey, E. C., 1996, A conceptual model for preliminary spring-basin delineation in the mantled karst terrane of the southern Ozarks: Abstracts with Programs - Geological Society of America, v. 28, no. 7, p. 344.

Braile, L. W., Hinze, W. J., Sexton, J. L., Keller, G. R., and Lidiak, E. G., 1982, Seismicity and tectonics of the midcontinent United States, *in* Sherif, M., eds., Third international earthquake microzonation conference, Seattle, WA, 1982, Proceedings: Arlington, VA, National Science Foundation, v. 1, p. 25-38.

Branner, J. C. , 1900, The zinc and lead region of North Arkansas: Fayetteville, AR, Arkansas Geological Survey annual report, v. 5, 395 p.

Branner, J. C., 1901, The zinc and lead deposits of north Arkansas: Transactions of the Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), v. 72, p. 718-719

- Branner, G. C., 1941, Limestones of northern Arkansas: Fayetteville, AR, Arkansas Geological Survey Monograph, 24 p.
- Brannon, J. C., Podosek, F. A., Viets, J. G., Leach, D. L., and Goldhaber, M. B., 1989, Strontium isotopic tracer for ore-forming fluids in the Viburnum Trend, SE Missouri: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 3.
- Brannon, J. C., Podosek, F. A., Viets, J. G., Leach, D. L., Goldhaber, M. B., Rowan, E. L., and McLimans, R., 1990, Comparison of Sr isotopic compositions of ore-forming fluids of two Mississippi Valley-type (MVT) ore deposits; Viburnum Trend, SE MO and Upper Mississippi Valley District, SW WI, USA: Abstracts - Geological Society of Australia, v. 27, p. 13.
- Brannon, J. C., Podosek, F. A., Viets, J. G., Leach, D. L., Goldhaber, M. B., and Rowan, E. L., 1991, Strontium isotopic constraints on the origin of ore-forming fluids of the Viburnum Trend, southeast Missouri: *Geochimica et Cosmochimica Acta*, v. 55, no. 5, p. 1407-1419.
- Brannon, J. C., Cole, S. C., and Podosek, F. A., 1995, Can all Mississippi Valley deposit be radiometrically dated?, *in* Leach, D. L., and Goldhaber, M. B., eds., International Field Conference on carbonate hosted lead-zinc deposits, , St. Louis, MO, 1995, Extended Abstracts: Lancaster, PN, Society of Economic Geologists, p. 27-29.
- Brannon, J. C., Cole, S. C., Podosek, F. A., Ragan, V. W., Coveney, R. M. Jr., Wallace, M. W., and Bradley, A. J., 1996, Th-Pb and U-Pb dating of ore-stage calcite, and Paleozoic fluid flow: *Science*, v. 271, p. 491-493.
- Braunsdorf, N. R., 1983, Isotopic trends in gangue carbonates from the Viburnum Trend; implications for Mississippi Valley-type mineralization: Master's, University of Michigan, Ann Arbor, MI.
- Braunsdorf, N. R., and Lohmann, K. C., 1983, Isotopic trends in gangue carbonates from the Viburnum Trend, Ozark lead mine, SE, Missouri: Abstracts with Programs - Geological Society of America, v. 15, no. 6, p. 532.
- Brecke, E. A., 1979, A hydrothermal system in the Midcontinent region: *Economic Geology*, v. 74, no. 6, p. 1327-1335.
- Brevard, O., Shimizu, N., and Allegre, C. J., 1978, Intra- and inter-crystalline variations of Pb isotopic composition in galena from the Mississippi Valley type ores; an ion-microprobe study, *in* Zartman, R. E., ed., Short papers of the fourth international conference, geochronology, cosmochronology, isotope geology, 1978: U. S. Geological Survey Open-File Report 78-0701, 49 p.
- Brichta, L. C., 1960, Catalog of recorded exploration drilling and mine workings, Tri-State Zinc-Lead District, Missouri, Kansas, and Oklahoma: Bureau of Mines Information Circular 7993, 13 p.
- Briskey, J. A., 1986, Descriptive model of southeast Missouri Pb-Zn, *in* Cox, D. P., and Singer, D. A., eds., Mineral deposit models: U. S. Geological Survey Bulletin 1693, p. 220-221.
- Brittain, D., 1907, The new sheet ground of the Joplin District: *Mining World*, v. 27, p. 841-844.
- Brittain, D., 1908, The minerals of Joplin and their association: *Mining World*, v. 28, p. 289-291.

- Broadhead, G. C., 1877, The southeast Missouri lead district: Transactions of the Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), v. 5, p. 100-107.
- Brockie, D. C., and Hare, E. H., 1963, Geological tour of the West-side Webber mines, *in* Guidebook to the geology in the vicinity of Joplin, Missouri, including Westside-Webber Mine, Oklahoma, 10th Annual Field Trip: Columbia, MO, Association of Missouri Geologists, p. 15-26.
- Brockie, D. C., Hare, E. H., and Dingress, P. R., 1968, The geology and ore deposits of the Tri-State District of Missouri, Kansas, and Oklahoma, *in* Ridge, J. D., ed., Ore deposits of the United States, 1933-1967: New York, NY, American Institute of Mining Metallurgy and Petroleum Engineers, v. 1, p. 400-430.
- Brooks, A. A., Ellison, R. D., Fields, D. E., Huff, D. D., and Luxmoore, R. J., 1974, Development of a unified transport model for toxic materials: Oak Ridge, TN, Oak Ridge National Laboratories report, ORNL-NSF-EATC-6, p. 43-92.
- Brown, J. S., 1958, Southeast Missouri lead belt, *in* Geological Society of America, 5th Field trip guidebook, Field Trip no. 1: Boulder, CO, Geological Society of America (GSA), p. 1-7.
- Brown, J. S., ed., 1967, Genesis of stratiform lead-zinc-barite-fluorite deposits in carbonate rocks: Lancaster, PA, Society of Economic Geologists Monograph, no. 3, 443 p.
- Brown, J. S., 1967, Isotopic zoning of lead and sulfur in southeast Missouri, *in* Genesis of stratiform lead-zinc-barite-fluorite deposits (Mississippi Valley type deposits)--A symposium: Lancaster, PA, Society of Economic Geologist Monographs, no. 3, p. 410-425.
- Brown, J. S., 1970, Mississippi Valley-type lead-zinc ores: Mineralium Deposita, v. 5, p. 103-119.
- Buckley, E. R., 1907, Review of Joplin District folio by W. S. T. Smith and C. E. Siebenthal: Economic Geology, v. 2, p. 518-529.
- Buehler, H. A., 1917, Geology and mineral deposits of the Ozark region: Transactions of the Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), v. 58, p. 389-408.
- Buehler, H. A., 1918, The characteristics of zinc deposits of North America; discussion: American Institute of Mining Engineers, v. 133, p. 62-63.
- Buelter, D. P., 1985, Geochemical investigation of epigenetic dolomite associated with lead-zinc mineralization of the Viburnum Trend, southeast Missouri: Master's, Southern Illinois University, Carbondale, IL, 105 p.
- Buelter, D. P., and Guillemette, R. N., 1986, Geochemical investigation of epigenetic dolomite associated with lead-zinc mineralization of the Viburnum Trend, southeast Missouri: Abstracts - SEPM Midyear Meeting, v. 3, p. 15-16.
- Buelter, D. P., and Guillemette, R. N., 1988, Geochemistry of epigenetic dolomite associated with lead-zinc mineralization of the Viburnum Trend, southeast Missouri; a reconnaissance study, *in* Shukla, V., and Baker, P. A., eds.: Society of Economic Paleontologists and Mineralogists Special Publication, v. 43, p. 85-93.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 1, 2, and 3: U. S. Geological Survey Open-File Report 89-0118, 34 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 4, 5, and 6: U. S. Geological Survey Open-File Report 89-0119, 25 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 7, 8, and 9: U. S. Geological Survey Open-File Report 89-0120, 22 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 10, 11, and 12: U. S. Geological Survey Open-File Report 89-0195, 15 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill holes Nos. 13, 14, and 15: U. S. Geological Survey Open-File Report 89-0215, 14 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analysis of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 16, 17, and 18: U. S. Geological Survey Open-File Report 89-0196, 7 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 19, 20, and 21: U. S. Geological Survey Open-File Report 89-0276, 11 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 22, 23, 24, 25, and 26: U. S. Geological Survey Open-File Report 89-0277, 17 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 27, 28, and 29: U. S. Geological Survey Open-File Report 89-0278, 16 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 30, 31, and 32: U. S. Geological Survey Open-File Report 89-0279, 18 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 33, 34, and 35: U. S. Geological Survey Open-File Report 89-0209, 19 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 36, 37, and 38: U. S. Geological Survey Open-File Report 89-0299, 13 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 39, 40, 41, and 42: U. S. Geological Survey Open-File Report 89-0280, 16 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 43, 44, and 45: U. S. Geological Survey Open-File Report 89-0281, 19 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 46, 47, and 48: U. S. Geological Survey Open-File Report 89-0558, 16 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 49 and 51: U. S. Geological Survey Open-File Report 89-0499, 19 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 53, 54, and 55: U. S. Geological Survey Open-File Report 89-0474, 22 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 56, 57, and 58: U. S. Geological Survey Open-File Report 89-0475, 17 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, in and adjacent to the Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 59, 60, and 61: U. S. Geological Survey Open-File Report 89-0536, 19 p.

Bullock, J. H., Jr., and Whitney, H. A., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 62, 63, and 64: U. S. Geological Survey Open-File Report 89-0537, 16 p.

Bullock, J. H., Jr., and Folger, H. W., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 71, 72, 73, and 74: U. S. Geological Survey Open-File Report 89-0656, 13 p.

Bullock, J. H., Jr., and Folger, H. W., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 75, 76, 77, 78 and 79: U. S. Geological Survey Open-File Report 89-0657, 11 p.

Bullock, J. H., Jr., and Folger, H. W., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 125, 126, 127: U. S. Geological Survey Open-File Report 89-0665, 14 p.

Bullock, J. H., Jr., and Folger, H. W., 1989, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 128, 129, 130: U. S. Geological Survey Open-File Report 89-0666, 17 p.

Bullock, J. H., Jr., and Folger, H. W., 1989, Spectrographic analyses of insoluble-residue samples in and around Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 131, 132, and 133: U. S. Geological Survey Open-File Report 89-0667, 13 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 65, 66, and 67: U. S. Geological Survey Open-File Report 90-0022, 13 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri; drill hole Nos. 68, 69, and 70: U. S. Geological Survey Open-File Report 90-0020, 11 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples in and adjacent to the Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 100, 101, and 102: U. S. Geological Survey Open-File Report 90-0058, 34 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples within and adjacent to the Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 103, 104, and 105: U. S. Geological Survey Open-File Report 90-0003, 37 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 106, 107, and 108: U. S. Geological Survey Open-File Report 90-0004, 37 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, within and adjacent to the Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 109, 110, and 111: U. S. Geological Survey Open-File Report 90-0005, 28 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 112, 113, 114, and 115: U. S. Geological Survey Open-File Report 90-0006, 19 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 116, 117, and 118: U. S. Geological Survey Open-File Report 90-0007, 22 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 119, 120, and 121: U. S. Geological Survey Open-File Report 90-0008, 19 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, within and adjacent to the Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 122, 123, and 124: U. S. Geological Survey Open-File Report 90-0009, 28 p.

Bullock, J. H., Jr., and Folger, H. W., 1990, Spectrographic analyses of insoluble-residue samples, Joplin 1 degrees X 2 degrees quadrangle, Missouri and Kansas; drill hole Nos. 134, 135, and 136: U. S. Geological Survey Open-File Report 90-0223, 19 p.

Burstein, I. B., Shelton, K. L., Hagni, R. D., and Maurogenes, J. A., 1991, District-wide sulfur isotope systematics of MVT ores in the world-class southeast Missouri Pb-Zn-Cu deposits: sulfur isotope anomalies indicative of the simultaneous presence of multiple fluids: Abstracts with Programs - Geological Society of America, v. 24, p. 414.

Burstein, I. B., Shelton, K. L., Hagni, R. D., and Brandom, R. T., 1992, Mobilization of copper by MVT fluids penetrating igneous basement rocks; sulfur isotope studies of the Precambrian Boss-Bixby Fe-Cu deposits, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 24, no. 7, p. 234.

Burstein, I. B., Shelton, K. L., Gregg, J. M., and Hagni, R. D., 1993, Complex, multiple ore fluids in the world class Southeast Missouri Pb-Zn-Cu MVT deposits; sulfur isotope evidence: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 10.

Burstein, I. B., Shelton, K. L., Gregg, J. M., and Hagni, R. D., 1993, Complex, multiple ore fluids in the world class southeast Missouri Pb-Zn-Cu MVT deposits; sulfur isotope evidence, *in* Shelton, K. L., and Hagni, R. D., eds., *Geology and geochemistry of Mississippi Valley-type Ore Deposits*: Rolla, MO, University of Missouri at Rolla, p. 1-15.

Calder, H. S., Kaufman, J., Hanson, G. M., and Meyers, W. J., 1984, Two-stage cementation of the Burlington-Keokuk limestone in Illinois, Missouri, and Iowa: Abstract with Programs-- Geological Society of America, v. 16, p. 631.

Cander, H., and Banner, J. L., 1994, The paradox of porosity and fluid-rock interaction in carbonate platforms, *in* AAPG annual convention, Denver, CO, 1994, Abstracts: Tulsa, OK, American Association of Petroleum Geologists, p. 115.

Cannon, R. S., Jr., Pierce, A. P., and Delevaux, M. H., 1968, Lead isotope variation with growth zoning in a galena crystal: *Science*, v. 142, no. 3592, p. 574-576.

Cannon, R. S., Jr., and Pierce, A. P., 1968, Isotope varieties of lead in stratiform deposits, *in* Brown, J. S., ed., *Genesis of stratiform lead-zinc, barite-fluorite deposits*: Lancaster, PA, Society of Economic Geologists Monograph, no. 3, p. 427-433.

Cantwell, H. J., 1914, The disseminated lead district of southeast Missouri: *Engineering and Mining Journal*, v. 97, p. 287-290.

Carpenter, A. B., and Miller, J. C., 1969, Geochemistry of saline subsurface water, Saline County (Missouri): *Chemical Geology*, v. 4, no. 1-2, p. 135-167.

Carroll, C. J., 1983, Petrographically-sited stable isotopes of the Bonneterre Formation; insights into diagenesis: Master's, University of Missouri at Columbia, Columbia, MO.

Cathles, L. M., and Smith, A. T., 1981, The effects of compaction-driven fluid flow on the thermal history of basins: Abstracts with Programs - Geological Society of America, v. 13, no. 7, p. 424.

Cathles, L. M., and Smith, A. T., 1983, Thermal constraints on the formation of Mississippi Valley-type lead-zinc deposits and implications for episodic basin dewatering and deposit genesis: Abstracts with Programs - Geological Society of America, v. 15, no. 6, p. 540.

Cathles, L. M., and Smith, A. T., 1983, Thermal constraints on the formation of Mississippi Valley-type lead-zinc deposits and their implications for episodic basin dewatering and deposit genesis: *Economic Geology*, v. 78, no. 5, p. 983-1002.

Cawfield, J. D., 1989, A general approach for evaluating risk due to groundwater flow, contaminant transport and geologic hazards: *Transactions of the Missouri Academy of Science*, v. 23, p. 91.

Chaudhuri, S., Clauer, N., et al., 1983, Strontium isotopic composition of gangue carbonate minerals in the lead-zinc sulfide deposits at the Brushy Creek Mine, Viburnum Trend, southeast Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits*: Rolla, MO, University of Missouri at Rolla, p. 140-144.

Chazin, B., and Erickson, M. S., 1987, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 1, 2, and 3: U. S. Geological Survey Open-File Report 87-0653, 40 p.

Chazin, B., and Erickson, M. S., 1987, Spectrographic analyses in insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 16, 17, and 20: U. S. Geological Survey Open-File Report 87-0654, 13 p.

Chazin, B., and Erickson, M. S., 1987, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 38 and 43: U. S. Geological Survey Open-File Report 87-0655, 22 p.

Chazin, B., and Erickson, M. S., 1988, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 15, 18, and 19: U. S. Geological Survey Open-File Report 88-0054, 23 p.

Chazin, B., and Erickson, M. S., 1988, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 31, 32, and 34: U. S. Geological Survey Open-File Report 88-0053, 22 p.

Chazin, B., and Erickson, M. S., 1988, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 45, 46, 47, 48, and 49: U. S. Geological Survey Open-File Report 88-0446, 53 p.

Chazin, B., and Erickson, M. S., 1988, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 50, 51, 52, 53, and 54: U. S. Geological Survey Open-File Report 88-0407, 64 p.

Chazin, B., and Erickson, M. S., (1988, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 55, 56, 57 and 58: U. S. Geological Survey Open-File Report 88-0447, 41 p.

Chazin, B., and Erickson, M. S., 1988, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 59, 60, 61, and 63: U. S. Geological Survey Open-File Report 88-0444, 49 p.

Chazin, B., and Erickson, M. S., 1988, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas; drill hole Nos. 64, 65, 66, and 67: U. S. Geological Survey Open-File Report 88-0529, 37 p.

Chen, H. W., 1970, An investigation of mining effluent and water quality in the "New Lead Belt" of southeastern Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 124 p.

Cheng, S. C., 1965, Zinc and copper content of stream sediment in south-central Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 48 p.

Chesley, J. T., Halliday, A. N., Kyser, T. K., and Spry, P. G., 1994, Direct dating of Mississippi Valley-type mineralization; use of Sm-Nd in fluorite: *Economic Geology*, v. 89, no. 5, p. 1192-1199.

Childers, G. A., 1995, Mineral zonation in the northern portion of the Fletcher Mine, a comparison to the West Fork Mine, Viburnum Trend, southeast Missouri, *in* Leach, D. L., and Goldhaber, M. B., eds., *International Field Conference on Carbonate-Hosted Lead-Zinc Deposits*, St. Louis, MO, 1995, Extended Abstracts: Lancaster, PA, Society of Economic Geologists, p. 37-38.

Christenson, S. C., Thomas, T. B., et al., 1991, Geophysical logs for selected wells in the Picher Field, northeast Oklahoma and southeastern Kansas: U. S. Geological Survey Open-File Report 91-0213, 95 p.

Clark, A. H., and Blyth, D. M., 1993, Reflected-light Nomarski interference contrast imaging of dolomite zoning, Viburnum Trend lead district, southeast Missouri; comparisons with cathodoluminescence and electron backscatter microscopy: *Economic Geology*, v. 88, no. 7, p. 1904-1910.

Clendenin, C. W., 1977, Suggestions for interpreting Viburnum Trend mineralization based on field studies at Ozark Lead Company, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 465-473.

Clendenin, C. W., and Rickman, D. L., 1979, Suggestions for interpreting Viburnum Trend mineralization based on field studies at Ozark Lead Company, southeast Missouri; II, Precipitation models: *Abstracts with Programs - Geological Society of America*, v. 11, no. 2, p. 145.

Clendenin, C. W., and Duane, M. J., 1990, Focused fluid flow and Ozark Mississippi Valley-type deposits: *Geology*, v. 18, no. 2, p. 116-119.

Clendenin, C. W., 1991, Facies control on ground preparation of Mississippi Valley-type Pb-Zn deposits, southeast Missouri: *Abstracts with Programs - Geological Society of America*, v. 22, no. 5, p. 6.

Clendenin, C. W., 1991, Focused fluid flow and Ozark Mississippi Valley-type deposits: Reply: *Geology*, v. 19, no. 2, p. 190-191.

Clendenin, C. W., 1991, Structure, stratigraphy, and mineralization; an interrelationship triangle and the southeast Missouri Mississippi Valley-type deposits: *Economic Geology*, v. 86, no. 1, p. 179-184.

Clendenin, C. W., 1993, Faults, fluids, and southeast Missouri MVT deposits: *Abstracts with Programs - Geological Society of America*, v. 25, no. 3, p. 12.

Clendenin, C. W., 1993, Small-scale positive flower structures; an ore control identified in the Viburnum Trend, southeast Missouri, USA: *Mineralium Deposita*, v. 28, no. 1, p. 22-27.

Clendenin, C. W., and Garven, G., 1994, Genesis of stratabound ore deposits in the Midcontinent basins of North America; 1, The role of regional groundwater flow; discussion and reply: *American Journal of Science*, v. 294, no. 6, p. 756-775.

Clendenin, C. W., Niewendorp, C. A., Duane, M. J., and Lowell, G. R., 1994, The paleohydrology of southeast Missouri Mississippi Valley-type deposits; interplay of faults, fluids, and adjoining lithologies: *Economic Geology*, v. 89, no. 2, p. 322-332.

Clerc, F. L., 1906, Ore deposits of the Joplin District: *Proceedings of the Colorado Scientific Society*, v. 8, p. 199-220.

Clerc, F. L., 1907, The ore deposits of the Joplin region, Missouri: *Transactions of the Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME)*, v. 38, p. 320-343.

Clevenger, T. E., 1990, Use of sequential extraction to evaluate the heavy metals in mining wastes: *Water, Air, and Soil Pollution*, v. 50, no. 3-4, p. 241-254.

Clevenger, T. E., and Rao, D., 1996, Mobility of lead in mine tailings due to landfill leachate: *Water, Air, and Soil Pollution*, v. 91, no. 3-4, p. 197-207.

- Connor, J. J., Shacklette, H. T., and Erdman, J. A., 1971, Extra-ordinary trace-element accumulations in roadside cedars near Centerville, Missouri; Geological Survey Research 1971: U. S. Geological Survey Professional Papers 750-B, p. B151-B156.
- Cook, K. L., 1958, Resistivity surveys over slump structures Tri-State lead-zinc mining district, Cherokee County, Kansas: *Geophysics*, v. 19, no. 3, p. 631.
- Cordell, L., 1979, Gravity and aeromagnetic anomalies over basement structure in the Rolla quadrangle and the southeast Missouri lead district: *Economic Geology*, v. 74, no. 6, p. 1383-1394.
- Cordell, L., and Knepper, D. H., 1987, Aeromagnetic images: fresh insight to the buried basement, Rolla quadrangle, southeast Missouri: *Geophysics*, v. 52, no. 2, p. 218-213.
- Cordell, L., and McCafferty, A. E., 1990, Geophysical studies in central Midcontinent CUSMAP quadrangles, *in* Pratt, W. P., and Goldhaber, M. B., eds., *Mineral-resource potential of the Midcontinent; program and abstracts*, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 3-4.
- Cornwall, H. B., 1902, Occurrence of greenockite on calcite from Joplin, Missouri: *American Journal of Science*, v. 14, p. 7-8.
- Coveney, R. M. R., 1977, Sphalerite enrichments in Kansas City Group shales: Abstracts with Programs - Geological Society of America, v. 9, no. 7, p. 938.
- Coveney, R. M. R., 1979, Sphalerite concentrations in mid-continent Pennsylvanian black shales Missouri and Kansas: *Economic Geology*, v. 74, p. 131-140.
- Coveney, R. M. R., and Goebel, E. D., 1981, Fluid inclusion geothermometry of sphalerite from minor occurrences in Kansas, northern Missouri and central Nebraska, *in* Biggs, D. L.: Abstracts with Programs - Geological Society of America, v. 13, no. 6, p. 274.
- Coveney, R. M. R., and Goebel, E. D., 1983, New fluid-inclusion homogenization temperatures for sphalerite from minor occurrences in the Mid-Continent area, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla*, p. 234-242.
- Coveney, R. M. R., and Goebel, E. D., 1987, Fluid inclusion geothermometry of sphalerite from minor occurrences in Kansas, northern Missouri and central Nebraska: Abstracts with Programs - Geological Society of America, v. 13, no. 6, p. 274.
- Coveney, R. M. R., Goebel, E. D., and Ragan, V. M., 1987, Pressures and temperatures from aqueous fluid inclusions in sphalerite from mid-continent country rocks: *Economic Geology*, v. 82, p. 740-751.
- Coveney, R. M. R., 1989, Relationships among metal-rich Pennsylvanian marine black shale, minor occurrences of sphalerite in country rocks and Mississippi Valley-type ore deposits of the midwestern United States, *in* Hagni, R. D., and Coveney, R. M. R., Jr., eds., *Mississippi Valley-type mineralization of the Viburnum Trend, Missouri: Guidebook series of the Society of Economic Geologists*, Lancaster, PA, Society of Economic Geologists, p. 166-181.
- Coveney, R. M. R., Jr., 1992, Evidence for expulsion of hydrothermal fluids and hydrocarbons in the Midcontinent during the Pennsylvanian, *in* Johnson, K. S., and Cardott, B. J., eds., *Source*

- rocks in the southern Midcontinent; 1990 symposium: Oklahoma Geological Survey Circular, v. 93, p. 133-143.
- Coveney, R. M. R., Jr., and Sangster, D. F., 1995, Hydrothermal origins for metals in black shales: Abstracts with Programs - Geological Society of America, v. 27, no. 6, p. 463.
- Cowart, J. B., 1981, Uranium isotopes and ^{226}Ra content in the deep groundwaters of the Tri-State region, USA: Journal of Hydrology, v. 54, no. 1-3, p. 185-193.
- Craig, J. R., and Carpenter, A. B., 1977, Cu-Ni-Co thiospinels from the New Lead Belt, Missouri: Abstracts with Programs - Geological Society of America, v. 8, no. 6, p. 824.
- Craig, J. R., and Carpenter, A. B., 1977, Fletcherite, $\text{Cu}(\text{Ni},\text{Co})_2\text{S}_4$, a new thiospinel from the Viburnum Trend (New Lead Belt), Missouri: Economic Geology, v. 72, no. 3, p. 480-486.
- Crocetti, C. A., and Holland, H. D., 1983, Lead isotope studies of the Viburnum Trend: Abstracts with Programs - Geological Society of America, v. 15, no. 6, p. 550.
- Crocetti, C. A., Holland, H. D., and Rye, R. M., 1984, Correlation between the isotopic composition of lead and sulfur in galena from the Viburnum Trend, Missouri: Abstracts with Programs - Geological Society of America, v. 16, no. 6, p. 480.
- Crocetti, C. A., 1985, Isotopic and chemical studies of the Viburnum Trend lead ores of southeast Missouri: Doctoral, Harvard University, Cambridge, MA, United States, p. 592.
- Crocetti, C. A., and Holland, H. D., 1985, A model for the origin of the lead ores of southeastern Missouri: Abstracts with Programs - Geological Society of America, v. 17, no. 7, p. 556.
- Crocetti, C. A., and Holland, H. D., 1986, Ionic and (super) ^{87}Sr / (super) ^{86}Sr ratios of fluid inclusions in galena from the Viburnum Trend, Missouri: Abstracts with Programs - Geological Society of America, v. 18, no. 6, p. 575.
- Crocetti, C. A., Holland, H. D., and McKenna, L. M., 1988, Isotopic composition of lead in galenas from the Viburnum Trend, Missouri: Economic Geology, v. 83, no. 2, p. 355-376.
- Crocetti, C. A., and Holland, H. D., 1989, Sulfur-lead isotope systematics and the composition of fluid-inclusions in galena from the Viburnum Trend, Missouri: Economic Geology, v. 84, no. 8, p. 2196-2216.
- Crunkilton, R. L., 1983, Missouri water pollution investigations and water quality research 1983: Jefferson City, MO, Missouri Department of Conservation, 36 p.
- Czarnecki, J. M., 1980, Effects of lead mine tailings upon the aquatic habitat in Big River: Jefferson City, MO, Missouri Department of Conservation unpublished report, 2 p.
- Czarnecki, J. M., 1985, Accumulation of lead in fish from Missouri streams impacted by lead mining: Bulletin of Environmental Contamination and Toxicology, v. 34, no. 5, p. 736-745.
- Czarnecki, J. M., 1987, Use of pocketbook mussel, *Lampsilis ventricosa*, for monitoring heavy metal pollution in an Ozark stream: Bulletin of Environmental Contamination and Toxicology, v. 38, p. 641-646.
- Dahlinger, K. L., 1988, The lead and zinc Tri-State mining district of Kansas and Oklahoma; environmental considerations: The Compass, v. 65, no. 2, p. 120-123.

- Daily, M. E., Berendsen, P., and Mosier, E. L., 1988, Geochemical trends in the subsurface of the Joplin quadrangle: Abstracts with Programs - Geological Society of America, v. 20, no. 2, p. 96.
- Damberger, H. H., 1974, Coalification patterns of Pennsylvanian coal basins of the eastern United States. Carbonaceous materials as indicators of metamorphism, *in* Dutcher, R. R., Hacquebard, P. A., Schopt, J. M., and Simon, J. A., eds.: Geological Society of America special papers, v. 153, p. 53-73.
- Daniels, L. D., 1986, Diagenesis and paleokarst of the Burlington-Keokuk Formation (Mississippian), central and southwestern Missouri: Master's, State University of New York at Stony Brook, Stony Brook, NY, 401 p.
- Darr, J. M., 1978, Geochemistry of ground water, southwestern Missouri: Master's, University of Missouri at Columbia, Columbia, MO, 113 p.
- Davis, J. H., 1958, Distribution of copper, zinc, and minor metals in the southeast Missouri lead district: *Economic Geology*, v. 53, no. 7, p. 917-918.
- Davis, J. H., 1960, Mineralization in the southeast Missouri lead district: Doctoral, University of Wisconsin-Madison, Madison, WI, 130 p.
- Davis, J. H., and Brown, W. J., 1973, Ore control breccias at the Buick Mine: Abstracts with Programs - Geological Society of America, v. 5, no. 4, p. 310.
- Davis, J. H., Rogers, R. K., and Brown, W. K., 1975, Buick Mine (Amax Inc. & Homestake Mining Co.), Viburnum Trend, southeast Missouri, in *Guidebook Geology and Ore Deposits Selected Mines, Viburnum Trend, Missouri*: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey Report of Investigation, v. 58, p. 30-39.
- Davis, J. H., 1977, Genesis of the southeast Missouri lead deposits: *Economic Geology*, v. 72, no. 3, p. 443-450.
- De Camara, R. P., 1969, Trace-element investigation of northern Arkansas sphalerite: Master's, University of Missouri at Columbia, Columbia, MO.
- De Camara, R. P. , 1969, Trace element investigation of northern Arkansas sphalerite: *Transactions of the Missouri Academy of Science*, v. 3, p. 104.
- Deloule, E., and Allegre, C. J., 1984, Isotopic microstratigraphy in a single galena crystal: *EOS, Transactions, American Geophysical Union*, v. 65, no. 16, p. 304.
- Deloule, E., Allegre, C. J., and Doe, B. R., 1986, Lead and sulfur isotope microstratigraphy in galena crystals from Mississippi Valley-type deposits: *Economic Geology*, v. 81, no. 6, p. 1307-1321.
- Deloule, E., and Turcotte, D. L., 1989, The flow of hot brines in cracks and the formation of ore deposits: *Economic Geology*, v. 84, no. 8, p. 2217-2225.
- Denham, M. E., and Tieh, T. T., 1992, Mineralization along stylolites in carbonate rocks: Abstracts with Programs - Geological Society of America, v. 24, no. 7, p. 353.
- Department of Civil Engineering, 1973, Transport mechanisms of lead industry wastes: *Proceeding of the 28th Industrial Waste Conference, Lafayette, IN, 1973*, v. 28, p. 19.

Derby, J. R., Upshaw, L. P., Carter, E. O., Roach, L. F., and Roach, D. G., 1982, Joplin quadrangle, Missouri and Kansas: Tulsa, OK, Geological Survey of Tulsa Report, 36 p.

Desai, A. A., 1966, Structure contours on the top and base of the M bed, the relationship of mineralization to structures, and the variation of the M bed thickness in the Tri-State District, Missouri, Kansas and Oklahoma: Master's, University of Missouri at Rolla, Rolla, MO.

Dieffenbach, W. H., 1968, Water quality survey of the southeast Ozark mining area: Jefferson City, MO, Missouri Department of Conservation unpublished report, 4 p.

Diehl, S. F., Goldhaber, M. B., and Mosier, E. L., 1989, Regions of feldspar precipitation and dissolution in the Lamotte Sandstone, Missouri; implications for MVT ore genesis, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 5-7.

Diehl, S. F., Goldhaber, M. B., Taylor, C. D., Swolfs, H. S., and Gent, C. A., 1992, Microstructures in the Cambrian Bonnetterre Formation, Lamotte Sandstone, and basal clastic rocks of southeast Missouri and northeast Arkansas; implications of regional sulfide occurrence in stylolites and extensional veinlets for ore genesis, *in* Thorman, C. H., ed., Application of structural geology to mineral and energy resources of the Central and Western United States: U. S. Geological Survey Bulletin 2012, p. A1-A13.

Diehl, S. F., and Goldhaber, M. B., 1994, REE, Th, Nb, F enrichment in the New Madrid Test Well, Reelfoot Rift, southeast Missouri; evidence of a deep carbonate complex?: Abstracts with Programs - Geological Society of America, v. 26, no. 7, p. 500.

Diehl, S. F., and Goldhaber, M. B., 1995, Feldspar diagenesis in Cambrian clastic rocks of the southern Ozark Mountains and Reelfoot Rift, southeastern Missouri and northeastern Arkansas; implications for Mississippi Valley-type ore genesis: U. S. Geological Survey Bulletin 1989, F1-F17 p.

Dilday, T. F., III, 1982, Hydrogeochemical exploration for Mississippian valley-type mineral deposits, Arkansas: Master's, University of Arkansas, Fayetteville, Fayetteville, AR, 82 p.

Dingess, P. R., 1974, Geology of the Creta copper deposit of Eagle Picher Industries, Inc., Jackson County, Oklahoma: Abstracts with Programs - Geological Society of America, v. 6, no. 2, p. 101.

Dingess, P. R., 1976, Geology and mining operations at the Creta copper deposit of Eagle-Picher Industries, Inc.: Oklahoma Geological Survey Circular, v. 77, p. 15-24.

Dingess, P. R., 1989, Geology of the ASARCO West Fork Deposit, Viburnum Trend, southeast Missouri. Mississippi Valley-type mineralization of the Viburnum Trend, Missouri, *in* Hagni, R. D., and Coveney, R. M., Jr., eds., Guidebook series to the Society of Economic Geologists: Lancaster, PA, Society of Economic Geologists, v. 5, p. 96-110.

Dismuke, S. R., Nicholas, D. E., and Cicchini, P. F., 1986, Pillar recovery at the Buick Mine, *in* Singh, M. M., ed.: Mine subsidence, p. 131-138.

Dixon, T. W., 1994, Mobilization of several heavy metals (Cd, Co, Cr, Cu, Pb, and Zn) from the Desloge tailing pile of southeastern Missouri by sanitary landfill leachate: Abstracts with Programs - Geological Society of America, v. 26, no. 5, p. 13.

- Doe, B. R., and Delevaux, M. H., 1972, Source of lead in southeast Missouri galena ores: *Economic Geology*, v. 67, no. 4, p. 409-425.
- Doerr, A. H., 1959, Man as a geomorphological agent in the Tri-State zinc-lead district: *Proceedings of the Oklahoma Academy of Science*, v. 36, p. 144.
- Dreyer, R. M., 1949, Radioactivity surveys in the Kansas part of the Tri-State zinc and lead mining district, Cherokee County, Kansas: *Kansas State Geological Survey Bulletin*, v. 76, no. 5, p. 115-120.
- Duchrow, R. M., 1983, Effects of lead tailings on benthos and water quality of three Ozark streams: *Transactions of the Missouri Academy of Science*, v. 17, p. 5-17.
- Duchrow, R. M., Robinson-Wilson, E., and Trail, L., 1980, The effects of lead mine tailings on the water quality of Logan Creek, Reynolds County, Missouri: Jefferson City, MO, Missouri Department of Conservation, 29 p.
- Duchrow, R. M., and Trial, L., 1980, The effects of lead mine tailings on the water quality of Saline Creek and the Little St. Francis River, Madison County, Missouri: Jefferson City, MO, Missouri Department of Conservation, 21 p.
- Dunn, R. G. R., and Grundmann, W. H., Jr., 1989, Geology of the Casteel Mine; copper-rich ore in a MVT setting. Mississippi Valley-type mineralization of the Viburnum Trend, Missouri, *in* Hagni, R. D., and Coveney, R. M., Jr., eds., *Guidebook series to the Society of Economic Geologists*: Lancaster, PA, Society of Economic Geologists, p. 58-83.
- Durham, N. N., 1985, Fiscal year 1984 program report Oklahoma Water Resources Research Institute: Stillwater, OK, Oklahoma Water Resources Research Institute program report, G-927-01, 34 p.
- Dwyer, F. J., Schmitt, C. J., Finger, S. E., and Mehrle, P. M., 1988, Biochemical changes in longear sunfish, *Lepomis Megalotis*, associated with lead, cadmium and zinc from mine tailings: *Journal of Fish Biology*, v. 33, p. 307-317.
- Eckelmann, F. D., Kulp, J. L., and Brown, J. S., 1956, Lead isotopes and the pattern of mineralization in southeast Missouri: *Geological Society of America Bulletin*, v. 67, no. 12, Part 2, p. 1689-1690.
- Ehrlich, M. I., 1966, Paleomagnetic and rock magnetic investigations of subsurface ore, host-rock, and basic dike specimens from the Precambrian Iron Mountain deposit, southeast Missouri: Master's, Washington University, St. Louis, MI, 122 p.
- El, E. H. A., 1967, The technique of lineaments and linear analysis and its application in the mineralogenic province of southeast Missouri: Doctoral, University of Missouri at Rolla, Rolla, MO, 272 p.
- Elderhorst, W., 1858, Chemical report of the ores, rocks, and mineral waters of Arkansas, *in* Owen, D. D., ed., *First report of a geological reconnaissance of the northern counties of Arkansas*: Little Rock, AR, Publisher unknown, p. 143-191.
- Elliott, L. E., 1982, Impacts of tailings from abandoned lead mines on the water quality and sediments of Flat River Creek and Big River in southeastern Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 63 p.

- Ellis, E. E., 1926, Occurrence of commercial zinc and lead ore bodies in the Tri-State District: *Engineering and Mining Journal*, v. 121, no. 5, p. 209-210.
- Engineering and Mining Journal*, 1926, Ore deposition in the Tri-State District: *Engineering and Mining Journal*, v. 121, no. 23, p. 913.
- Environmental Protection Agency, 1987, Superfund record of decision: Cherokee County/Galena, KS: Washington, DC, Environmental Protection Agency report, no. EPA/ROD/RO7-88/010, 35 p.
- Erickson, R. L., Mosier, E. L., and Viets, J. G., 1978, Generalized geologic and summary geochemical maps of the Rolla 1° x 2° quadrangle, Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 1004-A, scale 1:250,000, (Includes interpretive text).
- Erickson, R. L., Mosier, E. L., and Viets, J. G., 1978, Lithogeochemical studies in Missouri: U. S. Geological Survey Professional Paper 1100, 9 p.
- Erickson, R. L., Mosier, E. L., and Viets, J. G., 1981, Mississippi Valley-type deposits in Cambrian and Ordovician formations overlying the Bonneterre Formation, *in* Pratt, W. P., ed., *Metallic mineral-resource potential of the Rolla 1 degree by 2 degrees quadrangle, Missouri, as appraised in September 1980*: U. S. Geological Survey Open-File Report 81-0518, p. 20-22.
- Erickson, R. L., Mosier, E. L., and Viets, J. G., 1981, A favorable belt for possible mineral discovery in subsurface Cambrian rocks in southern Missouri: *Economic Geology*, v. 76, no. 4, p. 921-933.
- Erickson, R. L., Mosier, E. L., and Viets, J. G., 1983, Subsurface geochemical exploration in carbonate terranes; Midcontinent, USA, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla*, p. 575-583.
- Erickson, R. L., Mosier, E. L., and Viets, J. G., 1984, Subsurface geochemical exploration in carbonate terrane of Missouri, central United States: *Thirty-third Brazilian geological congress; abstracts, brief communications, workshops, field trips and round tables*, v. 33, p. 190-191.
- Erickson, R. L., Erickson, M. S., Mosier, E. L., and Chazin, B., 1985, Summary geochemical generalized geologic maps of the Springfield 1 degree by 2 degrees quadrangle and adjacent area, Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 1830-A, p. 53.
- Erickson, M. S., and Chazin, B., 1987, Spectrographic analyses of insoluble-residue samples, Harrison 1 degree by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. A7, 13, and 44: U. S. Geological Survey Open-File Report 87-0518, 61 p.
- Erickson, M. S., and Chazin, B., 1987, Spectrographic analysis of insoluble-residue samples, Harrison 1 degree by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 4, 5, and 6: U. S. Geological Survey Open-File Report 87-0522, 46 p.
- Erickson, M. S., and Chazin, B., 1987, Spectrographic analyses of insoluble-residue samples, Harrison 1 degree by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 7, 9, and 10: U. S. Geological Survey Open-File Report 87-0521, 16 p.
- Erickson, M. S., and Chazin, B., 1987, Spectrographic analyses of insoluble-residue samples, Harrison 1 degree by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 11, 12, and 14: U. S. Geological Survey Open-File Report 87-0520, 16 p.

Erickson, M. S., and Chazin, B., 1987, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 21, 23, and 24: U. S. Geological Survey Open-File Report 87-0519, 19 p.

Erickson, M. S., and Chazin, B., 1987, Spectrographic analyses of insoluble-residue samples, Harrison 1 degrees by 2 degrees quadrangle, Missouri and Arkansas; drill holes Nos. 26, 27, and 28: U. S. Geological Survey Open-File Report 87-0523, 28 p.

Erickson, R. L., Chazin, B., and Erickson, M. S., 1988, Summary geochemical maps of the Harrison 1 degrees X 2 degrees quadrangle, Arkansas and Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 1994-A, 57 p.

Erickson, R. L., Chazin, B., Erickson, M. S., and Mosier, E. L., 1988, Tectonic and stratigraphic control of regional subsurface geochemical patterns, *in* Kisvarsanyi, G., and Grant, S. K., eds., Midcontinent, USA North American conference on Tectonic control of ore deposits and the vertical and horizontal extent of ore systems, Rolla, MO, 1987, Proceedings: Rolla, MO, University of Missouri at Rolla, p. 435-446.

Erickson, R. L., Chazin, B., Erickson, M. S., and Mosier, E. L., 1989, Tectonic and stratigraphic control of subsurface geochemical patterns in the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 7-8.

Erickson, R. L., Chazin, B., Erickson, M. S., and Mosier, E. L., 1990, Tectonic and stratigraphic control of subsurface geochemical patterns in the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Circular 1043, p. 6.

Erickson, R. L., Chazin, B., Erickson, M. S., and Mosier, E. L., 1990, Subsurface geochemistry of the Harrison and Joplin 1 degrees X 2 degrees quadrangles, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Open-File Report 89-0169, p. 8.

Erickson, R. L., Chazin, B., Erickson, M. S., and Mosier, E. L., 1990, Subsurface geochemistry of the Harrison and Joplin 1 degrees X 2 degrees quadrangles, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 6-7.

Erickson, R. L., Chazin, B., Erickson, M. S., and Mosier, E. L., 1990, Summary geochemical maps of the Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri: U. S. Geological Survey Miscellaneous Field Studies Map, 82 p.

Erickson, R. L., and Chazin, B., 1991, Resource assessment for Mississippi Valley-type base-metal deposits, *in* Martin, J. A., and Pratt, W. P., eds., Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees Quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942, p. 90-94.

Erten, M. Z., Pitt, J. L., Gale, N. L., Wixson, B. G., and Hindenberger, E., 1989, Use of a biological meander treatment system for lead mine/mill wastes in southeast Missouri, USA, *in* Proceedings

- of the 43rd Industrial Waste Conference, West Lafayette, IN, 1989: Chelsea, MI, Lewis Publishers, p. 617-629.
- Escalera, W. A., 1973, Pollution abatement of mining effluents in the New Lead Belt of Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 87 p.
- Evans, H. T., Jr., and McKnight, E. T., 1963, New wurtzite polytypes from Joplin, Missouri: *American Mineralogist*, v. 44, no. 11-12, p. 1210-1218.
- Evans, L. L., 1977, Geology of the Brushy Creek Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 381-390.
- Farr, M. R., and Land, L. S., 1985, Cathodoluminescent zoning as a guide to regional paleohydrology of mineralizing brines in southern Missouri: AAPG Annual Midyear Meeting Abstracts, v. 2, p. 29.
- Farr, M. R., Gose, W. A., and MacPherson, G. L., 1986, Paleomagnetic age dates from Mississippi Valley-type deposits in central Texas and northern Arkansas: Abstracts with Programs - Geological Society of America. v, 18, no. 6, p. 598.
- Farr, M. R., 1988, Compositional variation of late Dolomite cement as a guide to parent flow directions in the Cambrian Bonneterre Formation, Missouri: Doctoral, University of Texas at Austin, Austin, TX, 261 p.
- Farr, M. R., 1989, Compositional zoning characteristics of late dolomite cement in the Cambrian Bonneterre Formation, Missouri; implications for parent fluid migration pathways, *in* Mazzullo, S. J., and Gregg, J. M. ,eds.: *Carbonates and Evaporites*, v. 4, no. 2, p. 177-194.
- Farr, M. R., 1989, Regional isotopic variation in Bonneterre Formation dolomite cements: Implications for brine migration pathways and sources, *in* Hagni, R. D., and Gregg, J. M., Symposium on the Bonneterre Formation (Cambrian), southeastern Missouri: Rolla, MO, University of Missouri at Rolla, p. 8.
- Farr, M. R., 1992, Geochemical variation of dolomite cement within the Cambrian Bonneterre Formation Missouri: Evidence for fluid mixing: *Journal of Sedimentary Petrology*, v. 62, p. 636-651
- Farrington, O. C., 1900, Crystal forms of calcite from Joplin, Missouri: *Geological Series - Field Museum of Natural History*, v. 1, p. 232-241.
- Fass, F. W. R., and Hagni, R. D., 1979, Mineral asymmetry and directions of flow of the ore-forming fluids in the Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 11, p. 424.
- Fass, F. W. R., 1980, Mineral asymmetry and the direction of flow of mineralizing solutions in the Viburnum Trend, southeast Missouri: Master's, University of Missouri at Rolla, Rolla, MO.
- Feder, G. L., Skelton, J., Jeffrey, H. G., and Harvey, E. J., 1969, Water resources of the Joplin area, Missouri: Rolla, MO, Missouri Geological Survey and Water Resources report, no. 24, 97 p.
- Femmer, S. R., and Joseph, R. L., 1994, National water-quality assessment program; Ozark Plateaus surface-water quality study: U. S. Geological Survey Fact Sheet 94-0015, 2 p.
- Femmer, S. R., 1995, National water-quality assessment program; Ozark Plateaus biological study: U. S. Geological Survey Fact Sheet 0116-95, 2 p.

Fennel, M. J., Hagni, R. D., and Bradley, M. F., 1996, Mineralogy, paragenetic sequence, mineral zoning, and genesis at the Magmont-West mine, southeast Missouri lead district, *in* Sangster, D. F., ed., Carbonate-Hosted Lead-Zinc Deposits: Auburn, MI, Data Reproductions Corp., Society of Economic Geologists Special Publication, no. 4, p. 597-610.

Fernandes, D. L., 1987, A study on chemical extraction and bioassays for lead, zinc and cadmium and effluent characterization in the New Lead Belt of Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 98 p.

Fetyani, A. A., 1980, Petrographic, chemical and Pb-isotopes composition of sphalerite, pyrite and chalcopyrite from a mineralogically zoned Pb-Zn ore body in the Viburnum Trend of southeast Missouri: Master's, Washington University, St. Louis, MO, 94 p.

Filipek, L. H., 1987, Timing of the Mid-Continent Mississippi Valley-type deposits; a hydrodynamic perspective: EOS, Transactions, American Geophysical Union, v. 67, no. 16, p. 275.

Fletcher, C. S., 1974, Effects of mining operations on ground water levels in the New Lead Belt, Missouri: Rolla, MO, University of Missouri at Rolla, 85 p.

Fletcher, C. S., 1974, The geology and hydrogeology of the New Lead Belt, Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 83 p.

Foil, J. L., 1975, Aquatic transport of lead and other heavy metals from a lead-zinc smelting area: Master's, University of Missouri at Rolla, Rolla, MO, 121 p.

Ford, J., 1985, Water quality problems caused by abandoned metal mines and tailings: Perspectives on Non-point Source Pollution, Proceedings of a National Conference, Kansas City, MO, 1985: Environmental Protection Agency, p. 344-345.

Fowler, G. M., and Lyden, J. P., 1931, The ore deposits of the Tri-State District (Missouri-Kansas-Oklahoma): Mining and Metallurgy, v. 12, no. 297, p. 401.

Fowler, G. M., and Lyden, J. P., 1932, The ore deposits of the Tri-State District (Missouri-Kansas-Oklahoma): Transactions of the American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), v. 102, p. 206-251.

Fowler, G. M., and Lyden, J. P., 1932, The ore deposits of the Tri-State District (Missouri-Kansas-Oklahoma) [with discussion]: American Institute of Mining, Metallurgical, and Petroleum Engineers Technical Publication, v. 446, p. 46.

Fowler, G. M., and Lyden, J. P., 1933, The ore deposits of the Tri-State District [discussion]: Economic Geology, v. 28, no. 1, p. 75-81.

Fowler, G. M., Lyden, J. P., and Gregory, F. E., 1934, Chertification in the Tri-State (Oklahoma-Kansas-Missouri) mining district: American Institute of Mining, Metallurgical, and Petroleum Engineers Technical Publication, v. 532, p. 50.

Fowler, G. M., and Lyden, J. P., 1934, The Miami-Picher zinc district: Economic Geology, v. 29, no. 4, p. 390-396.

Fowler, G. M., 1935, Geology of the Tri-State District [abstr. with discussion]: Tulsa Geological Society Digest, p. 43-47.

- Fowler, G. M., and Lyden, J. P., 1935, The ore deposits of the Tri-State District: Economic Geology, v. 30, no. 5, p. 565-575.
- Fowler, G. M., Lyden, J. P., and Gregory, F. E., 1935, Chertification in the Tri-State (Oklahoma-Kansas-Missouri) mining district: Transactions of the Society of Mining Engineers of American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), v. 115, p. 106-163.
- Fowler, G. M., 1938, Structural control of ore deposits in the Tri-State zinc and lead district: Engineering and Mining Journal, v. 139, no. 9, p. 46-51.
- Fowler, G. M., 1941, Controle estrutural dos depositos de chumbo e zinco do Tri-State, translated by Tharcisio D. de Souza Santos: Mineracao e Metalurgia, v. 5, no. 29, p. 219-224.
- Fowler, G. M., 1942, Ore deposits in the Tri-State zinc and lead district, *in* Ore deposits as related to structural features: Princeton, NJ, Princeton University Press, p. 206-211.
- Fowler, G. M., 1943, Tri-State geology [Kansas-Oklahoma-Missouri]: Engineering and Mining Journal, v. 144, no. 11, p. 73-79.
- Fowler, G. M., 1960, Structural deformation and ore deposits; Oklahoma-Kansas mining field in Tri-State mining district: Engineering and Mining Journal, v. 161, no. 6, p. 183-188.
- Fowler, G. M., 1969, Ore deposits in the Tri-State zinc and lead district, *in* Newhouse, W. H., ed., Ore deposits as related to structural features: New York, NY, Hafner Publishing Co., p. 206-211.
- Frank, M. H., and Lohmann, K. C., 1982, Cathodoluminescent and isotopic analysis of diagenetically altered dolomite, Bonneterre Formation, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 14, no. 7, p. 491.
- Frank, M. H., 1986, Textural and chemical alteration of dolomite; interaction of mineralizing fluids and host rock in a Mississippi Valley-type deposit, Bonneterre Formation, Viburnum Trend: Master's, University of Michigan, Ann Arbor, MI, 16 p.
- Freeman, T., Lyle, J., Ellison, J., and Medary, T., 1989, Sedimentology and diagenesis of the Bonneterre Formation in the Viburnum Trend, southeast Missouri, *in* Gregg, J. M., Palmer, J. R., and Kurtz, V. E., eds., Field guide to the Upper Cambrian of southeastern Missouri; Stratigraphy, sedimentology, and economic geology: Rolla, MO, University of Missouri at Rolla, p. 56-60.
- Freiwald, D. A., 1991, National water-quality assessment program; Ozark Plateaus: U. S. Geological Survey Open-File Report 91-0162, 2 p.
- Fuchs, E. H., 1972, Ozark mining water quality survey: Jefferson City, MO, Missouri Department of Conservation unpublished report, 28 p.
- Gage, J. R., 1874, Lead mines, southeast Missouri: Rolla, MO, Missouri Department of Natural Resources, Geological and Land Survey report, p. 1873-1874.
- Gale, N. L., Wixson, B. G., and McMenus, Lead concentrations in edible fish filets collected from Missouri's Old Lead Belt: Rolla, MO, University of Missouri at Rolla, 17 p.

Gale, N. L., Hardie, M. G., Jennett, J. C., and Aleti, A., 1972, Transport of trace pollutants in lead mining waste waters, *in* Hemphill, D. D., ed., Trace Substances in Environmental Health, 6th, Columbia, MO, 1972, Proceedings: University of Missouri at Columbia, p. 95-106.

Gale, N. L., Wixson, B. G., Hardie, M. G., and Jennett, J. C., 1972, Algal growth problems and trace metals dissemination in water resources studies in the New Lead Belt of SE Missouri: American Water Resources Conference, 8th, St. Louis, MO, 1972, Proceedings: University of Missouri at Rolla, p. 36.

Gale, N. L., Wixson, B. G., Hardie, M. G., and Jennett, J. C., 1973, Aquatic organisms and heavy metals in Missouri's New Lead Belt: Water Resources Bulletin, v. 9, no. 4, p. 673-688.

Gale, N. L., Hardie, M. G., Whitfield, J., and Marcellus, P., 1974, The impact of lead mine and mill effluent on aquatic life: Proceedings of the 27th Industrial Waste Conference, Lafayette, IN, 1972: Purdue University, p. 9.

Gale, N. L., Bolter, E., and Wixson, B. G., 1976, Investigation of Clearwater Lake as a potential sink for heavy metals from lead mining in southeast Missouri, *in* Hemphill, D. D., ed., Trace Substances in Environmental Health, 10th, Columbia, MO, 1976, Proceedings: University of Missouri at Columbia, p. 187-196.

Gale, N. L., and Wixson, B. G., 1983, Lead in fish from streams in the Old and New Lead Belts of Missouri, *in* Hemphill, D. D., ed., Trace Substances in Environmental Health, 17th, Columbia, MO, 1983, Proceedings: University of Missouri at Columbia, p. 13.

Gale, N. L., and Wixson, B. G., 1985, Continued evaluation of lead in fish and mussels in the Big River of southeastern Missouri *in* Hemphill, D. D., ed., Trace Substances in Environmental Health, 19th, Columbia, MO, 1985, Proceedings: University of Missouri at Columbia, p. 11.

Gale, N. L., Haas, M. J., Wixson, B. G., and Hinderberger, E. J., Jr., 1986, Historical trends for lead in fish, clams and sediments in the Big River of southeastern Missouri, *in* Hemphill, D. D., ed., Trace Substances in Environmental Health, 20th, Columbia, MO, 1986, Proceedings: University of Missouri at Columbia, p. 18.

Gale, N. L., and Wixson, B. G., 1986, Fish from Missouri's lead belt: to eat or not to eat: Environmental Geochemistry and Health, v. 8, p. 3-10.

Gann, E. E., Harvey, E. J., Barks, J. H., Fuller, D. L., and Miller, D. E., 1974, Water resources of west-central Missouri: U. S. Geological Survey Hydrologic Investigations Atlas HA-491.

Gann, E. E., Harvey, E. J., and Miller, D. E., 1976, Water resources of south-central Missouri: U. S. Geological Survey Hydrologic Investigation Atlas HA-550, 4 sheets.

Garf, J. L., and Richards, B., 1981, Rare earth elements in hydrothermal carbonates associated with breccia-filling and replacement, Pb-Zn-Cu sulfide deposits in dolomite host rock, Viburnum Trend, Missouri: Abstracts with Programs - Geological Society of America, v. 13, no. 6, p. 279.

Garrison, F. L., 1907, Notes on minerals: Proceedings of the Academy of Natural Sciences of Philadelphia, v. 59, p. 445-446.

Garrison, E. J., 1974, Heavy and alkali metal content of surface and ground waters in the Joplin area, Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 71 p.

Garven, G., and Freeze, R. A., 1984, Theoretical analysis of the role of groundwater flow in the genesis of stratabound ore deposits; 1, Mathematical and numerical model: *American Journal of Science*, v. 284, no. 10, p. 1085-1124.

Garven, G., and Freeze, R. A., 1984, Theoretical analysis of the role of groundwater flow in the genesis of stratabound ore deposits; 2, Quantitative results: *American Journal of Science*, v. 284, no. 10, p. 1125-1174.

Garven, G., Ge, S., Person, M. A., and Sverjensky, D. A., 1993, Genesis of stratabound ore deposits in the Midcontinent basins of North America; 1, The role of regional groundwater flow: *American Journal of Science*, v. 293, no. 6, p. 497-568.

Ge, S., and Garven, G., 1989, Tectonically induced transient groundwater flow in foreland basin, *in* Price, R. A., ed., *Origin and evolution of sedimentary basins and their energy and mineral resources*: American Geophysical Union Monograph, no. 48, part 3, p. 145-158.

Ge, S., and Garven, G., 1992, Hydromechanical modeling of tectonically driven groundwater flow with application to the Arkoma foreland basin: *Journal of Geophysical Research*, v. 97, no. B6, p. 9119-9114.

George, P. W., 1929, Experiments with Eoetvoes torsion balance in the Tri-State zinc and lead district: *American Institute of Mining and Metallurgy Engineers*, v. 81, p. 561-571.

Gerdemann, P. E., and Myers, H. E., 1972, Relationships of carbonate facies patterns to ore distribution and to ore genesis in the southeast Missouri lead district: *Economic Geology*, v. 67, no. 4, p. 426-433.

Gerdemann, P. E., and Gregg, J. M., 1986, Field trip to the Upper Cambrian Lamotte, Bonneterre, and Davis formations, St. Francois Mountains area, Missouri, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al. eds., *Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1: Rolla, MO*, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 51-61.

Gerdemann, P. E., and Gregg, J. M., 1986, Sedimentary facies in the Bonneterre Formation (Cambrian), southeast Missouri and their relationship to ore distribution, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al., eds., *Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1: Rolla, MO*, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 37-49.

Geronsin, R. L., 1980, Chemical relationship of the Mississippi-Valley type ore deposits in Missouri, Oklahoma, and Kansas: Doctoral, Yale University, New Haven, CT, 156 p.

Ghosh, M. M., and Lochmoeller, T., 1982, Influence of particle size distribution on water quality in agricultural: Springfield, VA, National Technical Information Service, completion report, OWRT A-132-MO(1)

Goebel, E. D., Thompson, T. L., Waugh, T. C., and Mueller, L.C., 1968, Mississippian conodonts from the Tri-State District, Kansas, Missouri and Oklahoma, *in* Zeller, D. E., ed.: *Kansas, State Geological Survey Bulletin*, v. 91, Part 1, p. 21-25.

Goebel, E. D., Coveney, R. M. R., and Ragan, V. M., 1988, Fluid inclusion evidence from country rocks bearing on the extent of ore-mineralizing systems in the mid-continent, U. S., *in* Kisvarsanyi, G., and Grant, S. K. ,eds., *North American Conference on Tectonic Control of Ore Deposits and*

the Vertical and Horizontal Extent of Ore Systems, Rolla, MO, 1987, Proceedings: University of Missouri at Rolla, p. 447-454.

Goebel, E. D., Coveney, R. M. R., et al., 1989, Sulfur isotopes and fluid inclusions from trace and minor occurrences of Mississippi Valley-type base metals in country rocks in the Midcontinent: Abstracts with Programs - Geological Society of America, v. 21, no. 4, p. 12.

Goebel, E. D., and Ragan, V. M., 1989, Fluid inclusions and sulfur isotopes from MVT deposition and the role of intra-cratonic unconformities: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 359.

Goebel, E. D., and Thompson, T. L., 1993, Hydrothermally, color-altered conodonts from MVT Tri-State mines: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 21.

Goebel, E. D., 1995, Thermal history of the Tri-State district from conodont alteration index and fluid inclusion data (extended abs.), *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 108-110.

Goebel, E. D., 1996, The pathway for MVT hydrothermal fluids within the Tri-State mining district from stratigraphic plotting of conodont alteration indices, *in* Sangster, D. F., ed., Carbonate-Hosted Lead-Zinc Deposits: Auburn, MI, Data Reproductions Corp., Society of Economic Geologists Special Publication, no. 4, p. 413-418.

Goldhaber, M. B., and Viets, J. G., 1985, Isotope evidence for sulfur sources for the Viburnum Trend of lead-zinc mineralization, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 17, no. 7, p. 594.

Goldhaber, M. B., and Stanton, M. R., 1987, Experimental formation of marcasite at 150-200 degrees C; implications for carbonate hosted Pb/ Zn deposits, *in* Dickinson, W. R., ed.: Abstracts with Programs - Geological Society of America, v. 19, no. 7, p. 678.

Goldhaber, M. B., 1988, Contrasting sulfur sources for lower versus upper Midcontinent Mississippi Valley-type ores; implications for ore genesis, *in* Schindler, K. S., ed., USGS research on mineral resources, 1989; program and abstracts: U. S. Geological Survey Circular 1035, p. 23.

Goldhaber, M. B., Church, S. E., and Doe, B. R., 1989, Pb isotopic constraints on fluid flow paths for Mid-Continent Mississippi Valley type (MVT) Pb-Zn ores: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 4.

Goldhaber, M. B., and Mosier, E. L., 1989, Sulfur sources for southeast Missouri MVT ores; implications for ore genesis, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Open-File Report 89-0169, p. 8-9.

Goldhaber, M. B., Hayes, T. S., Eidel, J. J., LaRock, E. J., and Sargent, M. L., 1992, Assessment of Mississippi Valley-type mineralization; examples from the Middle Ordovician Dutchtown Formation, *in* Goldhaber, M. B., and Eidel, J. J., eds., Mineral resources of the Illinois Basin in the context of basin evolution: U. S. Geological Survey Open-File Report 92-0001, p. 16-18.

Goldhaber, M. B., E. L. Mosier, Church, S. E., and Diehl, S. F., 1993, The critical role of hematite cement in the Lamotte Sandstone for the genesis of the southeast Missouri Mississippi Valley-type lead districts: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 21.

Goldhaber, M. B., Church, S. E., Doe, B. R., Aleionikoff, J. N., Brannon, J. C., Podosek, F. A., Mosier, E. L., Taylor, C. D., and Gent, G. A., 1995, Lead and sulfur isotope investigation of Paleozoic sedimentary rocks from the southern Midcontinent of the United States; implications for paleohydrology and ore genesis of the southeast Missouri lead belts: *Economic Geology*, v. 90, no. 7, p. 1875-1910.

Goodman, W. M., and Ogden, A. E., 1980, A preliminary investigation of the ground-water resources of northern Searcy County, Arkansas, *in* Heidt, G. A., ed.: *Proceedings of the Arkansas Academy of Science*, v. 34, p. 54-57.

Gott, J. D. et al., 1975, Soil survey of Mark Twain National Forest area, Missouri (parts of Carter, Oregon, Ripley, and Shannon counties: U. S. Department of Agriculture, Forest Service and Soil Conservation Service, p. 56 and maps.

Graf, J. L. R., 1983, Rare earth elements in carbonate rocks and minerals from the Viburnum Trend, southeast Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla*, p. 131-139.

Graf, J. L. R., 1984, Rare earth element distributions in carbonate rocks and minerals from the Tri-State District, Missouri, Kansas, Oklahoma: *Abstracts with Programs - Geological Society of America*, v. 16, no. 6, p. 522.

Graf, J. L. R., 1984, Effects of Mississippi Valley-type mineralization on REE patterns of carbonate rocks and minerals, Viburnum Trend, southeast Missouri: *Journal of Geology*, v. 92, no. 3, p. 307-324.

Graf, J. L. R., 1989, Rare earth element study of ore deposits in the Tri-State District: *Transactions of the Missouri Academy of Science*, v. 23, p. 88-89.

Graf, J. L. R., 1990, Rare earth element (REE) distributions of carbonate cements in Upper Cambrian carbonate rocks (Bonnetterre and Davis formations) and MVT ore deposits, southeast Missouri and northern Arkansas: *Abstracts with Programs - Geological Society of America*, v. 22, no. 7, p. 222.

Graff, J. L., Jr., 1990, Rare earth element studies of Mississippi Valley-type (MVT) Pb-Zn-Cu deposits in Kansas, Oklahoma, and Missouri, USA, *in* Pelissonnier, H., and Sureau, J. F., eds., *Mobilite et concentration des metaux de base dans les couvertures sedimentaires, manifestations, mecanismes, prospection; actes du colloque international: Paris, France; Bureau de Recherches Geologiques et Minieres, (BRGM)*, v. 183, p. 75-88.

Graney, J. R., Halliday, A. N., Keeler, G. J., Nriago, J. O., Norton, S. A., and Robbins, J. A., 1993, Tracing regional and local sources of lead pollution in lake sediments from the northeastern United States using isotope ratios: *Abstracts with Programs - Geological Society of America*, v. 25, no. 6, p. 194.

Grant, N. K., Laskowski, T. E., and Foland, K. A., 1984, Rb-Sr and K-Ar ages of Paleozoic glauconites from Ohio-Indiana and Missouri: *EOS, Transactions, American Geophysical Union*, v. 65, no. 16, p. 303.

Grant, N. K., Laskowski, T. E., and Foland, K. A., 1984, Rb-Sr and K-Ar ages of Paleozoic glauconites from Ohio-Indiana and Missouri, USA": *Chemical Geology*, v. 46, no. 3, p. 217-239.

Gratacap, L. P., 1900, Note on an interesting specimen of calcite from Joplin, Missouri: *Bulletin of the American Museum of Natural History*, v. 13, p. 95-97.

Gregg, J. M., 1985, Regional epigenetic dolomitization in the Bonneterre Dolomite (Cambrian), southeastern Missouri: *Geology*, v. 13, no. 7, p. 503-506.

Gregg, J. M., and Shelton, K. L., 1986, Minor and trace element distributions at the Bonneterre Dolomite/ Lamotte Sandstone contact (Cambrian) SE Missouri; evidence for basinal fluid pathways: *Abstracts with Programs - Geological Society of America*, v. 18, no. 6, p. 621.

Gregg, J. M., and Hagni, R. D., 1987, Irregular cathodoluminescent banding in late dolomite cements; evidence for complex faceting and metalliferous brines: *Geological Society of America Bulletin*, v. 98, no. 1, p. 86-91.

Gregg, J. M., and Shelton, K. L., 1988, Stable isotopes in the back reef facies of the Bonneterre and Davis formations (Cambrian), MO, evidence for a complex diagenetic history: *Abstracts with Programs - Geological Society of America*, v. 20, no. 7, p. 120.

Gregg, J. M., 1988, Origins of dolomite in the offshore facies of the Bonneterre Formation (Cambrian), southeast Missouri, *in* Shukla, V., and Baker, P. A., eds.: *Society of Economic Paleontologists and Mineralogists Special Publication*, v. 43, p. 67-83.

Gregg, J. M., and Shelton, K. L., 1989, Geochemical and petrographic evidence for fluid sources and pathways during dolomitization and lead-zinc mineralization in southeast Missouri; a review, *in* Mazzullo, S. J., and Gregg, J. M., eds.: *Carbonates and Evaporites*, v. 4, no. 2, p. 153-175.

Gregg, J. M., and Shelton, K. L., 1989, Minor- and trace-element distributions in the Bonneterre Dolomite (Cambrian), Southeast Missouri; evidence for possible multiple-basin fluid sources and pathways during lead-zinc mineralization; with Supplement. Data 89-05: *Geological Society of America Bulletin*, v. 101, no. 2, p. 221-230.

Gregg, J. M., Palmer, J. R., and Kurtz, V. E., eds., 1989, *Field guide to the Upper Cambrian of southeastern Missouri; stratigraphy, sedimentology, and economic geology*: Rolla, MO, University of Missouri at Rolla, 124 p.

Gregg, J. M., and Gerdemann, P. E., 1989, Sedimentary facies, diagenesis and ore distribution in the Bonneterre Formation (Upper Cambrian), southeast Missouri, *in* Gregg, J. M., Palmer, J. R., and Kurtz, V. E., eds., *Field guide to the Upper Cambrian of southeastern Missouri; stratigraphy, sedimentology, and economic geology*: Rolla, MO, University of Missouri at Rolla, p. 43-55.

Gregg, J. M., 1989, Carbonate porosity evolution in the Bonneterre Dolomite (Cambrian) during Mississippi Valley-type mineralization in southeastern Missouri: *Abstracts with Programs - Geological Society of America*, v. 21, no. 6, p. 78.

Gregg, J. M., Shelton, K. L., and Baur, R. M., 1992, Geochemical and fluid inclusion evidence for regional alteration of Upper Cambrian carbonates by basinal fluids in southern Missouri, *in* Johnson, K. S., and Cardott, B. J., eds., *Source rocks in the southern Midcontinent; 1990 symposium*: Oklahoma Geological Survey Circular, p. 313-320.

Gregg, J. M., 1993, Porosity reduction by basinal fluids during Mississippi Valley-type mineralization, Bonneterre Dolomite (Cambrian) southeastern Missouri: *Annual meeting abstracts - American Association of Petroleum Geologists 1993 annual convention*, p. 110.

- Gregg, J. M., Laudon, P. R., Woody, R. E., and Shelton, K. E., 1993, Porosity evolution of the Cambrian Bonnetterre Dolomite, south-eastern Missouri, USA: *Sedimentology*, v. 40, no. 6, p. 1153-1169.
- Gregg, J. M., Shelton, K. L., Keller, T. J., and Palmer, J. R., 1993, Petrology, geochemistry, and fluid/rock interactions in Cambro-Ordovician Carbonates from the Reelfoot Rift initial findings, *in* *Geology and Geochemistry of Mississippi Valley-type Ore Deposits, Proceeding Volume: Rolla, MO, University of Missouri at Rolla Press*, p. 73-85.
- Grisafe, D. A., and Rueff, A. W., 1990, Industrial mineral resources of the Joplin quadrangle, *in* Pratt, W. P., and Goldhaber, M. B., eds., *U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts*, St. Louis, Missouri, April 11-12, 1989: *U. S. Geological Survey Circular 1043*, p. 9.
- Grisafe, D. A., and Rueff, A. W., 1991, Maps showing industrial mineral resources of the Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri: *U. S. Geological Survey Miscellaneous Field Studies Map, 2125-B, 1 sheet*.
- Grohskopf, J. G., 1955, Subsurface geology of the Mississippi Embayment of southeast Missouri: Columbia, MO, Missouri Division of Geological and Water Resources, v. 37, 133 p.
- Grundmann, W. H. R., 1977, Geology of the Viburnum No. 27 Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 349-364.
- Guinness, E. A., and Arvidson, R. E., 1982, Integration of digital geophysical, geological, and remote sensing data; application to studies of the structure of the midcontinent, *in* Morris, J. D. R., and Morgan, K. M., eds., *Proceedings of the International symposium on remote sensing of environment; second thematic conference; iRemote sensing for exploration geology*, Fort Worth, TX, 1982: Ann Arbor, MI, Environmental Resources Institute Michigan, p. 137-138.
- Guinness, E. A., Arvidson, R. E., Leff, C. E., Edwards, M. H., and Bindschandler, D. L., 1983, Digital image processing applied to analysis of geophysical and geochemical data for southern Missouri: *Economic Geology*, v. 78, no. 4, p. 654-663.
- Gustafson, L. B., and Williams, N., 1981, Sediment-hosted stratiform deposits of copper, lead, and zinc, *in* Skinner, B. J., ed.: *Economic geology, Seventy-fifth anniversary volume 1905-1980*, p. 139-178.
- Gutierrez, G. N., 1987, Controls on ore deposition in the Lamotte Sandstone, Goose Creek Mine, Indian Creek subdistrict, southeast Missouri: Master's, University of Texas at Austin, Austin, TX, 119 p.
- Hagni, R. D., 1962, Mineral paragenesis and trace element distribution in the Tri-State zinc-lead district, Missouri, Kansas, Oklahoma: Doctoral, University of Missouri at Columbia, Columbia, MO, 252 p.
- Hagni, R. D., 1963, Mineral paragenesis and trace element distribution in the Tri-State district, Missouri, Kansas, Oklahoma: *Economic Geology*, v. 58, no. 1, p. 162-163.
- Hagni, R. D., and Grawe, O. R., 1963, Mineral paragenesis in the Tri-State District, Missouri, Kansas, Oklahoma: *Mining Engineering*, v. 15, no. 1, p. 61.
- Hagni, R. D., and Grawe, O. R., 1963, Tabular review of the genesis of Tri-State ores, *in* *Guidebook to the geology in the vicinity of Joplin, Missouri, including Westside-Webber Mine*,

Oklahoma; Association of Missouri Geologists, 10th Ann. Field Trip 1963: Columbia, MO, Association of Missouri Geologists, p. 36-44.

Hagni, R. D., and Grawe, O. R., 1964, Mineral paragenesis in the Tri-State District, Missouri, Kansas, Oklahoma: *Economic Geology*, v. 59, no. 3, p. 449-457.

Hagni, R. D., and Saadallah, A. A., 1965, Alteration of host rock limestone adjacent to zinc-lead ore deposits in the Tri-State District, Missouri, Kansas, Oklahoma: *Economic Geology*, v. 60, no. 8, p. 1607-1619.

Hagni, R. D., and Desai, A. A., 1968, Solution thinning of the M bed host rock limestone in the Tri-State District, Missouri, Kansas, Oklahoma: *Economic Geology*, v. 61, no. 8, p. 1436-1442.

Hagni, R. D., 1976, The influence of original host rock character upon alteration and mineralization in the Tri-State District of Missouri, Kansas, and Oklahoma, USA: *Abstracts--Congres Geologique Internationale, Resumes*, v. 25, no. 1, part 4, p. 163-164.

Hagni, R. D., 1976, Tri-State ore deposits; the character of their host rocks and their genesis, *in* Wolf, K. H., ed., *Handbook of strata-bound and stratiform ore deposits; II. Regional studies and specific deposits*: New York, NY, Elsevier Publishing Co., v. 6(Cu, Zn, Pb, and Ag deposits), p. 457-494.

Hagni, R. D., and Trancynger, T. C., 1977, Sequence of deposition of the ore minerals at the Magmont Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 451-464.

Hagni, R. D., 1982, The influence of original host rock character upon alteration and mineralization in the Tri-State District of Missouri, Kansas, and Oklahoma, USA, *in* Amstutz, G. C., El, G. A., Frenzel, G., et al., eds., *Ore genesis; the state of the art*: Berlin, Federal Republic of Germany, Springer-Verlag, p. 97-107.

Hagni, R. D., 1983, Ore microscopy, paragenetic sequence, trace element content, and fluid inclusion studies of the copper-lead-zinc deposits of the southeast Missouri lead district, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits; proceedings volume*: Rolla, MO, University of Missouri at Rolla, p. 187-194.

Hagni, R. D., 1986, Mineral paragenetic sequence of the lead-zinc-copper-cobalt-nickel ores of the southeast Missouri Lead District, USA, *in* Craig, J. R., Hagni, R. D., Kiesel, W., et al, eds., *Mineral Paragenesis*: Athens, Greece, Theophrastus Publ. S. A., p. 90-132.

Hagni, R. D., 1986, Ore microscopy and paragenetic sequence of the ores in the southeast Missouri lead district, *in* Prewitt, C. T., ed., *Papers and Proceedings of the General Meeting of the International Mineralogical Association*: Stanford, CA, 1986, p. 118.

Hagni, R. D., 1986, Southeast Missouri lead district, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al., eds., *Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1*: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 1-35.

Hagni, R. D., 1988, Ore microscopy and mineral paragenetic sequence of the early bornite ores in the Viburnum Trend, southeast Missouri, *in* Zachrisson, E., ed., *Proceedings of the Seventh Quadrennial IAGOD Symposium*, Lulea, Sweden, 1988: Stuttgart, Federal Republic of Germany, E. Schweizerbartische Verlagsbuchhandlung, p. 167-170.

- Hagni, R. D., 1989, Applications of ore microscopy to processing the ores in the southeast Missouri lead district, *in* Hagni, R. D., and Coveney, R. M., Jr., eds., Mississippi Valley-type mineralization of the Viburnum Trend, Missouri; Guidebooks of the Society of Economic Geologists: Lancaster, PA, Society of Economic Geologists, v. 5, p. 182-193.
- Hagni, R. D., 1989, Mineral paragenesis and paragenetic sequence of the nickel-arsenic sulfide ores in the Magmont-West mine, Viburnum Trend, southeast Missouri, *in* Zachrisson, E., ed., Proceedings of the Eighth Quadrennial IAGOD Symposium, Lulea, Sweden, 1989: Stuttgart, Federal Republic of Germany, E. Schweizerbart'sche Verlagsbuchhandlung, p. 75-87.
- Hagni, R. D., 1989, The mineralogy and paragenesis of the Viburnum Trend ores, *in* Gregg, J. M., Palmer, J. R., and Kurtz, V. E., eds., Field guide to the Upper Cambrian of southeastern Missouri; stratigraphy, sedimentology, and economic geology: Rolla, MO, University of Missouri at Rolla, p. 103-109.
- Hagni, R. D., 1989, Ore microscopy of nickel-arsenic sulfide ores in the Magmont-West ore deposit, Magmont Mine, Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 21, no. 4, p. 14.
- Hagni, R. D., 1989, The southeast Missouri lead district, *in* Baxter, J. W., Kisvarsanyi, E. B., Hagni, R. D., et al., eds., Mineral deposits of North America; Volume 2, Precambrian and Paleozoic geology and ore deposits in the Midcontinent region: Washington, DC, American Geophysical Union, v. 2, p. 51-63.
- Hagni, R. D., 1989, The southeast Missouri lead district; a review. Mississippi Valley-type mineralization of the Viburnum Trend, Missouri, *in* Hagni, R. D., and Coveney, R. M., Jr., eds., Guidebook series of the Society for Economic Geologists: Lancaster, PA, Society of Economic Geologists, v. 5, p. 12-57.
- Hagni, R. D., and Coveney, R. M. R., 1989, Mississippi Valley-type mineralization of the Viburnum Trend, Missouri, *in* Vineyard, J. D., and Wedge, W. K., eds.: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey Special Publication, v. 5, p. 185-186.
- Hagni, R. D., 1993, Mineral paragenesis and paragenetic sequence of the nickel-arsenic sulfide ores at the Magmont-West ore deposit, Magmont mine, Viburnum Trend, southeast Missouri, *in* Maurice, M. E., ed., Proceedings of the Eighth Quadrennial IAGOD Symposium: Lulea, Sweden, 1993: Stuttgart, Federal Republic of Germany, E. Schweizerbart'sche Verlagsbuchhandlung, p. 75-88.
- Hagni, R. D., 1995, Mineralogy and minor element character of early bornite and nickel-arsenic sulfide ores in the Viburnum Trend, southeast Missouri lead district; relationship to the lead-zinc ores and their genetic significance: Abstracts with Programs - Geological Society of America, v. 27, no. 6, p. 378-379.
- Hagni, R. D., 1995, The southeast Missouri lead district, *in* Misra, K. C., ed., Carbonate-Hosted Lead-Zinc-Fluorite-Barite Deposits of North America; Guidebook series of the Society for Economic Geologists: Lancaster, PA, Society of Economic Geologists, v. 22, p. 44-78.
- Hagni, R. D., 1996, Mineralogy and significance of bornite bores in the Viburnum Trend, southeast Missouri lead district, *in* Sangster, D. F., ed., Carbonate-Hosted Lead-Zinc Deposits: Auburn Hills, MI, Data Reproductions Corp., Society for Economic Geologists Special Publication, no. 4, p. 611-630.

- Hagni, R. D., 1996, Variations of mineralogy, paragenetic sequence, and minor element geochemistry in early bornite lenses in the Viburnum Trend, southeast Missouri lead district: Abstracts with Programs - Geological Society of America, v. 28, no. 6, p. 41.
- Hall, W. E., and Friedman, I., 1969, Oxygen and carbon isotopic composition of ore and host rock of selected Mississippi Valley deposits. Geological Survey research 1969: U. S. Geological Survey Professional Paper 650, p. C140-C148.
- Hall, D. C., 1986, Description of the hydrologic system and the effects of coal mining on water quality in the east fork Little Chariton river and the alluvial aquifer between Macon and Huntsville, north-central Missouri: U. S. Geological Survey Water Resources Investigations Report 86-4160, 66 p.
- Hall, D. C., and Davis, R. E., 1986, Ground-water movement and effects of coal strip mining on water quality of High-Wall Lakes and aquifers in the Macon-Huntsville area, north-central Missouri: U. S. Geological Survey Water Resource Investigation Report, 85-4102, 102 p.
- Hambleton, W. W., Lyden, J. P., and Brockie, D. C., 1959, Geophysical investigations in the Tri-State zinc and lead mining district: Kansas State Geological Survey Bulletin, v. 137, p. 357-375.
- Handler, A. R., 1969, Some effects of lead-zinc mining wastewater on a stream environment: Master's, University of Missouri at Rolla, Rolla, MO, 82 p.
- Hannah, J. L., and Stein, H. J., 1984, Evidence for changing ore fluid composition; stable isotope analyses of secondary carbonates, Bonneterre Formation, Missouri: Economic Geology, v. 79, no. 8, p. 1930-1935.
- Hannah, J. L., Stein, H. J., and Posey, H. H., 1983, Oxygen and carbon isotopic compositions of vein and vug carbonates from the Bonneterre Formation, Missouri; variations in ore fluid composition: Geological Association of Canada, Program with Abstracts, v. 8, p. 30.
- Hanor, J. S., 1979, The sedimentary genesis of hydrothermal fluids, *in* Barnes, H. L., ed., Geochemistry of Hydrothermal Ore Deposits: New York, NY, Wiley-Interscience, p. 137-142.
- Hanor, J. S., 1995, Controls on the solubility of lead and zinc in basinal brines: Abstracts with Programs - Geological Society of America, v. 27. no. 6, p. 291.
- Hansuld, J. A., 1970, Geochemical surface halos - Tri-State district (abs.): Mining Engineering, v. 22, no. 9, p. 50.
- Harbaugh, M. D., 1931, The story of the Tri-State zinc and lead district: New York, NY, American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), 43 p.
- Harbaugh, M. D., 1935, Geology and development of the Tri-State zinc and lead mining district; development of the district: Tulsa Geological Society Digest, v. 35, p. 41-42.
- Harbaugh, J. W., 1950, Biogeochemical investigations in the Tri-State zinc and lead mining district: Master's, University of Kansas, Lawrence, KS, 88 p.
- Harbaugh, J. W., 1951, Biogeochemical investigations in the Tri-State District: Economic Geology, v. 45, no. 6, p. 548-567.
- Hardie, M. G., Jennett, J. C., Bolter, E., Wixson, B. G., and Gale, N. L., 1974, Water resources problems and solutions associated with the New Lead Belt of SE Missouri *in* Water Resources

Problems Related to Mining, Minneapolis, MN, 1974 Proceedings: American Water Resources Association, no. 18, p. 109-122.

Hare, E. H. R., 1993, Tri-State lead-zinc mining district of Missouri, Kansas & Oklahoma: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 24.

Hart, S. R., Shimizu, N., and Sverjensky, D. A., 1981, Lead isotope zoning in galena; an ion microprobe study of a galena crystal from the Buick Mine, southeast Missouri: *Economic Geology*, v. 76, no. 7, p. 1873-1878.

Hart, S. R., Shimizu, N., and Sverjensky, D. A., 1983, Toward an ore fluid lead isotope "stratigraphy" for galenas from the Viburnum Trend, SE Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 257-270.

Harvey, E. J., 1980, Ground water in the Springfield-Salem Plateaus of southern Missouri and northern Arkansas: U. S. Geological Survey Water-Resources Investigation 80-0101, 66 p.

Harvey, E. J., and Emmett, L. F., 1980, Hydrology and model study of the proposed prosperity reservoir, Center Creek basin, southwestern Missouri: U. S. Geological Survey Water-Resources Investigation 80-0007, 50 p.

Harwood, J. J., Koirtjohann, S. R., and Schmitt, C. J., 1987, Effects of cover materials on leaching of constituents from dolomitic lead mine tailings: *Water, Air, and Soil Pollution*, v. 34, p. 31-43.

Hasan, S. E., 1996, A case study of implementation of environmental justice: Abstracts with Programs - Geological Society of America, v. 28, no. 7, p. 260.

Hathaway, L. R., and Macfarlane, P. A., 1980, Water quality in the lower Paleozoic aquifers of the Tri-State area *in* Trace Substances in Environmental Health, 14th, Columbia, MO, 1980, Proceedings: University of Missouri at Columbia, p. 148-154.

Hawkins, A. C., and Wherry, E. T., 1918, Famous mineral localities; 4, The Joplin District: *American Mineralogist*, v. 3, p. 36-37.

Haworth, E., 1900, The Galena-Joplin lead and zinc district: *Mineral Industry*, v. 8, p. 658-666.

Haworth, E., 1904, History, geography, geology, and metallurgy of Galena-Joplin lead and zinc: *Kansas Geological Survey*, v. 8, p. 1-126.

Hay, R. L., Lee M., Kolata, D. R., Matthews, J. C., and Morton, J. P., 1988, Episodic potassic diagenesis of Ordovician tuffs in the Mississippi Valley area: *Geology*, v. 16, p. 743-747.

Hayes, T. S., Palmer, J. R., and Krizanich, G., 1989, Cross sections of Lower Ordovician carbonate depositional lithofacies and Mississippi Valley-type zinc and iron sulfide mineralization in the Caulfield District, Harrison 1 degrees X 2 degrees quadrangle, Missouri, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 11-12.

Hayes, T. S., Burruss, R. C., Palmer, J. R., and Rowan, E. L., 1989, UV fluorescence of hydrothermal dolomite of the Ozark regional Mississippi Valley-type ore system: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 3.

Hayes, T. S., Palmer, J. R., and Rowan, E. L., 1989, Correlation of hydrothermal dolomite generations across the Mississippi Valley-type mineralizing system of the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 12-13.

Hayes, T. S., Palmer, J. R., and Rowan, E. L., 1990, Correlation of hydrothermal dolomite generations across the Mississippi Valley-type mineralizing system of the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 11-12.

Hayes, T. S., Palmer, J. R., Krizanich, G., 1990, Cross sections of Lower Ordovician carbonate depositional lithofacies and Mississippi Valley-type zinc and iron sulfide mineralization in the Caulfield District, Harrison 1 degrees X 2 degrees quadrangle, Missouri, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 9-10.

Hayes, T. S., LaRock, E. J., Gaines, J., Seeger, C. M., Masemit, Z., and Olive, W. W., 1992, Mapping lithologic criteria for mineral deposit potential using a subsurface lithologic database interactive with ARC/ INFO, *in* Goldhaber, M. B., and Eidel, J. J., eds., Mineral resources of the Illinois Basin in the context of basin evolution: U. S. Geological Survey Open-File Report 92-0001, p. 22-25.

Hayes, T. S., Palmer, J. R., and Krizanich, G. W., 1992, Cross sections of Lower Ordovician carbonate depositional lithofacies and Mississippi Valley-type zinc- and iron-sulfide mineralization in the Caulfield District, east-central part of Harrison 1 degrees X 2 degrees quadrangle, Arkansas and Missouri: U. S. Geological Survey Miscellaneous Field Studies Map, 1994-C, 15 p.

Hayes, T. S., Palmer, J. R., Pratt, W. P., Krizanich, G. W., Whitfield, J. W., and Seeger, C. M., 1997, Cross sections showing stratigraphic and depositional lithofacies of Upper Cambrian rocks and the relation of lithofacies to potential for Mississippi Valley-type mineralization in the Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas (folio of the Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas: U. S. Geological Survey Miscellaneous Field Studies Map, 1994-E, 1 sheet.

He, Z., 1995, Sedimentary facies and variation of stable isotope composition of Upper Cambrian to Lower Ordovician strata in southern Missouri; implications for the origin of MVT deposits, and the geochemical and hydrological features of regional ore-forming fluids: Doctoral, University of Missouri-Rolla, Rolla, MO, 124 p.

Hearn, P.P., Jr., Sutter, J. F., and Belkin, H. E., 1987, Authigenic K-feldspar; an indicator of the geochronology and chemical evolution of mineralizing fluids in carbonate-hosted lead-zinc deposits, *in* USGS research on mineral resources, 1987; program and abstracts: U. S. Geological Survey Circular 1035, p. 28.

Hearn, P.P., Jr., Sutter, J. F., and Evans, J. R., 1987, Authigenic K-feldspar in the Bonneterre Dolomite - Evidence for a Carboniferous fluid-migration event [abs.], *in* Greigg J. M., and Hagni, R. D., eds., Symposium on the Bonneterre Formation (Cambrian), southeastern Missouri, Rolla, MO, 1987, Abstracts with Programs: University of Missouri at Rolla, p. 11.

- Hedburg, E., 1898, Lead and zinc ores; the manner of their occurrence and their geological relation to the coal area of Missouri: *Mines and Minerals* (Scranton), v. 18, p. 289-290.
- Hemphill, D. D., Marienfield, C. J., Reddy, R. S., Heidlage, W. D., and Pierce, J. O., 1973, Toxic heavy metals in vegetables and forage grasses in Missouri's lead belt, *in* Symposium on Industrial Chemicals as Food Contaminates, Washington, D. C., 1972, Proceedings: University of Missouri at Columbia, p. 994-998.
- Hemphill, D. D., Marienfield, C. J., Reddy, R. S., and Pierce, J. O., 1974, Roadside lead contamination in the Missouri lead belt: *Archives of Environmental Contamination and Toxicology*, v. 12, p. 535-541.
- Hennigh, Q. T., Shelton, K. L., and Hagni, R. D., 1990, Sulfur isotope studies of early copper (bornite pod) & zinc mineralization in the Viburnum Trend, MO, do (super) ^{32}S -enriched sulfides indicate basement sulfur and metal sources?: Abstracts with Programs - Geological Society of America, v. 22, no. 7, p. 134.
- Henry, A. L., Anderson, G. M., and Heroux, Y., 1992, Alteration of organic matter in the Viburnum Trend lead-zinc district of southeastern Missouri: *Economic Geology*, v. 87, no. 2, p. 288-309.
- Henshaw, P. C., 1966, Exploration for lead in southeast Missouri: *American Mining Congress Journal*, v. 51, no. 12, p. 28-30.
- Herrick, R. L., 1907, The Joplin zinc district: *Mines and Minerals* (Scranton), v. 28, p. 145-157.
- Heyl, A. V., Brock, M. R., Jolly, J. C., and Wells, C. E., 1966, Regional structure of the southeast Missouri and Illinois-Kentucky mineral districts: *U. S. Geological Bulletin* 1202-B, p. 1-20.
- Heyl, A. V., 1967, Some aspects of genesis of stratiform zinc-lead-barite-fluorite deposits in the United States, *in* Brown, J. S., ed., *Genesis of Stratiform Lead-Zinc-Barite-Fluorite Deposits in Carbonates Rocks*: Lancaster, PA, Society of Economic Geologists, Monograph 3, p. 20-32.
- Heyl, A. V., 1972, The 38th parallel lineament and its relationship to ore deposits: *Economic Geology*, v. 67, no. 7, p. 879-894.
- Heyl, A. V., Landis, G. P., and Zartman, R. E., 1974, Isotopic evidence for the origin of Mississippi valley-type mineral deposits; a review: *Economic Geology*, v. 69, no. 6, p. 992-1006.
- Heyl, A. V., 1980, Copper, cobalt, and nickel in Viburnum Trend: *U. S. Geological Survey Professional Paper* 1150, 7 p.
- Heyl, A. V., 1982, Mineral deposit occurrence model for the Viburnum Trend subregion of the southeast Missouri base metal and barite district, *in* Erickson, R. L., ed., *Characteristics of mineral deposit occurrences*: *U. S. Geological Survey Open-File Report* 82-0795, p. 158-171.
- Heyl, A. V., 1983, Geologic characteristics of three major Mississippi Valley districts, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits; proceedings volume*: Rolla, MO, University of Missouri at Rolla, p. 27-60.
- Hinaman, K. C., 1989, Are lead-zinc deposits caused by the tectonic expulsion of fluids?: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 129.

- Hinze, W. J., Braile, L. W., Keller, G. R., and Lidiak, E. G., 1980, Models for midcontinent tectonism, *in* Continental tectonics: Washington, DC, National Academy of Science, p. 73-83.
- Hinze, W. J., Sexton, J. L., von-Frese, R. R. B., and Braile, L. W., 1981, Correlation of regional geologic features with long-wavelength magnetic anomalies in the U. S.: Abstracts with Programs - Geological Society of America, v. 13, no. 7, p. 473.
- Hoff, J. A., Hanson, G. N., Meyers, W. J., 1988, U-Th-Pb systematics in dolomites and whole rock dolostones from Burlington-Keokuk formations, Iowa, Illinois, and Missouri: AAPG Bulletin, 72, no. 2, p. 198.
- Hofstra, A. H., Leach, D. L., Landis, G. P., Viets, J. G., Rowan, E. L., and Plumlee, G. S., 1989, Fluid inclusion gas geochemistry as a monitor of ore depositional processes in Mississippi Valley-type deposits in the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 13-15.
- Hofstra, A. H., Leach, D. L., Landis, G. P., Viets, J. G., Rowan, E. L., and Plumless, G. S., 1990, Fluid inclusion gas geochemistry as a monitor of ore depositional processes in Mississippi Valley-type deposits in the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 11-12.
- Holcombe, C. J., 1985, Paleoflow modeling for sedimentary ore bodies: Economic Geology, v. 80, no. 1, p. 172-179.
- Horrall, K. B. H., Richard D., and Kisvarsanyi, G., 1981, The paragenesis of the lead-zinc-copper ores from selected mines in the southeast Missouri lead district and its possible relationship to ultramafic and mafic sources in the New Madrid Rift: Abstracts with Programs - Geological Society of America, v. 13, no. 7, p. 476.
- Horrall, K. B., 1982, Mineralogical, textural, and paragenetic studies of selected ore deposits of the southeast Missouri lead-zinc-copper district and their genetic implications: Doctoral, University of Missouri at Rolla, Rolla, MI, 650 p.
- Horrall, K. B., Hagni, R. D., and Kisvarsanyi, G., 1983, Mineralogical, textural, and paragenetic studies of selected ore deposits of the southeast Missouri lead-zinc-copper district and their genetic implications, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 289-316.
- Horrall, K. B., Hagni, R. D., and Kisvarsanyi, G., 1993, Mafic and ultramafic plutons associated with the New Madrid rift complex; a possible major source of the copper-cobalt-nickel mineralization of southeast Missouri: Economic Geology, v. 88, no. 2, p. 328-343.
- Horrall, K.B., M. R. Farr, and Hagni, R. D., 1996, Evidence for focusing of Mississippi Valley-type fluids along the Bloomfield Lineament Zone, southeast Missouri, *in* Sangster, D. F., ed., Carbonate-Hosted Lead-Zinc Deposits: Auburn, MI, Data Reproductions Corp., Society of Economic Geologists Special Publication, no. 4, p. 400-412.
- Houseknecht, D. W., Hathon, L. A., and McGilvery, T. A., 1992, Thermal maturity of Paleozoic strata in the Arkoma basin: Oklahoma Geological Circular, v. 91, p. 72.

- Howard, T. N., 1969, The background concentrations of copper, lead, and zinc in streams of the 'New Lead Belt', Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 77 p.
- Howland, J. R., 1974, The biological recovery of Center Creek with notes on the effects of zinc pollution: Jefferson City, MO, Missouri Department of Natural Resources unpublished report, 8 p.
- Hufham, J., 1981, A baseline study of the heavy metal content of open waters at Fredericktown, Missouri: Denver, CO, Anschutz Mining Corporation, p. 18.
- Huggins, S. A., Odom, I. E., and Paarlberg, N. L., 1980, The morphology of dickite and kaolinite as related to sulphide mineral associations, Fletcher and Brushy Creek mines, Viburnum, Missouri: Program and Abstracts - Annual Clay Minerals Conference, v. 29, p. 51.
- Hutson, F. J., and Freeman, T., 1986, Cement history of the Middle Devonian Cedar City Formation, central Missouri: Abstracts - SEPM Midyear Meeting, v. 3, p. 56.
- Imes, J. L., and Smith, B. J., 1990, Aerial extent, stratigraphic relation, and geohydrologic properties of regional geohydrologic units in southern Missouri: U. S. Geological Survey Hydrologic Investigation Atlas 711-J, 3 p.
- Imes, J. L., and Smith, P. J., 1991, Correlation of regional geohydrologic units to geologic formations in southern Missouri: U. S. Geological Survey Hydrologic Investigation Atlas 711-M, 1 map.
- Imes, J. L., 1990, Major geohydrologic units in and adjacent to the Ozark plateaus province, Missouri, Arkansas, Kansas and Oklahoma: U. S. Geological Survey Hydrologic Investigation Atlas 711-A, 1 p.
- Imes, J. L., 1990, Major geohydrologic units in and adjacent to the Ozark plateaus province, Missouri, Arkansas, Kansas and Oklahoma; Ozark Aquifer: U. S. Geological Survey Hydrologic Investigation Atlas 711-E, 3 p., 3 maps..
- Imes, J. L., 1990, Major geohydrologic units in and adjacent to the Ozark plateaus province, Missouri, Arkansas, Kansas and Oklahoma; Ozark confining units: U. S. Geological Survey Hydrologic Investigation Atlas 711-F, 3 p.
- Imes, J. L., 1990, Major geohydrologic units in and adjacent to the Ozark plateaus province, Missouri, Arkansas, Kansas and Oklahoma Springfield Plateau Aquifer: U. S. Geological Survey Hydrologic Investigation Atlas 711-G, 3 p., 3 maps.
- Imes, J. L., 1990, Major geohydrologic units in and adjacent to the Ozark plateaus province, Missouri, Arkansas, Kansas and Oklahoma; St. Francois aquifer: U. S. Geological Survey Hydrologic Investigation Atlas 711-C, 2 p.
- Imes, J. L., 1990, Major geohydrologic units in and adjacent to the Ozark plateaus province, Missouri, Arkansas, Kansas and Oklahoma; St. Francois confining unit: U. S. Geological Survey Hydrologic Investigation Atlas 711-D, 3 p.
- Imes, J. L., 1990, Major geohydrologic units in and adjacent to the Ozark plateaus province, Missouri, Arkansas, Kansas and Oklahoma; western interior plains confining systems: U. S. Geological Survey Hydrologic Investigation Atlas 711-H, 3 p., 3 maps.

Imes, J. L., and Davis, J. V., 1990, Water type and concentration of dissolved solids, chloride, and sulfate in water from the Springfield Plateau aquifer in Missouri, Arkansas, Kansas, and Oklahoma: U. S. Geological Survey Hydrologic Investigation Atlas 711-J, 1 sheet.

Imes, J. L., and Davis, J. V., 1990, Water type and concentration of dissolved solids, chloride, and sulfate in water from the Springfield plateau aquifer in Missouri, Arkansas, Kansas, and Oklahoma: U. S. Geological Survey Hydrologic Investigation Atlas 711-L, 2 sheet.

Imes, J. L., and Davis, J. V., 1991, Water type and concentration of dissolved solids, chloride, and sulfate in water from the Ozark aquifer in Missouri, Arkansas, Kansas, and Oklahoma: U. S. Geological Survey Hydrologic Investigation Atlas 711-K, 4 sheet.

Imes, J. L., and Emmett, L. F., 1994, Geohydrology of the Ozark plateaus aquifer system in parts of Missouri, Arkansas, Oklahoma, and Kansas: U. S. Geological Survey Professional Paper 1414(D), 127 p.

Imes, J. L., and Kleeschulte, M. J., 1995, Seasonal ground-water level changes, 1990-93) and flow patterns in the Fristoe Unit of the Mark Twain National Forest, southern Missouri: U. S. Geological Survey Water-Resources Investigations Report 95-4096, 1 sheet.

Jackson, S. A., 1966, A study of Mississippi Valley type lead-zinc mineralization with special reference to sediment diagenesis: Master's, University of Toronto, Toronto, ON, Canada.

Jackson, S. A., and Beales, F. W., 1967, An aspect of sedimentary basin evolution; the concentration of Mississippi Valley-type ores during late stages of diagenesis: Bulletin of Canadian Petroleum Geology, v. 15, no. 4, p. 383-433.

Jakosky, J. J., Dreyer, R. M., and Wilson, C. H., 1942, Geophysical investigations in the Tri-State zinc and lead mining district: Kansas, State Geological Survey Bulletin, v. 27, no. 1, p. 151.

Jenne, E. A., Ball, J. W., Burchard, J. M., Vivit, D. V., and Barks, J. H., 1982, Geochemical modeling; apparent solubility controls on Ba, Zn, Cd, Pb, and F in waters of the Missouri Tri-State mining area, *in* Trace Substances in Environmental Health, 14th, Columbia, MO, 1982, Proceedings: University of Missouri at Columbia, p. 353-361.

Jennett, J. C., and Wixson, B. G., 1972, Problems in lead mining waste control: Journal Water Pollution Control Federation, v. 44, no. 11, p. 2103-2110.

Jennett, J. C., Wixson, B. G., Bolter, E., and Pierce, J. O., 1972, Environmental problems and solutions associated with the development of the world's largest mining district, *in* Society of Engineering Science First International Meeting on Pollution; Engineering and Scientific Solutions, 1st, Tel Aviv, Israel, 1972, Proceedings: University of Missouri at Rolla, p. 15.

Jennett, J. C., Wixson, B. G., Bolter, E., and Gale, N. L., 1973, Transport mechanism of lead industry wastes, *in* Purdue Industrial Waste Conference, 28th, Lafayette, IN, 1973, Proceedings: University of Missouri at Rolla, p. 18.

Jennett, J. C., Bolter, E., Gale, N., Jranter, W., and Hardie, M., 1975, The Viburnum Trend, southeast Missouri; the largest lead-mining district in the world-environmental effects and controls, *in* Jones, M. J., ed., Minerals and the Environment: London, United Kingdom, Institute of Mining and Metallurgy, p. 13-26.

Jennett, J. C., Callier, A. J., and Foil, J. L., 1976, Trace metal and trace organic emissions to the environment by lead-zinc mining and milling operations, *in* Hemphill, D. D., ed., Trace Substances

in *Environmental Health*, 10th, Columbia, MO, 1976, Proceedings: University of Missouri at Rolla, p. 251-264.

Jennett, J. C., and Foil, J. L., 1979, Trace metal transport from mining, milling and smelting watersheds: *Water Pollution Control Federation Journal*, v. 51, no. 2, p. 378-402.

Jennett, J. C., Wixson, B. G., and Kramer, R. L., 1981, Some effects of century old abandoned lead mining operations on streams in Missouri, USA: *Minerals and the Environment*, v. 3, p. 17-20.

Jessey, D. R., Hagni, R. D., Mugal, D. N., and Faddies, T. B., 1979, Some genetic implications from a study of cobalt-nickel zoning and paragenesis in the "Viburnum Trend", southeast Missouri: *Abstracts with Programs - Geological Society of America*, v. 11, p. 451.

Jessey, D. R., 1981, An investigation of the nickel-cobalt occurrence in the southeast Missouri mining district: Doctoral, University of Missouri at Rolla, Rolla, MO, 222 p.

Jessey, D. R., 1983, The occurrence of nickel and cobalt in the southeast Missouri mining district, in Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla*, p. 145-154.

Jobe, J., 1988, Effects of heavy metals in sediments on the macroinvertebrate community in the Short Creek/Empire Lake Aquatic System, Cherokee County, Kansas; A recommendation for site-specific criteria: Washington, DC, Environmental Protection Agency report, 600/9-89/48, 8 p.

Johnson, K. S., and D. C. Brockie, 1973, Eagle-Picher Industries, Inc.'s copper mine at Creta, sec. 3, 4, 9, 10, 15, and 16, T. 1 S., R. 22 W., Jackson County, in *Geological Society of America, Annual Meeting, Field Trip Guidebook, 1973(6, Igneous geology of the Wichita Mountains and economic geology of Permian rocks of Southwest Oklahoma)*: Boulder, CO, Geological Society of America, p. 29-32.

Jones, B., 1976, The Viburnum Trend; minerals from the new lead mines of Missouri: *Rock & Gem*, v. 6, no. 9, p. 20-28.

Jones, J. R., Tracy, B. H., Sebaugh, J. L., Hazelwood, D. H., and Smart, M. M., 1981, Biotic index tested for ability to assess water quality of Missouri Ozark: *Transactions of the American Fisheries Society*, v. 110, no. 5, p. 627-637.

Joralemon, I. B., 1968, Environment of generation of some base metal ore deposits: *Economic Geology*, v. 63, no. 7, p. 846-847.

Kaiser, C. J., Kelly, W. C., Wagner, R. J., and Shanks, W. C. III, 1983, Zoning and controls of mineralization in the southeast Missouri barite district: *Abstracts with Programs - Geological Society of America*, v. 15, no. 6, p. 606.

Kaiser, C. J., and Ohmoto, H., 1985, A kinematic model for tectonic structures hosting North American Mississippi Valley-type mineralization; implications for timing and hydrology: *Abstracts with Programs - Geological Society of America*, v. 17, no. 7, p. 622.

Kaiser, C. J., Kelly, W. C., Wagner, R. J., and Shanks, W. C. III, 1987, Geologic and geochemical controls of mineralization in the southeast Missouri barite district: *Economic Geology*, v. 82, no. 3, p. 719-734.

Kaiser, C. J., and Ohmoto, H., 1987, The kinetics of sulfate reduction by organic matter under hydrothermal conditions, *in* Dickinson, W. R., ed.: Abstracts with Programs - Geological Society of America, v. 19, no. 7, p. 721.

Kaiser, C. J., and Ohmoto, H., 1988, Ore-controlling structures of Mississippi Valley-type mineralization on the North American midcontinent as products of late Paleozoic convergent plate tectonism, *in* Kisvarsanyi, G., and Grant, S. K., eds., North American conference on Tectonic control of ore deposits and the vertical and horizontal extent of ore systems, Proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 424-430.

Kania, D. M., and Nash, T., 1986, Impact of lead on migratory birds in Missouri: Columbia, MO, U. S. Fish and Wildlife Service, 41 p.

Kastler, E. J., 1972, Mineralization of the Fletcher lead-zinc mine in southeast Missouri: Master's, University of Missouri at Columbia, Columbia, MO, 118 p.

Kaufman, J., Cander, H., Meyers, W. J., 1985, Near-surface and burial diagenesis of Mississippian Burlington and Keokuk formations: AAPG Bulletin, v. 69, no. 2, p. 272.

Keller, F., Jr., and Henderson, J. R., Jr., 1963, Aeromagnetic map of part of the Tri-State mining district, Kansas, Missouri, and Oklahoma: U. S. Geological Survey Geophysical Investigations Map 427, 1 map.

Keller, W. D., and Huang, W. H., 1976, Electron-excited luminescence of selected API reference clay minerals and other dickites and kaolinities: Program and Abstracts - Annual Clay Minerals Conference, v. 25, p. 16.

Keller, D. J., 1989, Applications of ore microscopy to geological and metallurgical industrial problems: Transactions of the Missouri Academy of Science, v. 23, p. 98.

Keller, T. J., Shelton, K. L., and Gregg, J. M., 1995, Fluid/ rock interactions and fluid migration in the Reelfoot rift system: American Association of Petroleum Geologists 1995 annual convention, v. 4, p. 48-49.

Kennicutt, W., 1984, Minerals of the Tri-State: Lapidary Journal, v. 37, no. 12, p. 1684-1685, 1688-1689.

Kent, D. C., Al, S. Z., Vaden, D. W., and Bayley, P. W., 1986, A hydrogeological and geochemical assessment of acid drainage in the Tri-State mining district: Abstracts with Programs - Geological Society of America, v. 18, no. 6, p. 655.

Kent, D. C., Al, S. Z., Vaden, D. W., and Bayley, P. W., 1987, Hydrogeological and geochemical aspects of ground and surface water pollution associated with lead and zinc mines in the Tri-State mining district, *in* Averett, R. C., and McKnight, D. M., eds., Chemical quality of water and the hydrologic cycle: Chelsea, MI, Lewis Publishing, p. 73-88.

Kesler, S. E., Appold, M. S., Martini, A. M., Walter, L. M., Huston, J. J., and Kyle, J. R., 1995, Na-Cl-Br systematics of mineralizing brines in Mississippi Valley-type deposits: Geology, v. 23, no. 7, p. 641-644.

Keyes, C. R., 1909, Migrations of the Joplin zinc belt: Engineering and Mining Journal, v. 87, p. 1049.

Kidwell, A. L., 1946, The Buckshot barite mine of central Missouri: *Rocks and Minerals*, v. 21, no. 9, p. 578-579.

Kish, S. A., and Stein, H. J., 1979, The timing of ore mineralization, Viburnum Trend, southeast Missouri lead district; Rb-Sr glauconite dating: *Abstracts with Programs - Geological Society of America*, v. 11, no. 7, p. 458.

Kissin, S. A., 1988, The five-element suite; an indication of non-magmatic ore types related to rifting and basin development: *Explore*, v. 64, p. 5-8.

Kissin, S. A., 1989, The five-element suite; an indicator of non-magmatic ore types related to rifting and basin development, *in* V. M. Goldschmidt conference, Baltimore, MD, 1988, Program and abstracts: University Park, PA, Pennsylvania States University, p. 52.

Kisvarsanyi, G., and Kisvarsanyi, E. B., 1976, Structural lineaments and mineralization in southeast Missouri: Rolla, MO, Missouri Geological Survey Report of Investigations, v. 60, p. 174-183.

Kisvarsanyi, G., 1977, The role of the Precambrian igneous basement in the formation of the stratabound lead-zinc-copper deposits in southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 435-442.

Kisvarsanyi, E. B., and Hebrank, A. W., 1982, Guidebook A; Field trip to the St. Francois Mountains and the historic Bonne Terre Mine: U. S. Geological Survey Open-File Report 82-0016, 42 p.

Kisvarsanyi, E. B., and Howe, W. B., 1983, The Bee Fork volcanic center and its relationship to the southeast Missouri lead-zinc district: *Abstracts with Programs - Geological Society of America*, v. 15, no. 6, p. 614.

Kisvarsanyi, G., 1983, Multiple source and multiple stage theory of ore genesis in the southeast Missouri district, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 486-496.

Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., 1983, International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, 603 p.

Kisvarsanyi, E. B., 1987, Precambrian basement map of the Springfield 1 degrees by 2 degrees quadrangle, Missouri: U. S. Geological Survey Miscellaneous Field Studies Map, 1830-E, 1 sheet.

Kisvarsanyi, E. B., 1988, Precambrian ring complexes and mineralization in southeast Missouri, *in* Kisvarsanyi, G., and Grant, S. K., eds., Midcontinent, USA North American conference on Tectonic control of ore deposits and the vertical and horizontal extent of ore systems, 1987, Proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 312-321.

Kisvarsanyi, E. B., 1989, Geology and mineral resource potential of the Precambrian basement in the Harrison and Joplin quadrangles, *in* Pratt, W. P., and Goldhaber, M. B. eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 16-18.

Kisvarsanyi, E. B., 1990, Geology and mineral-resource potential of the Precambrian basement in the Harrison and Joplin quadrangles, *in* Pratt, W. P., and Goldhaber, M. B. eds., U. S. Geological

Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 13-15.

Kisvarsanyi, E. B., 1991, Precambrian geology and mineral-resource potential, *in* Martin, J. A., and Pratt, W. P., eds., Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942, p. 102-110

Kitson, H. W., 1919, The mining districts of Joplin and southeast Missouri: Engineering and Mining Journal, v. 104, p. 1067-1073.

Kleeschulte, M. J., and Sutley, S. J., 1995, Hydrologic data for the Fristoe Unit of the Mark Twain National Forest, southern Missouri, 1988-93: U. S. Geological Survey Open-File Report 95-0106, p. 106.

Koestal, M. A., 1987, Cobalt mineralization associated with Cambrian Mississippi Valley-type rocks in southeastern Missouri: New York, NY, American Institute of Mining, Metallurgical and Petroleum Engineers, Society of Mining Engineers, v. 87-88, p. 14.

Konig, R. H., 1974, Relationship of geomorphic anomalies on ERTS imagery to the distribution of mineralization in northern Arkansas: Abstracts with Programs - Geological Society of America, v. 6, no. 2, p. 110.

Kopp, O. C., 1995, Cathodoluminescence observations constrain models for the deposition of Mississippi-Valley type (MVT) ore deposits: Abstracts with Programs - Geological Society of America, v. 27, no. 6, p. 118.

Kramer, R. L., 1976, Effects of a century old Missouri lead mining operation upon the water quality, sediments and biota of Flat River Creek: Master's, University of Missouri at Rolla, Rolla, MO, 111 p.

Krouse, H. R., Viau, C. A., Eliuk, L. S., Ueda, A., and Halas, S., 1988, Chemical and isotopic evidence of thermochemical sulphate reduction by light hydrocarbon gases in deep carbonate reservoirs: Nature, v. 333, no. 6172, p. 415-419.

Kullerud, G., Donnay, J. D. H., and Donnay, G., 1968, Cross-twinning as a mechanism of phase transition: Year Book, v. 66, p. 503-504.

Kulp, J. L., Ault, W. U., and Miller, D. S., 1966, Relation of lead and sulfur isotopes to the origin of Mississippi Valley ores: Geological Society of America Bulletin, v. 67, no. 12, Part 2, p. 1713.

Kyle, J. R., and Gutierrez, G. N., 1988, Origin of the Indian Creek sandstone-hosted lead deposits, southeast Missouri, USA, *in* Zachrisson, E., ed., Proceedings of the Seventh Quadrennial IAGOD Symposium, Lulea, Sweden, 1986: Stuttgart, Federal Republic of Germany, E. Schweizerbartische Verlagsbuchhandlung, p. 669-684.

Lahti, R., and Hoekstra, P., 1988, Ground penetrating radar investigations in the Tri-State mining district, Kansas: *in* Abstracts for Second international symposium on geotechnical applications of ground-penetrating radar, Gainesville, FL, 1988: v. 2, p. 32.

Lamonds, A. G., 1972, Water-resources reconnaissance of the Ozark plateaus province, northern Arkansas: U. S. Geological Survey Hydrologic Investigations Atlas 383, 1 sheet.

Landes, K. K., 1937, The Tri-State zinc-lead District: Guidebook - Kansas Geological Society Field Conference, v. 11, p. 96-98.

Landis, G. P., Hofstra, A. H., Leach, D. L., and Rye, R. O., 1987, Quantitative analysis of fluid-inclusion gases; applications to studies of ore deposits, *in* Sachs, J. S., ed., USGS research on mineral resources, 1987, program and abstracts: U. S. Geological Survey Circular 1035, p. 38-39.

Lange, S., Chaudhuri, S., and Clauer, N., 1983, Strontium isotopic evidence for the origin of barites and sulfides from the Mississippi Valley-type ore deposits in southeast Missouri: *Economic Geology*, v. 78, no. 6, p. 1255-1261.

Lange, S., Chaudhuri, S., and Clauer, N., 1985, Strontium isotopic evidence for the origin of barites and sulfides from the Mississippi Valley-type ore deposits in southeast Missouri; reply: *Economic Geology*, v. 80, no. 3, p. 775-776.

LaRock, E. J., Hayes, T. S., Green, G. N., and Sargent, M. L., 1992, Subsurface lithologic mapping for mineral resource potential assessment of the Paducah CUSMAP quadrangle, *in* Goldhaber, M. B., and Eidel, J. J., eds., Mineral resources of the Illinois Basin in the context of basin evolution: U. S. Geological Survey Open-File Report 91-0001, p. 34-35.

Larsen, K. G., 1975, Stratigraphic and facies nomenclature of the Viburnum Trend, southeast Missouri. Guidebook, geology, and ore deposits of selected mines, Viburnum Trend Missouri: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, v. 58, p. 15-19.

Larsen, K. G., 1977, Sedimentology of the Bonneterre Formation, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 408-419.

Larsen, K. G., and Clendenin, C. W., 1977, The development of breccia bodies in response to gravity sliding and solution activity: Abstracts with Programs - Geological Society of America, v. 9, p. 619-620.

Larsen, K. G., 1979, Stratigraphic and facies nomenclature of the Viburnum Trend, southeast Missouri, *in* Paarlberg, N., ed., The 26th Annual Field Trip Guidebook: Columbia, MO, Association of Missouri Geologists, p. 15-19.

Laskowski, T. E., 1982, Rb-Sr, K-Ar, and (super) ^{40}Ar / (super) ^{39}Ar systematics in Paleozoic glauconite from Mississippi Valley-type localities, and the dating of events during sediment diagenesis: Doctoral, Miami University, Oxford, OH, 117 p.

Lasmanis, R., 1989, Galena from Mississippi Valley-type deposits: *Rocks and Minerals*, v. 64, p. 1, p. 10-34.

Latham, L. R., Newill, R. J., and Wallin, E. T., 1989, U-Pb geochronology of southern Missouri: Abstracts with Programs - Geological Society of America, v. 20, no. 2, p. 122.

Lavery, N. G., Leach, D. L., and Saunders, J. A., 1994, Lithogeochemical investigations applied to exploration for sediment-hosted Zn-Pb ore deposits, *in* Fontebote, L., and Boni, M., eds., *Sediment Hosted Zn-Pb Ores*: New York, NY, Springer-Verlag, p. 393-428.

Layne, G. D., Hart, S. R., Duane, J. A., and Clendenin, C. W., 1989, An ion microprobe study of lead isotope zonation in complex galena crystals from the Sweetwater Mine, Viburnum Trend, SE Missouri: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 361.

Layne, G. D., Hart, S. R., and Shimizu, N., 1991, Microscale lead and sulfur isotope zonation in hydrothermal sulfides by ion microprobe; new findings from the Mississippi Valley-type Pb-Zn deposits of the Viburnum Trend, SE Missouri: Abstracts with Programs - Geological Society of America, v. 23, no. 5, p. 101-102.

Layne, G. D., and Hart, S. R., 1993, Microscale lead and sulfur isotope variations in galena; indicators of multiple ore-forming fluids and the mechanism of ore deposition in the southeast Missouri lead district: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 34.

Layne, G. D., and Hart, S. R., 1993, Microscale lead and sulfur isotope variations in ore sulphides from the southeast Missouri lead district; implications for the source(s) and nature of the ore-forming fluids: Abstracts with Programs - Geological Society of America, v. 25, no. 6, p. 277.

Leach, D. L., 1973, Possible two-stage mineralization in the central Missouri barite district: Abstracts with Programs - Geological Society of America, v. 5, no. 4, p. 331.

Leach, D. L., Jr., 1973, A study of the barite-lead-zinc deposits of central Missouri and related mineral deposits in the Ozark region: Doctoral, University of Missouri at Columbia, Columbia, MO, 185 p.

Leach, D. L., and Wharton, H. M., 1973, Barite deposits of the central Missouri District: Boulder, CO, Geological Society of America, unpaginated.

Leach, D. L., Nelson, R. C., and Williams, D., 1975, Fluid inclusion studies in the northern Arkansas zinc district: *Economic Geology*, v. 70, no. 6, p. 1084-1091.

Leach, D. L., 1979, Temperature and salinity of the fluids responsible for minor occurrences of sphalerite in the Ozark region of Missouri: *Economic Geology*, v. 74, no. 4, p. 931-937.

Leach, D. L., 1980, Nature of mineralizing fluids in the barite deposits of central and southeast Missouri: *Economic Geology*, v. 75, no. 8, p. 1168-1180.

Leach, D. L., Rowan, L. P., and Heddal, J. A., 1983, Evidence for ore fluid migration in the Bonneterre Formation, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 15, no. 6, p. 625.

Leach, D. L., and Rowan, L., 1985, An anomalous geothermal gradient in the Mid-Continent and its possible relationship to the Late Pennsylvanian-Early Permian Ouachita Orogeny: Abstracts with Programs - Geological Society of America, v. 17, no. 3, p. 164.

Leach, D. L., Landis, G. P., Leventhal, J. S., and Hofstra, A. H., 1985, Analysis of gases in Mississippi Valley-type ore fluids: Abstracts with Programs - Geological Society of America, v. 17, no. 7, p. 641.

Leach, D. L., and Rowan, E. L., 1986, Genetic link between Ouachita foldbelt tectonism and the Mississippi Valley-type lead-zinc deposits of the Ozarks: *Geology*, v. 14, no. 11, p. 931-935.

Leach, D. L., 1988, Hydrothermal breccias in Mississippi Valley-type deposits: Abstracts with Programs - Geological Society of America, v. 20, no. 7, p. 140.

Leach, D. L., Plumlee, G. S., Viets, J. G., Hofstra, A. H., Rowan, L. C., and Landis, G. P., 1989, Chemical modeling of Mississippi Valley-type depositional processes based upon quantitative fluid inclusion analyses, *in* Dymek, R. F., and Shelton, K. L., eds.: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 9.

- Leach, D. L., Plumlee, G. S., Hofstra, A. H., Landis, G. P., Rowan, L. C., and Viets, J. G., 1990, Precipitation of saddle dolomite cement by CO₂; effervescence from upward-migrating basinal brines: AAPG Bulletin, v. 74, no. 5, p. 701.
- Leach, D. L., Rowan, E. L., and Viets, J. G., 1991, Fluid-inclusion evidence for the source of ore fluids for Mississippi Valley-type deposits in Missouri, Arkansas, Kansas, and Oklahoma, *in* Martin, J. A., and Pratt, W. P., eds., Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942, p. 87-89.
- Leach, D. L., Plumlee, G. S., Hofstra, A. H., Landis, G. P., Rowan, L. C., and Viets, J. G., 1991, Origin of late dolomite cement by CO₂-saturated deep basin brines; evidence from the Ozark region, central United States; with Supplement Data 91-10: *Geology*, v. 19, no. 4, p. 348-351.
- Leach, D. L., and Rowan, E. L., 1991, Focused fluid flow and Ozark Mississippi Valley-type deposits, *Comment: Geology*, v. 19, no. 2, p. 190.
- Leach, D. L., and Rowan, E. L., 1993, Discussion on "fluid-inclusion studies of regionally extensive epigenetic dolomites, Bonneterre Dolomite (Cambrian), southeast Missouri; Evidence of multiple fluids during dolomitization and lead-zinc mineralization" by Shelton and others, 1992a: *Geological Society of America Bulletin*, v. 105, no. 7, p. 968-978.
- Leach, D. L., and Sangster, D. F., 1993, Mississippi Valley-type (MVT) lead-zinc deposits, *in* Kirkham, R. V., Sinclair, W. D., Thrope, R. I., and Duke, J. M., eds., Mineral deposit modeling: *Geological Association of Canada Special Paper*, v. 40, p. 289-314.
- Leach, D. L., 1994, Genesis of Ozark Mississippi Valley-type metallogenic province, *in* Fontbote, L., and Boni, M., eds., *Sediment Hosted Zn-Pb Ores*: New, NY, Springer-Verlag, p. 104-138.
- Leach, D. L., 1997, Genetic studies of Mississippi Valley-type lead-zinc deposits in the United States midcontinent: implications for the exploration for undiscovered deposits: *NotÈs et MÈmoire Service GÈologique du Maroc*, v. 388, p. 99-112.
- Leach, D. L., Apodaca, L. E., Repetski, J. E., Powell, J. W., and Rowan, E. L., 1997, Evidence for hot Mississippi Valley-type brines in the Reelfoot rift complex, south-central United States, in late Pennsylvanian-early Permian: *U. S. Geological Survey Professional Paper* 1577, 36 p.
- Leith, C. K., 1932, Structures of the Wisconsin and Tri-State lead and zinc: *Economic Geology*, v. 27, no. 5, p. 405-418.
- Leventhal, J. S., 1990, Organic matter and thermochemical sulfate reduction in the Viburnum Trend, southeast Missouri: *Economic Geology*, v. 85, no. 3, p. 622-632.
- Leventhal, J. S., Clendenin, C. W., and Viets, J. G., 1985, Spatial relationships and characterization of types of organic matter in Mississippi Valley-type Pb-Zn deposits, Viburnum Trend, Missouri: *Abstracts with Programs - Geological Society of America*, v. 17 no. 7, p. 643.
- Lewchuk, M. T., and Symons, D. T. A., 1995, Age and duration of Mississippi Valley-type ore-mineralizing events: *Geology*, v. 23, no. 3, p. 233-236, with correction, v. 24, p. 576.
- Lewchuk, M. T., and Symons, D. T. A., 1995, A synthesis of recent paleomagnetic research on MVT deposits; inferences drawn from the use of Bingham statistics: *Program with Abstracts - Geological Association of Canada*, v. 19, p. 64.

- Liaskos, D. A., 1984, Resources estimation from historical data; upper Mississippi Valley, Tri-State, and mid-Tennessee base-metal districts; zinc, lead test cases: Master's, University of Wisconsin-Milwaukee, Milwaukee, WI, 167 p.
- Lieber, W., 1992, Joplin und der Tri-State District, USA: Mineralien-Magazin, Lapis, v. 17, no. 1, p. 30-50.
- Lieber, W., 1992, Joplin, Viburnum Trend, Elmwood; Fluorit-, Blei- und Zinkerz-Lagerstaetten vom "Mississippi Valley type": Mineralien-Magazin, Lapis, v. 17, no. 1, p. 13-14.
- Lieber, W., 1992, Viburnum Trend; Blei-Zinkerz-Lagerstaetten in Suedost-Missouri: Mineralien-Magazin, Lapis, v. 17, no. 1, p. 15-23.
- Ligasacchi, A., 1959, A study of the genesis of the Krueger zinc deposit and the near-by barite deposits of the Potosi quadrangle, Washington County, Missouri: Master's, University of Missouri at Rolla, Rolla, MO.
- Lillie, R. J., Nelson, K. D., de Voogd, B, Brewer, J. A., Oliver, J. E., Brown, L. D., Kaufman, S., and Viele, G. W., 1983, Crustal structure of the Ouachita Mountains, Arkansas: a model based on integration of COCORP reflection profiles and regional geophysical data: AAPG Bulletin, v. 67, p. 907-931.
- Lin, G., and Nunn, J. A., 1995, Thermal insulation by low conductivity coal; an important mechanism for formation of Mississippi Valley-type ore deposits: Abstracts with Programs - Geological Society of America, v. 27, no. 6, p. 426.
- Lindgren, W., 1933, Mineral Deposits: New York, NY, McGraw-Hill.
- Littell, B. A., 1978, Chemical and biological analysis of the Big River: Washington, DC, Environmental Protection Agency unpublished report, 12 p.
- Long K. R., 1983, Ground preparation and zinc mineralization in bedded and breccia ores of the Monte Cristo Mine, north Arkansas: Master's, University of Michigan, Ann Arbor, MI.
- Long, K. R., Kelly, W. C., Ohle, E. L., and Cohmann, K. C., 1986, Ground preparation and zinc mineralization in bedded and breccia ores of the Monte Cristo Mine, north Arkansas: Economic Geology, v. 81, no. 4, p. 809-830.
- Lovering, T. G., 1972, Jasperoid in the United States; its characteristics, origin, and economic significance: U. S. Geological Survey Professional Paper 710, 164 p.
- Luza, K. V., 1983, Environmental problems associated with abandoned underground mines in the Picher Field, Oklahoma and Kansas, in Hannan, D. L., ed.: Program - Association of Engineering Geologists, National Meeting, v. 26, p. 84.
- Luza, K. V., 1983, Steel hopper and derrick, Picher, Oklahoma: Oklahoma Geology Notes, v. 42, no. 1, p. 2 and front cover.
- Luza, K. V., 1986, Stability problems associated with abandoned underground mines in the Picher Field, northeastern Oklahoma: Oklahoma Geological Survey Circular, v. 88, p. 114.

- Lyden, J. P., 1951, Aspects of structure and mineralization used as guides in the development of the Picher field [Oklahoma-Kansas]: Transactions of the American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), v. 51, p. 187.
- Lyden, J. P., 1951, Aspects of structure and mineralization used as guides in the development of the Picher field [Oklahoma-Kansas]: Mining Engineering, v. 187, no. 12, p. 1251-1259.
- Lydon, J. W., 1983, Chemical parameters controlling the origin and deposition of sediment-hosted stratiform lead-zinc deposits, *in* Sangster, D. F., ed., Sediment-hosted Stratiform Lead-Zinc Deposits: Short Course Handbook, v. 9, p. 1-30.
- Lyle, J. R., 1977, Petrography and carbonate diagenesis of the Bonneterre Formation in the Viburnum Trend area, southeast Missouri: Economic Geology, v. 72, no. 3, p. 420-434.
- Macfarlane, P. A., 1981, Distribution of radium-226 in the Cambro-Ordovician groundwater system, Tri-State region, Kansas, Missouri, Oklahoma: Abstracts with Programs - Geological Society of America, v. 12, p. 5-6.
- Macfarlane, P. A., and Hathaway, L. R., 1988, The hydrogeology and chemical quality of ground waters from the lower Paleozoic aquifers in the Tri-State region of Kansas, Missouri, and Oklahoma: Lawrence, KS, Kansas Geological Survey Groundwater Series, v. 9, p. 36.
- Mallery, L. L., 1983, Lead-zinc metallotects of the Ozark Dome: Master's, University of Missouri at Rolla, Rolla, MO, 135 p.
- Malone, D. S., Walstrom, J. S., Jarman, R., 1987, Tar Creek: diversion efforts towards an unpolluted future, *in* Water Resources Related to Mining and Energy-Preparing for the Future, Bethesda, MD, 1987, Proceedings: American Water Resources Association, p. 299-308.
- Mantei, E. J., 1977, Antimony and silver content variation of the galena cubes of the "Viburnum Trend" and Indian Creek mines, Missouri: Springfield, MO, Southeast Missouri States University Geoscience Series, no. 4, 13 p.
- Mantei, E. J., and Foster, M., 1988, Possible directions of ore fluid movement associated with the SE MO ore deposits: Transactions of the Missouri Academy of Science, v. 22, p. 141.
- Mantei, E. J., and Foster, M., 1989, Possible directions of ore fluid movement associated with the SE Mo. ore deposits, *in* Stearn, C. W., ed.: Program with Abstracts - Geological Association of Canada, v. 14, p. 116.
- Mantel, E. J., 1987, Using the variation of trace element quantities as a guide to the movement of ore fluids related to igneous bodies and to sulfide ores: Transactions of the Missouri Academy of Science, v. 20, p. 96.
- Marikos, M. A., and Laudon, R. C., 1985, Relation of bitumen to ore in the Magmont West ore body, southeast Missouri: Transactions of the Missouri Academy of Science, v. 19, p. 127.
- Marikos, M. A., 1986, Relation of bitumen to ore in the Magmont West ore body, Viburnum Trend, Missouri, *in* Dean, W. E., ed., Proceedings of the Denver Region Exploration Geologists Society symposium, Organics and ore deposits, Denver, CO, 1985: Denver Region Exploration Geological Society, p. 157-164.
- Marikos, M. A., Laudon, R. C., and Leventhal, J. S., 1986, Solid insoluble bitumen in the Magmont West ore body, southeast Missouri: Economic Geology, v. 81, no. 8, p. 1983-1988.

- Marikos, M. A., 1987, Chemically precipitated (?) "pseudo-host" dolomite in the Viburnum Trend, southeast Missouri: Abstracts - SEPM Midyear Meeting, v. 4, p. 51-52.
- Marikos, M. A., 1989, Gangue anhydrite from the Viburnum Trend, southeast Missouri: *Economic Geology*, v. 84, no. 1, p. 158-161.
- Martin, J. A., and Pratt, W. P., eds., 1985, Geology and mineral-resource potential of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Open-File Report 85-0042-MR, 82 p.
- Martin, J. A., and Pratt, W. P., 1991, Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1442, 115 p., 2 sheets.
- Mason, J. M., and Gabriel, W. J., 1994, An integrated approach to the development of a geologic model: Abstracts with Programs - Geological Society of America, v. 26, no. 3, p. 59.
- Mather, W. B., 1947, Barite deposits of central Missouri: American Institute of Mining, Metallurgical, and Petroleum Engineers, Technical Publication, v. 11, no. 5, p. 94-108.
- Mavrogenes, J. A., Hagni, R. D., and Dingess, P. R., 1988, Mineralogy, paragenetic sequence, and mineral zoning of the West Fork Mine, Viburnum Trend, southeast Missouri: *Transactions of the Missouri Academy of Science*, v. 22, p. 140.
- Mavrogenes, J. A., 1989, Mineralogy, paragenesis, and mineral zoning of the West Fork Mine, Viburnum Trend, southeast Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 44 p.
- Mavrogenes, J. A., Hagni, R. D., and Dingess, P. R., 1989, Metal sulfide mineral zoning at ASARCO's West Fork Mine, Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 21, no. 4, p. 40-41.
- Mavrogenes, J. A., Hagni, R. D., and Dingess, P. R., 1989, Mineralogy, paragenetic sequence, and mineral zoning of the ores at the ASARCO West Fork Mine, Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 3.
- Mavrogenes, J. A., Hagni, R. D., and Dingess, P. R., 1989, An ore microscopic study of ASARCO'S West Fork Mine, Viburnum Trend, southeast Missouri: *Transactions of the Missouri Academy of Science*, v. 23, p. 88.
- Mavrogenes, J. A., Hagni, R. D., and Dingess, P. R., 1992, Metal sulfide mineral zoning at ASARCO's West Fork Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 86, p. 113-124.
- Mavrogenes, J. A., Hagni, R. D., and Dingess, P. R., 1992, Mineralogy, paragenesis, and mineral zoning of the West Fork Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 87, no. 1, p. 113-124.
- Maxwell, J. C., and Harvey, E. J., 1968, Use of abandoned mines as potential water resource, Joplin District, Missouri: *Mining Engineering*, 17, no. 8, p. 51.
- McCafferty, A. E., and Cordell, L. E., 1992, Geophysically inferred structural and lithologic map of the Precambrian basement in the Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 2125-D, 1 sheet.

McCauley, J. R., Smith, D. C., and Robertson, C. E., 1989, Geology of the Joplin quadrangle, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 20-21.

McCauley, J. R., Smith, D. C., and Robertson, C. E., 1990, Geology of the Joplin quadrangle, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 17.

McCracken, M. H., 1972, Structural features of Missouri: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey Report of Investigations, v. 49, 99 p.

McElwaine, R. B., Romslo, T. M., Thoenen, J. R., 1948, Investigation of the north Arkansas zinc mines, Searcy, Boone, and Newton counties, Arkansas: U. S. Bureau of Mines Report of Investigations 4343, 25 p.

McFarland, M. C., and J. C. Brown, Jr., 1983, Study of stability problems and hazard evaluation in the Missouri portion of the Tri-State mining area: U. S. Geological Survey Open-File Report 82-0014-MR, 140 p.

McFarland, M. C., 1989, Safety and environmental hazards in the Missouri portion of the Tri-State zinc-lead mining district: Transactions of the Missouri Academy of Science, v. 23, p. 90-91.

McFarland, M. C., Colton, G. W., and McCauley, J. R., 1989, Metallic mines and prospects of the Harrison and Joplin quadrangles, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 21-22.

McFarland, M. C., Colton, G. W., and McCauley, J. R., 1990, Metallic mines and prospects of the Harrison and Joplin quadrangles, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 17-18.

McKibben, M. A., and Eldridge, C. S., 1991, Sulfur isotopic compositions of Cu-Fe, Fe, Pb and Zn sulfides in ores from the Viburnum Trend; as measured using SHRIMP: Abstracts with Programs - Geological Society of America, v. 23, no. 5, p. 101.

McKibben, M. A., and Eldridge, C. S., 1995, Microscopic sulfur isotope variations in ore minerals from the Viburnum Trend, southeast Missouri; a SHRIMP study. A group of papers devoted to the application of microanalytical techniques to economic geology, *in* Eldridge, C. S., and McKibben, M. A., eds.: Economic Geology, v. 90, no. 2, p. 228-245.

McKnight, E. T., 1935, Zinc and lead deposits of northern Arkansas: U. S. Geological Survey Bulletin 0853, 311 p.

McKnight, E. T., 1943, Zoning of ore deposits in the Tri-State District: Journal of the Washington Academy of Sciences, v. 32, no. 9, p. 282.

McKnight, E. T., and Fischer, R. P., 1973, Geology and ore deposits of the Picher Field, Oklahoma and Kansas: U. S. Geological Survey Professional Paper 558, 165 p.

- Medary, T. A., 1986, Replacement and recrystallization textures in Bonneterre dolostones: Master's, University of Missouri at Columbia, Columbia, MO.
- Melton, R. W., 1976, The regional geohydrology of the Roubidoux and Gasconade Formations, Arkansas and Missouri: Master's, University of Arkansas, Fayetteville, AR, 160 p.
- Melton, D. C., 1978, Base metal mineralization in south central Missouri: Master's, University of Missouri at Rolla, Rolla, MO.
- Melton, D. C., Jr., and Proctor, P. D., 1979, Minor fringe Mississippi Valley-type mineral deposits, south-central Missouri: Abstracts with Programs - Geological Society of America, v. 11, p. 163.
- Middendorf, M. A., Thompson, K. C., et al., 1987, Bedrock geologic map of the Springfield 1 degrees by 2 degrees quadrangle, Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 1830-D, 1 sheet.
- Middendorf, M. A., and McFarland, J. D., III., 1989, Geologic and structural overview of the Harrison quadrangle, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 22-23
- Middendorf, M. A., and McFarland, J. D., III., 1990, Geologic and structural overview of the Harrison quadrangle, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 18-19.
- Middendorf, M. A., Thomson, K. C., et al., 1991, Bedrock geologic map of the Springfield 1 degrees X 2 degrees quadrangle, Missouri: U. S. Geological Survey Miscellaneous Investigations Series Map I-2029.
- Middendorf, M. A., 1991, Geologic and structural overview, *in* Martin, J. A., and Pratt, W. P. eds., Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942, p. 3-6.
- Middendorf, M. A., Thomas, K. C., et al., 1994, Geologic map of the Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas: U. S. Geological Survey Open-File Report 94-0430, 15 p.
- Middendorf, M. A., Thomson, K. C., et al., 1997, Geologic map of the Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas: U. S. Geological Survey Miscellaneous Investigations Series 2548, 1 sheet.
- Millen, T. M., Montgomery, C. W., and Perry, E. C., Jr., 1988, Anomalous Mississippi Valley leads; another suggestion; Geologic causes of natural radionuclide anomalies, *in* Marikos, M. A., and Hansman, R. H., eds.: Rolla, MO, United States, Missouri Department of Natural Resources, Division of Geological and Land Survey, Special Publication, no. 4, p. 103-117.
- Miser, H. D. , 1936, [Review of] Zinc and lead deposits of northern Arkansas, by Edwin Thor McKnight, 1935: Bulletin of the American Association of Petroleum Geologists, v. 20, no. 3, p. 322-324.

Missouri Department of Natural Resources, 1991, Census of Missouri public water systems: Jefferson City, MO, Missouri Department of Natural Resources, Division of Environmental Quality, 460 p.

Missouri Division of Environmental Quality, 1982, Missouri water quality report 1982: Jefferson City, MO, Missouri Division of Environmental Quality, 52 p.

Missouri Geological Survey, 1942, Geological maps showing mining and mineralized areas of the Joplin District: Rolla, MO, Missouri Geological Survey and Water Resources.

Missouri Water Pollution Control Program, 1984, Missouri water quality basin plans: Jefferson City, MO, Missouri Water Control Program, 8 p.

Missouri Water Pollution Control Program, 1985, Missouri water quality report 1984: Jefferson City, MO, Missouri Water Control Program.

Missouri Water Pollution Control Program, 1986, Missouri water quality report 1986: Jefferson City, MO, Missouri Water Control Program.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 4: U. S. Geological Survey Open-File Report 78-0470-A, 14 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 1: U. S. Geological Survey Open-File Report 78-0470-C, 32 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 2: U. S. Geological Survey Open-File Report 78-0470-D, 20 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 9: U. S. Geological Survey Open-File Report 78-0470-E, 19 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 12: U. S. Geological Survey Open-File Report 78-0470-F, 20 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978) Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 3: U. S. Geological Survey Open-File Report 78-0470-G, 16 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 10: U. S. Geological Survey Open-File Report 78-0470-K, 31 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 11: U. S. Geological Survey Open-File Report 78-0470-L, 28 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri.: Drill holes No. 18, 19, and 20: U. S. Geological Survey Open-File Report 78-0470-Q, 19 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 23 and 24: U. S. Geological Survey Open-File Report 78-0470-R, 23 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 30 and 31: U. S. Geological Survey Open-File Report 79-0364-B, 21 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 34 and 35: U. S. Geological Survey Open-File Report 79-0364-D, 27 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 43 and 44: U. S. Geological Survey Open-File Report 79-0364-H, 23 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 45 and 46: U. S. Geological Survey Open-File Report 79-0364-I, 23 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 48 and 49: U. S. Geological Survey Open-File Report 79-0364-J, 31 p.

Mosier, E. L., Viets, J. G., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 21: U. S. Geological Survey Open-File Report 79-0364-K, 23 p.

Mosier, E. L., and Motooka, J. M., 1983, Induction coupled plasma--atomic emission spectrometry; analysis of subsurface Cambrian carbonate rocks for major, minor, and trace elements, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 155-165.

Mosier, D. L., and Briskey, J. A., 1986, Grade and tonnage model of southeast Missouri Pb-Zn and Appalachian Zn deposits, *in* Cox, D. P., and Singer, D. A., eds., Mineral deposit models: U. S. Geological Survey Bulletin 1693, p. 224-226.

Mosier, E. L., 1986, Analytical results and sample locality map of the heavy-mineral concentrates of Lamotte and Reagan sandstones from Missouri, Arkansas, and Kansas: U. S. Geological Survey Open-File Report 86-0197, 14 p.

Mosier, E. L., 1991, Geochemistry of basal Cambrian sandstones in parts of Missouri, Arkansas, and Kansas, *in* Martin, J. A., and Pratt, W. P., eds., Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942, p. 53-64.

Mouat, M. M., and Clendenin, C. W. R., 1975, Ozark Lead Company mine, Viburnum Trend, southeast Missouri, *in* Guidebook of geology and ore deposits selected mines, Viburnum Trend, MO: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, v. 58, p. 48-56.

- Mouat, M. M., and Clendenin, C. W., 1977, Geology of the Ozark Lead Company Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 398-407.
- Moylett, M. T., 1985, Depositional settings of subsurface Bonneterre Formation of south central Missouri: *Abstracts with Programs - Geological Society of America*, v. 17, no. 5, p. 319.
- Mugel, D. N., 1983, Geology of the blanket lead-zinc deposit, Buick Mine, Viburnum Trend, southeast Missouri: Master's, University of Missouri at Rolla, Rolla, MO, 155 p.
- Mugel, D. N., and Hagni, R. D., 1985, Mineralogy and geology of the Blanket lead-zinc deposit, Buick Mine, Viburnum Trend, southeast Missouri, *in* Park, W. C., Hausen, D. M., and Hagni, R. D., eds., *Applied mineralogy: New York, NY, American Institute of Mining, Metallurgy, and Petroleum Engineers, Metallurgy Society*, p. 965-986.
- Munro, J. K., Jr., Luxmore, R. J., et al., 1976, Application of the unified transport model to the movement of Pb, Cd, Zn, Cu, and S through the Crooked Creek Watershed: Oak Ridge, TN, Oak Ridge National Laboratories report, ORNL/NSF/EATC-28, 89 p.
- Murowchick, J. B., and H. L. Barnes, 1986, Marcasite precipitation from hydrothermal solutions: *Geochimica et Cosmochimica Acta*, v. 50, no. 12, p. 2615-2629.
- Musgrove, M., and Banner, J. L., 1993, Regional ground-water mixing and the origin of saline fluids; Midcontinent, United States: *Science*, v. 259, no. 5103, p. 1877-1882.
- Musgrove, M., and Banner, J. L., 1994, Mixing and evolution of saline groundwaters in the Midcontinent, USA; implications for carbonate diagenesis: *American Association of Petroleum Geologists 1993 annual convention, New Orleans, LA, 1993, Abstracts: Tulsa, OK, American Association of Petroleum Geologists*, p. 155.
- Myers, H. E., 1993, The differences and similarities of the mineralization occurrences at the various mines along the Viburnum Trend in Missouri: *Abstracts with Programs - Geological Society of America*, v. 25, no. 3, p. 69.
- Naething, F. S., 1927, Ores of the Joplin region (discussion): *Engineering and Mining Journal*, v. 123, no. 14, p. 575.
- Nagel, N. B., 1989, Development of a geostatistical analysis program for sulphide deposits of southeastern Missouri: Doctoral, University of Missouri at Rolla, Rolla, MO, 411 p.
- Nakai, S., and Halliday, A. N., 1993, Rb-Sr dating of sphalerites from Mississippi Valley-type (MVT) ore deposits: *Geochimica et Cosmochimica Acta*, v. 57, no. 2, 417-427.
- Nason, F. L., 1902, The disseminated lead ores of southeast Missouri: *Engineering and Mining Journal*, v. 73, p. 478-480.
- Nason, F. L., 1914, The disseminated lead district of southeast Missouri (discussion): *Engineering and Mining Journal*, v. 97, p. 1158-1159.
- Nelson, K. D., Lillie, R. J., de Voogd, B., Brewer, J. A., Oliver, J. E., Kaufman, S., Brown, L., and Viele, G. W., 1982, COCORP seismic reflection profiling in the Ouachita Mountains of western Arkansas; geometry and geologic interpretation: *Tectonics*, v. 1, no. 5, p. 413-430.
- Netzband, W. F., 1927, The role of geology in prospecting for lead and zinc in the Tri-State District: Master's, University of Missouri at Rolla, Rolla, MO.

Netzband, W. F., 1928, Relation of fracture zones to ore bodies in the Tri-State District: *Mining and Metallurgy*, v. 9, no. 262, p. 446-447.

Netzband, W. F., 1963, General geology of the Tri-State District; Missouri-Oklahoma-Kansas. Guidebook to the geology in the vicinity of Joplin, Missouri, including Westside-Webber Mine, Oklahoma: Rolla, MO, Association of Missouri Geologists, p. 31-35.

Newhouse, W. H., 1933, The temperature of formation of the Mississippi Valley lead-zinc deposits: *Economic Geology*, v. 28, p. 744-750.

Nichols, R. R., 1965, A study of the piezometric surface of the Grand Falls: Master's University of Missouri at Rolla, Rolla, MO.

Niethammer, K. R., Atkinson, R. D., Baskett, T. S., and Samson, F. B., 1985, Metals in riparian wildlife of the lead mining district of southeastern Missouri: *Archives of Environmental Contamination and Toxicology*, v. 14, p. 213-223.

Niewendorp, C. A., 1987, Possible role of petroliferous materials in sulfide precipitation at the Frank R. Millikan Mine, southeast Missouri: Master's, Western Michigan University, Kalamazoo, MI.

Niewendorp, C. A., and Clendenin, C. W., 1993, Paragenetic link between organic matter and late-stage ore deposition in the Sweetwater Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 88, no. 4, p. 957-960.

Niewendorp, C. A., and Clendenin, C. W., 1994, Paragenetic link between organic matter and late-stage ore deposition in the Sweetwater Mine, Viburnum Trend, southeast Missouri: *Abstracts with Programs - Geological Society of America*, v. 25, no. 3, p. 70.

Noble, E. A., 1963, Formation of ore deposits by water of compaction: *Economic Geology*, v. 58, p. 1145-1156.

Norman, D. K., and Throop, A. H., 1995, Tri-State agreement on mining begins implementation: *Geology*, v. 23, no. 7, p. 641-644.

Northrop, H. R., and Whitney, G., 1985, Sediment-hosted ore deposits; genetic processes inferred from the mineralogic, chemical, and isotopic composition of clay minerals, *in* Krafft, K., ed., *USGS research on mineral resources, 1985; program and abstracts*: U. S. Geological Survey Circular 1035, p. 38-39.

Novak, J. T., and Hasselwander, G. B., 1980, Control of mine tailing discharge to Big River: Jefferson City, MO, Missouri Department of Natural Resources, 75 p.

Nuelle, L. M., and McFarland, M. C., 1990, Ore distribution in the Missouri and Kansas portions of the Tri-State District of Missouri, Kansas, and Oklahoma, *in* Pratt, W. P., and Goldhaber, M. B., eds., *U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts*, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 21-22.

Ohle, E. L., Jr., 1952, Geology of the Hayden Creek lead mine, southeast Missouri: *Mining Engineering*, v. 4, no. 5, p. 477-483.

- Ohle, E. L., Jr., and Brown, J. S. E., 1954, Geologic problems in the southeast Missouri lead district: *Geological Society of America Bulletin*, v. 65, no. 3, p. 201-221.
- Ohle, E., 1959, Some considerations in determining the origin of ore deposits of the Mississippi Valley-type, Part 1: *Economic Geology*, v. 54, p. 769-789.
- Ohle, E. L., 1981, Some considerations in determining the origin of ore deposits of the Mississippi Valley type; Part II: *Economic Geology*, v. 75, no. 2, p. 161-172.
- Ohle, E. L., 1985, Breccias in Mississippi Valley-type deposits, *in* Sawkins, F. J., and Sillitoe, R. H., eds.: *Economic Geology*, v. 80, no. 6, p. 1736-1752.
- Ohle, E. L., and Gerdemann, P. E., 1989, Recent exploration history in southeast Missouri. Mississippi Valley-type mineralization of the Viburnum Trend, Missouri, *in* Hagni, R. D., and Coveney, R. M., Jr., ed., *Guidebook series of the Society of Economic Geologists*: Lancaster, PA, Society of Economic Geologists, v. 5, p. 1-11.
- Ohle, E. L., 1989, Similarities and differences between the Old Lead Belt and the Viburnum Trend, southeast Missouri: *Abstracts with Programs - Geological Society of America*, v. 21, no. 6, p. 3.
- Ohle, E. L., 1990, A comparison of the Old Lead Belt and the New Lead Belt in southeast Missouri: *Economic Geology*, v. 85, no. 8, p. 1894-1895.
- Ohle, E. L., 1991, Lead and zinc deposits, *in* Gluskoter, H. J., Rice, D. D., and Taylor, R. B., eds., *Economic Geology, U. S., in collection, The geology of North America*: Boulder, CO, Geological Society of America, p. 43-62.
- Ohle, E. L., 1996, Significant events in the geological understanding of the southeast Missouri lead district, *in* Sangster, D. F., ed., *Carbonate-Hosted Lead-Zinc Deposits*: Auburn, MI, Data Reproductions Corp., Society of Economic Geologists Special Publication, no. 4, p. 1-7.
- Oliver, J., 1986, Fluids expelled tectonically from orogenic belts; their role in hydrocarbon migration and other geologic phenomena: *Geology*, v. 14, no. 2, p. 99-102.
- Orr, W. L., 1982, Rate and mechanism of non-microbial sulfate reduction: *Abstracts with Programs - Geological Society of America*, v. 14, no. 7, p. 580.
- Overmann, S. R., and Krajicek, J. J., 1995, Snapping turtles (*Chelydra serpentina*) as biomonitors of lead contamination of the Big River in Missouri's Old Lead Belt: *Environmental and Toxicology Chemistry*, v. 14, no. 4, p. 689-695.
- Paarlberg, N. L., and Evans, L. L., 1975, Fletcher Mine (St. Joe Minerals Corporation), Viburnum Trend, southeast Missouri, *in* *Guidebook to the geology and ore deposits selected mines, Viburnum Trend, Missouri*: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 40-47.
- Paarlberg, N. L., and Evans, L. L., 1977, Geology of the Fletcher Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 391-397.
- Palmer, E. J., 1939, The mines and minerals of the Tri-State District: *Rocks and Minerals*, v. 14, no. 2, p. 35-49.

Palmer, K. T., and Kucera, C. L., 1980, Lead contamination of sycamore and soil from lead mining and smelting operations in eastern Missouri: *Journal of Environmental Quality*, v. 9, no. 1, p. 106-111.

Palmer, J. R., and Hayes, T. S., 1988, Late Cambrian lithofacies and their control on the Mississippi Valley-type mineralizing system in the Ozark region, *in* Schindler, K. S., ed., *USGS research on mineral resources, 1989; program and abstracts*: U. S. Geological Survey Circular 1035, p. 51-54.

Palmer, J. R., 1989, Regional Upper Cambrian lithofacies framework of southern Missouri, *in* Pratt, W. P., and Goldhaber, M. B., eds., *U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts*: U. S. Geological Survey Open-File Report 89-0169, p. 29-31.

Palmer, J. R., Hayes, T. S., Seeger, C. M., Krizanich, G. W., Werdon, M., and Whitfield, J. W., 1989, Application of Cambrian lithofacies mapping in the Springfield, Harrison, and Joplin CUSMAP assessments for Mississippi Valley-type deposits, *in* Pratt, W. P., and Goldhaber, M. B., eds., *U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts*: U. S. Geological Survey Open-File Report 89-0169, p. 31-32.

Palmer, J. R., Hayes, T. S., Seeger, C. M., Krizanich, G. W., Werdon, M., and Whitfield, J. W., 1990, Application of Cambrian lithofacies mapping in the Springfield, Harrison, and Joplin CUSMAP assessments for Mississippi Valley-type deposits, *in* Pratt, W. P., and Goldhaber, M. B., eds., *U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts*, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 26.

Palmer, J. R., 1990, Regional Upper Cambrian lithofacies framework of southern Missouri, *in* Pratt, W. P., and Goldhaber, M. B., eds., *U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts*, St. Louis, Missouri, April 11-12, 1989. U. S. Geological Survey Circular 1043, p. 24-25.

Palmer, J. R., 1991, Distribution of lithofacies and inferred depositional environments in the Cambrian System, *in* Martin, J. A., and Pratt, W. P., eds., *Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985*: U. S. Geological Survey Bulletin 142, p. 9-38.

Palmer, J. R., 1991, Stratigraphy and porosity characteristics, uppermost Lamotte sandstone, Bonneterre formation, and basal Davis formation, in tow closely spaced drill cores; Greer 7.5 minute quadrangle, Oregon county, Missouri: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, 24 p.

Palmer, J. R., 1992, Cambrian and Ordovician stratigraphy and the potential for Mississippi Valley-type and Mount Isa-type base metals, western Paducah 1 degrees X 2 degrees area, *in* Goldhaber, M. B., and Eidel, J. J., eds., *Mineral resources of the Illinois Basin in the context of basin evolution*: U. S. Geological Survey Open-File Report 91-0001, p. 43-45.

Palmer, J. R., and Hayes, T. S., 1997, Maps showing locations of known Mississippi Valley-type deposits and occurrences in the Ozark Mountains region relative to Late Cambrian shaly lithofacies and other shales, Missouri, Arkansas, Kansas, and Oklahoma and Oklahoma (folio of the Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas: U. S. Geological Survey Miscellaneous Field Studies 1994-F, p. 5 sheet.

Pan, H., Symons, D. T. A., and Sangster, D. F., 1989, Paleomagnetism of mineralized and host Paleozoic carbonates from the northern Arkansas and Tri-State Pb-Zn districts: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 4-5.

Pan, H., Symons, D. T. A., and Sangster, D. F., 1990, Paleomagnetism of the Mississippi Valley-type ores and host rocks in the northern Arkansas and Tri-State districts: Canadian Journal of Earth Sciences = Journal Canadien des Sciences de la Terre, v. 27, no. 7, p. 923-931.

Pan, H., 1993, Paleomagnetism of Mississippi Valley-type ores and their Paleozoic host rocks in eastern North America: Doctoral, University of Western Ontario, London, ON, Canada, 168 p.

1981, Genetic implications of halogen host rocks aureoles surrounding a Mississippi Valley-type ore deposit: Abstracts with Programs - Geological Society of America, v. 13, no. 7, p. 525.

Panno, S. V., Harbottle, G., and Sayre, E. V., 1982, Trace element halos surrounding the Mississippi Valley-type deposits of southeast Missouri; the use of bromine as an exploration guide: Abstracts with Programs - Geological Society of America, v. 14, no. 7, p. 582.

Panno, S. V., Harbottle, G., Sayre, E. V., and Hood, W. C., 1983, Genetic implications of halide enrichment near a Mississippi Valley-type ore deposit: Economic Geology, v. 78, no. 1, p. 150-156.

Panno, S. V., Harbottle, G., and Sayre, E. V., 1985, Alteration of shale of the Davis Formation overlying a Pb-Zn deposit of the Viburnum Trend, SE Missouri: Abstracts with Programs - Geological Society of America, v. 17, no. 7, p. 684.

Panno, S. V., Harbottle, G., and Sayre, E. V., 1988, Distribution of selected elements in the shale of the Davis Formation, Buick Mine area, Viburnum Trend, southeast Missouri: Economic Geology, v. 83, no. 1, p. 140-152.

Panno, S. V., and Moore, D. M., 1990, Alteration of clay minerals in shale of the Davis Formation, southeast Missouri, *in* Burst, J. F., and Johns, W. D., eds., Clay Minerals Society, 27th annual meeting, Columbia, MO, 1990, Program and Abstracts: Clay Mineral Society, v. 27, p. 101.

Panno, S. V., and Moore, D. M., 1994, Mineralogy of the clay-sized fraction of the Davis Shale, southeast Missouri; alteration associated with a Mississippi Valley-type ore deposit: Economic Geology, v. 89, no. 2, p. 333-340.

Parkhurst, D. L., 1987, Chemical analyses of water samples from the Picher mining area, northeast Oklahoma and southeast Kansas: U. S. Geological Survey Open-File Report 87-0453, 43 p.

Parkhurst, D. L., 1988, Mine-water discharge, metal loading, and chemical reactions, *in* Ragone, S. E., ed., U. S. Geological Survey program on toxic waste-ground-water contamination; proceedings of the Second technical meeting, Cape Cod, Massachusetts, October 21-25, 1985: U. S. Geological Survey Open-File Report 86-0481, p. D11-D15.

Parsons, J. D., 1977, Effects of acid mine wastes on aquatic ecosystems: Water, Air, and Soil Pollution, v. 7, no. 3, p. 333-354.

Patel, D., 1973, Distribution of trace elements in host rock limestone in the Tri-State zinc-lead district: Master's, University of Missouri at Rolla, Rolla, MO.

PEDCo Environmental, 1983, Evaluation of management practices for mine solid waste storage, disposal, and treatment--V.1, characterization of mining industry wastes: Washington, DC, U. S. Environmental Protection Agency Contract, no. 68-03-2900, p. 4-52 to 4-56 and A-281 to A-293.

PEDCo Environmental, Inc., 1983, Monitoring of active tailings impoundment at St. Joe Minerals Corporation's Viburnum division-final draft: Washington, DC, U. S. Environmental Protection Agency Contract, no. 68-03-2900, 69 p.

Pelissonnier, H., 1982, Essai de synthese sur les donnees isotopiques plomb-plomb appliquees aux gisements de basse temperature; consequences genetiques, *in* Bulletin du Bureau de Recherches Geologiques et Minieres; Section 2: Geologie des Gites Mineraux: v. 4, p. 321-327.

Peterson, R. M., 1978, Structure of the Joplin, Kansas-Missouri quadrangle as interpreted from landsat images: EOS, Transactions, American Geophysical Union, v. 59, no. 4, p. 228.

Pettus, J. R., Jr., and Dunn, R. G. R., 1986, Geology of the St. Joe Minerals Corporation Number 28 mine, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al., eds., Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 63-75.

Pettus, J. R., Jr., and Dunn, R. G. R., 1986, Mine tour; St. Joe Number 28 mine, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al., eds., Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1: Rolla, MO, Missouri Department of Natural Resources; Division of Geological and Land Survey, p. 77-83.

Piechowski, M. F., and Carroll, S. A., 1992, Mobilities of heavy metals in surface waters; a field study of mineral branch, Tri-State mining district: Abstracts with Programs - Geological Society of America, v. 17, no. 1, p. 30-50.

Pignolet, S., and Hagni, R. D., 1983, Cobalt-nickel mineralization associated with lead-zinc-copper mineralization in the Mississippi Valley-type deposits at Fredericktown, Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 187-194.

Pignolet, B. S., and Hagni, R. D., 1985, Characterization of cobalt-nickel mineralization associated with the lead-zinc-copper deposits of southeast Missouri: Abstracts with Programs - Geological Society of America, v. 17, no. 7, p. 689.

Pignolet, B. S., and Hagni, R. D., 1985, Mineralogy and mineral composition of cobalt and nickel in the southeast Missouri lead district, *in* Park, W. C., Hausen, D. M., and Hagni, R. D., eds., Applied Mineralogy: New York, NY, American Institute of Mining, Metallurgy, and Petroleum Engineers, Metallurgy Society, p. 987-999.

Pignolet, B. S., Hagni, R. D., and Brandom, P. T., 1986, Unusual occurrences of cobalt and nickel minerals in the southeast Missouri lead district, *in* Prewitt, C. T., ed., The Fourteenth general meeting of the International Mineralogical Association, Stanford, CA, 1986, Abstracts with programs: International Mineralogical Association, p. 200-201.

Pignolet, B. S., 1988, Mineralogy, paragenesis and electron microprobe analysis of the cobalt-nickel and nickel minerals in the Mississippi Valley-type deposits of southeast Missouri: Doctoral University of Missouri at Rolla, Rolla, MO, 245 p.

- Playton, S. J., Davis, R. E., and McClafflin, R. G., 1979, Water quality in abandoned zinc mines in the Picher Field, Tri-State mining district: Abstracts with Programs - Geological Society of America, v. 10, no. 1, p. 24.
- Plumlee, G. S., Leach, D. L., Hofstra, A. H., Landis, G. P., Rowan, E. L., and Viets, J. G., 1994, Chemical reaction path modeling of ore deposition in Mississippi Valley-type Pb-Zn deposits of the Ozark region, U. S. Midcontinent: *Economic Geology*, v. 89, no. 6, p. 1361-1383.
- Posey, H. H., Stein, H. J., Fullager, P. D., and Kish, S. A., 1983, Rb-Sr isotopic analyses of Upper Cambrian glauconites, southern Missouri; implications for movement of Mississippi Valley type ore fluids in the Ozark region, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 166-173.
- Potter, P. E., and Spohn, R., 1992, Field trip guide; the Geoscience Information Society explores the geology of the Tri-State in conjunction with the 1992 annual meeting of the Geological Society of America: United States, Geoscience Information Society Monograph, 13 p.
- Pratt, W. R., Odland, S. K., Hubert, A. F. Siems, D. F., and Viets, J. G., 1980, Spectrographic and chemical analyses of Precambrian rocks, Rolla 1° x 2° quadrangle: U. S. Geological Survey Open-File Report 80-0025, 26 p.
- Pratt, W. P., Erickson, R. L., Mosier, E. L., Odland, S. K., Erickson, M. S., Viets, J. G., Miller, M. H., Heyl, A. V., Anderson, K. H., Martin, J. A., Satterfield, I. R., Wharton, H. M., and Middendorf, M. A., 1981, Mississippi Valley-type base metal deposits in the Bonneterre Formation and Lamotte Sandstone, *in* Pratt, W. P., ed., Metallic mineral-resource potential of the Rolla 1° x 2° quadrangle, Missouri, as appraised in September 1980: U. S. Geological Survey Open-File 81-0518, p. 10-19.
- Pratt, W. P., Erickson, R. L., and Kisvarsanyi, E. B., 1981, Methodology for mineral-resource appraisal, Rolla 2 degrees quadrangle, MO: Abstracts with Programs - Geological Society of America, v. 13, no. 7, p. 532.
- Pratt, W. P., Walker, K. M., Jenson, S. K., Francica, J. R., Hastings, D. A., and Trautwein, C. M., 1983, Mineral-resource appraisal of the Rolla 1 degrees X 2 degrees quadrangle, Missouri; manual vs. digital (computer-assisted) synthesis, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 584-595.
- Pratt, W. P., and Erickson, R. L., 1984, Appraisal of mineral-resource potential in carbonate terranes; Rolla 1 degrees X 2 degrees quadrangle, Missouri, USA: Resumos - Congresso Brasileiro de Geologia, v. 33, p. 191-192.
- Pratt, W. P., Erickson, R. L., Jenson, S. K., and Hastings, D. A., 1986, The Rolla and Springfield, Missouri, CUSMAP resource assessments, *in* Cargill, S. M., and Green, S. B., eds., Prospects for mineral resource assessments on public lands; proceedings of the Leesburg workshop: U. S. Geological Survey Circular 980, p. 140-159.
- Pratt, W. P., 1989, Regional permissivity of selected carbonate units for Mississippi Valley-type deposits in the northern Midcontinent, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 32-34.
- Pratt, W. P., Martin, J. A., Bush, W. V., and Berendsen, P., 1989, Assessment of potential for undiscovered Mississippi Valley-type deposits in the Harrison and Joplin quadrangles, *in* Pratt, W.

P., and Goldhaber, M. B, eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 33, 35.

Pratt, W. P., Martin, J. A., Bush, W. V., and Berendsen, P., 1990, Assessment of potential for undiscovered Mississippi Valley-type deposits in the Harrison and Joplin quadrangles, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 27, 29.

Pratt, W. P., and Goldhaber, M. B, 1990, U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, 42 p.

Pratt, W. P., 1990, Regional permissivity of selected carbonate units for Mississippi Valley-type deposits in the northern Midcontinent, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 27-28.

Pratt, W. P., 1991, The conterminous United States mineral-resource assessment program; background information to accompany folio of geologic and mineral-resource maps of the Rolla 1 degrees X 2 degrees Quadrangle, Missouri: U. S. Geological Survey Circular 1068, p. 10.

Pratt, W. P., 1992, Maps showing aerial extent of selected Paleozoic shales in the northern Midcontinent, USA: U. S. Geological Survey Miscellaneous Field Studies Map 1835-H, 7 sheets.

Pratt, W. P., Hayes, T. S., Erickson, R. L., Berendsen, P., and Kisvarsanyi, E. B, 1993, Assessment of the Joplin 1 degrees X 2 degrees quadrangle, Kansas and Missouri, for Mississippi Valley-type deposits and other minerals: U. S. Geological Survey Miscellaneous Field Studies Map 2125-E, 2 sheets.

Pratt, W. P., Hayes, T. S., Erickson, R. L., Kisvarsanyi, E. B., McFarland, M. C., Rueff, A. W., Colton, G. W., and McFarland, J. D., II, 1993, Mineral-resource assessment maps of the Harrison 1 degrees X 2 degrees quadrangle, Missouri and Arkansas: U. S. Geological Survey Miscellaneous Field Studies Map 1994-D, 22 p.

Pratt, W. P., 1995, Regional potential of selected Paleozoic carbonate units in the northern Midcontinent for undiscovered Mississippi Valley-type deposits: U. S. Geological Survey Bulletin 1989-G, p. 1-14.

Pratt, W. P., 1995, The midcontinent strategic and critical minerals project; summary and background information to accompany folio of maps of the northern midcontinent area, latitude 36 degrees -46 degrees N., and longitude 88 degrees -100 degrees W: U. S. Geological Survey Circular 1124, 19 p.

Pratt, W. P., and Wandrey, C. J., 1996, Maps showing thickness and limestone-dolostone ratios of selected Paleozoic carbonate units in the northern Midcontinent, USA; folio of the northern Midcontinent area: U. S. Geological Survey Miscellaneous Field Studies Map 1835-I, 3 sheets.

Proctor, P. D., Kisvarsanyi, G., Garrison, E., and Williams, A., 1973, Heavy metal content of surface and ground waters of the Springfield-Joplin areas, Missouri *in* Hemphill, D. D., ed., Trace Substances in Environmental Health, 7th, Columbia, MO, 1973, Proceedings: University of Missouri at Columbia, p. 62-73.

Proctor, P. D., Kisvarsanyi, G., Garrison, E., and Williams, A., 1973, Water quality as related to possible heavy metal additions in surface and groundwater in the Springfield and Joplin areas, Missouri: Rolla, MO, Water Resource Research Center completion report, OWRRB-054-MO (1), 56 p.

Proctor, P. D., Butz, T., and Sinha, B., 1975, Heavy metal (Cu, Pb, Zn, Cd, Ni, As, Hg) additions to surface waters, stream sediment sand selected aquatic life in the Meramec Park Reservoir Drainage Basin, Missouri: Columbia, MO, Missouri Water Resources Center completion report, OWRT A-072-MO (1), 44 p.

Proctor, P. D., Kisvarsanyi, G., and Garrison, E., 1977, Heavy metal additions to waters of the Joplin Area, Tri-State Mining District, Missouri, *in* Dilamarter, R. R., and Csallany, S. C., eds., Hydrologic problems in karst regions: Bowling Green, KY, University of Western Kentucky, p. 369-387.

Proctor, P. D., and Sinha, B., 1978, Heavy metal mobilization, transportation and fixation in the Fredericktown Co-Ni-Cd-Cu-Zn-Pb province of Lake Wappapello, Missouri as related to surface waters, stream sediments and stream algae: Columbia, MO, Missouri Water Resource Research Center completion report, OWRT A-096-MO(1) 42 p.

Proctor, P. D., and Sinha, B. N., 1978, Cobalt-nickel-cadmium transportation and fixation in surface waters, stream sediments and selected aquatic life in Fredericktown Co-Ni metallogenic province and St. Francis River drainage area, Missouri, *in* Hemphill, D. D., ed., Trace Substances in Environmental Health, 12th, Columbia, MO, 1978, Proceedings: University of Missouri at Columbia, p. 119-128.

Proctor, P. D., and Sinha, B. N., 1979, Heavy metal patterns in stream waters, stream sediments, and selected aquatic life, northern New Lead Belt, southeast Missouri: Transactions of the American Institute of Mining, Metallurgical and Petroleum Engineers, Incorporated (AIME), v. 266, p. 1991-1996.

Proctor, P. D., Toweh, S. H., and Kisvarsanyi, G., 1980, Landsat image analysis of the Tri-State District: Abstracts with Programs - Geological Society of America, v. 11, no. 5, p. 254.

Proctor, P. D., Afzali, B., Collins, S., Panhorst, T., and Sinha, B., 1981, Lead additions to stream sediments, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 13, no. 5, p. 261.
index data: Economic Geology, v. 89, no. 3, p. 493-514.

Pugh, A. L., and Adamski, J. C., 1993, National water-quality assessment program; Ozark Plateaus ground-water study: U. S. Geological Survey Open-File Report 93-0434, 2 p.

Purdue, A. H., and Miser, H. D., 1916, Description of the Eureka Springs and Harrison quadrangles, Arkansas-Missouri: U. S. Geological Survey Geologic Atlas Folio 0202, 22 p.

Ragan, V. M., 1987, Geothermometry and organic matter-mineral link at the Prescott zinc deposit and adjacent country rocks of Linn County, Kansas: Master's, University of Missouri, Kansas City, Kansas City, MO, 96 p.

Ragan, V. M., 1993, A distal expression of the Tri-State hydrothermal event evidenced in sphalerite and fluorite crystals in SE Kansas: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 73.

- Ragan, V. M., 1993, A distal expression of the Tri-State hydrothermal event evidenced in sphalerite and fluorite crystals in SE Kansas, *in* Shelton, K. L., and Hagni, R. D., eds., *Geology and geochemistry of Mississippi Valley-type ore deposits*, Proceedings: University of Missouri at Kansas City, p. 105-120.
- Ragan, V. M., 1994, Mineralogy and fluid inclusion geochemistry of Tri-State-type mineralization in eastern Kansas: *Economic Geology*, v. 89, no. 6, p. 1411-1418.
- Ragan, V. M., 1996, Evidence for extensive hydrothermal events in the genesis of the Mississippi Valley-type (MVT) deposits of eastern Kansas and the Tri-State zinc-lead mining district of Kansas, Missouri, and Oklahoma: Doctoral, University of Missouri, Kansas City, Kansas City, MO, 167 p.
- Ragan, V. M., and Coveney, R. M., Jr., 1996, Migration paths for fluids and northern limits of the Tri-State districts from fluid inclusions and radiogenic isotopes, *in* Sangster, D. F., ed., *Carbonate-Hosted Lead-Zinc Deposits*: Auburn, MI, Data Reproductions Corp., Society of Economic Geologists Special Publication, no. 4, p. 419-431.
- Ramage, W. E., and Holland, H. D., 1984, Chemical zoning of gangue dolomite in lead ores of the Viburnum Trend, Missouri: *Abstracts with Programs - Geological Society of America*, v. 16, no. 6, p. 629.
- Ransome, A. L., 1941, Enargite and plumbojarosite at Picher, Oklahoma: *American Mineralogist*, v. 20, no. 11, p. 799-805.
- Rasberry, M. A., Hagni, R. D., Walker, W. T., and Childers, A. G., 1992, Mineralogy of clay-like pods in the Viburnum Trend, southeast Missouri lead district: *Abstracts with Programs - Geological Society of America*, v. 24, no. 4, p. 60.
- Rasberry, M. A., Hagni, R. D., Walker, W. T., and Childers, A. G., 1993, Mineralogy and paragenesis of potassic alteration associated with late copper and iron mineralization at the Sweetwater and Viburnum 29 mines in the Viburnum Trend, southeast Missouri: *Abstracts with Programs - Geological Society of America*, v. 25, no. 3, p. 74.
- Rasberry, M. A., Hagni, R. D., Walker, W. T., and Childers, A. G., 1993, Potassic alteration associated with east-west faulting and its relationship to ore deposition in the Viburnum Trend, southeast Missouri: *Abstracts with Programs - Geological Society of America*, v. 25, no. 6, p. 276.
- Reed, M. H., 1982, Calculation of multicomponent chemical equilibria and reaction processes in systems involving minerals, gases and an aqueous phase: *Geochimica et Cosmochimica Acta*, 46, no. 4, p. 513-528.
- Rickman, D. L., Hagni, R. D., and Clendenin, C. W., 1980, Paragenesis of the ores of the Milliken Mine, Viburnum Trend, MO: *Abstracts with Programs - Geological Society of America*, v. 12, no. 7, p. 509.
- Rickman, D. L., 1981, A thermochemical study of the ore deposits of the Milliken Mine, New Lead Belt, Missouri: Doctoral, University of Missouri at Rolla, Rolla, MO, 310 p.
- Ridge, J. D., 1935, The genesis of the Tri-State zinc and lead ores: Doctoral, University of Chicago, Chicago, IL, 69 p.
- Ridge, J. D., 1936, The genesis of the Tri-State zinc and lead ores: *Economic Geology*, v. 31, no. 3, p. 298-313.

Roark, S., and Brown, K., 1996, Effects of metal contamination from mine tailings on allozyme distributions of populations of Great Plains fishes: *Environmental and Toxicology Chemistry*, v. 15, no. 6, p. 821-827.

Roark, T., 1991, Paragenesis of the Burlington Limestone, Boone County, Missouri: Master's, University of Missouri at Columbia, Columbia, MO, 61 p.

Robertson, C. E., 1984, Structural lineaments and mineralization in the St. Francois Mountains, Missouri: *Abstracts with Programs - Geological Society of America*, v. 16, no. 3, p. 191.

Robertson, C. E., and Thompson, T. L., 1991, Field guide, Springfield area, Missouri, *in* Martin, J. A., Pratt, W. P., eds., *Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942*, p. 114-115.

Roedder, E., 1967, Environment of deposition of stratiform (Mississippi Valley-type) ore deposits, from studies of fluid inclusions, *in* Brown, J. S., ed., *Genesis of stratiform lead-zinc-barite-fluorite deposits (Mississippi Valley type deposits)--A symposium, New York, 1966: Lancaster, PA, Society of Economic Geologists Monographs*, no. 3, p. 349-361.

Roedder, E., 1967, Fluid inclusions as samples of ore fluids, [Chapter] 12, *in* Barnes, H. L., ed., *Geochemistry of hydrothermal ore deposits: New York, NY, Holt, Rinehart and Winston*, p. 515-574.

Roedder, E., 1977, Fluid inclusion studies of ore deposits in the Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 474-479.

Roedder, E., 1979, Fluid inclusions as samples of ore fluids, *in* Barnes, H. L., ed., *Geochemistry of hydrothermal ore deposits: New York, NY, Holt, Rinehart and Winston*, p. 684-737.

Rogers, A. F., 1900, Annotated list of the minerals occurring in the Joplin lead and zinc district: *Kansas University Quarterly*, v. 9, p. 161-165.

Rogers, A. F., 1900, Mineralogical notes: *American Journal of Science*, v. 9, no. 9, p. 364-366.

Rogers, A. F., 1902, The minerals of the Joplin, Missouri, lead and zinc region: *Annals of the New York Academy of Sciences*, v. 15, no. 60-61, p. 867-868.

Rogers, A. F., 1904, Minerals of the Galena-Joplin lead and zinc district: *Kansas Geological Survey*, v. 8, p. 445-509.

Rogers, R. K., and Davis, J. H., 1977, Geology of the Buick Mine, Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 372-380.

Roggio, R. G., Ford, G. L., and Brahana, J. V., 1996, Hydrogeologic controls of the springs in northern Arkansas, *in* Cloos, M.: *Abstracts with Programs - Geological Society of America*, v. 28, no. 1, p. 61

Rothbard, D. R., 1983, Diagenetic history of the Lamotte Sandstone, southeast Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., *International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla*, p. 385-395.

Rowan, L., Leach, D. L., and Viets, J. G., 1985, Regional and small scale features of cathodoluminescent zonation in hydrothermal dolomite from the Viburnum Trend, southeast Missouri, and northern Arkansas: Abstracts with Programs - Geological Society of America, v. 17, no. 7, p. 703.

Rowan, E. L., 1986, Cathodoluminescent zonation in hydrothermal dolomite cements: relationship to Mississippi Valley-type Pb-Zn mineralization in southern Missouri and northern Arkansas, *in* Hagni, R. D., ed., Process Mineralogy VI: Warrendale, PA, Metallurgical Society, p. 69-87.

Rowan, E. L., 1987, Homogenization temperatures and salinities of fluid inclusions from the Viburnum Trend, southeast Missouri, and the northern Arkansas zinc district: U. S. Geological Survey Open-File Report 87-0675, 26 p.

Rowan, E. L., and Leach, D. L., 1989, Constraints from fluid inclusions on sulfide precipitation mechanisms and ore fluid migration in the Viburnum Trend lead district, Missouri: Economic Geology, v. 84, no. 7, p. 1948-1965.

Rowan, E. L., and Leach, D. L., 1989, Implications from fluid inclusions for the hydrology and sulfide precipitation mechanisms of the Viburnum Trend lead-zinc district, southeast Missouri, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 35-36.

Rowan, E. L., and Leach, D. L., 1990, Implications from fluid inclusions for the hydrology and sulfide precipitation mechanism of the Viburnum Trend lead-zinc district, southwest Missouri, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 29-30.

Roy, C. J., 1937, Origin of the chert in the Tri-State (Missouri-Oklahoma-Kansas) zinc lead district [abstracts]: American Mineralogist, v. 22, no. 3, p. 214-215.

Rueff, A. W., 1987, Industrial mineral resources of the Springfield 1 degrees by 2 degrees quadrangle, Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 1830-F, 1 sheet.

Rueff, A. W., 1989, Industrial minerals and the CUSMAP Program, *in* Hughes, R. E., and Bradbury, J. C., eds., Proceedings of the 23rd Forum on the Geology of industrial minerals in Illinois Mineral Notes: Champaign, IL, Illinois State Geological Survey, v. 23, p. 97-100.

Rueff, A. W., 1991, Industrial mineral resources, *in* Martin, J. A., and Pratt, W. P., eds., Geology and mineral-resource assessment of the Springfield 1 degrees X 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942, p. 77-80.

Rueff, A. W., 1994, Mineral production in Missouri, 1993: Rolla, MO, Missouri Department of Natural Resources.

Ruhl, O., 1909, History of southeast Missouri lead district: Mining World, v. 30, p. 721-724.

Ruhl, O., 1946, Tri-State zinc-lead ore reserves [Missouri-Kansas-Oklahoma]: Bureau of Mines Report of Investigations 3922, 7 p.

Ruhl, O., Allen, S. A., and Holt, S. P., 1949, Zinc-lead ore reserves of the Tri-State District: Bureau of Mines Report of Investigations 4490, 59 p.

Ruiz, J., Kelly, W. C., and Kaiser, C. J., 1985, Strontium isotopic evidence for the origin of barites and sulfides from the Mississippi Valley-type ore deposits in southeast Missouri; discussion: *Economic Geology*, v. 80, no. 3, p. 773-775.

Russell, M. J., and Skauli, H., 1988, Carbonate hosted lead zinc deposits: Abstracts with Programs - Geological Society of America, v. 20, no. 7, p. 20.

Ryck, F. M., Jr., 1974, Missouri stream pollution survey: Jefferson City, MO, Missouri Department of Conservation Aquatic Series, v.8, 37 p.

Ryck, F. M., Jr., 1974, Pollution abatement in the lead mining district of Missouri, *in* Purdue Industrial Waste Conference, 29th, Lafayette, IN, Proceedings: University of Missouri at Rolla, p. 29.

Ryck, F. M., Jr., 1974, Water quality survey of the southeast Ozark mining area, 1965-1971: Jefferson City, MO, Missouri Department of Conservation, v. 10, 28 p.

Ryck, F. M., Jr., 1974, Water quality survey of the southeast Ozark mining area, 1972-1973: Jefferson City, MO, Missouri Department of Conservation Aquatic Series, 28 p.

Ryck, F. K., Jr., 1974, Water quality survey of the southeast Ozark mining area, 1974: Jefferson City, MO, Missouri Department of Conservation Aquatic Series, 15 p.

Ryck, F. M., Jr., 1977, Water quality survey of the southeast Ozark mining area, 1975: Jefferson City, MO, Missouri Department of Conservation Aquatic Series, 12 p.

Saadallah, A. A., 1965, Nature and lateral variation of host rock limestone in the Tri-State zinc-lead district: Master's, University of Missouri at Rolla, Rolla, MO.

Sales, R. H., 1933, The ore deposits of the Tri-State District: *Economic Geology*, v. 28, no. 8, p. 780-786.

Sangster, D. F., 1968, Some chemical features of lead-zinc deposits in carbonate rocks: Geological Survey of Canada Paper, v. 17, p. 68-39.

Sangster, D. F., 1983, Mississippi Valley-type deposits; a geological melange, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 7-19.

Sangster, D. F., 1988, Breccia-hosted lead-zinc deposits in carbonate rocks, Paleokarst, *in* James, N. P., and Choquette, P. W., eds.: New York, NY, Springer-Verlag, p. 102-116.

Sangster, D. F., 1989, Thermal comparison on MVT deposits and their host rocks, *in* Dymek, R. F., and Shelton, K. L., eds.: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 7.

Sangster, D. F., 1990, Mississippi Valley-type and SEDEX lead-zinc deposits; a comparative examination: *Applied Earth Science*, v. 99, p. 21-42.

Sangster, D. F., 1993, Evidence for, and implications of, a genetic relationship between MVT and SEDEX zinc-lead deposits: World Zinc '93, Hobart, Australia, 1993, Proceedings: Australasian Institute of Mining and Metallurgy, p. 85-94.

Sangster, D. F., Nowlan, G. S., and McCracken, A. D. , 1994, Thermal comparison of Mississippi Valley-type lead-zinc deposits and their host rocks using fluid inclusion and conodont color alteration index data: *Economic Geology*, v. 89, no. 3, p. 493-514.

Sangster, D. F., and Leach, D. L., 1995, Evidence for a genetic link between SEDEX and MVT deposits, *in* Leach, D. L., and Goldhaber, M. B., eds., *International Field Conference on Carbonate-Hosted Lead-Zinc Deposits*, St. Louis, MO, 1995, *Extended Abstracts*: Lancaster, PA, Society of Economic Geologists, p. 260-263.

Sangster, D. F., Nowlan, G. S., and McCracken, A. D., 1995, Thermal comparison of Mississippi Valley-type lead-zinc deposits and their host rocks using fluid inclusion and conodont color alteration index data: *Economic Geology*, v. 89, no. 3, p. 493-514.

Sankpill, B. L., 1970, Center Creek water pollution survey report: Jefferson City, MO, Missouri Water Pollution Board unpublished report, 15 p.

Sankpill, B. L., 1971, Center Creek water pollution survey report: Jefferson City, MO, Missouri Water Pollution Board unpublished report, 9 p.

Sargent, M. L., 1989, Lithofacies of the Eau Claire (Bonnetterre) Formation in Illinois, *in* Gregg, J. M., Palmer, J. R., and Kurtz, V. E., eds., *Field guide to the Upper Cambrian of southeastern Missouri; stratigraphy, sedimentology, and economic geology*: Rolla, MO, University of Missouri-Rolla, p. 61-72.

Sawkins, F. J., 1968, The significance of Na/ K and Cl/ SO₄ ratios in fluid inclusions and subsurface waters, with respect to the genesis of Mississippi Valley-type ore deposits: *Economic Geology*, v. 63, no. 8, p. 935-942.

Sawkins, F. J., 1969, Chemical brecciation, an unrecognized mechanism for breccia formation?" *Economic Geology*, v. 64, no. 6, p. 613-617.

Scheibach, R. B., Williams, R. E., Genes, B. R., and Jarman, R., 1984, Controlling acid mine drainage from the Picher Mining District, Oklahoma: *Ground Water*, v. 21, no. 2, p. 225.

Schmidt, A., 1874, *The lead region of central Missouri*: Jefferson City, MO, Tribune Printing, p. 1873-1874.

Schmidt, R. A., 1962, Temperatures of mineral formation in the Miami-Picher zinc-lead district (Oklahoma-Kansas) as indicated by liquid inclusions: *Economic Geology*, v. 57, no. 1, p. 1-20.

Schmitt, C. J., and Finger, S. E., 1982, The dynamics of metal form past and present mining activities in the Big and Black River watersheds, southeastern Missouri: U. S. Fish and Wildlife Service, 153 p.

Schmitt, C. J., Dwyer, F. J., and Finger, S. E., 1984, Bioavailability of Pb and Zn from mine tailings as indicated by Erythrocyte: *Canadian Journal of Fisheries and Aquatic Science*, v. 41, no. 7, p. 1030-1040.

Schmitt, C. J., 1985, Chemical characterization and biological activity of metals in leachates from lead mine tailings: U. S. Fish and Wildlife Service, 137 p.

Schmitt, C. J., Finger, S. E., May, T. W., and Kaiser, M. S., 1987, Bioactivity of lead and cadmium from mine tailing to the pocket mussel (*Lampsilis ventricosa*), *in* Neves, R. J., ed., *Workshop on*

Dieoffs of Freshwater Mussels in the United States, Proceedings: Washington, DC, U. S. Fish and Wildlife Service, p. 115-142.

Schoenen, M. A. A., and Barnes, H. L., 1991, Mechanisms of pyrite and marcasite formation from solution: III Hydrothermal processes: *Geochimica et Cosmochimica Acta*, v. 55, p. 3491-3504.

Schoolcraft, H.R., 1819, A view of the lead mines of Missouri, including some observations on the mineralogy, geology, geography, antiquities, soil, climate, population, and production of Missouri, Arkansas, and other sections of the western country: Publisher unknown, New York, NY, 299 p.

Schramm, M. W., Jr., and Caplan, W. M., 1971, Southeastern Oklahoma and northern Arkansas: *MÉmoire - American Association of Petroleum Geologists*, v. 15, p. 1077-1082.

Schwalb, H. R., and Bodnar, R. J., 1982, Paleozoic geology of the New Madrid area: Washington, DC, U. S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research report 2909, 61 p.

Seeger, C. M., 1989, Structure contour maps on the base of Mississippian strata and the top of Upper Cambrian strata, Springfield 1 degrees X 2 degrees quadrangle, Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 1830-G, 1 sheet.

Seidemann, D. E., Stein, H. J., and Kish, S., 1993, The significance of Rb-Sr glauconite ages, Bonneterre Formation, Missouri; Late Devonian-Early Mississippian brine migration in the Midcontinent; discussion and reply: *Journal of Geology*, v. 100, no. 5, p. 639-645.

Settles, P. L., 1988, The geochemistry of radioactive ground water within the Cambrian-Ordovician system of central Missouri: Master's, University of Missouri at Columbia, Columbia, MO.

Sharp, F. H., and Clifford, K. L., 1973, Recycling milling water in Missouri's New Lead Belt: *Mining Engineering*, v. 25, no. 7, p. 68-72.

Sharp, J. M., Jr., 1978, Energy and momentum transport model of the Ouachita basin and its possible impact on formation of economic mineral deposits: *Economic Geology*, v. 73, p. 1057-1068.

Shelton, K. L., Reader, J. M., Ross, L. M., Viele, G. W., and Seidemann, D. E., 1986, Ba-rich adularia from the Ouachita Mountains, Arkansas; implications for a postcollisional hydrothermal system: *American Mineralogist*, v. 71, no. 7-8, p. 916-923.

Shelton, K. L., and Gregg, J. M., 1987, Chemical reconstruction of basinal fluid pathways, SE Missouri; evidence for a northern source of fluid in the Viburnum Trend lead-zinc district: Abstracts - SEPM Midyear Meeting, v. 4, p. 76-77.

Shelton, K. L., Burstein, I. B., and Hagni, R. D., 1991, Sulfur isotope geochemistry of detailed mineral paragenesis, Viburnum Trend MVT deposits, SE MO, evidence of multiple basement and basinal sulfur sources, *in* Fawcett, J. J., ed., Program with Abstracts - Geological Association of Canada, v. 16, p. 113.

Shelton, K. L., Bauer, R. M., and Gregg, J. M., 1992, Fluid-inclusion studies of regionally extensive epigenetic dolomites, Bonneterre Dolomite (Cambrian), southeast Missouri; evidence of multiple fluids during dolomitization and lead-zinc mineralization; with Supplement Data 92-18: *Geological Society of America Bulletin*, v. 104, no. 6, p. 675-683.

- Shelton, K. L., Haeussler, G. T., Burstein, I. B., Gregg, J. M., and Palmer, J. R., 1992, Dolomitization and fluid interaction in the Reelfoot Rift, southeastern Missouri; geochemical and petrologic studies: Abstracts with Programs - Geological Society of America, v. 24, no 7, p. 57.
- Shelton, K. L., Burstein, I. B., Hagni, R. D., Vierrether, C. B., Grant, S. K., Hennigh, Q. T., Bradley, M. F., and Brandom, R. T., 1993, Comparison of sulfur isotope geochemistry of the West Fork and Fletcher mines, Viburnum Trend MVT Pb-Zn-Cu district, southeast Missouri, *in* The Viburnum Trend, a Second Look, Field Guidebook, 40th Annual meeting: Columbia, MO, Association of Missouri Geologists, p. 6-38.
- Shelton, K. L., Bauer, R. M., and Gregg, J. M., 1993, Fluid-inclusion studies of regionally extensive epigenetic dolomites, Bonneterre Dolomite (Cambrian), southeast Missouri; evidence of multiple fluids during dolomitization and lead-zinc mineralization, Reply: Geological Society of America Bulletin, v. 105, no. 7, p. 972-978.
- Shelton, K. L., Burstein, I. B., and Gregg, J. M., and Hagni, R. D., 1993, In the absence of a regional thermal gradient, does the Viburnum Trend fit into a common regional hydrologic flow model with other Ozark region MVT deposits?: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 81.
- Shelton, K. L., Burstein, I. B., Hagni, R. D., Vierrether, C. D., Grant, S. K., Hennigh, Q. T., Bradley, M. F., and Brandom, R. T., 1995, Sulfur isotope evidence for penetration of MVT fluids into igneous basement rocks, southeast Missouri, USA: Mineralium Deposita, v. 30, no. 5, p. 339-350.
- Siebenthal, C. E., 1905, Structural features of the Joplin District [Missouri]: Economic Geology, v. 1, p. 119-128.
- Siebenthal, C. E., and Smith, W. S. T., 1907, Description of the Joplin District [Missouri-Kansas]: U. S. Geological Survey Geological Atlas Folio 148, 20 p.
- Siebenthal, C. E., 1911, [Lead and zinc], central and southeast Missouri, *in* Mineral Resources of the United States: Reston, VA, U. S. Geological Survey, p. 658-664.
- Siebenthal, C. E., 1914, Spring deposits at Sulphur Springs, Arkansas: Economic Geology, v. 9, p. 758-767.
- Siebenthal, C. E., 1915, Origin of the zinc and lead deposits of the Joplin region, Missouri, Kansas, and Oklahoma: U. S. Geological Survey Bulletin, v. 606, 283 p.
- Siebenthal, C. E., 1927, Contour map of the surface of the beds underlying the Cherokee Shale in a portion of the Picher District, Oklahoma, showing relations of ore bodies to the surface contoured: U. S. Geological Survey Special Map 1925, 4 p.
- Sinha, B. N., 1980, Geochemistry of lead, zinc, copper, cobalt, nickel, cadmium, iron and manganese in surface water and stream sediments, St. Francis River drainage basin, southeastern Missouri: Doctoral, University of Missouri at Rolla, Rolla, MO, 292 p.
- Sivenas, P., and Beales, F. W., 1982, Natural geobatteries associated with sulphide ore deposits; I, Theoretical studies: Journal of Geochemical Exploration, v. 17, no. 2, p. 123-143.
- Sivenas, P., and Beales, F. W., 1982, Natural geobatteries associated with sulphide ore deposits; II, Field studies at the Viburnum Trend, southeast Missouri, USA: Journal of Geochemical Exploration, v. 17, no. 2, p. 145-160.

- Smith, W. S. T., 1903, Lead and zinc deposits of the Joplin District, Missouri-Kansas: U. S. Geological Survey Bulletin 213, p. 197-204.
- Smith, W. S. T., 1905, Water resources of the Joplin District, Missouri-Kansas: U. S. Geological Survey Water-Supply Paper 145, p. 74-83.
- Smith, W. S. T., 1922, Jasperoid of the Joplin District, Missouri, Kansas, and Oklahoma: Geological Society of America Bulletin, v. 33, no. 1, p. 147-148.
- Smith, W. S. T., 1935, Fluid inclusions in sphalerite and galena of the Joplin region [abstracts]: American Mineralogist, v. 20, no. 3, p. 204.
- Smith, W. S. T., 1935, Secondary character of pebble and ruby jack of the Joplin District: Economic Geology, v. 30, no. 6, p. 699-702.
- Smith, W. S. T., 1943, Ore deposits of the Joplin (Tri-State) region: Geological Society of America Bulletin, v. 54, no. 12, p. 1827.
- Smith, K. S., Filipek, L. H., Updegraff, D. M., and Papp, C. S. E., 1988, Distribution of microorganisms and selected metals in mine drainage, stream water, and sediment, *in* Ragone, S. E., ed., U. S. Geological Survey program on toxic waste-ground-water contamination; proceedings of the Second technical meeting, Cape Cod, Massachusetts, October 21-25, 1985: U. S. Geological Survey Open-File Report 86-0481, p. D11-D1520.
- Smith, B. J., and Schumacher, J. G., 1991, Hydrochemical and sediment data for the Old Lead Belt, southeastern Missouri; 1988-89: U. S. Geological Survey Open-File Report 91-0024, 98 p.
- Smith, B. J., and Schumacher, J. G., 1993, Surface-water and sediment quality in the Old Lead Belt, southeastern Missouri 1988-1989: U. S. Geological Survey Water-Resources Investigations Report 93-4012, 92 p.
- Snyder, F. G., and Emery, J. A., 1956, Geology in development and mining, southeast Missouri Lead Belt: Mining Engineering, v. 8, no. 12, p. 1216-1224.
- Snyder, F. G., and Odell, J. W., 1958, Sedimentary breccias in the southeast Missouri lead district: Geological Society of America Bulletin, v. 69, no. 7, p. 889-925.
- Snyder, F. G., and Odell, J. W., 1965, Some aspects of mine geology in the southeast Missouri lead district: Mining Engineering, v. 12, no. 12, p. 1248.
- Snyder, F., and Gerdemann, P. E., 1968, Geology of the southeast Missouri lead district, *in* Ridge, J. D., ed., Ore deposits of the United States, 1933-1967: New York, NY, American Institute of Mining, Metallurgy and Petroleum Engineers, v. 1(Graton-Sales Volume), p. 326-358.
- Snyder, F. G., 1968, Criteria for origin of stratiform ore bodies with application to southeast Missouri, *in* Brown, J. C., ed., Genesis of stratiform lead-zinc-barite-fluorite deposits (Mississippi Valley type deposits)--A symposium, New York, 1966: Lancaster, PA, Society of Economic Geologists Monographs, no. 3, p. 1-12.
- Snyder, F. G., 1968, Geology and mineral deposits, midcontinent United States, *in* Ridge, J. D., ed., Ore deposits of the United States, 1933-1967: New York, NY; American Institute of Mining, Metallurgy and Petroleum Engineers, v. 1(Graton-Sales Volume), p. 257-286.

- Specht, D. J., 1983, A new solubility model and its application to the Mississippi Valley lead deposits: Master's, California State University, Hayward, Hayward, CA, 108 p.
- Spector, A., and Pichette, R. J., 1983, Applications of the aeromagnetic method to lead exploration in SE Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 596-603.
- Spencer, R. J., and Moller, N., 1990, The prediction of mineral solubilities in natural waters: a chemical equilibrium model for the Na-K-Ca-Mg-Cl-SO₂-H₂O system at temperatures below 25°C: *Geochimica et Cosmochimica Acta*, v. 54, no. 3, p. 575-590.
- Spirakis, C. S., and Heyl, A. V., 1989, Possible relationships among volcanic ash, pre-ore diagenetic pyrite, and Mississippi Valley-type deposits of southeast Missouri: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 130.
- Spirakis, C. S., and Heyl, A. V., 1989, Reactions involving organic matter and thiosulfate in precipitating sulfides, disulfides, fluorite, and barite, and in producing the carbonate paragenesis in Mississippi Valley-type ores, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 41.
- Spirakis, C. S., and Heyl, A. V., 1990, Reactions involving organic matter and thiosulfate in precipitating sulfides, disulfides, fluorite, and barite and in producing the carbonate paragenesis in Mississippi Valley-type ores, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; Mineral-resource potential of the Midcontinent; program and abstracts, St. Louis, Missouri, April 11-12, 1989: U. S. Geological Survey Circular 1043, p. 34.
- Spirakis, C. S., and Heyl, A. V., 1993, Organic matter (bitumen and other forms) as the key to localization of Mississippi Valley-type ores, *in* Parnell, J., Kucha, H., and Landais, P., eds., Bitumens in ore deposits: New York, NY, Springer-Verlag, v. 9, p. 381-398.
- Spruill, T. B., 1984, Assessment of water resources in lead-zinc mined areas in Cherokee County, Kansas, and adjacent areas: U. S. Geological Survey Water-Supply Paper 2268, 68 p.
- Spurr, J. E., 1927, Ores of the Joplin region (Picher district [Oklahoma]): *Engineering and Mining Journal*, v. 123, no. 5, p. 199-209.
- Spycher, N. F., and Reed, M. H., 1989, Evolution of a broadlands-type epithermal ore fluid along alternative P-T paths; implications for the transport and deposition of base, precious, and volatile metals: *Economic Geology*, v. 84, no. 2, p. 328-359.
- Stanton, M. R., and Goldhaber, M. B., 1991, Experimental studies of the synthesis of pyrite and marcasite (FeS₂) from 0 degrees -200 degrees C and summary of results: U. S. Geological Survey Open-File Report 91-0310, 27 p.
- Steele, J. H., 1900, The Joplin zinc district of southwestern Missouri: *Colorado School of Mines Bulletin*, v. 1, p. 43-50.
- Steele, K. F., Macdonald, H. C., and Brown, T. W. S., 1975, Trace element composition of stream sediments, an integrating factor for water quality: Fayetteville, AR, University of Arkansas, Water Resources Research Center Monograph, no. 31, 160 p.

- Steele, K. F., and Fay, W. M., 1982, Orientation study of St. Francois Mountain and Decaturville Precambrian areas, Missouri; hydrogeochemical and stream sediment reconnaissance: Springfield, VA, National Technical Information Services Contract, DE-AC09-76SR00C01, 72 p.
- Steele, K. F., 1983, Chemistry of the springs of the Ozark mountains, northwestern Arkansas: Fayetteville, AR, University of Arkansas at Fayetteville, Water Resources Research Center Monograph, no. 98, 50 p.
- Steele, K. F., 1984, Groundwater quality and mineral deposits relationships in the Ozark mountains. Fayetteville, AR; University of Arkansas, Arkansas Water Resources Research Center Monograph, no. 109, 59 p.
- Steele, K. F., and Dilday, T. F., III, 1984, Hydrogeochemical exploration for lead-zinc deposits, Ozark mountains: Abstracts with Programs - Geological Society of America, v. 16, no. 2, p. 114.
- Stein, H. J., 1978, Evidence for intertidal-supratidal facies control of strataform ore at Magmont Mine, Viburnum Trend, southeast Missouri: Master's University of North Carolina at Chapel Hill, Chapel Hill, NC, 49 p.
- Stein, H. J., 1980, Evidence for intertidal-supratidal facies control of stratiform ore at the Magmont Mine, Viburnum Trend, southeast Missouri, *in* Ridge, J. D., ed., Proceedings of the Fifth Quadrennial IAGOD Symposium on the genesis of ore deposits, Lulea, Sweden, 1980: Stuttgart, Federal Republic of Germany, E. Schweizerbart'sche Verlagsbuchhandlung, p. 767-784.
- Stein, H. J., and Kish, S. A., 1985, The timing of ore formation in southeast Missouri; Rb-Sr glauconite dating at the Magmont Mine, Viburnum Trend: *Economic Geology*, v. 80, no. 3, p. 739-753.
- Stein, H. J., and Kish, S. A., 1991, The significance of Rb-Sr glauconite ages, Bonneterre Formation, Missouri; Late Devonian-Early Mississippian brine migration in the midcontinent: *Journal of Geology*, v. 99, no. 3, p. 468-481.
- Sterrett, D. B., 1904, A new type of calcite from the Joplin mining district [Kansas]: *American Journal of Science*, v. 18, no. 18, p. 73-76.
- Stewart, D. R., 1980, Water resources contamination from abandoned zinc-lead mining-milling operations and abatement alternatives: Joplin, MO, Ozark Gateway Council of Governments, 63 p.
- Stoiber, R. E., 1942, Movement of mineralizing solutions in the Picher field, Oklahoma-Kansas: *Geological Society of America Bulletin*, v. 52, no. 12, Part 2, p. 1936.
- Stoiber, R. E., 1944, Movement of mineralizing solutions in the Picher field, Oklahoma - Kansas: *American Mineralogist*, v. 27, no. 3, p. 234.
- Stoiber, R. E., 1950, Movement of mineralizing solutions in the Picher field, Oklahoma-Kansas: *Economic Geology*, v. 41, no. 8, p. 800-812.
- Stormo, S., and Sverjensky, D. A., 1983, Silicate hydrothermal alteration in a Mississippi Valley-type deposit, Viburnum, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 15, no. 6, p. 699.
- Strong, M. B., 1963, Galena; queen of the Tri-State District: *Mineralogist*, v. 31, no. 5, p. 16-18.

- Sumner, J. S., 1976, Principles of induced polarization for geophysical exploration: developments in economic geology 5: New York, NY, Elsevier Scientific Publishing Co., 165 p.
- Sun, Y., Hagni, R. D., and Walker, W. T., 1993, The classification of galena morphology in the No. 7 ore body at the Sweetwater Mine, Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 25, no. 6, p. 276-277.
- Sun, Y., Hagni, R. D., and Walker, W. T., 1993, A study of galena morphology in the east ore body at the Sweetwater Mine, Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 85.
- Sun, Y., Hagni, R. D., and Walker, W. T., 1996, Classification and spatial distribution of galena crystals at the Sweetwater mine, Viburnum Trend, southeast Missouri, USA in Sangster, D. F., ed., Carbonate-Hosted Lead-Zinc Deposits: Auburn, MI, Data Reproductions Corp., Society of Economic Geologists Special Publication, no. 4, p. 587-596.
- Sverjensky, D. A., Rye, D. M., and Doe, D. R., 1979, The lead and sulfur isotopic compositions of galena from a Mississippi Valley-type deposit in the New Lead Belt, southeast Missouri: Economic Geology, v. 74, no. 1, p. 149-153.
- Sverjensky, D. A., and Wassermann, M. D., 1979, Hydrothermal alteration around a Mississippi Valley-type deposit in the Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 10, no. 7, p. 501.
- Sverjensky, D. A., 1980, The origin of a Mississippi Valley-type deposit in the Viburnum Trend, southeast Missouri: Doctoral, Yale University, New Haven, CT, 156 p.
- Sverjensky, D. A., 1980, The origin of a Mississippi Valley-type deposit in the Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 12, no. 7, p. 531.
- Sverjensky, D. A., 1981, The origin of a Mississippi Valley-type deposit in the Viburnum Trend, southeast Missouri: Economic Geology, v. 76, no. 7, p. 1848-1872.
- Sverjensky, D. A., 1983, Chemistry of water-rock interactions in the aquifers of sedimentary carbonate and sandstone-hosted basement sulfide ore deposits: Abstracts with Programs - Geological Society of America, v. 15, no. 6, p. 702-703.
- Sverjensky, D. A., 1984, Oil field brines as ore-forming solutions: Economic Geology, v. 79, no. 1, p. 23-37.
- Sverjensky, D. A., 1986, Genesis of Mississippi Valley-type lead-zinc deposits: Annual Review of Earth and Planetary Sciences, v. 14, p. 177-199.
- Sverjensky, D. A., and Garven, G., 1989, Chemical mass transfer in regional flow systems associated with the formation of Mississippi Valley-type deposits in the Mid-Continent: Abstracts with Programs - Geological Society of America, v. 21, no. 6, p. 9.
- Sweeney, P. H., Harrison, E., and Bradley, M. F., 1975, Magmont Mine (Cominco American Inc. & Dresser Industries Inc.), Viburnum Trend, southeast Missouri, *in* Guidebook of geology and ore deposits selected mines, Viburnum Trend, MO: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, Geological Survey, p. 20-29.
- Sweeney, P. H., Harrison, E. D., and Bradley, M. F., 1977, Geology of the Magmont Mine, Viburnum Trend, southeast Missouri: Economic Geology, v. 72, no. 3, p. 365-371.

Sweeney, P. H., Harrison, E. D., and Bradley, M. F., 1986, Geology of the Magmont Mine, Viburnum Trend, southeast Missouri, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al., eds., Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 85-93.

Symons, D. T. A., and Sangster, D. F., 1991, Paleomagnetic age of the central Missouri barite deposits and its genetic implications: *Economic Geology*, v. 86, no. 1, p. 1-12.

Symons, D. T. A., and Sangster, D. F., 1991, Paleomagnetic methods for dating the genesis of Mississippi Valley-type deposits, *in* Fontebote, L., and Boni, M., eds., Sediment hosted Zn-Pb ores: New York, NY, Springer-Verlag, p. 42-58.

Tarr, W. A., 1934, The Miami-Picher zinc-lead district: *Economic Geology*, v. 28, no. 5, p. 463-479.

Tarr, W. A., 1936, The origin of the southeast Missouri lead deposits: *Economic Geology*, v. 31, p. 712-736, 832-866.

Taylor, M., 1983, Estimation of inclusion fluid composition in Mississippi Valley-type mineralization from low-temperature phase behavior: Abstracts with Programs - Geological Society of America, v. 15, no. 6, p. 704.

Tedesco, S. A., 1994, The application of petroleum surface geochemical methods to detecting Mississippi Valley and Carlin type ore bodies: AAPG annual convention, p. 269-270.

Thacker, J. L., and Anderson, K. H., 1977, The geologic setting of the southeast Missouri lead district; regional geologic history, structure and stratigraphy: *Economic Geology*, v. 72, no. 3, p. 339-348.

Thacker, J. L., and Anderson, K. H., 1979, Preliminary carbonate lithofacies maps of the Cambrian Davis formation Rolla 1° x 2° quadrangle, Missouri 1:250,000: Rolla, MO, Missouri Department of Natural resources, Division of Geological and Land Survey, 2 sheets.

Thompson, W. E., Hoye, R. L., and Greber, J. S., 1984, Evaluation of management practices for mine solid waste storage, disposal, *in* Proceedings of the Seventh National Ground Water Quality Symposium, Las Vegas, NV, 1984: National Water Well Association, p. 224-234.

Tibbs, N. H., 1969, Background concentrations of copper, lead, and zinc in streams of the "New Lead Belt", (southeast portion of Missouri from Ellington, to Viburnum, Missouri): Master's, University of Missouri at Rolla, Rolla, MO, 77 p.

Tobin, R. C., 1991, Diagenesis, thermal maturation and burial history of the Upper Cambrian Bonneterre dolomite, southeastern Missouri; an interpretation of thermal history from petrographic and fluid inclusion evidence: *Organic Geochemistry*, v. 17, no. 2, p. 143-151.

Tourtlot, H. A., Goldhaber, M. B., and Hudson, M. R., 1988, Relationship between filled-sink and Mississippi Valley-type mineralization in Missouri: Abstracts with Programs - Geological Society of America, v. 20, no. 7, p. 140.

Toweh, S. H., 1978, Landsat image analysis of linears and lineaments in the Tri-State district, Missouri-Oklahoma-Kansas: Master's, University of Missouri at Rolla, Rolla, MO.

Trancynger, T. C., 1975, Mineral paragenesis of the Magmont ores, Viburnum Trend, southeast Missouri: Master's, University of Missouri at Rolla, Rolla, MO.

Trapp, J. S., 1972, Trend surface analysis as an aid in exploration for Mississippi Valley type ore deposits (Missouri): Doctoral, University of Missouri at Rolla, Rolla, MO, 171 p.

Trapp, J. S., 1973, Trend surface analysis as an aid in exploration for Mississippi Valley type ore deposits, Dissertation Abstracts International, Section B: The Sciences and Engineering, v. 34, no. 1, p. 279b.

Trapp, J. S., and Rockaway, J. D., 1976, Trend-surface analysis as an aid in exploration for Mississippi Valley-type ore deposits: International Geological Congress, Abstracts--Congres Geologique Internationale, Resumes, v. 25, no. 3, p. 916-917.

Trapp, J. S., and Rockaway, J. D., 1977, Trend-surface analysis as an aid in exploration for Mississippi Valley-type ore deposits, *in* Davis, J. C., ed.: Journal of the International Association for Mathematical Geology, v. 9, no. 4, p. 393-408.

Trial, L., and Robinson, W. E., 1981, Water quality of the southeast Ozark mining area of Missouri: Jefferson City, MO, Missouri Department of Conservation unpublished report, 11 p.

Trial, L., 1983, Water quality of the southeast Ozark mining area of Missouri, 1981: Jefferson City, MO, Missouri Department of Conservation unpublished report, 9 p.

U. S. Department of Agriculture, Forest Service, and U. S. Department of the Interior, Bureau of Land Management, 1987, Draft environmental impact statement, hardrock mineral leasing Mark Twain National Forest, Missouri: Rolla, MO, U. S. Department of Agriculture, 129 p. with appendices.

U. S. Department of the Interior, 1932, Zinc and lead deposits of northern Arkansas: Memorandum for the press P. N. 67437, 4 p.

U. S. Environmental Protection Agency, 1978, Big River survey southeastern Missouri, October 27, 1978; Region VII Surveillance and Analysis Division: Washington, DC, U. S. Environmental Protection Agency unpublished report, 21 p.

U. S. Geological Survey, 1944, Maps showing structural geology and dolomitized areas in part of the Picher zinc-lead field, Oklahoma and Kansas, 1:6,000: U. S. Geological Survey Special Map 1944.

U. S. Geological Survey, and Missouri Division of Geology and Land Survey, 1967, Mineral and water resources of Missouri, U. S. 90th Congress, 1st session, Washington, DC; U. S. Government, Senate Document 19, 399 p.
Also Missouri Department of Natural Resources, Division of Geology and Land Survey, v. XLIII, 2nd. ser., 399 p.

U. S. Geological Survey, 1976, Land use and land cover and associated maps for Joplin, MO: U. S. Geological Survey Open-File Report 76-0107.

U. S. Geological Survey, 1995, Stream water and sediment quality in the Old Lead Belt, Missouri: U. S. Geological Survey Fact Sheet 95-214, 1 p.

Underwood, R., 1968, Geology of the Miami-Picher lead-zinc field, northeastern Oklahoma and southeastern Kansas: Oklahoma Geology Notes, v. 28, no. 1, p. 11.

Union Carbide Corporation, Oak Ridge Gaseous Diffusion Plant 1979, National Uranium Resource Evaluation Program; Hydrogeochemical and stream sediment reconnaissance basic data for Joplin NTMS quadrangle, Kansas, Missouri, Uranium Resource Evaluation Project: Oak Ridge, TN, Union Carbide Corporation Monograph, 34 p.

Vaasjoki, M., and Gulson, B. L., 1986, Carbonate-hosted base metal deposits; lead isotope data bearing on their genesis and exploration: *Economic Geology*, v. 81, no. 1, p. 156-172.

VanDoren, S. R., Hall, M. S., Frazier, L. B., and Leach F. R., 1984, Rapid-cell culture assay of water quality: *Bulletin of Environmental Contamination and Toxicology*, v. 32, no. 2, p. 220-226.

VanNostrand, R. G., and Cook, K. L., 1966, Interpretation of resistivity data: *Economic Geology Professional Paper* 499, 310 p.

Verma, A. R., 1959, A phase-contrast microscopic study of the surface structure of blende crystals: *Mineralogical Magazine*, v. 31, no. 233, p. 136-144.

Viele, G. W., 1979, Geologic map and cross section, eastern Ouachita Mountains, Arkansas: *Geological Society of America Bulletin*, v. 90, no. 12, p. 1096-1099.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of drill core from Precambrian igneous rocks of the St. Francois igneous province in southeast Missouri: U. S. Geological Survey Open-File Report 78-0402, 12 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 1: U. S. Geological Survey Open-File Report 78-0470-J, 24 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 5: U. S. Geological Survey Open-File Report 78-0470-H, 22 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 6: U. S. Geological Survey Open-File Report 78-0470-C, 18 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 7: U. S. Geological Survey Open-File Report 78-0470-I, 18 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 13: U. S. Geological Survey Open-File Report 78-0470-M, 18 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 14 and 15: U. S. Geological Survey Open-File 78-0470-N, 21 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 16: U. S. Geological Survey Open-File Report 78-0470-O, 20 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 17: U. S. Geological Survey Open-File Report 78-0470-P, 27 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1978, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 25: U. S. Geological Survey Open-File Report 78-0470-S, 16 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 28 and 19: U. S. Geological Survey Open-File Report 79-0364-A, 23 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 32 and 33: U. S. Geological Survey Open-File 78-0364-C, 23 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 36, 37, and 38: 79-0364-E, 23 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 39 and 40: U. S. Geological Survey Open-File 79-0364-F, 19 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 41 and 42: U. S. Geological Survey Open-File Report 79-0364-G, 15 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 50 and 51: U. S. Geological Survey Open-File Report 79-0364-L, 23 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill hole No. 52 and 54: U. S. Geological Survey Open-File 79-0364-M, 25 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 55 and 56: U. S. Geological Survey Open-File Report 79-1558, 23 p.

Viets, J. G., Mosier, E. L., and McDanal, S. K., 1979, Spectrographic and chemical analyses of whole-rock and insoluble-residue samples, Rolla 1• x 2• quadrangle, Missouri: Drill holes No. 57, 58, 59, and 60: U. S. Geological Survey Open-File Report 79-1559, 21 p.

Viets, J. G., Mosier, E. L., and Erickson, M. S., 1983, Geochemical variations of major, minor, and trace elements in samples of the Bonneterre Formation from drill holes transecting the Viburnum Trend Pb-Zn district of southeast Missouri, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 174-186.

Viets, J. G., Rowan, L. P., and Leach, D. L., 1984, Composition of fluids extracted from sphalerite, galena, and dolomite in Mississippi Valley-type deposits of the Mid-Continent; implications for the origin of the fluid: Abstracts with Programs - Geological Society of America, v. 16, no. 6, p. 682.

Viets, J. G., Leach, D. L., Meier, A. L., Rosde, E. L., and Rowan, E. L., 1985, Application of induction coupled plasma mass spectrometry to the analysis of fluids extracted from Mississippi Valley-type deposits of the Midcontinent, USA: Abstracts with Programs - Geological Society of America, v. 17, no. 7, p. 740.

Viets, J. G., and Leach, D. L., 1988, Ore deposition in the Viburnum Trend of southeast Missouri by two geochemically distinct fluids: Abstracts with Programs - Geological Society of America, v. 20, no. 7, p. 39.

Viets, J. G., Leach, D. L., and Mosier, E. L., 1989, Two distinct ore fluids in the Viburnum Trend; genetic implications. Mississippi Valley-type mineralization of the Viburnum Trend, Missouri, *in* Hagni, R. D., and Coveney, R. M., Jr., eds., Guidebook series of the Society of Economic Geologists: Lancaster, PA, Society of Economic Geologists, v. 5, p. 155-165.

Viets, J. G., and Leach, D. L., 1990, Genetic implications of regional and temporal trends in ore fluid geochemistry of Mississippi Valley-type deposits in the Ozark region: *Economic Geology*, v. 85, no. 4, p. 842-861.

Viets, J. G., and Leach, D. L., 1990, Genetic implications of regional and temporal trends in ore fluid geochemistry of Mississippi Valley-type deposits of the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Open-File Report 89-0169, p. 44-45.

Viets, J. G., and Leach, D. L., 1990, Genetic implications of regional and temporal trends in ore fluid geochemistry of Mississippi Valley-type deposits of the Ozark region, *in* Pratt, W. P., and Goldhaber, M. B., eds., U. S. Geological Survey-Missouri Geological Survey symposium; mineral-resource potential of the Midcontinent; program and abstracts: U. S. Geological Survey Circular 1043, p. 36-37.

Viets, J. G., Hopkins, R. T., and Miller, B. M., 1992, Variations in minor and trace metals in sphalerite from Mississippi Valley-type deposits of the Ozark region; genetic implications: *Economic Geology*, v. 87, no. 7, p. 1897-1905.

Vineyard, J. D., 1973, Minerals, memories and murals: *Missouri Mineral Industry News*, v. 13, no. 9, p. 157-163.

Vineyard, J. D., and Feder, G. L., 1974, Springs of Missouri *with sections on* Fauna of Missouri springs by W. L. Pflieger and Flora of Missouri Ozark Springs by R. G. Lipscomb: Rolla, MO, Missouri Department of Natural Resources, Division of Geology and Land Survey, Water Resources Report, no. 29, 266 p.

Vineyard, J. D., ed., 1977, An issue devoted to the Viburnum Trend, southeast Missouri: *Economic Geology*, v. 72, no. 3, p. 337-490.

Von, D. W. C., Jr., 1974, An investigation of the vertical distribution of sulfur forms in surface mine spoils, Henry County, Missouri: Master's, University of Missouri at Rolla, Rolla, MO.

Voss, R. L., and Hagni, R. D., 1984, A cathodoluminescent microstratigraphy for sparry dolomite from the Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 16, no. 6, p. 683.

Voss, R. L., and Hagni, R. D., 1984, Preliminary observations on a cathodoluminescent microstratigraphy for the sparry dolomite from the Viburnum Trend, southeast Missouri, *in* Jone, J. R., ed.: Transactions of the Missouri Academy of Science, p. 107.

Voss, R. L., and Hagni, R. D., 1985, The application of cathodoluminescence microscopy to the study of sparry dolomite from the Viburnum Trend, southeast Missouri, *in* Hausen, D. M., and Kopp, O. C., eds., Mineralogy; applications to the minerals industry; proceedings of the Paul F. Kerr memorial symposium: New York, NY: American Institute of Mining, Metallurgy and Petroleum Engineers, Society of Mining Engineers, p. 51-68.

Voss, R. L., Hagni, R. D., and Gregg, J. M., 1987, Sequential deposition of zoned dolomite and its relationship to sulfide mineral deposition in the Viburnum Trend, southeast Missouri: Abstracts - SEPM Midyear Meeting, v. 4, p. 87.

Voss, R. L., Hagni, R. D., and Gregg, J. M., 1989, Sequential deposition of zoned dolomite and its relationship to sulfide mineral paragenetic sequence in the Viburnum Trend, southeast Missouri: Carbonates and Evaporites, v. 4, p. 195-209.

Wagner, R. J., 1969, Geology and zonation of the southeast Missouri barite district: Economic Geology, v. 64, no. 8, p. 938-939.

Wagner, R. J., 1970, Geology and zonation of the southeast Missouri barite district (abs): Mining Engineering, v. 22, no. 1, p. 41.

Wagner, G. H., and Steele, K. F., 1974, Extractive zinc in the sediments of the Buffalo River, northern Arkansas: Abstracts with Programs - Geological Society of America, v. 6, no. 2, p. 128.

Wagner, G. H., 1974, Trace elements in the sediments of the Buffalo River, Arkansas: Master's, University of Arkansas, Fayetteville, AR, 86 p.

Wagner, R. J., 1986, Geology, zoning, and controls of mineralization in the southeast Missouri barite district, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al., eds., Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 119-122.

Walker, W. T., Jr., 1976, Petrology and mineralization of the C-1 Zone, Sweetwater Mine, Viburnum Trend, southeast Missouri: Master's, University of Missouri at Rolla, Rolla, MO.

Walker, W. T., and Hagni, R. D., 1978, Petrology and mineralization of a portion of the Bonneterre Formation, Ozark Lead Company mine, Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 9, p. 662-663.

Walker, K. M., 1983, Digital spatial data handling techniques applied to the development of quantitative geologic models, *in* Proceedings of the international symposium on remote sensing of environment, Ann Arbor, MI, 1983: Environmental Research Institute of Michigan, v. 17, p. 827-838.

Walker, W. B., 1989, Geology of the Sweetwater Mine, Viburnum Trend, southeast Missouri, *in* Hagni, R. D., and Coveney, R. M. R., eds., Mississippi Valley-type mineralization of the Viburnum Trend, Missouri; Guidebook series of the Society of Economic Geologists: Lancaster, PA, Society of Economic Geologists, v. 5, p. 111-131.

Walker, W. T., 1993, Alteration and associated faulting, Sweetwater Mine, Viburnum Trend, southeast Missouri: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 88.

- Wallace, M. H., 1942, Geochemical investigations in the Tri-State zinc and lead mining district: Master's, University of Kansas, Lawrence, KS, 72 p.
- Warner, D. L., 1974, Effect Of mining operations on groundwater levels In the New Lead Belt, Missouri: Columbia, MO, Missouri Water Resources Research Center completion report, no. A-060, 85 p.
- Warner, D. L., 1977, Alternatives for control of drainage for inactive mines and mine waste sites, Joplin area, Missouri: Joplin, MO, Ozark Gateway Council of Governments, 55 p.
- Wasserstein, B., 1951, Precision lattice measurements of galena: *American Mineralogist*, v. 36, no. 1-2, p. 102-115.
- Wei, C. S., 1976, Fluid inclusion of geothermometry of Tri-State sphalerite: Master's, University of Missouri at Rolla, Rolla, MO, 68 p.
- Weidman, S., 1925, Tri-State lead and zinc district: *Bureau Monthly*, v. 1, no. 1, p. 19.
- Weidman, S., 1933, The Miami-Picher zinc-lead district, Oklahoma: *Oklahoma Geological Survey Bulletin*, v. 43, no. 1, p. 177.
- Weidman, S., 1935, Tourmaline in jasperoid of the Miami-Picher zinc-lead district: *Proceedings of the Geological Society of America*, v. 1933, p. 117-118.
- Weller, S., and Clair, S. St., 1928, The geology of Ste. Genevieve County, Missouri: *Missouri Bureau of Geology and Mines*, v. 22, p. 248-251.
- Wharton, H. M., Martin, J. A., Rueff, A. W., Robertson, C. E., Wells, J. S., and Kisvarsanyi, E. B., 1969, Missouri minerals--resources, production, and forecasts: Rolla, MO, Missouri Department of Natural Resources, Division of Geology and Land Survey Special Publication, v. 1, p. 303.
- Wharton, H. M., 1975, Introduction to the southeast Missouri lead district, *in* Guidebook of geology and ore deposits selected mines, Viburnum Trend, MO: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, Geological Survey, p. 3-14.
- Wharton, H. M., Larsen, K. G., Sweeney, P. H., Harrison, E., Bradley, M. F., Davis, J. H., Rogers, R. K., Brown, W. J., Paarlberg, N. L., Evans, L. L., Mouat, M. M., and Clendenin, C. W. R., 1975, Guidebook to the geology of ore deposits of selected mines in the Viburnum Trend, Missouri: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey Report of Investigations, v. 58, 56 p.
- Wharton, H. M., 1986, Washington County or southeast Missouri barite district, *in* Hagni, R. D., Bradley, M. F., Dunn, R. G. R., et al., eds., Sediment-hosted Pb-Zn-Ba deposits of the Midcontinent; pre-meeting field trip No. 1: Rolla, MO, Missouri Department of Natural Resources, Division of Geological and Land Survey, p. 109-117.
- Wharton, H. M., 1987, Mines, prospects, and occurrences of metallic minerals and barite, Springfield 1 degrees by 2 degrees quadrangle, Missouri: U. S. Geological Survey Miscellaneous Field Studies Map 1830-C, 2 sheets.
- Wharton, H. M., 1991, Mines, prospects, and occurrences of metallic minerals and barite, *in* Martin, J. A., and Pratt, W. P., eds., Geology and mineral-resource assessment of the Springfield

- 1 degrees x 2 degrees quadrangle, Missouri, as appraised in September 1985: U. S. Geological Survey Bulletin 1942, p. 81-86.
- Wheeler, H. A., 1904, Notes on the source of the southeast Missouri lead: Engineering and Mining Journal, v. 77, p. 517-518.
- Wheeler, H. A., 1910, Geology of southeast Missouri lead district: Engineering and Mining Journal, v. 89, p. 465-466.
- Whelan, G. E., 1983, The distribution and accumulation of lead and cadmium within a lotic benthic community: Master's, University of Missouri at Columbia, Columbia, MO, 157 p.
- White, D. E., 1958, Liquid inclusions in sulfides from Tri-State: Economic Geology, v. 53, no. 7, p. 929.
- White, D. E., 1968, Environment of generation of some base-metal deposits: Economic Geology, v. 63, p. 301-335.
- Williams, C. F., 1926, Ore deposition in the Tri-State District: Engineering and Mining Journal - Press, v. 121, no. 22, p. 893.
- Williams, F. N., 1996, Three-dimensional subsurface characterization using geoscientific information systems in the Springfield-Harrison 1:250,000 map quadrangles, Missouri and Arkansas: Master's, Colorado School of Mines, Golden, CO, 200 p.
- Wisniowiecki, M. J., Vander Voo, R., McCabe, C., and Kelley, W. C., 1983, A Pennsylvanian paleomagnetic pole from the mineralized Late Cambrian Bonneterre Formation, southeast Missouri: Journal of Geophysical Research, v. 88, no. 8, p. 6540-6548.
- Wittich, L. L., 1910, Developing a new ore horizon: Mines and Minerals (Scranton), v. 30, p. 637-639.
- Wixson, B., and Bolter, E., 1969, Missouri stream studies relating to the 'New Lead Belt', in Mining Environmental Conference, Rolla, MO, 1969, Proceedings: University of Missouri-Rolla, p. 9-20.
- Wixson, B. G., Bolter, E. A., Tibbs, N. H., and Handler, A. R., 1969, Pollution from mines in the 'New Lead Belt' of south eastern Missouri: Papers presented at the 24th annual Purdue Industrial Waste Conference, Lafayette, IN, 1969, Proceedings: Purdue University Engineering Extension Series 135, p. 632-643.
- Wixson, B. G., 1970, Advanced analytical methods for investigating aquatic environments, in Symposium on hydrobiology, 'bioresources of shallow water environments', Miami Beach, FL, 1970: University of Missouri at Rolla, p. 357-0364.
- Wixson, B. G., Bolter, E. A., Tibbs, N. H., and Handler, A. R., 1970, Pollution from mines in the "New Lead Belt" of southeast Missouri, in Wixson, B. G., and Chen, H. W., eds.: Columbia, MO, Missouri Water Resources Research Center.
- Wixson, B. G., and Chen, H. W., 1970, Stream pollution in the 'New Lead Belt' of SE Missouri: Columbia, MO, Missouri Water Resources Research Center completion report, no. A-021, 17 p.
- Wixson, B. G., Bolter, E., Jennett, J. C., and Purushothaman, K., 1971, Environmental impact of trace metals on the New Lead Belt of SE Missouri, in American Geophysical Union fall national meeting, San Francisco, CA, 1971, Proceedings: University of Missouri at Rolla, p. 12.

Wixson, B. G., and Bolter, E., 1972, Evaluations of stream pollution and trace substances in the New Lead belt of Missouri, *in* Hemphill, D. D., eds., Trace Substances in Environmental Health, Annual Conference, 5th, Columbia, MO, 1972, Proceedings: University of Missouri at Columbia, p. 143-152.

Wixson, B. G., Bolter, E., Gale, N. L., Jennett, J. C., and Purushothaman, K., 1972, The lead industry as a source of trace metals in the environment, *in* Environmental resources conference on cycling and control of metals, Columbus, OH, 1972, Proceedings: University of Missouri at Rolla, p. 23.

Wixson, B. G., and Tranter, W. H., 1972, An investigation of environmental pollution by lead and other heavy metals from industrial development in southeastern Missouri, *in* National Telecommunications Conference, Houston, TX, 1972, Proceedings: University of Missouri at Rolla, p. 13.

Wixson, B. G., and Anderson, M. N., 1973, Missouri Lead Belt project, *in* National Science Foundation RANN Symposium, Washington, DC, 1973, Proceedings: University of Missouri at Rolla, p. 11.

Wixson, B. G., 1974, An interdisciplinary investigation of environmental pollution by lead and other heavy metals from industrial development in the New Lead Belt of southeastern Missouri, *in* Interim Report to the National Science Foundation Research Applied to National Needs (RANN) for the period 1 June 1971 to 1 June 1972: Rolla, MO, University of Missouri at Rolla, p. 318.

Wixson, B. G., 1975, Development of a cooperative programme for environmental protection between the lead-mining industry, Government and the University of Missouri, *in* Jones, M. J., ed., Minerals and the environment: London, United Kingdom, Institute for Mining and Metallurgy, p. 3-11.

Wixson, R. G., 1975, Environmental pollution in the New Lead Belt, (Rann Utilization Experience, Case Study No. 2): Arlington, VA, National Science Foundation report, NSF-RA-G-75-030, 23p.

Wixson, B. G., 1977, The Missouri lead study, in an interdisciplinary investigation of environmental pollution by lead and other heavy metals form industrial development in the New Lead Belt of southeastern Missouri: Rolla, MO, University of Missouri at Rolla progress final report, no. 1, 108 p.

Wixson, B. G., Gale, N. L., and Downey, K., 1977, Control of environmental contamination by cadmium, lead and zinc near New Lead Belt smelters, *in* Hemphill, D. D., ed., Trace elements in environmental health, 11th, Columbia, MO, 1977, Proceedings: University of Missouri at Columbia, p. 455-461.

Wixson, B. G., 1978, Biogeochemical cycling of lead in the New Lead Belt of Missouri, *in* The Biogeochemistry of Lead in the Environment: Elsevier/North Holland Biomedical Press, p. 119-134.

Wixson, B. G., Gale, N. L., Elliott, L. G., and Davies, B. E., 1982, Influence of tailings from the Old Lead Belt of Missouri on sediments of the Big River, *in* Hemphill, D. D. ,ed., Trace elements in environmental health, 16th, Columbia, MO, 1982, Proceedings: University of Missouri at Columbia, p. 3-11.

Wixson, B. G., Gale, N. L., and Davies, B. E., 1983, A study on the possible use of chat and tailings from the Old Lead Belt of Missouri for agriculture limestone: Jefferson City, MO, Missouri Department of Natural Resources, 107 p.

Woody, R. E., and Gregg, J. M., 1993, Relationships between texture and petrophysical properties of Cambro-Ordovician dolomites from southeastern Missouri: Abstracts with Programs - Geological Society of America, v. 25, no. 3, p. 91.

Woolverton, D. G., 1975, Cu-Fe-S mineralization of the Sweetwater mine, Reynolds County Missouri: Master's, University of Missouri at Columbia, Columbia, MO, 71 p.

Wright, C. A., 1913, Mining and treatment of lead and zinc ores in the Joplin District, Missouri; a preliminary report: U. S. Bureau of Mines, Technical publication, v. 41, p. 43.

Wu, Y., and Beales, F., 1982, A reconnaissance study by paleomagnetic methods of the age of mineralization along the Viburnum Trend, southeast Missouri: Economic Geology, v. 76, no. 7, p. 1879-1894.

Wu, Y., 1996, Silver distribution in iron sulfides at the Buick and Brushy Creek mines, Viburnum Trend, southeast Missouri: Master's, University of Missouri at Rolla, Rolla, MO.

Wu, Y., Hagni, R. D., and Paarlberg, N., 1996, Silver distribution in iron sulfides at the Buick and Brushy Creek mines, Viburnum Trend, southeast Missouri, *in* Sangster, D. F., ed., Carbonate-Hosted Lead-Zinc Deposits: Auburn, MI, Data Reproductions Corp., Society of Economic Geologists Special Publication, no. 4, p. 577-586.

Zachritz, W. H., 1978, The effects of the "Old Lead Belt" Mining district of the southeastern Missouri on the water quality and sediment of the Big River basin: Master's, University of Missouri at Rolla, Rolla, MO.

Zartman, R. E., and Doe, B. R., 1981, Plumbotectonics; the model; Evolution of the upper mantle, *in* Zartman, R. E., and Taylor, S. R., eds.: Tectonophysics, v. 75, no. 1-2, p. 135-162.

Zimmermann, R. A., and Amstutz, G. C., 1983, Barite, its place and role in Mississippi Valley-type deposits, *in* Kisvarsanyi, G., Grant, S. K., Pratt, W. P., and Koenig, J. W., eds., International conference on Mississippi Valley type lead-zinc deposits; proceedings volume: Rolla, MO, University of Missouri at Rolla, p. 279-288.

Zimmermann, R. A., and Spreng, A. C., 1985, Sedimentary and diagenetic features in the sulfide-bearing sedimentary dikes and strata of Lower Ordovician dolomites, Decaturville, Missouri, USA *in* Wauschkuhn, A., Kluth, C., and Zimmermann, R. A., eds., Syngeneses and epigenesis in the formation of mineral deposits: Heidelberg, Federal Republic of Germany; Springer-Verlag, p. 350-372.