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SELECTED BIBLIOGRAPHY OF OIL SHALE

October 2, 1961

May 8, 1884 Distillation of shale, Young, Engineering (London).

Nov. 15, 1895. The shale oil industry. The article describes the oil shale, methods of extracting the oil and its accompanying products. It employs 2,500,000# capital. Engineering (London).

March 12, 1896: New South Wales. Kerosene shale in the New South Wales - the Genowlan mine. General description with production analysis. Australian Mining Standard, Sidney, Australia.

Oct. 1, 1896. The bituminous shales of New South Wales. Deals with the so-called bituminous shale, which contains volatile, hydrocarbon in large quantities, variously known as torbanite, boghead mineral, joadja mineral, petroleum oil, cannel coal, and shale, and is only now procurable in New South Wales. Australian Mining Standard.

Dec. 25, 1896. The shale oil industry in Scotland. A description of the Young-Beilby furnaces for distilling oil and paraffine from shale. Weekly, La Revue Technique, Paris.

Sept. 3, 1898. A bituminous rock deposit in Santa Barbara, California. A. S. Cooper. Illustrated description showing why it is difficult to locate with any great certainty a subterranean reservoir of petroleum. Engineering and Mining Journal, Weekly, New York.

Dec. 30, 1899. The bituminous schist industry in France. A comparison of the French and Scotch industries, calling attention to the superior output of mineral oil, paraffine, etc. obtained by the Scottish process of distillation. Moniteur Industrial.

August 1900. The oil bearing shales of the coast of Brazil. John C. Branner. Describes the material and width of the belt at various places, exposures, etc. Illustrated. The Transactions, American Institute of Mining Engineers. New York. (a monthly publication)

June 1901 Prospecting for oil in Colorado. Arthur Lakes. Considers the signs that may indicate oil, and the geological formations which are favorable. Mines and Mining.

June 17, 1901. New Zealand Coal and Oil Company. Brief account of how the shale works at Orepuki are to be carried on. Weekly. New Zealand Mines Record, Wellington, New Zealand.

October 1901. Prospecting for oil in Colorado. Prof. Arthur Lakes. An illustrated description of the oil springs, the Archuleta oil field, the San Juan River anticline and Navajo Basin. Mines and Mining.

November 1901 — Oil springs of the Rio Blanco County, Colorado. Arthur Lakes. Illustrated description of the Whisky Creek Oil Region, with analyses of the oil. Weekly. Mines and Mining.

January 1902 — Oil in Colorado. Arthur Lakes discusses geology and deposits, and various horizons in which signs of oil have been found. Mines and Mining.

Jan. 30, 1902 — The Colorado oil industry. A report of conditions in this state, processes and products, their use, etc. with brief notices of recently incorporated companies. Mining Report.

March 29, 1902 — The Boulder oil fields. Information concerning this field in Colorado, which is at present causing much excitement. Engineer and Mining Journal.

April 1902 — The western oil field of Mesa and Rio Blanco Counties, Colorado. Arthur Lakes. Illustrates and describes a region geographically favorable for oil. Mines and Mining.

May 1902 — Prospecting for oil in the region of the cliff dwellers of southwestern Colorado. Arthur Lakes. Describes the formations and discusses the possibilities of it containing oil. Illustrated. Mines and Mining.

August 1902 — Oil in the Bookcliff region of Colorado. A description of the formations near Rifle Creek, showing oil signs. Mines and Mining.

Feb. 7, 1903 — The Boulder oil field, Colorado. J. E. Kirkbride. A brief account of this district, the wells, the yield, etc. Engineering and Mining Journal.

April 1903 — The present oil situation in Colorado. Prof. Arthur Lakes. A review of the histories of the several regions, and the discoveries which have been made. Mines and Mining.

July 14, 1904 — Kerosene Shale in Australia. John Plummer. Information concerning these deposits, the products derivable, etc. Illustrated. Engineering and Mining Journal.

April 30, 1908 — Prospecting in the oil fields of western Colorado. Arthur Lakes. Describes 5 oil bearing zones west of the Continental Divide. Map included. Mining Science. No. 92081.

Oct - Nov 1908 — The shale oil industry of Scotland. D. R. Steuart. An account of the nature, extent, and origin of the industry; its history, geology, and methods. Illustrated. 7,000 words. Economic Geology. South Bethlehem, Pa.

July 24, 1909 — Economic Possibilities of American Oil Shales. Charles Baskerville. Information concerning this industry both abroad and in America. The by-products often pay entire expense. Illustrated. Engineering and Mining Journal. Serial 1st part, No. 6639.

August 6, 1909 — Oil Shales in Scotland. R. Weed. A brief discussion of the oil shale works and mines known as Broxburn, and methods. 1500 words. Iron and Coal Trade Review.

1910 — Joint Report on the Bituminous, or oil shales of New Brunswick and Nova Scotia, also on the Oil Shale Industry of Scotland. Part 1, Economics. Part 2, Geology. R. W. Ells. Illustrated, contains 36,000 words. Western Canadian Dept. of Mines. Publication No. 55 and No. 1107.

April 1910 — The Commercial Value of Oil Shales of Eastern Canada, Based on Their Contents, Analysis, and Crude Oil and Ammonium Sulphate. Dr. R. W. Ells. This article was read before the Mining Society of Nova Scotia. Contains 12,500 words. Published in Industrial Advocate. Published monthly in Halifax, Nova Scotia.

August 6, 1910 — The Acquisition of Public Oil Lands. William Forstner. Discusses the law and regulations formerly affecting these lands, and the new law recently passed. 2,000 words. Mining and Scientific Press. Weekly. San Francisco, California.

Aug. 27, 1910 — Oil Shale Deposits, Blue Mountains, N.S.W. H. L. Jene. Describes shale in Australia similar to the Scotland deposits and the system of working. 1,500 words. Engineering and Mining Journal.

April 18, 1912 — The Oil Shale Industry. Extracts from report on 50 tons of the material sent to Scotland for testing. 2,000 words. Canadian Engineer.

Aug. 29, 1913 — The Scottish Shale Oil Industry. A. E. von Groeling. Article contains a general discussion of a Scottish refinery, and shale retorts of old and modern types and their workings. The article is illustrated, contains 4,000 words. The Engineer of London, Serial, of first part.

Feb. 14, 1914 — The Tertiary Oil Shales of the Narrows Port, Port Curtis District. Lionel C. Ball. Information concerning the oil shales and fire-clays of that district. Includes a map. 3,500 words. Queensland Government Mining Journal.

March 6, 1914 — Oil Shale Mining. J. F. Kellock Brown. This article was read before the western branch of the Scottish Federal Institute of Mining Students. Discusses the subject as the investor ought to see and understand it, considering the geology, exploration, mining, chemistry, manufacture, etc. 5,000 words. Iron and Coal Trade Review.

June 1914 The placer law as applied to petroleum. Max L. Ball. Article summarized present law, its provisions, origin, development, and effects, , presenting the essentials of the existing situation. 9,000 words. Bulletin of the American Institute of Mining Engineers.

Jan. 1916 Lowmead No. 1 bore, in the tertiary oil shales of Battle Creek. Lionel C. Ball. Illustrated. 4,000 words. Queensland Government Mining Journal. Results of boring.

March 1916 Fuel oil from shale. Dr. A. Selwyn-Brown. 4,000 words. The Engineering Magazine, Contains an outline of the process; possibility of North American development.

Dec. 9, 1916-The bituminous-shale industry in northwestern Colorado. G.R.DeBeque. Illustrated. 1,000 words. Engineering & Mining Journal. The area is about 20 by 50 miles in extent. Yield per ton given.

Dec.15,1916 The oil shale industry. Lionel C. Ball. Contains 12,500 words. Queensland Government Mining Journal. Report contains an introduction to report; nature, distribution, and treatment. Article from the Engineering Index Annual 1917.

Dec.18,1916 Oil shale in northwestern Colorado and adjacent areas. Dean E. Winchester. Illustrated and maps. 60 pages. U.S. Geological Survey, Bulletin 641-F. Economic study.

Mar.9,1917 Scottish shale oil industry. 1800 words. The Engineering Journal (London). First part of serial. Contains a general treatment.

Apr.13,1918 The commercial aspects of shale oil industry. J.H.G.Wolf. 1800 words. Mining and Scientific Press. San Francisco, California.

Apr.13,1918 The oil shale industry. Arthur J. Hoskin. Contains map and illustrations. 6,000 words. Mining and Scientific Press. Areas of oil yielding shale. Geology; methods of distillation, etc.

May 1918 The oil shale industry. Arthur J. Hoskin. Illustrated. 5,000 words. Western Engineering. Deals with varieties of shale, methods of distillation, prospective development, etc.

June 1918 The commercial aspects of shale oil industry. J.H.G.Wolf. 2,000 words. Western Engineering. Covers requirements for a successful plant.

June 1,1918 The economic position of oil shales. Jac.C.Morrell and Gustav Egloff. 7,000 words. Metallurgical & Chemical Engineering, New York. Economic distribution and methods of production, yields, etc.

Sept. 5,1918 Will shales give us oil and gasoline in practically unlimited supply? 3,000 words. Manufacturer's Record. Baltimore, Md. Contains important aspects of the problem of making available these natural resources.

1919 The oil shales of northwestern Colorado. Bureau of Mines of State of Colorado. Bulletin No. 8. 59 pages, 5 figures. Noting commercial possibilities and precautions that must be taken in mining; including geological notes and general bibliography on oil shale industry.

Feb. 1,1919 Commercial possibilities of oil shale. Harry J. Wolf. Engineering & Mining Journal, vol. 107, no. 5, pages 217-219, 2 figures. The oil bearing shales in Colorado and Utah and their present development; methods of mining and milling, comparison with Scottish shale deposits.

Feb. 14, 1919-Manufactured gas process of extracting oil from shale results in maximum yield of oil and the byproduct, sulphate of ammonia. E. G. Church. American Gas Engineering Journal of New York. vol. 112, no. 7, pages 117-119. It is said that submitting shale oil to that process results in high yield of gasoline, lubricating oil, and high melting point paraffine.

Apr. 15,1919 Oil shales in the Great Uintah Basin, Utah. Don Maguire. Salt Lake Mineral Review, vol. 21, no. 1, pages 21-26, 4 figures. Report of mineralogical survey. Mineralogist and Metallurgist.

May 24,1919 The winning of oil from rocks. Arthur J. Hoskin. Mining & Scientific Press, vol. 118, no. 21, pages 697-707, incl. 10 figures. The practices followed in oil shale industry in Scotland, France, and Germany are quoted and conclusions drawn as to what writer believes we may and should accomplish with similar shales in this country.

June 1919 The value of American oil shales. Charles Baskerville. Bulletin of American Institute of Mining and Metallurgical Engineers, no. 150. Pages 957-960. Contains discussion on the fundamental features concerning economic development of shale oil industry.

June 1919 Oil shales. Dean E. Winchester. Journal of Franklin Institute, vol. 187, no. 6, pages 689-703. Discusses the optimism that is expressed concerning capability of furnishing from shales the oil that is needed for future operation of motors; it is observed, however, that before this raw material can be used, some treatment must be devised that will permit efficient and economical elaboration.

Aug. 15,1919 Oil shales. Louis Simpson. Chemical and Metallurgical Engineer, vol. 21, no. 4, pages 176-178. Suggestions in regard to selecting a retort method.

October 1919 The oil shale industry. Victor C. Alderson. Quarterly, Colorado School of Mines Journal, vol. 14, no. 4, pages 3-15, 1 figure. Proposed operations for distillation of oil shales and refining of products.

Oct. 4,1919 The possibilities of oil shale industry. H.M. Roeschlaub. Engineering and Mining Journal, vol. 108, no. 14, pages 572-576, 3 figures.
Notes on differences between American and foreign practice and relative value of oils and byproducts.

Dec. 6,1919 Irish-Scottish oil shale. Engineering and Mining Journal, vol. 108, no. 21, pages 872-873. Percentage of geological and mineralogical character of deposits; an estimation of reserves.

Jan. 3, 1920 Manufactured gas to supply heat for extraction of oil from shale. H. J. Gifford. American Gas Engineering Journal, vol. 112, pages 7,8,11, & 12.

Jan. 7, 1920 Recovery of nitrogen contained in oil shales. Simpson, Louis Chemical and Metallurgical Engineering, vol. 22, no. 1, pages 20-22. The writer believes that the future of oil shale industry is largely dependent on the construction of a "single purpose" retort that can be erected at low cost and which will recover maximum quantity of oil.

Jan.14, 1920 Eventual retort plant for distillation of oil shale. Louis Simpson. Chemical and Metallurgical Engineering, vol. 22, no. 2, pages 71-2. Alleges that horizontal, revolving kiln as constructed for furning of cement clinker, is more capable of handling spent shale than Scotch retort.

Jan.21, 1920 Oil shales of DeBeque, Colorado. G. Robert DeBeque. Engineering & Mining Journal, vol. 109, no. 5, pages 348-353, 3 figures. Concerning the geology and properties of deposits with notes on retorting problems to be solved in their exploitation.

Feb.14, 1920 Manufactured gas process of extracting oil from shale oil results in maximum yield of oil and byproduct, sulfate of ammonia. E.G. Church. Illustrated. American Gas Engineering Journal, vol.112, pages 117-119.

Feb. 21,1920 Incomplete retorting of oil shales suggested. G.R. DeBeque. Engineering & Mining Journal, vol. 109, page 523.

Mar. 6, 1920 Western oil shale. Mining & Scientific Press, vol. 120, pages 349-356. Review of mining from correspondents in the field.

Mar.13, 1920 Distillation of shale oil. J. A. Bishop. Mining & Scientific Press, vol. 120, pages 371-5.

Apr.28, 1920 Report of test of New Brunswick oil shales in the Wallace retort. Chemical and Metallurgical Engineering Journal, vol. 22, no. 17, pages 809-810, 2 figures. Retort for carbonization of coal and retorting of oil-bearing shales invented by W. G. Wallace. Essential idea is removing volatile products without subjecting them to temperature higher than that at which they are liberated from the shale. Design is said to secure advantages of low temperature distillation in that volatile products are given off at minimum temperature, immediately cooled, and removed from the influence of heat.

May 8, 1920 Precious metals and oil shale. W. E. Burlingame. Mining and Scientific Press, vol. 120, page 668.

July 1920 Oil shale retorting. Martin J. Gavin and Leslie H. Sharp. Natural Gas and Gasoline Journal, vol. 14, no. 7, pages 211-212. Investigations of the fundamentals of oil shale retorting with cooperation of the State of Colorado.

Aug. 7, 1920 Oil shales and their economic importance. M. J. Gavin. American Gas and Engineering Journal, vol. 113, pages 114-15.

September 1920 The Johns process of shale oil extraction. Chemical Age. New York, vol. 28, no. 9, page 313, 1 figure. Process is continuous and utilizes oil shale pulverized to such a degree of fineness as permits maximum efficiency of handling prior to retorting, and quick penetration of heat to all parts of bulk material in retort.

September 1920 Oil shales and petroleum prospects in Brazil. Horace E. Williams. Mining and Metallurgical, no. 165, pages 22-23. Article states that Brazil has enormous oil resources and rich oil shales in different parts of the country. Only suitable processes for extraction of oil are lacking.

September 1920 Recent oil shale literature. Mining and Metallurgical Journal, vol. 165, pages 31, 32.

Sept. 8, 1920 The necessity for research in the oil shale industry. Martin J. Gavin. Chemical & Metallurgical Engineering Journal, vol. 23, no. 10, pages 489-495, 4 figures. Account of the shale oil industry as developed in Scotland. Steam regulated pyrolytic distillation. Quality and quantity of oil yields.

Sept. 18, 1920 Physical and chemical data on Colorado oil shale. Martin J. Gavin and Leslie H. Sharp. Engineering & Mining Journal, vol. 110, no. 12, pages 579-580. Results of recent work by government investigators on density, heat, combustion, thermal conductivity, analyses, specific heat, and oil yield of representative sample of massive rock. Excerpt from U.S. Bureau of Mines, Reports of Investigations, No. 2152, July 1920.

Sept. 22,1920 Oil shale industry - its present and future possibilities. H. L. Wood. National Petroleum News, vol. 12, pages 29-30. Abstract in Society of Automotive Engineers Journal, vol.8, page 70, Jan. 1921.

1920 The oil shale industry. V. C. Alderson. 175 pages, publ. by Stokes. Reviewed in Mining & Scientific Press, vol. 121, pages 441-2, Sept. 25, 1920.

Sept. 25, 1920 Relation of the Bureau of Mines to the oil shale industry. J. O. Lewis. Engineering and Mining Journal, vol. 110, pages 628,629.

October 1920 Possibilities of producing oil from oil shale. Martin J. Gavin. Reports of Investigations, Bureau of Mines, Dept. of Interior, Serial no. 2176. 7 pages. Method of utilizing Scottish oil shale and its application to deposits in the U. S. (Abstract). Paper presented before the convention of Independent Oil Mens Association.

October 1920 A directory of oil shale retorts with bibliography. Victor C. Alderson. Quarterly, Colorado School of Mines, vol. 15, no. 4, 21 pages. Classified list giving characteristics of various types of retorts as submitted by inventors or owners.

October 1920 The oil shale industry of Scotland and England. Victor C. Alderson. Quarterly, Colorado School of Mines Journal, vol. 15, no. 4, pages 5-7. Concerns characteristics of deposits; methods of treating shales.

Oct. 2, 1920 The oil shale industry in Scotland and England. American Gas and Engineering Journal, vol. 113, no. 14, pages 255-260, 265. Analyzes methods employed abroad and bases suggestions on these findings for utilization of American shales.

Oct. 20,1920 Commercial retorting of oil shales. Louis Simpson. Chemical and Metallurgical Engineering Journal, vol. 23, no.16, pages 789-791. Applicability of methods used in Scotland to American oil shales.

Oct. 27, 1920 Oil shale industry, a necessity for commonsense. Simpson. Chemical and Metallurgical Engineering, vol. 23, pages 813-816.

Oct. 30, 1920 Oil shale and shale oil. H. McRae. Mining and Scientific Press, vol. 121, pages 616-17.

Nov.13, 1920 Oil shales of Indiana. John R. Reeves. Engineering and Mining Journal, vol. 110, no. 20, pages 954-955. Advantages of location and homogeneous character of raw material warrant expectation of commercial possibilities when experimental data determine satisfactory method of recovery. Res Results of dry and steam distillation tests.

December 1920 Problems of oil shale industry. Russell D. George. Mechanical Age, (New York), vol. 28, no. 12, pages 453-457. Comparison of Colorado-Utah and Scottish systems. Methods of retorting.

December 1920 The necessity for research in oil shale industry. Martin J. Gavin. Science & Industry Journal, Melbourne, Australia, vol. 2, no. 12, pages 746-760, 4 figures. Account of the shale oil industry as developed in Scotland. Steam regulated pyrolitic distillation. Quality and quantity of oil yields.

Dec.6, 1920 The production of oil from oil shale. Robert P. Skinner. Commerce Reports, (England) No. 286, pages 1038, 1039. Yield of good quality crude oil by means of treatment in specially designed retorts is reported.

Dec. 15,1920 Action of steam and gases on yields of ammonia from carbonization of oil shales and coal. Arthur J. Franks. Chemical and Metallurgical Engineering Journal, vol. 23, no. 24, pages 1149-1154. Discussion of various factors of physical chemical laws affecting ammonia equilibrium. Synthetic action of steam and hydrogen. Removing action of inert gases from decomposition zone.

Dec. 18, 1920 Oil shale and the engineer. E. Bray. Engineering & Mining Journal, vol. 110, pages 1182,1183.

Dec. 20, 1920 The commercial aspect of oil shale industry of the western slope. J. B. Jenson. Salt Lake Mining Review, vol. 22, no. 18, pages 21-25, 6 figures. Concerns conditions necessary for proper development.

1921 Studies in Colorado shale oils. A. J. Franks. Chemical & Metallurgical Engineering, vol. 24, pages 561-4; vol. 25, pages 49-53, 731-735, 778-782. March 30, July 13, and October 19-26, 1921. Discussion. vol. 25, pages 452-3, September 7, 1921.

1921 Selected bibliography on oil shale. E. H. Burrows and M. J. Gavin, U. S. Bureau of Mines, Serial No. 227, pages 1-66. (Typewritten).

1921 The oil shale bibliography for 1921, Railroad Red Book, vol. 39, pages 17-27.

1921 Oil shales of Colorado. R. D. George. 78 pages (Colorado Geological Society Bulletin No. 25) Eames Bros., Denver.

1921 Short papers from the cooperative oil shale laboratory. M. J. Gavin and L. Sharp. Colorado Cooperative Oil Shale Investigation, Bulletin No. 1, 68 pages.

January 1921 The laboratory testing of oil shale for oil and ammonia yield. E. Lawson Lomax and F. G. P. Remfry. Journal of Petroleum Technologists, vol. 7, no. 25, pages 34-45, ( ). (Discussion, pages 45-47), 1 figure. This is an outline of procedure.

January 1921 Petroleum from shale. A. Selwyn-Brown. Society of Automotive Engineering, vol. 8, pages 63-64.

Jan. 15, 1921 Mining, equipment, crushing and retorting of western petrol shales. J. B. Jenson. Salt Lake Mining Review, vol. 22, no. 19, pages 19-24, 4 figures. Based on examination of retorting industry in Scotland.

Jan. 15, 1921 New methods of analyses of oil shales. Henry M. Adkinson. Salt Lake Mining Review, vol. 22, no. 19, pages25, 1 figure. Concerns rotary retorting, stationary retorting.

Jan. 22, 1921 Review of the progress of the oil shale industry in 1920. B. C. Alderson. American Gas Engineering Journal, vol.114, pages 69-71.

Jan. 29, 1921 Refining of oil shale. A. L. Pearse. Mining & Scientific Press, vol. 122, page 151.

Jan. 30, 1921 American versus Scotch methods in retorting of petrol shales. J. B. Jenson. Salt Lake Mining Review, vol. 22, no. 20, pages 17-23, 12 figures. Pumpherston and Henderson types of retorts.

Jan. 8, 1921 Legal status of oil shale deposits on the public domain. J. R. Jones, Engineering & Mining Journal, vol. 111,
Feb. 5, 1921 pages 68, 69. Discussion by L. A. Palmer, vol. 111, pages 255-6.

February 1921 Some items of investment, expense and profit in commercial shale oil production. A. H. Sharp and A. T. Strunk. Chemical Age, vol. 29, pages 69-70. Also in Report of Investigations, Bureau of Mines, Dept. of Interior, Serial No. 2214, 3 pages. Equipment necessary for large scale commercial utilization of oil shales.

February 1921 Chemical engineering and economics in shale oil recovery. A. J. Franks. Chemical Aids, vol. 29, pages 67-69.

Feb. 5, 1921 Oil shales and petroleum in Brazil. Horace E. Williams. Oil News, vol. 9, no. 3, pages 36-40. This paper read before the American Institute of Mining & Metallurgical Engineers.

Feb.16, 1921 Experimental shale oil retorting plant. Chemical and Metallurgical Engineering Journal, vol. 24, no. 7, pages 312-313, 3 figures. 15 ton commercial unit installed by Shale Oil Refining Corp., Denver, Colorado, using Johns education process. Illustrated diagrams.

Feb. 23, 1921 Plant designed for hot gas pyrolitic distillation of shale. Louis Simpson; Chemical & Metallurgical Engineering Journal, vol. 24, no. 8, pages 341-345, 2 figures. Description and plan of 2,000 ton per day shale oil plant operating on indirect heading process, employing hot gases for conveying reacting heat and resultant oil vapors from pyrolosis of shale.

Feb.& Mar.1921 Oil shale industry in 1920. Victor C. Alderson. Mining & Oil Bulletin, vol. 7. no. 3; pages 149-152, 154; 1 figure. See also Combustion, vol. 4, no. 3, pages 28-32,42. Scotland processes said not to be adapted to American shales; shales in England non-commercial because of sulfur content. Deposits in other countries. Shale activities in Canada, Nevada, Utah, Kentucky, and Colorado, and California.

March 1921 The oil shale industry. Scientific American, vol. 3, page 266.

March 1921 A convenient and reliable retort for assaying oil shales for oil yield. L. C. Karrick. Report of Investigations, Bureau of Mines, Dept. of Interior, no. 2229, 7 pages, 1 figure. Assay report.

Mar. 2, 1921 Possible uses for the spent shale oil from oil shale operations. Curly Thomas. Chemical & Metallurgical Engineering Journal, vol. 24, no. 9, pages 389-390. Uses as fuel; as non-conductor material for electrical applications, and as material for making brick.

Mar.-Oct.1921 Studies in Colorado shale oils. Arthur J. Franks. Chemical & Metallurgical Engineering Journal, vol. 24, no. 13, pages 561-564, 2 figures. Vol. 25, nos. 16 & 17, Oct. 19 & 26, 1921. Pages 731-735, 4 figs. Pages 778-782, 1 figure, March 30: Lighter hydrocarbon oil fractions found to be more saturated than heavier fractions. Methods used in obtaining data. Practical analyses of distillation cuts, showing temperatures, saturation of specific gravities. Oct. 19 and 26: Secondary oils obtained from a representative Colorado shale oil by successive distillation at atmospheric pressure. Character and composition of these decomposition products and their parent material.

April 1921 Oil shale industry, a selected bibliography. Victor C. Alderson. Quarterly, Colorado School of Mines, vol. 16, no. 2, pages 27-38.

Apr. 16, 1921 Oil shale activities. L. Bothwell. Illustrated. American Gas Journal, vol. 114, pages 336-337.

May 7, 1921 Plant for hot gas pyrolytic distillation of shale. Louis Simpson. Petroleum Times, vol. 5, no. 122, pages 521-523, 4 figures. Description of plan in a 2,000 ton per day shale oil plant operating an indirect heating process, employing hot gases for conveying reacting heat and resultant oil vapors from pyrolosis of the shale.

May 28, 1921 — Oil shale investigation. Engineering & Mining Journal, vol. 111, pages 914-915.

May 18, 1921 — A study of the saturated and unsaturated oils in shale. C. W. Botkin. Chemical & Metallurgical Engineering Journal, vol. 24, no. 20, pages 876-880. See also Petroleum Times, June 4, 1921 vol. 5, nos. 1-6, pages 659-663. Investigation of amount and causes of unsaturated shale oils cracking during retorting and distillation accompanied by increase in saturation. Unsaturates vary with nature of shale and methods of pyrolysis.

June 1921 — Notes on the oil shale industry with particular reference to the Rocky Mountain district. M. J. Gavin, H. H. Hill, and W. E. Perdew. Reports of Investigations, Dept. of Interior, Bureau of Mines, Serial No. 2256, 36 pages, 2 figures. Discusses mining retorting and refining in Scotland and U. S.

June 6, 1921 — Colorado oil shale progress. Oil, Paint, and Drug Reporter, vol. 9, page 23, sec. 2.

June 11, 1921 — The distillation of oil shale. A. H. Low. Petroleum Times, vol. 5, nos. 1-7, pages 689-690. 1 figure. Method adopted in Colorado School of Mines.

June 11, 1921 — The oil shale industry. J. E. Mills Davies. South African Mining & Engineering Journal, vol. 32, no. 1550, pages 1281-1283. Processes of Pumpherston works; retorting and refining production of ammonium sulfate and paraffine shale.

June 17, 1921 — Anglo-Persian activity in New Brunswick oil shales. Alexander Gray. Canadian Mining Journal, vol. 42, no. 24, pages 474-479. An 8-ton testing plant in operation, technical staff to be increased and larger plans to be framed.

June, July, August, 1921 — Origin and composition of certain oil shales. Reinhart Thiessen. Economic Geology, vol. 16, nos. 4 & 5, pages 289-300, 6 figures. Preliminary report on microscopical study of oil shales by Bureau of Mines of Salt Lake City; State Geological Survey of Kentucky. Concludes that oil shale as such does not contain oil but that oils distilled from them are contained in them. Read before the Geological Society of America.

July 1921 Aspects of Colorado's oil shale industry. Arthur J. Hoskin. Colorado's Scientific Society, Proceedings, vol. 11, pages 295-328. Geographical distribution; varieties and quality of oil shale; stratification; continuity of measures; mining; crushing; types of American retorts; comparison of petroleum and shale oil; byproducts; refining; etc.

July 8, 1921 The search for oil in the Tasquia Hills. R. C. Wallace. Canadian Mining Journal, vol. 42, no. 2, pages 540-542. Preliminary report of the Commissioner for Northern Manitoba.

July 29, 1921 Long waits, slow profit for shale oil industry. National Petroleum News, vol. 13, page 26.

August 1921 What are oil shales? Alexander Moss. Combustion, vol. 5, no. 2, pages 72-75 & 81. Notes on relations of oil shales, particularly in the U.S, formation, extraction of oil shales, and possibilities for development in the U. S.

August 1921 The thermal decomposition of oil shales. Ralph H. McKee and E. E. Lyder. Journal of Industrial & Engineering Chemistry, vol. 13, no. 8, pages 678-684, 3 figures. Determination of heat reaction involved in the thermal decomposition; results of experiments show that decomposition takes place between 400° and 410° C.

August 1921 Present status of American oil shale development. M. J. Gavin; H. H. Hill, and W. E. Perdew. Chemical Age, New York, vol. 29, no. 8, pages 305-310, 3 figures. Article discusses mining, crushing, retorting, by-products, location of plants, etc.

Aug. 20, 1921 Distillation of oil shale. E. Day. Diagrams. Mining & Scientific Press, vols. 1, 2, 3, pages 257-62.

September 1921 Selected bibliography on oil shale. U. S. Bureau of Mines, Reports of Investigations, Serial No. 2277, 66 pages. Compiled by E. H. Burroughs and M. J. Gavin.

September 1921 The fuel problem for oil shale retorts. George McDonald Johns. Combustion, vol. 5, no. 3, pages 121-124, 2 figures. Discusses distilling operation and analyzes cost.

Sept. 24, 1921 The present availability of oil shale. Francis P. Webb. American Gas Journal, vol. 115, no. 13, pages 271, 272, and 282. Describes retort of the Index Shale Oil Company, designed by H. L. Brown, which is tubular, horizontal, and has positive feed.

October 1921 Oil shale, a potential world-wide industry. Victor C. Alderson. Mining Congress Journal, vol. 7, no. 10, pages 406-409. A review of the world's deposits.

Oct. 15, 1921 Alignment chart for determining oil yields in assaying oil shale. Engineering & Mining Journal, vol. 112, page 621.

Dec. 14, 1921 Apparatus for studying thermal decomposition of oil shales. R. H. McKee and E. E. Lyder. Diagrams. Chemical and Metallurgical Engineering, vol. 25, pages 1100-1.

December 1921 Recent progress in oil shale development. Victor
January 1922 C. Alderson. Combustion, vol. 5, no. 6, pages 251-253, 260-261, 265; also in January 1922 vol. 6, no. 1, page 27. Reviews resources in Europe, South Africa, South America, Australia, and Canada.

1922 Oil shale, a historical, technical, and economic study. Martin J. Gavin: U. S. Bureau of Mines, Bulletin No. 210, 1922, 201 pages, 31 figures. Investigation to determine most favorable conditions of retorting Colorado oil shales to yield the most and best products from them. Foreign and U.S. deposits; origin; chemistry of distillations; oil shale industry in Scotland & U.S.; future of industry; estimates of costs and profits. Bibliography, pages 190-198. About 75 references with extensive descriptive notes.

1922 Geology of the Moncton map area. W. J. Wright. Canadian Dept. of Mines, Geological Survey, No. 129, Geological Series 110, 69 pages, 18 figures. Partly on supplemental plates in pocket. Geology of area is primarily that of carboniferous rocks, which are of special importance because they contain economic deposits of oil and gas, oil shale, salt, and coal. Oil shale of New Brunswick and Nova Scotia.

Oil shale; bibliography of recent articles. B. C. Alderson Circular of information, pages 5-8. Colorado School of Mines, Golden, Colorado.

1922 Oil shale of the Rocky Mountain region. D. E. Winchester. U. S. Geological Survey Bulletin, vol. 729, page 143-202. Bibliography.

Feb. 25, 1922 New method of treating oil shales. Petroleum Times, vol. 7 no. 164, page 262. Describes British patent granted to S. H. Dolbear of San Francisco, object of which is the separation of valuable organic compounds in shale from waste or gangue, which produces no oil.

Feb. & March 1922 Some factors affecting products from destructive distillation of oil shales. Lewis C. Karrick. Also, The Chemical Age (New York), vol. 30, no. 3, pages 112-114, 1 figure. Bureau of Mines, Reports of Investigations No. 2324, 5 pages. Complex problem due to effects of heat on organic components and impracticability of separating them from mineral matter.

Mar. 1, 1922 A study of the saturated and unsaturated oils from shale. C. W. Botkin. Chemical & Metallurgical Engineering Journal, vol. 26, no. 9, pages 398-401. Results of experimental work on compositions and properties, lighter fractions and heavier undecomposed residues, resulting from pyrolitic treatment of crude shale oils.

Mar.15,1922 Concerning nomenclature--Shaloilogy--oil shale nomenclature. J. B. Jenson. Chemical & Metallurgical Engineering Journal, vol. 26, no. 11, pages 509-512. Discusses inconsistencies in present oil shale terminology and suggests improvements.

Mar.18, 1922 The mining of oil shale in Colorado. R. L. Chase. Mining & Scientific Press, vol. 24, no. E-11, pages 373-375, 4 figures. Developments during the past year.

Mar.22, 1922 The problems of the American shale oil industry. Charles Allen Jones. The Chemical & Metallurgical Engineering Journal, vol. 26, no. 12, pages 546-553. Discusses briefly present state of our knowledge in various divisions of the field of oil shale technology, and suggests channels of future investigational effort may take.

March 1922 Analytical distillations of typical shale oils. Martin J. Gavin. U.S. Bureau of Mines, Reports on Investigations, Serial No. 2332, 12 pages. Also, Oil Field Engineering,
April 1922 vol. 24, no. 4, pages 104-105. Important characteristics characterized, results of redistillations of oils from Utah's shales are tabulated, showing change in quality caused by repeated redistillations. Also in Engineering & Mining Journal, vol. 113, page 683-4.

Apr.8, 1922 Some recent oil shale developments. John T. Norman. Petroleum Times, vol. 6, no. 170, pages 477-478, 1 figure. Comments on German and Esthonian oil shales.

Apr.22, 1922 The "fusion" patent low temperature retort. C. J. Goodwin. Chemical Age (London), vol. 6, no. 149, pages 515-517, 4 figures. Brief description of principles underlying design and operation of retort.

May 1 & 10, 1922 Russian methods of distilling oil shale. E. E. von Groeling. Petroleum Journal, vol. 18, nos. 16 & 14, pages 487-493 and 539-545, 3 figures. May 1: lays stress on the individual treatment of the different oil shales and describes retorting process. May 10: discusses various methods of retorting and concludes that essential conditions for a success are plants with very large daily turnover, continuous working, very fine crushing of shale, avoiding excessively high temperatures of distillation, etc.

May 3,1922 Australian oil shale industry, now in commercial operation. Douglas A. Fell, National Petroleum News, publ. in Cleveland Ohio, vol. 14, no. 18, pages 89, 90; & 93, 1 figure. Oil shale, a going industry in Scotland, France, and Australia. Some details of Australian development.

May 20, 1922 Sampling of oil shale. Charles C. Starr. Engineering & Mining Journal Press, vol. 113, no. 20, pages 873-877, 6 figures. On account of the low per ton value of material, accuracy is important. Results of work done in Colorado. Precautions that should be taken.

May 20, 1922 Abuse of the oil shale industry. Engineering & Mining Journal, vol. 113, pages 850-1.

July 1, 1922 Shale oil. Oil Engineering & Finance Journal, vol. 1, no.25, pages 813-815. Decomposition products of asphaltum, sulphur, and nitrogen compounds.

July 8, 1922 Factors influencing the value of oil shale lands. D.E. Winchester. Engineering & Mining Journal Press, vol.114, no.2, pages 61-66. 3 figures. Careful analysis of factors other than recovery of oil which affect value of a deposit.

August 1922 The New Albany shale in Indiana. John R. Reeves. U. S. Bureau of Mines - Report of Investigations, No. 2390, 8 pages, 1 figure. Investigation of oil shales conducted by the Univ. of Indiana in cooperation with the Bureau of Mines. Physical and chemical characteristics and distribution of shale; amount and nature of products; distillation and analyses.

Sept.2, 1922 Oil shale mining regulations. Bureau of Mines. Engineering & Mining Journal, vol. 114, page 421.

Sept.25,1922 Oil shale, a resume for 1921. Victor C. Alderson. Petroleum Times, vol. 7, no. 164, pages 259-261. Reviews activities in Utah, Colorado, Canada, Kentucky, Esthonia, Tasmania, and other places.

Sept.30, 1922 The geology and technology of the oil shales of Germany and the Tyrol. E. Hentze. Braunkohle, vol. 21, no. 26, pages 465,469. Discusses oil shale problems and points out how little has been accomplished so far towards solution of these problems.

Sept.30, 1922 The African Oil Corporation, Limited. J. E. Mills-Davies. South African Mining & Engineering Journal, vol. 33, no.1618, pages 33-34, 1 figure. Results of investigation in regard to industrial value of African Oil Corporation oil shale properties.

October 1922 Oil shale industry. Frank E. Shepherd. Gas Industry, vol.16, no. 10, pages 319-323, 6 figures. Describes Baum fractionating retort developed by the Index Shale Oil Company of Denver, Colorado which is able to handle pieces of large diameter and treat 250 to 300 tons of shale rock in 24 hours.

October 1922 The oil shale-Kentucky. Victor C. Alderson. Colorado School of Mines Quarterly, vol. 17, no. 4, pages 3-15, 8 figures. Also in Combustion, vol. 7, no. 4, pages 202-205; and

Nov. 18, 1922 Petroleum Times, vol. 8, no. 32, pages 751-752. Concerns the geology and contents of deposits; operations of Debon Oil shale Co.; Scotch process of retorting, advantages of Kentucky oil shale.

November 1922 Bureau of Mines investigates gold in oil shales and its possible recovery. Thomas-Varley, U. S. Bureau of Mines-Reports of Investigations, No. 2413, 10 pages. Investigations show that if gold is actually in oil shales it can be determined accurately by ordinarily accepted fire assay method.

Nov. 4, 1922 What's wrong with the American oil shale industry? Arthur J. Hoskin. Illustrated. Engineering & Mining Journal, vol. 114, pages 815-818. 1 figure. Reasons for present quiescent condition. Shale oil said to be superior to well oil for many purposes. Not competitive but complimentary. Commercial development believed to be practical.

December 1922 Some economic aspects of Kentucky oil shales. C. S. Crouse. Combustion, vol. 7, no. 6, pages 337-343, 6 figures. Amount of shales available; distillation processes; comparative costs of mining; ease of breaking and retorting; refining, etc.

December 1922 A section through the New Albany shale. John R. Reeves, U. S. Bureau of Mines - Reports of Investigations, No. 2425 5 pages, 1 figure. Investigation of Indiana oil shales.

Dec. 2, 1922 The "fusion" rotary retort. Stainer Hutchins, Petroleum Times, vol. 8, no. 204, pages 823-824. Retorts installed at a testing station of Fusion Corporation, and metal which were testing samples.

Jan. 20, 1923 Distribution of the oil shale deposits of the U. S. Dean E. Winchester. Petroleum Times, vol. 9, no. 211, page 84. Includes table showing distribution of geological age of principal oil yielding substances in the U. S.

Feb. 17, 1923 Oil shales of the U.S. David T. Day. Oil Engineering & Finance, vol. 3, no. 58, pages 209-217, 6 figures. Occurrence in North America; government investigation; mining; sampling and examination; present activities.

Apr. 30, 1923 Utah shale soon to supplement waning petroleum supply; an argument for the industry and a boost for Utah. J. B. Jenson. Salt Lake Mining Review, vol. 25, no. 2, pages 9-13, 1 figure. Origin of the oil shale; extent and volume of western shales; birth and growth of petroleum industry; rapid increase of petroleum needs; States in which oil produced, not extracted.

January 1923 — Oil shale. Victor C. Alderson. Colorado School of Mines Quarterly, Supplement B, vol. 18, no. 1, 28 pages, 1 figure. Resume for 1922. World deposits and production. Oil shale bibliography for 1922.

January 1923 — A chemical examination of the organic matter in oil shales. Ralph H. McKee and Ralph T. Goodwin. Colorado School of Mines Quarterly, Supplement A, vol. 18, no.1, April & May 1923 41 pages, 13 figures. Also in Oil Engineering & Finance, vol. 3, nos. 67, 68, 69, pages 511-514, 555-559, and 581-582, 3 figures. Determination of nature of kerogen; origin of oil shales; chemical composition; analysis of oil shales from various localities; thermal decomposition of organic content of oil shales; primary reaction and decomposition of oil shales; distillation of California shale under reduced pressure.

Mar. 17, 1923 — The chemistry of oil shale distillation. Petroleum Times, vol. 9, no. 219, pages 393-394. Chapter from Martin J. Gavin's work on oil shale.

April 1923 — Economic study of the New Albany shale. John R. Reeves, U. S. Bureau of Mines - Reports of Investigations, No. 2466, 19 pages. 3rd of series of papers on investigation of Indiana oil shales conducted by Indiana University, Dept. of Conservation of State of Indiana, in cooperation with Bureau of Mines.

July 1923 — The destructive distillation of oil shale. R.J.G. Stewart and J. Trenchard. Colorado School of Mines Quarterly, vol. 18, no. 3, pages 6-32, 11 figures. Resume of oil shale industry; problems of industry; discussion of shale and its retorting, hydrocarbon; nature of destructive distillation of oil shale; effect of temperature lag and rate of heat supply; cracking of heavy oils; use of steam types of retorts; results of laboratory experiments; etc.

September 1923 — Oil shales of Colorado and Indiana compared. D. E. Winchester. The Railroad Redbook, vol. 40, no. 9, pages 823-828, 2 figures. It is claimed that Colorado shales far surpass Indiana shales because of many times greater thickness and richness and greater availability for manufacture of high value products--shale oil and ammonium sulfate--at low cost.

September 1923 — Oil shale in Santa Barbara County, California. F.D. Gore. Mining in California, vol. 19, no. 4, pages 211-224, 7 figures. Comparison of California oil shales to other shales. Protation tests; shale oil v. commercial crude; future possibilities of oil shale industry in California.

Aug. & Sept. 1923 — Organic matter of Colorado oil shales. Arthur J. Franks and B. B. Goodier. Oil Engineering & Finance Journal, vol. 4, nos. 84 & 86, pages 175-177, and 257-61. Results of investigation to secure information concerning organic portion of typical high grade Colorado oil shale, and study mechanism of its transition to oil.

October 1923 — Oil shale, a comprehensive survey. Victor C. Alderson. Colorado School of Mines Quarterly, vol. 18, no. 4, pages 46-51. Railroad Redbook, vol. 40; pages 951-956.

November 1923 — Data on oil shale industry of Scotland, England, Germany, Sweden; Spain, Portugal, South Africa, Tasmania, Esthonia, and U. S. Also, Mining Congress Journal, vol. 9, no. 10, pages 383-385.

October 1923

November 1923 — A new development in the treatment of oil shales. R. H. Crozier. Mining Magazine, vol. 29, no. 5, pages 265-269, 4 figures. Describes Crozier experimental retort which has been in operation in Rangoon during past year for treatment of oil shale of the Thaungyin valley, Burma, embodying several new principles in retorting; 6' height by 14" diameter. It is anticipated that full size may be built to handle 500 tons or even 1,000 tons per day at very low cost.

November 1923 — Our oil shale industry. Lawrence C. Phipps. Mining Congress Journal, vol. 9, no. 11, pages 405-406. Data regarding vast area of oil shale lands in Colorado, Utah, and Wyoming, which promise to meet all increased demands for oil; oil produced from these shales has proved to be equal if not superior to highest grade petroleum.

December 1923 — Possibilities for immediate oil shale development. J. H. Ginet. Mining Congress Journal, vol. 9, no. 12, pages 463-464, 2 figures. Why development of oil shale industry is being brought about so slowly; what of real practical value has been accomplished towards actual commercial operations; it has been proved conclusively by laboratory and field demonstrations that oil can be properly recovered from shale.

1923 Oil shale of the Rocky Mountain region. Dean E. Winchester. U. S. Geological Survey Bulletin No. 729, 204 pages, 26 figures. Field work; physical and chemical character and distribution of oil shale; information by states; character; refining and origin of shale oil. Bibliography.

1923 Uses of water in the oil shale industry, with particular reference to engineering and sanitary requirements. J. J. Jakosky. U. S. Bureau of Mines, Technical Paper No. 324, 57 pages, 8 figures. Uses of water in production of shale oil (retorting, refining, mining, etc.) and estimation of water requirements. Chapter on the sanitation of oil shale camps by A. L. Murray.

Dec. 8, 1923 Extraction of oil from shale. E. W. Wallace. Chemical Age (London), vol. 9, no. 234, pages 624-627, 5 figures. Describes new process in operation in California; cost data.

January 1924 Oil shale bibliography, 1923. Railroad Redbook, vol. 41, no. 1, pages 11-16. Compilation by editorial department of Railroad Redbook of important articles on subject printed in 1923.

January 1924 The oil shale industry. W. C. Alderson. Colorado School of Mines, Quarterly, vol. 19, no. 1, pages 1-19. See also The Mining Journal, vol. 144, nos. 4613, 4614, and 4615, Jan.& Feb. 1924 Jan. 19, 26, and February 2, 1924, pages 47-48, 74-75, and 91-92. Resume of industry of the different countries for 1923. See also oil shale bibliography compiled by W. C. Alderson on pages 20-29.

Jan. 30, 1924 Probable origins of light oils in the Rocky Mountain region. W. H. Geis. National Petroleum News, vol. 16, pages 71-72. Map.

Jan.& Feb. 1924 A section of the Monterey (Salinas) shales in Pine Canyon, Monterey County, California. W. Stalder. American Association of Petroleum Geologists-Bulletin, vol. 8, no. 1, pages 55-60, 1 figure. Description of bituminous shale area and nature of beds, particularly with relation to oil indications.

February 2, March 1,1924 The shale oil industry of New South Wales. N. Waterhouse. Oil Engineering and Finance Journal, vol. 5, nos. 94 & 95, pages 86-89 and 158-160, 7 figures. Occurrence of shale; Joadja Valley operations; Wolgan Valley operations; layout of works.

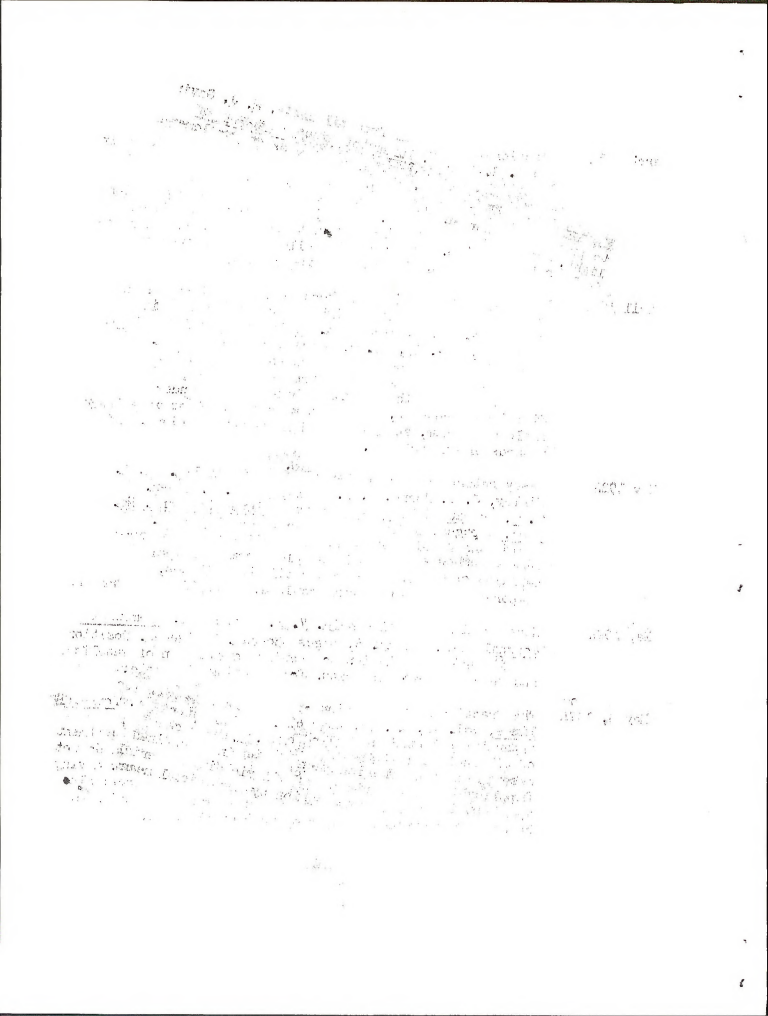
March 1924 Fractional "education" of oil from oil shale. M. J. Gavin and L. C. Karrick. U. S. Bureau of Mines - Reports of Investigation, No. 2588, 10 pages, 3 figures on supplemental plates. Term fractional "education" is an expression to prove that when an oil shale is heated it produces light, low boiling oils at low temperatures, and increasingly heavier, higher boiling oils as temperature of retorting rises. Details of experiments.

April 1924 Investigation of oil shale kerogen by fractionation of the primary bituminum in high vacuum and by organic extraction. C. O. Blackburn. Colorado School of Mines, Quarterly, vol. 19, no. 2, pages 9-36, 14 figures. Investigation undertaken for purpose of securing additional information on nature of oil shale, Elko, Nevada. Deals with retorting shale kerogen under diminished pressure, high vacuum fractionations of primary shale bituminum, analysis of high vacuum fractions, and methods of extractions.

May 1924 Assay retort studies of ten typical oil shales. W. L. Finley, J. W. Horne, B. W. Gould, and A. D. Bauer; U. S. Bureau of Mines - Reports of investigations, No. 2603, 9 pages. 6 figures and supplemental plates. Yields and results of analyses of oil and gas produced from a number of oil shale samples from principal deposits of Colorado and other oil shale States, compared with samples from Scotland, Australia, and Brazil.

May 1924 Heat treatment of oil shale. V. Z. Caracristi. Combustion Journal, vol. 10, no. 5, pages 336-340, 7 figures. Position of oil shale in relation to growing consumption of gasoline, and description of apparatus for treating oil shale.

May 3, 1924 The fractional distillation of oils from oil shale. Petroleum Times, vol. 11, no.278, page 619, 1 figure. Describes apparatus patented in England by R. H. Crozier for treatment of oil shale and similar oil yielding materials which do not become soft and plastic but retain their capacity for moving freely by gravitation when heated in a confined space; also applicable to treatment of oil yielding materials which may be kept in continuous motion by mechanical means.



July -August 1924 — Oil shale in Santa Barbara County, California. F. D. Gore. Amn. Association of Petroleum Geologists-Bulletin, vol. 8, no. 4, pages 459-472, 5 figures. Comparison of California shales to other shales; location of deposits; geology; activities of operating companies.

July 1924 — The refining of oil shale. E. M. Bailey. Institution of Petroleum Technologists Journal, vol. 10, no. 44, pages 527-553, and discussion on pages 553-559; 8 figures.

June 1924 — Also in Chemical Trade Journal, and Chemical Engineer, vol. 74, no. 1933, pages 679-682. Production of crude oil and sulphate of ammonia; distillation of crude oil; treatment or washing of distillates; extraction of solid paraffine; refining of crude, solid paraffine.

Sept. 1924 — The Trumble oil shale cycle distillation plant. V. C. Alderson. Railroad Redbook, vol. 41, no. 9, pages 789-793, 2 figures. See also Chemical Age (New York), vol. 32; no.9, pages 364-365, 3 figures. Discusses preheater retort, dephlegmator, cracking stills, sulphate of ammonia, producer gas plant, superheater, turbin, starting plant and steam cycle.

Sept. 1924 — Trumble oil shale process. Memo. on Oil Bulletin, vol. 10 no. 9, pages 918-919 and 983; 2 figures. Describes process which employs superheated steam throughout, under high pressure, an experimental plant at Alhambra, California.

Oct. 1924 — See also article by C. O. Sprenger in Oil Trade, vol. 15, no. 10, pages 34 and 39.

Oct. 1924 — Papers presented at the National Oil Shale Conference, Sacramento, California concerning U. S. oil shale industry. Colorado School of Mines Quarterly, vol. 19, no. 4, pages 49-98, 2 figures. Includes following papers:

Progress on oil shale. L.C.Phipps
The Naval Oil Shale Reserves. H.H. Rousseau.
Trumble shale carbonizing and refining process. L. R. Ball.
Imminence of shale oil industry in the U.S. L. C. Urens
Mining oil shale. L. R. Ball
The present oil shale outlook. D.D. Potter
Oil for U. S. Navy. D.E. Winchester
Plan of oil shale investigation at Colorado School of Mines. R. C. Beckstrom,
Also brief communications.
Proceedings of conference -- pages 3-49.

Oct. 3, 1924 Bituminous shales of New Brunswick. M. Lodge. Canadian Mining Journal, vol. 45, no. 40, pages 972-975, 4 figures. Some estimates of quantities in New Brunswick field.

Oct. 16, 1924 Principles of oil shale retorting. J. E. Meyer. Oil & Gas Journal, vol. 23, no. 21-A, pages 92 & 101, 2 figures. Report of investigation by Colorado School of Mines covering distillation of oil from Grand Valley, Colorado shale.

Oct. 20, 27, Nov. 3,17, 1924 Economics and technology of oil shale. S. V. Kirkpatrick. Chemical & Metallurgical Engineering Journal, vol. 31, nos. 16, 17, 18, & 20; pages 611-615, 651-655, 688-692, and 770-775; 16 figures. Oct. 20: Survey of resources and history of their development. Oct. 27: Economic problems and development. Nov. 3: Problems of mining, crushing, and retorting shale, and refining products. Nov. 17: Status of principal processes proposed for distillation; operations of Catlin & Brown retorts.

Nov. 17, 1924 Colorado oil shale development. Chemical & Metallurgical Engineering, vol. 31, pages 773-5.

Dec. 8, 1924 Persistent pioncering in shale oil production. S. D. Kirkpatrick. Chemical & Metallurgical Engineering Journal, vol. 31, no. 23, pages 884-885, 3 figures. Results shown at Ginet's plant at De Beque, Colorado after five years of experiment; refining procedure.

January 1925 Distillation of Albany (Indiana) oil shales. A. W. Homberger and F. M. Shipman. Colorado School of Mines Quarterly, vol. 20, no. 1, pages 1-7. Experimental work; yields from different methods; experimental work on oils; conclusions.

Jan.- Feb. 1925 The effect of rock flowage on the kerogen of oil shale. F. M. Van Tuyl and C. O. Blackburn. American Association of Petroleum Geologists - Bulletin, vol. 9, no. 1, pages 158-164. Concerns experimental work by authors on typical oil shales from Elko, Nevada and Grand Valley, Colorado to determine quantitatively amount of oil produced when these shales are subjected to rock flowage at ordinary temperatures; disclosed fact that no free oil was formed under such conditions.

January 1925 Oil shales. J. C. Dawson. Canadian Institute of Mining & Metallurgy Journal, Bulletin No. 153, pages 26-59, 4 figures. Present oil situation; nature and origin of oil shales; chemical examination of the kerogen-constituent elements; distribution of oil shale throughout the world; method of mining; destructive distillation of oil shale; retorts; oil shale products and additional equipment required.

February 1925 Oil shale, 1924. V. C. Alderson. Mining Congress Journal, pages 71-77, 3 figures. Review of progress in oil shale matters in different countries during 1924. Outstanding events or interest of government in developing an oil reserve; competition of the Elko plant; Trumble process for distillation; and Sacramento meeting.

Feb. 9, 1925 Making shale oil in California. George W. Wallace. Chemical & Metallurgical Engineering Journal, vol. 32, no.6, pages 237-239, 4 figures. Internally heated retort being used successfully at 40-ton plant of N-T-U Company.

Feb. 23, 1925 Some signs of progress in oil shale development. Chemical & Metallurgical Engineering Journal, vol. 32, no. 8, pages 324-325, 4 figures. California company finds source of petroleum and oil-impregnated diatonite; experimental steam retort at Colorado station of Bureau of Mines shows interesting trend of development; oil shale development in Utah that failed to reach completion.

Feb. 28, 1925 Production of shale oil by N-T-U process. G. W. Wallace. Chemical Age (London), vol. 12, no. 298, pages 196-199. 5 figures. Gives result of test.

March 1925 The oil shales of Canada. S. C. Ells. Canadian Institute of Mining and Metallurgy - Bulletin 155, pages 294-297. Deposits in Nova Scotia, New Brunswick, Quebec, Ontario, etc.

Mar. 30, 1925 Jenson's new Devonian oil shale retort. J. B. Jenson. Salt Lake Mining Review, vol. 26, no. 24, pages 12-14, 1 figure. Author, who has been working for years to perfect a method or process for commercial treatment of oil shales, oil sands, and other hydrocarbons of the western slope of the U.S., describes what has been accomplished by him to date.

April 1925 Colorado oil shale. V. C. Alderson. Colorado School of Mines Quarterly, vol. 20, no. 2, 53 pages, 14 figures. Partly on supplemental plates. Nature of industry; amount of shale in production; relative value of shale; government regulations for classification of oil shale lands; patenting oil shale lands; operations; retorting.

May 30, 1925 Distillation of New Albany oil shales. A. W. Homberger and F. M. Shipman. Petroleum Times, vol. 13, no. 334, pages 995-997. A study of oil shales using those found at lower Indiana; products derived from them by various methods of distillation; and properties of products obtained by distillation.

May 1925 — Description of shale oil installation plant. Association of Chinese and American Engineers Journal, vol. 6, no. 5, pages 85-89, 2 figures. Description of proposed plant for Fushum mines of South Manchuria Railway; capacity 1,000 tons per day.

June 1925 — Oil shale and how to work it. H. Trenkler. Feuerungstechnik, vol. 13, no. 17, pages 205-208, 3 figures. Describes oil shale and bituminous shale, distilling in retorts, Scotch processes, low temperature treatment in gas producers and rotary retorts; Trenkler process.

August 1925 — The adoption of gas producer practice to the retorting of oil shales. F. G. Green. Canadian Chemical & Metallurgical Journal, vol. 9, no. 8, pages 185-186. Development of direct heating method in Europe and America, successive yields obtained; importance of factor of cost.

August 1925 — Excerpts. Mining Congress Journal, vol. 11, pages 403-6.

August 1925 — Colorado shales hold vast store of oil. V. C. Alderson. Fuel Oil Journal, vol. 4, no. 2, pages 11-12, 64, 66, 68, & 70. Content determines nature of oil distillation; estimates as to oil production; tables showing approximate relative value of oil shales from six states.

Aug. 22, 1925 — A proposed method for caving oil shale. F. Carroll and G. R. DeBeque. Engineering & Mining Journal Press, vol. 120, no. 8, pages 299-300, 2 figures. Estimated cost of mining certain strata of DeBeque-Grand Valley, Colorado.

Oct.-Nov. 1925 — Development of a standard Canadian laboratory distillation method for examination of oil shale. R. E. Gilmore and A.A. Swinnerton. Canadian Chemical and Metallurgy Journal, vol. 9, nos. 10 & 11, pages 215-217 and 235-239, 2 figures. Reviews comparative results of distilling a standard oil shale by different methods, and discusses factors to be considered in the selection of a simple and reliable laboratory, which authors hope may be adopted as a Canadian standard laboratory distillation method.

November 1925 — The relation of oil shale to petroleum. F. M. Van Tuyl and C. O. Blackburn. The American Association of Petroleum Geologists - Bulletin, vol. 9, no. 8, pages 1127-1142, 5 figures. Discusses the flowage experiment on typical oil shales at ordinary or high temperature, to test the theory that kerogen of oil shales is converted into petroleum at high temperature and pressures; concludes that kerogen and petroleum are not genetically related but represent different end products of the transformation of organic debris.

Nov. 5, 1925 Extraction of oil from shale. Industrial Australian and Mining Standard in Melbourne Weekly, vol. 74, no.19, 25, page 611. Construction and operation of the Crozier retorts. A flat-sided cylinder with semi-circle ends, surrounded by brickwork, constructed to form encircling internal flue divided into compartments by means of fire tile partitions.

December 1925 Hydrogenation and desulfurization of Norfolk shale oil. H. G. Shatwell. The Institute of Petroleum Technologists Journal, vol. 11, pages 548-555, 1 figure. Cracking of Norfolk shale oil causes partial desulfurization of oil and increases yield of low boiling constituents; hydrogenating and cracking do not give radically dissimilar results.

December 1925 Oil shale, oil field, or oil shale field, which? V. C. Alderson. Mining Congress Journal, vol. 11, pages 610-12.

Dec. 12, 1925 Possibilities of shale oil; inquiry into the recovery, prices, and costs. S. F. Shaw. Engineering & Mining Journal, vol. 120, pages 529-30.

1926 Coking of oil shales. W. L. Finley and A. D. Bauer. U. S. Bureau of Mines, Technical Paper 398, 11 pages, 6 figures. Tendency of shales to coke; mixing coking shale with spent shale; use of steam in the retort; oxidation of shale; extraction of shale with organic solvents.

1926 Manual for testing methods for oil shale and shale oil. L. C. Karrick. U. S. Bureau of Mines - Bulletin 249, 70 pages, 24 figures. Manual of apparatus and methods that Bureau has developed for work on oil shale and found satisfactory for routine tests and research.

1926 Shore phases of the Green River formation in northern Sweetwater County, Wyoming, W. H. Bradley. U.S.Geological Survey - Professional Paper 140, pages 121-31. Plates 58-62.

Jan. 1, 1926 Shale is economic answer to industry's ills. V. C. Alderson. Petroleum Age, vol. 17, page 17.

Feb.24, 1926 Billions of barrels of shale oil are available at cost of $1.00 a barrel. K. J. Schuyler. National Petroleum News, vol. 18, pages 92-94.

February 1926 The probable future of the utilization of the oil shale. R. A. Baxter. Wisconsin Engineering Journal, vol. 30, no. 5, pages 154-155, 157, 170, 172, 174. Oil shale versus coal; utilization of substitute fields.

Feb.,June;Aug. Oct. 1926, & Feb. 1927 — Current oil shale bibliography. Mining Congress Journal, vol. 12, pages 132, 470, 603, 764; vol.13, page 158.

March 1926 — Economic possibilities of eastern oil shales. C. S. Crouse. Mining Congress Journal, vol. 12, no. 3, pages 166-169, 5 figures. Possibilities of oil shale deposits from Kentucky; practice governing economic development; economic byproducts; mining methods; crushing, retorting, and refining; prospecting, sampling, and selection of plant site.

April 1926 — Kentucky oil shales loom as economic factor. M. J. Ingerson. Oil Trade, vol. 17, no. 4, pages 19 & 20, 3 figures. Kentucky shale is a tough, brownish-black, fine-grained rock which on weathering becomes fissile and light gray colored.

Apr.21, 1926 — The Württemberg oil shales. F. C. Gaisser and H. Bader. Chemiker-zeitung, vol. 50, no. 46, pages 277-280. These shales yield satisfactory amount of ammonium sulfate and also contain iodine, both of which should be utilized for profitable working of shales; coke from these shales low in ash and makes excellent fuel; tar is high in sulfur and contains pyridine basis.

Apr.30, 1926 — Estimating costs of mining and treating oil-bearing shale. V. C. Alderson. Salt Lake Mining Review, vol. 28, no. 2, pages 19-21. Underground mining operations at Elko, Nevada; method proposed to produce oil at 60¢ per barrel; points out that Scottish conditions cause higher costs than are likely in the U.S.; Canadian and Swedish operations; analysis of cost figures.

Apr. 30, 1926 — The cost of producing shale oil. V. C. Alderson. Canadian Mining Journal, vol. 47, no. 18, pages 473-474. Presents analysis from which it is reasonable to infer that oil shale company, adequately financed and operating on an open-cut plan with 500 ton daily throughput, can manufacture shale oil at cost of approximately $1.25 a barrel. See also the Mining Congress Journal, vol. 12, no. 4, pages 265-266.
April 1926

May 1926 — Undercut cave mining method proposed for western oil shale deposits. F. Carroll. Mineral Age, vol. 11, no. 5, pages 15-18, 2 figures. Problem of mining from 10 to 525 feet on big scale; plan for proposed undercut caving method of mining oil shale in area north of Colorado River and the DeBeque-Grand Valley District.

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May 1926 — Economic status of Kentucky oil shale. M. I. Ingerson. Mineral Age, vol. 11, no. 5, pages 13-14, and 19; 2 figures. Future of the oil shale industry in eastern and western U. S.; Devonian oil shale of Kentucky.

June 19, 1926 — A problem in the oil shale extraction. T. M. Beins. Engineering & Mining Journal Press, vol. 121, no. 25, pages 1009-1013; 4 figures. Procedure to be found in attempting to solve mining research problem; basic principles involved; investigation of all known methods which might be applied to problem; applying new methods; problem of loading deep and almost flat holes; fire risk involved.

June 1926 — Explosibility of oil-shale dust. V. C. Alderson and A. D. Bauer. U. S. Bureau of Mines - Reports of Investigations No. 2758, 8 pages, 1 figure. Investigations show that oil shale dusts are explosive and that their explosiveness increases with the combustible content; formation of dust during the handling of oil shale is almost unavoidable and same precautions against explosions should be taken as in coal mines.

July 1926 — Development of the shale oil industry in California. G. W. Wallace. Mechanical Engineering, vol. 48, no. 7, pages 731-738, 15 figures. Particulars regarding experimental plants developed by author in which conditions are most favorable for maximum recovery of best quality oil; description of process and estimates of plant costs data on plant yield and oil composition.

July 1926 — Distribution of sulfur and oil shale. E. P. Harding and W. Thordarson. Industrial and Engineering Chemical Journal, vol. 18, no. 7, pages 731-733. Investigation to determine forms in which sulfur exists in important oil shale of the Green River formation.

August 1926 — Oil bearing shales in North Carolina. F. C. Vibrandt. Industrial and Engineering Chemical Journal, vol. 18, no. 8, pages 793-795. Survey of Deep River Valley oil-bearing shales together with their retort assays, shale analyses, tonnage use, and analytical distillation data of oils.

November 1926 — Results at the government oil-shale testing plant. M.J. Gavin. Mining and Metallurgical Journal, vol. 7, no. 239, pages 480-482, 1 figure. Experimental plant now operating; details of equipment; comparative method of operation of two types of retort.

November 1926 The oil shale industry. G. C. Riddell. Mining and Metallurgical Society of America, Bulletin, vol. 19, no. 4, pages 80-91, and discussion on pages 91-93. History of the industry; shale oil in commercial use; centers of industry and oil shale reserves; nature of processes; character of oil, costs of plants; byproducts; shale field versus oil field. Also in Engineering & Mining Journal, vol. 12, pages 1013-17.

December 1926 Thermal relations in the Scottish oil shale retort. L. C. Karrick. Chemical and Metallurgical Engineering, vol. 33, no. 12, pages 740-744, 2 figures. Study of the heat requirements from the heat distribution of this device when using draw stream.

December 1926 Present activities in the oil shale industry. V.C. Alderson. Mining Congress Journal, vol. 12, no. 12, pages 864-869, 7 figures. Gasoline from shale oils; methods of mining; retorts; developments in Colorado, Kentucky, California, Nevada, and Wyoming. Illustrated.

Dec. 8, 1926 Secretary Work holds conference to decide status of shale oil claims. National Petroleum News, vol. 18, page 20.

December 1926 Shale oil. R. M. Catlin. Mining & Metallurgical Society of America - Bulletin 186, vol. 19, no. 5, pages 117-126, and discussion, pages 127-132. Products of crude oil from shale.

January 1927 Mass production as applied to shale oil. R. M. Catlin. Mining & Metallurgical Journal, vol. 8, no. 241, pages 24-27, 1 figure. Results of many years of research on working shale near Elko, Nevada; plant equipment and operation; heat balance of process.

Jan. to May 1927 The genesis of oil shale and relation to petroleum in other fields. R. H. McKee and P.D.V. Manning. Oil Bulletin, vol. 13, nos. 1, 2, 3, 4, 5; pages 65-69, 175-181, 291-301, 401-405, 489, 491, 493; 2 figures. January: Character of oil shale; place in the economic history of fuels. February: Origin of shale. March: Origin of petroleum. April & May: Gas from oil shale.

June 1927 New type of oil shale retort to eliminate internal mechanism. Mountain States Mineral Age, vol. 12, no. 6, pages 12-14, 3 figures. Kraul retorting process, designed to insure continuous speed and low temperature with low cost per ton per hour.

July & Aug. 1927 Gases from oil shale. R. H. McKee and P.D.V. Manning. The Oil Bulletin, vol. 13, no. 7 & 8, pages 729,731,733, 735,737,837,839,841,843; 10 figures. Results of researches on gas products of pyrolysis of oil shale; these results are interpreted in support of new theory for origin of oil shale and petroleum proposed and considered in the first paper published and succeeding numbers of Oil Bulletin. Results are also interpreted to show limiting conditions of commercial retorting of oil shale. New methods have been developed for accurate analysis of oil shale gases.

October 1927 Comparison of oils derived from coal and from oil shale. J. W. Horne and A. D. Bauer. U. S. Bureau of Mines - Report of Investigations No. 2832, 34 pages. Results of investigations on yields and properties of the oils produced from oil shale, lignite, and sub-bituminous coal using standard assay method developed by Bureau for oil shale testings; purpose was to obtain information on a account of character of yield of crude oil tar from different typical oil shales, yield of light oil or naphtha that might be suitable for use in motor fuels and other products of shale oil.

Oct.15, 1927 Close first chapter of oil shale investigation by Bureau of Mines. Petroleum Age, vol. 20, page 41.

November 1927 The geology of the oil shales of the eastern U. S. W. R. Jillson. Pan American Geologist, vol. 48, no. 4, pages 262-272, 5 figures. Location and extent of the shale beds at Indiana, Ohio and States south of these. In this district there are 200 thousand million tons of oil shale suitable for oil production.

December 1927 Oil shale progress. V. C. Alderson. Illustrated. Mining Congress Journal, vol. 14, pages 883-8; 7 figures. Review of progress in industry during 1927, including new activities along the research lines; well oil versus shale oil.

Jan.23,1928 Possible substitutes in shale oil development; second part of federal oil conservation report. Oil, Paint, and Drug Reporter, vol. 113, pages 25, 26. Also National Petroleum
Jan. 10,1928 News, vol. 20, pages 27,28.

Jan.28, 1928 Oil shale industry, 1927. M. J. Gavin. Engineering & Mining Journal, vol. 125, page 167.

February 1928 — Manufacture of high compression gasoline from shale oil. R. Cross. Mining Congress Journal, vol. 14, no. 2, pages 74-76, 4 figures. Shale oil must be available at price approaching ordinary petroleum; such shale oil can be made into gasoline by ordinary standard cracking processes that are refined in accordance with standards for motor fuels; gasoline made from shale oil has unusually good explosive properties.

March 1928 — The oil shale hurdles. D. D. Potter. Mining Congress Journal, vol. 14, no. 3, pages 156-157, 1 figure. Difficulties with which oil shale industry has been confronted are serious but not insurmountable; statement of problems that must be solved; development of oil shale industry will assure adequate future supply of oil in U.S.

May 19, 1928 — Shale oils and their cracked products. Petroleum Times, vol. 19, no. 488, page 920. Character of oils obtained from shales determined by nature of oil which shale can yield under suitable conditions and by method of obtaining oil from shale; from 52% to 66% of crude shale oils can be cracked into motor oil.

June 27, 1928 — Economy in shale blasting operations. F. T. Hallford. Contract Record no. 26, pages 693-695. Considerations to be taken into account when using explosives; how costs can be kept down by proper attention to detail; typical blasting methods; strength of explosives; methods of shale blasting; drilling shale deposits; three descriptions of shale blasting methods in Ontario which are most commonly used; different methods employed are fairly well covered.

July 5, 1928 — Oils from shale, lignite, and coal. J. W. Horne and H. D. Bauer. Oil & Gas Journal, vol. 27, no. 7, pages 168,170, 172, and 174-177; 1 figure. Results of general study being conducted by the U.S. Bureau of Mines and Cooperating Associates of Colorado on yields and properites of oil produced from oil shale, lignite, and sub-bituminous coals, using Bureau standard assay methods; samples chiefly obtained from Rocky Mountain States; some shale from Kentucky, Scotland, Brazil, and Australia; tabulated analysis; description of apparatus and procedure; discussion results.

July 1928 — Manufacturing oil from oil shale and bituminous coal. G. W. Wallace. Combustion Journal, vol. 19, no. 1, pages 23-28, 4 figures. See also Petroleum Times, July 28, 1928 vol. 20, no. 498, page 146. Description of Dundas-Howes process; low temperature distillation of oil shale and bituminous coal; units of Santa Barbara County, California; general arrangement of the N-T-U Company's plant in California; capacity of plant is 200 tons per day; cost of operating plant.

July 28, 1928 — Oil shale developments in Canada. A.A.Swinnerton; Petroleum Times, vol. 20, no. 498, pages 171-173, and Sept. 1, 1928 supplementary articles in No. 503, pages 361-363, 5 August 1928 figures. See also Petroleum World, vol. 9, No. 335, pages 309-314. Also Chemical News and Journal of Industrial Science, July 1928 vol. 47, no. 29, pages 743-747. Bituminous shales found in practically every province, principal localities enumerated; history of development of industry; table of yields obtained; gasoline yield by cracking of shale oil; testing and investigation with the laboratories of Mines Branch at intervals since 1909; further research planned.

August 1928 — Oil shale. Society of Automotive Engineers Journal, vol. 23, no. 2, page 161. Attempts to produce oil from shale are discussed; unlikely that any fundamental change in the U. S. petroleum industry in the near future will make oil shale operation economically possible. From Bulletin of Arthur D. Little.

Aug. 2, 1928 — Government and future oil supply. D. E. Winchester and H. K. Savage. Oil and Gas Journal, vol. 27, no. 11, pages 40-132, 2 figures. See also Oil Engineering & September 1928 Technology, vol. 9, no. 9, pages 249-251. Garfield County, Colorado resources capable of yielding 100 billion barrels of oil; also vast deposits in Utah, Wyoming, Indiana, and Kentucky. Problems of Mining, retorting, and refining require capital and time for research; government should encourage by allowing land claimants to acquire free title located in good faith under mining laws prior to Leasing Act of 1920; authors recommend cooperation between landowners and government in financing research.

September 1928 — Can oil shale be mined by stripping methods? F.E. Cash and M. W. von Bernewitz. Mining Congress Journal, vol. 14, no. 9, pages 665-668 and 733, 10 figures. Investigations of Bureau of Mines have led to the conclusion that only small percentage of oil shale deposits can be recovered through stripping methods; review of various deposits and brief description of possible methods of mining which may be utilized in their recovery.

September 1, 1928 — Carbonization of bituminous fields at low temperature. F. H. Martin. French Revue de L'Industrie Minerale, No. 185, pages 359-364, 5 figures. Describes mechanical retorts for treating oil shale, installed at Boson, France, and oils obtained from it.

Oct. 25, 1928 — Water supply in shale retorting. R. H. McKee and H.H. Parker. Oil & Gas Journal, vol. 27, no. 23, pages 104,137,141,176, and 199; 5 figures. Establishment of shale petroleum industry involves more than the drilling of wells and collection of oil; paper discusses problem of water requirements in shale industry up to production of crude oils; no attempt made to discuss refinery requirements; deals with climate conditions in regions surrounding DeBeque, Colorado, precipitation, wind volocity, temperatures, stream flow; comparison with Scotland; conservation of water.

Nov. 3, 1928 — Oil shale mining costs. Petroleum Times, vol. 20, no. 512, pages 811-812. Development of oil shale depesits is slow chiefly because of cheapness of products of petroleum; possibilities of shale mining in Colorado; most of shales must be extracted by underground methods are similar to coal mining; some can be worked open pit. Abstract from unspecified Bulletin of U. S. Bureau of Mines.

Nov.8, 1928 — Development of American oil shale. H.H. Hill. Oil & Gas Journal, vol. 27, no. 25; pages 124 & 164. An engineer of the Standard Oil Company, formerly with U. S. Bureau of Mines, describes experiments and explains results of work carried on by the U. S. Government covering production and refining methods; the deposits known in U.S.; little or no oil contained in shales but carbonaceous materials yield oils by destructive distillation; experimental plant located on Naval Oil Shale Reserve No. 3 near Rulison, Colorado; operating results with the Pumpherston retorts.

Nov. 12, 1928 — Oil shale production in New Brunswick, Canada. F. C. Johnson. Commerce Reports, No. 46, pages 425-426, 2 figures. Main problems of retorting; New Brunswick oil yield reported to exceed Scotch process of obtaining products; producers regard gasoline as of high quality; plant in operation has to have daily capacity of 100 tons of shale yielding forty gallons of oil per ton.

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1929 Index of oil shale patents. S. Klosky. U. S. Bureau of Mines Bulletin 468, 650 pages. Superintendent of Documents. Price: $1.50

1929 Oil shale in a producing oil field in California. H. W. Hoots. U. S. Geological Survey - Professional Paper No. 154E, pages 171-173, 2 figures on supplemental plates. Oil shale from a well in southwest corner in section 22, T. 11 N., R. 20 W. at south end of San Joaquin Valley is similar to oil shale found in Rocky Mountain states; description of samples; shale contains no free oil but yields oil when heated; close stratographic relation of oil and oil shale is considered suggestive.

Jan. 19, 1929 Oil shale industry, 1928. M. J. Gavin. Engineering & Mining Journal, vol. 127, pages 100-101.

February 1929 The world's oil shale resources and their exploitation. Bohrhammer, vol. 2, no. 32, pages 29-31. In view of the possible exhaustion of crude oil resources of the world; importance of investigation and development of other oil sources is stressed. Summary description of principal known deposits of oil shale; developments; extraction; processes and equipment and yield; manufacture of brick and cement from residues after oil extraction.

Mar. 10, 1929 Experiments in securing rubber from shale. W. D. Morgan. Illustrated. Rubber Age, vol. 24, pages 615-16.

March 1929 The Bureau of Mines experimental oil shale plant. M. J. Gavin. Mining Congress Journal, vol. 15, no. 3, pages 191-196 and 200; 6 figures. Mine and retorting plant near Rifle, Colorado. An experimental refinery and research laboratory at the University of Colorado at Boulder; shale, principally mines underground, yields 30.5 gallons per ton; drilling and blasting procedure described; types of retorts discussed; commercial value of experimental plant is great; its future dependent on appropriation.

Apr. 22, 1929 Additions to the flora of the Green River formation. R. W. Brown. U. S. Geological Survey - Professional Paper No.154J, pages 279-292, 62 figures on supplemental plates. Notes on the study of fossils.

April 1929 The generation of oil in rocks by shearing pressures. J. E. Hawley, American Association of Petroleum Geologists - Bulletin, vol. 13, no. 4, pages 329-365, 8 figures. Details regarding experiments with oil shales in Colorado, Australia, Kentucky, and Cleveland, Ohio. Subjected to high shearing pressures of varying intensity and under different conditions; in no case was any oil generated; general conclusion is that high shearing on oil shales at low temperatures and relatively short periods of time are not important in generation of oil.

July 1929 — Studies in the preparation of ichthyol. R. A. Baxter and H. A. Dumont. Colorado School of Mines Magazine, vol. 19, no. 7, page 17. Ichthyol is defined as a complex water-soluble preparation made by sulfonation of various high sulfur shale oil or petroleum fractions; notes on preliminary investigations of means of sulfonation of fractions from English and Colorado shale oils. Abstract of paper from cases presented by A. J. Dumont. Bibliography.

July 1929 — Shale -- some new reactions. S. J. Popham. Industrial Chemist, vol. 54, no. 50, pages 269-272. Account of recent experiments with oil shale and its treatment.

October 1929 — Significance of micro-crystals of carbonates in bituminous shales. A preliminary note by J. R. Takahashi. American Association of Petroleum Geologists Bulletin, vol. 13, no. 10, pages 1377-1386, 7 figures on supplemental plates. Minute crystals of carbonates are found imbedded in matrices of Fushun shales; they are also found in varying degree, in oil shales from Colorado, Scotland, and elsewhere; preliminary investigation reveals that those occurring in shales of terrestrial origin are mostly sideritic and those in marine kerogen shales are largely dolomitic.

December 1929 — Oil from oil shale in U. S. R. A. Cattell. Institute of Petroleum Journal, vol. 35, no. 312, pages 841-7. Methods, process, and equipment used by the U. S. Bureau of Mines on oil shale deposits in Colorado, Wyoming, and Utah. Illustrations.

April 1930 — Generation of oil in rocks by shearing pressures. J. E. Hawley. American Association of Petroleum Geologists Bulletin, vol. 14, no. 4, pages 451-481, 3 figures. Results of research in 1928-1929, supplementing papers indexed in Engineering Index 1929, page 139 from April 1929 issue of same bulletin.

Oct. 25, 1930 — Shale oil possibilities. South African Mining & Engineering Journal, vol. 41, part 2, no. 2039, pages 178-179. Latest American bulk tests; oil for Navy; practical lessons for South Africa; data derived from U. S. Bureau of Mines Report; not specifically cited but apparently Bulletin No.315, 1930.

1931 — Origin and microfossils of oil shale of the Green River formation of Colorado and Utah. W. H. Bradley. U. S. Geological Survey, Professional Paper 168, 58 pages. General and geological description; fossil data.

April 15, 1932 — World survey of recent oil shale developments. A. A. Swinnerton. Chemical News, vol. 144, no. 3757, pages 241-247. Production in the British Empire, Europe, Asia, U. S.; during recent years over 3/4th of world's production of shale oil has been from Scotland.

October 1932 — Genesis of oil by high radial axial pressure. K. Uwatoko. American Association of Petroleum Geologists Bulletin, vol. 16, no. 10, pages 1029-1037. High pressure experiments with oil shales from Colorado, California, and bituminous coal from Fushun; in all experiments liquid oil was generated and pressure appears to have had some effects on the solubility of bituminous matter; it is concluded that high radial axial pressure (hydraulic pressure) on oil shales and coal at room temperature has quantitatively some importance in generation of liquid oil from such bituminous rocks. Bibliography.

October 1933 — Generation of oil in rocks by shearing pressures — IV & V. Further studies of the effects of heat on oil shales. W. P. Rand. American Association of Petroleum Geologists Bulletin, vol. 17, no. 10, pages 1229-50. Report of research contained in study by J. E. Hawley, indexed in Engineering Index, 1930, page 1231, from issue of 1930. Character and amount of products formed by action of heat on organic matter of oil shale are found to depend on a combined influence of temperature, duration of heating, and ratio between volumes of organic material and pore space available to gases generated as a result of heating. Bibliography.

Dec. 20, 1933
Jan. 20, 1934 — Carbonization of oil shales. P. N. Kogerlman. Energia Termica, vol. 1, no. 3, pages 57-62; vol. 2, no. 1, pages 3-6. Experiences with Esthonian shale which might be applied with certain modifications to treatment of other shales as well; various systems and plants described and illustrated.

Jan. 2, 1935 — Oil from shale is costly. J. Cadman. National Petroleum News, vol. 27, page 18.

February 1935 — Determination of carbon and hydrogen in substances of bituminous or pyro-bituminous nature occurring in shales. H. W. Hoots, A. L. Blount, and P. H. Jones. American Association of Petroleum Geologists - Bulletin, vol. 19, no. 2, pages 293-299. Supplementary investigation; combustion furnace and auxiliary apparatus; procedure is typical of the Liebig method with exception that care must be exercised in preventing excessive heating of lead chromate.

June 10, 1935 U. S. loses fight to cancel oil claims. Oil, Paint, and Drug Reporter, vol. 127, page 56.

February 1937 Oil shale in light of technological advancement. H. K. Savage. Mines Magazine, vol. 27, no. 2, pages 7-12. Review of technological advancement in industry during recent years; cost of producing automotive fuels from oil shale; available oil shale resources in western Colorado; feasible mining methods; retorts for destructive distillation of shales; refining of shale oil; mining; transportation and marketing products; estimates of cost of producing shale gasoline with the equipment now available. Bibliography.

1938 Studies of certain properties of oil shale and shale oil. B. Guthrie. U. S. Bureau of Mines Bulletin, 159 pages, 25¢. Report is based entirely upon subject matter that appeared in published and unpublished manuscripts of the U. S. Bureau of Mines; although methods of evaluating crude oil and motor fuels have changed and new and improved tests have been developed. Since original preparation of reports, no attempt has been made to alter materially subject matter as originally written.

December 1938 Treatment of shale oil by hydrogenation. M. Pier. Institute of Petroleum Technologists Journal, vol. 24, no. 182, pages 692-705. Experiments described indicate that it is possible by catalytic hydrogenation under pressure to produce marketable products of high purity with exceptionally high yield from shale oil and from oils obtained by low temperature carbonization of shale. Oil types of shale oil can be converted into automotive fuels, with about 80% yield by weight.

April 1939 Analysis of kerogen of oil shales. A. L. Down. Institute of Petroleum Journal, Birmingham, England; vol. 25, no. 186, pages 230-237. Attention is directed to difficulties in determination of the correct composition of organic matter in oil shales; attempts of previous workers to isolate kerogen are surveyed and method adopted described; samples of five British oil shales have been examined; compositions of kerogens calculated from analyses of de-ashed samples is compared with those obtained from ultimate analyses of original samples. Bibliography.

July 1940 Classification of oil shales and cannel coals. A.L.Down and G. W. Himus. Institute of Petroleum Journal, vol. 26, no. 201, pages 329-335. Discussion, pages 336-348. Supplemental plates. Attention is directed to confusion that exists in nomenclature and classification of naturally occurring oil yielding materials; a system nomenclature based

on principal plant and mineral constituents; and classification showing inter-relationships and gradation of properties of these substances is put forth.

September 1941 — Shale oil industry in Esthonia. P. Kents. Mines Magazine, vol. 31, no. 9, pages 455-456, and 486. Comment on oil shale boom of 20 years ago due to rumors of probable oil shortage in the U. S.; commercial oil shale industry exists only in Scotland, Esthonia, South Africa, Australia, and Manchuria. Esthonian commercial production started in 1924; four companies with ten plants produce shale oil; geology and chemistry of deposits; underground mining methods; distillation; characteristics of shale oil of Esthonia resembling crude petroleum. Bibliography.

Oct. 31, 1942; Nov. 7; 1942; Jan. 23, 1943; Sept-Oct. 1942; Apr. 22, 1943; March, April & May 1943 — Mining & refining of oil shales. R. Stelling. South African Mining and Engineering Journal, vol. 53, part 2, nos. 2596 and 2597; pages 185 and 191; also Nov. 7, pages 213,215,216. See also Mining Journal (London), vol. 220, no. 5605, page 48; Chemical, Metallurgical and Mining Society of South Africa Journal, vol. 43, nos. 3 & 4, pages 34-55. Discussion pages 55-59; Colliery Guardian, vol. 166, no. 4295, page 512; Industrial Chemist, vol. 19, nos. 218,219,220, pages 149-154 in March 1943 issue; April issue: pages 204-212; May: pages 260-266. Comparative details of practice in South Africa and elsewhere; four groups of oil shale considered: French type, lignite and coaly shales, torbanites, and true oil shales. Oil forming constituent; mining methods; retorting and refining; experience in various countries.

November 1942; Jan. 14, 1943 — Proposed methods and estimated costs of mining oil shale at Rulison, Colorado. E. D. Gardner and C. N. Bell. U. S. Bureau of Mines Information Circular No. 7218, 59 pages; supplemental plates. See also the Digest of Oil & Gas Journal, vol. 41, no. 36, pages 47 & 49. Methods adaptable to mining certain American shales, applying specifically to conditions in Green River formation on Naval Oil Shale Reserve, No. 1. Bibliography.

Apr. 22, 1943; April 29, 1943 — Oil shale and shale oil. B. H. Weil and W. Weinrich. Oil and Gas Journal, vol. 41, nos. 50 and 51, pages 48,51, 53,55,72; April 29: pages 73, 75, 76, 79. General survey of available information; analyses of oil shale from various localities. Amount of oil obtainable per ton from oil shale varies widely; serious problem in waste shale disposal; comparison of charges and yields from same shale from two types of retorts; distillation data; shale oil refinery gases; gasolines obtained by hydrogenation. Bibliography.

October 1943 Oil shale in carbon minerals technology. R. A. Baxter. Mines Magazine, vol. 33, no. 10, pages 545-548. Outline of history of oil shale development. The only oil shale fields besides Scotch that have been developed to any extent are in Esthonia and Manchuria. Notes on various other deposits; possibilities of utilization of oil shales; illustrations and comments on shales of western Colorado.

July 22, 1944 Oil production from shale. South African Mining & Engineering Journal, vol. 55, part 1, no. 2685, page 497.

Feb. 12, 1944 Survey of world resources and production. Also U. S. Department of Commerce publication, Foreign Commerce Weekly.

September 1944 Colorado oil shale. R. A. Baxter and A. W. Buell. Mines Magazine, vol. 34, no. 9, pages 493-495. Brief review of history of oil shale and process for extracting its hydrocarbons. Bibliography.

June 1945 Oil shales of west. J. O. Ball. Compressed Air Magazine, vol. 50, no. 6, pages 156-160. Discussion of oil shale resources in U. S.; factors influencing necessity for giving serious attention to technology and methods of making liquid fuel from our domestic reserves. Features of research program by U. S. Bureau of Mines; estimate of operational expenditures and shale mining procedures.

July 2, 1945 U. S. begins oil shale work. Oil Weekly, vol. 118, no. 5, page 47. Illustrations and brief descriptive text. Laboratories are being built at Laramie, Wyoming and demonstration plant near Rifle, Colorado; 200 ton per day mine will be opened by Naval Reserves with 1½ mile tramway from mine to plant.

Sept. 10, 1945 Development of oil shale resources undertaken by U. S. Bureau of Mines. A. J. Kraemer and F. E. Buchan. Chemical and Engineering News, vol. 23, no. 17, pages 1623-1627. Paper reviews events leading up to passage of Synthetic Liquid Fuels Act, and outlines Bureau of Mines program that deals with development of oil shale resources of nation.

September 1945 Studying shale oil production. World Petroleum Journal, vol. 16, no. 10, pages 80, 81. Brief illustrated description of exploration and research done by U. S. Bureau of Mines; new process of shale oil recovery giving data on method developed by Socony-Vacuum Oil Co., Inc. as result of experiments conducted at Paulsborough, New Jersey.

Nov. 5, 1945 Oil shale development. A. Gibbon. Oil Weekly, vol. 119, no. 10, pages 30-33. Editorial staff summary of progress based largely on reports by A. J. Kraemer, E.W. Hartman, J. R. Reeves, D. E. Winchester; estimates of costs of mining and retorting of oil shale; experimental plant operated by U. S. Bureau of Mines near Rulison, Colorado, 1925-1929. Proposed large plant near Rifle, Colorado.

Nov. 25, 1945 Oil shale investigations. Chemical & Engineering News, vol. 23, page 2100.

Dec. 21, 1945 Dec. 28, 1945 Shale oil. Engineer, vol. 180, nos. 4693-4694, pages 498-500; pages 520,521. Discussion of properties of shale and shale products; hydrocarbons from shale are similar to those from petroleum; illustrated description of retorts; hydrogenation of shale oil; anti-knock properties of shale oil gasoline.

Jan. 2, 1946 Oil shale retorting. J. W. Payne, C. H. Lechthaler, and E. V. Bergstrom. National Petroleum News, vol. 38, no. 1, section 2, page R36-9. Experiences gained in thermal catalytic cracking (TCC) processes used to develop method of retorting shale continuously by gravity flow through chamber in which shale is heated by counter-current flow of heated product gas; operations of laboratory pilot plant retort; product yields and properties; 100 ton per day pilot plant has been proposed by Bureau of Mines for inclusion in Synthetic Liquid Fuels Program.

Aug. 31, 1946 Oil shale - America's fuel ace in the hole. Oil & Gas Journal vol. 45, no. 17, pages 68, 97, 98, and 100. Illustrations and notes on the status of investigations by the U. S. Bureau of Mines in Colorado, Utah, and Wyoming; oil shale as possible future source of liquid fuels; American oil shale deposits estimated to contain 92 billion barrels of oil; demonstration plant being built on Naval Oil Shale Reserves in western Colorado; research laboratory under construction at Laramie, Wyoming; technical problems which must be solved; program to test German oil shale processes.

Sept. 10, 1946 Century in oil shale patents (1845-1945). S. Klosky. Bibliography. 76 references. Chemical and Engineering News, vol. 24, pages 2342-2344.

Sept. 9, 1946 Shale oil experiment. Oil Weekly, vol. 123, no. 2, page 33. Illustrations with brief test dealing with work conducted by U. S. Bureau of Mines near Rifle, Colorado.

October 1946 European shale treating progress. E. Evans. Petroleum Engineer, vol. 18, no. 1, pages 82, 85, 88, 90. Review based on report by W. W. Crdell and E. L. Baldeschwieler.

1946 Indexed in Engineering Index, 1946; page 770 from

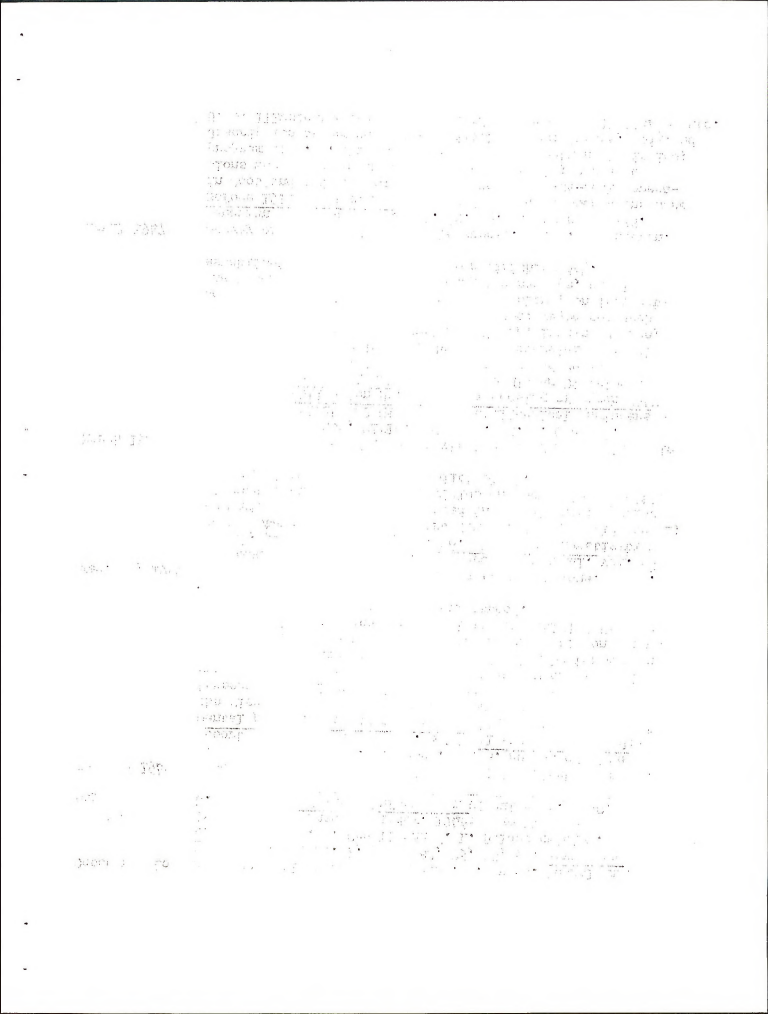
May 1946 U. S. Bureau of Mines Information Circular No. 7348.

October 1946 Methods of assaying oil shale by modified Fischer retort. K. E Stanfield and I. C. Frost. U. S. Bureau of Mines - Report of Investigations No. 3977, 11 pages with supplemental plates. Method presented utilizes modification of the Fischer cast aluminum retort commonly used for low temperature coal carbonizations; proposed method has several advantages over conventional Bureau of Mines oil shale assay method and is recommended until better method is developed; effects of different experimental conditions upon oil yields; comparison of yields by modified Fischer retort with those by conventional method.

Feb. 14, 1947 Retorting oil shale by fluidized solids technique. R. H. Blandings & B. E. Roetheli. Oil and Gas Journal, vol. 45, no. 41, pages 84, 86, 87, 88, 96. Notes on investigations by the Standard Oil Development Company during World War II; analysis of Australian shale used in experiments; results of batch coking experiments; yields and operating conditions for experimental operations; pilot plant.

March 1947 Progress of mining studies at the Bureau of Mines oil shale mine, Anvil Points, Rifle, Colorado. E. D. Gardner. American Institute of Mining and Metallurgical Engineers - Technical Publication No. 2286 from meeting of March 1947. 11 pages. Principal job of Oil Shale Mining Division of the Bureau of Mines is to select methods and devise practices for producing oil shale on commercial scale at lowest possible cost. Method for mining, loading device, and haulage equipment have been selected; major research to be done on drilling and blasting problems, on integrating breaking of shale with loading and haulage, and in establishing costs; procedures for finishing job.

April 1947 Survey of the world's oil shale supply. A. A. Swinnerton. Canadian Mining Journal, vol. 68, no. 4, pages 229-235. Before 1914 chief commercial-sized oil shale operations were in Scotland and France; from 1920 to 1930 wide-scale operations were started in Esthonia and Manchuria; research program of U. S. Bureau of Mines; oil production statistics; description of operations in British Empire; Europe, Asia, and U. S. Illustrated notes on shale mining and distillation plants.



July 1947 Oil shale demonstration plant. Petroleum Engineer vol. 18 no. 11, pages 87, 90, 92, 95, 98, 99. Demonstration plant on U. S. Naval Oil Shale Reserves, 7½ miles west of Rifle, Colorado; recently dedicated and will produce oil from nearby oil deposits. One ton of high quality oil shale will yield about 45 gallons or more of oil; plant details; estimate of the reserves; processing.

September 1947 Oil shale mining. T. Ertl. American Institute of Mining & Metallurgical Engineers - Technical Publication No. 2359 on meeting of September 1947. 8 pages. Term "oil shale" is defined; foreign developments; richest and most extensive oil deposits in the U. S. lie in western Colorado; Bureau of Mines is opening areas for underground mining; from first area oil shales are mined selectively as required by retorting plant; second area is being developed to ascertain most practical methods of mining and to determine costs. In both areas research will be carried on.

September 1947 Oil shale processing. J. B. Langford and B. Guthrie. American Institute of Mining and Metallurgical Engineers - Technical Publication No. 2360 of meeting of September 1947. 12 pages. Progress report on research program at Bureau of Mines plant at Rifle, Colorado. Large scale crushing plant and two 40-ton N-T-U retorts are described in detail; data on typical N-T-U retort runs; yields of 90% to 100% of assay are realized on 30 gallons to ton shale with retort cycle time of 18 hours; comparison of Mid-Continent petroleum and N-T-U shale oil; problems involved in refining shale oil are discussed in detail.

1948 Oil shales and shale oils. H. S. Bell. D. van Nostrand Co. New York, Toronto, London, 1948. Book. 157 pages. Illustrated, diagrams, charts, tables. Price $4.00. Beginning with geographical distribution and history of exploitation, book presents existing information on methods and economics on producing oil from shale; oil shales of world discussed; mining methods; retorting and refining of oil. Relative costs of oil source tabulated; references from wide variety of sources.

Feb. 13, 1948 Oil from shale. Iron & Coal Trades Review, vol. 156, no.4170, pages 307-317. Operations in mining, retorting, and distillation of Scottish oil shales; geological features of oil shales measures; description of practice at principal mines and refineries.

Dec. 1948 Oil shale mining investigations, Rifle, Colo. E.M.Sipprelle. Mines Magazine, vol.38,no.12,pages 61-64. Green River formation contains important resources of oil shale estimated to approximate 300 billion barrels of oil shale within area of 1,000 square miles in Piceance Creek Basin; about 1/3 in beds 70 to 100 feet thick called mahogany ledge. Paper deals with Bureau of Mines work to develop,demonstrate methods,determine costs.

February 1948 Oil shale deposits of world and recent developments in their exploitation and utilization reviewed to May 1947. W. H. Cadman. Institute of Petroleum Journal, vol. 34, no. 290, pages 109-132. See also Institute of Petroleum Review, vol. 1, no. 11, pages 365-372. Brief survey of deposits; nature and chemical composition of oil shales and some oil shale products; extent of exploitation of potential reserves; extent of development of economical method of obtaining oil from shale; Swedish discovery of uranium in oil shale; value of shale uranium as source of atomic energy. Bibliography.

April 1948 Guide to geology of central Colorado, with index maps showing major geological structure and significant oil and gas information. Illustrated. Colorado School of Mines (Golden) Quarterly, 43, No. 2, Pages 1-176; 14 plates.

April 1948 Mining Program - Bureau of Mines Oil Shale Project, Rifle, Colorado. E. D. Gardner. U. S. Bureau of Mines - Report of Investigations No. 4269, 19 pages, supplemental plates. Oil shales known to occur in about 20 States and in Alaska; most extensive development deposits are in the Green River formation of Colorado, Utah, Wyoming and Chilicothe formation of Ohio, and Albany formation in Indiana; estimate reserves in Green River formation; mine facilities and site selected for project; experiment; surface excavation; underground development; mining problems; hazards.

September 1948 Oil shale resources in Colorado, Utah, and Wyoming. C.Belser. American Institute of Mining and Metallurgical Engineers - Technical Publication No. 2358 for meetings. 11 pages.

May 1948 Also in Petroleum Technology. Summary of data based on reports of U. S. Geological Survey on results of core drilling and sampling by U. S. Bureau of Mines on drill cuttings from general petroleum well, on unpublished report by Geological Survey and from information supplied by geologists of private companies who have investigated the Green River formation; paper also contains the revised estimate of grade and tonnage of mineable thickness of oil shale of western Colorado.

August 1948 Oil Shale. Bureau of Petroleum Journal, vol. 19, no.9, pages 49 and 50. U. S. Bureau of Mines shale mines and shale oil plant near Rifle, Colorado produces oil shale at rate of 25 tons per man day. Crushing and retorting plant daily produces about 50 barrels of oil that will serve as No. 6 or No. 5 residual fuel. To make light distillate fuel, crude oil has to be subjected to deeper refining. Crude shale is being shipped to refineries that have agreed to cooperate in this work; approximate estimates on production of fuels showing relative cost of producing liquid fuels from crude oil, natural gas, coal, and oil shales.

September 1948 — Studies of soluble materials in oil shales. B. J. Ferris. Mines Magazine, vol. 38, no. 9, pages 19, 20, 21, 22, 28, and 44. Thin sections of fresh samples of oil shale from Bed G of Green River formation at Rifle, Colorado were observed through microscope while droplets of carbon tetrachloride were placed on them with eye dropper; photomicrographs were taken of selected areas; slides were then emersed in carbon tetrachloride at room temperature at specific time intervals, additional photomicrographs were taken; solubility as function of particle size; as function of temperature of solvent, of specific gravity, and function of oil yield. Libliography.

October 1948 — Mining of Colorado oil shale. T. Ertl. American Society of Mining Engineers - Advance Paper No. 48 - PET-11 for meeting of October 3-6, 1948; 5 pages; 3 supplemental plates. Oil shale is defined and major foreign and domestic deposits noted. Geology, topography, and physical characteristics of Colorado oil shale described; choice of beds to be mined; mining method to be applied; handling of oil shale to plant and disposal of spent oil shale discussed.

November 1948 — Determination of room and pillar dimensions for oil shale mine at Rifle, Colorado. F. D. Wright and P. B. Bucky. American Institute of Mining and Metallurgical Engineers - Technical Publication No. 2489 for meeting February 1948, 8 pages; (Mining Technology). Work done at Columbia School of Mines barodynamic laboratory in determining maximum safe unsupported roof spans and minimum safe pillar dimensions for oil shale mine at Rifle, Colorado; structure and sampling of deposit; physical characteristics of oil shale; roof and pillar design; because of effects of surface weathering, recommendations are valid only if workings are more than 200 feet from surface. Bibliography.

December 1948 — Progress in oil shale development and research. J. Boyd. Mines Magazine, vol. 38, no. 12, pages 47-50 and 64. Experimental program was authorized by Synthetic Liquid Fuels Act of 1944; demonstration plant near Rifle, Colorado was placed in operation in May 1947; occurrences of oil shale in U. S., largest deposits are in the Green River formation of Colorado, Utah, and Wyoming; richest beds are area about 1,000 square miles in the Piceance Creek Basin north of Rifle, Colorado, up to 500 feet thick, and with average assay yield of 15 gallon per ton; details of Bureau of Mines plant.

December 1948 — Shale and air counterflow in new continuous retort. H. Reed and C. Berg. Petroleum Processing, vol. 3, no. 12, pages 1187-8, 1191-2. See also Petroleum Engineering, vol. 20 December 1948, no. 3, pages 214, 216, 218; Mechanical Engineering, vol. 71, August 1949, no. 8, pages 639-42. Indexed in Engineering Index, 1948. 1948 From Am.Soc.of Mech.Engineers Advance Paper No. 48,PET-15. October 1948

January 1949 — Oil shale mining. Mining World, vol. 11, no. 1, pages 32-34. Notes on U. S. Bureau of Mines project at Rifle, Colorado; plant development; geology; estimated reserves; mining technique; crushing and processing.

May-June 1949 — Mining oil shale at Rifle, Colorado. F. D. Wright. Explosives Engineering, vol. 27, no. 3, pages 78-81, 86 & 92. Bureau of Mines experiments underground indicate that mining of oil shale in Colorado will be recommended for commercial operations; drilling done from two-platform, multiple drill jumbo mounted at rear of Diesel cargo truck; load of charges 45% semi-gelatine dynamite and 1-3/4 inch by 8 inch cartridges; production of over 1400 tons per shift obtained with working force of 12 men.

June 1949 — Mining of Colorado oil shale. T. Ertl. Mechanical Engineering, vol. 71, no. 6, pages 478-80. Indexed in Engineering Index, 1948; page 850 from American Society of Mechanical Engineers - Advance Paper No. 48--PET-11, for meeting Oct.3-6, 1948.

June 1949 — Method of assaying oil shale by modified Fisher retort. K. E. Stanfield and I. C. Frost. U. S. Bureau of Mines--Report of Investigations No. 4477; 13 pages, supplementary plates. Revision of Report of Investigation No. 3977 indexed in Engineering Index 1946, page 770. Methods of utilizing modification of Fisher cast aluminum retort. Proposed method has several advantages over former Bureau of Mines oil assay method. Report shows effects of different experimental conditions upon oil yields and comparison of yields by this method with those obtained by former Bureau of Mines assay method.

June 1949 — Experimental shale refinery completed. H. B. Morris and D. L. Gilbertson. World Petroleum, vol. 20, no. 6, pages August 1949 46-49. See also Petroleum Engineering, vol. 21, no. 9, pages C26-C28, C30-C32. Latest step in study of oil recovery from shale, conducted by Bureau of Mines is the construction of experimental refinery at Rifle, Colorado; flow diagram of refinery and of chemical treating unit; details of equipment and process steps.

July 1949 — Technologists discuss progress in oil shale. R. Sneddon. Petroleum Engineering, vol. 21, C-36 - C-37.

September 1949 — Mechanization at Bureau of Mines oil shale mine. E. D. Gardner and E. M. Sipperelle. Mining Engineering, vol. 1, no. 9, Section 3--Transportation, pages 317-323. Outline description of deposits in the Green River formation of Colorado, Utah, and Wyoming. Called "oil shale", rock is stated to be marlstone containing organic matter named "kerogen"; Bureau of Mines demonstration mine is on Naval Oil Shale Reserve No. 1, about 5½ miles from plant site,

10 miles west of Rifle, Colorado; desired goal of underground mining costs set up 1945 was 50¢ per ton. Bibliography.

November 1949 Underground quarry. Excavating Engineer, vol. 43, no. 11, pages 20-25, 44, 46-48. Practicing underground bench method of open pit mining and techniques of stone quarries, U. S. Bureau of Mines cut cost of taking oil shale out of earth to 32.9 cents per ton; demonstration plant near Rifle, Colorado mahogany ledge is worked on three levels with advance heading at top; drilling was performed with hard surface bits; best fragmentation resulted from 45% Gelex No.2 with 5/10 to 6/10 pound required for each ton blasted.

Dec. 8, 1949 Retorting Colorado's mahogany ledge shales--Report on developments. R. Havrick. Oil & Gas Journal, vol. 48, no.31, pages 75-76, 88. Containing neither shale nor oil, Colorado oil shale is magnesium marlstone composed of calcium magnesium carbonates with clay minerals and solid organic matter from which shale oil is recovered. Description of the deposit, mining, retorting, and refining.

Jan.-Feb.1950 Colorado oil shale mine demonstration. P. B. Bucky. Explosives Engineering, vol. 28, no. 1, pages 12-15. Geological formation at Rifle, Colorado is magnesium marlstone containing solid carbonaceous material called kerogen; when heated to 800 degrees Fahrenheit the latter is converted to shale oil; equipment used in experimental full scale mine includes jumbo; mounting four grills, portable blasting platform, compressor, and scaling rig, three cubic yard electric shovel, caterpillar bulldozer, and 15 ton Euclid rear dump trucks; mining yields 90 tons per man day at cost less than 50¢ per ton.

Jan. 25, 1950 Bureau of Mines says cost of producing oil from shale is 7.3¢ per gallon, excluding amortization, profit. National Petroleum News, vol. 42, page 16.

January 1950 Liquid fuels from coal and oil shale; with cost data. G. Roberts, Jr. and P. R. Schultz. Bibliography. Diagrams. Petroleum Refiner, vol. 29, pages 104-8.

January 1950 Oil shale facts; abstract. H. M. Thorne, and others. Chemical Engineering, vol. 57, pages 241-2.

March 1950 Estimated oil yield from oil shale from its specific gravity. I. E. Stanfield. Analytical Chemistry, vol. 22, paragraph 491-492.

July 1950 Shale oil progress. Petroleum, vol. 13, no. 7, pages 173-174. Historical notes on development of shale oil industry from time of British patent granted to James Young in 1850; report on industry U. S.; description of new extraction process developed by American Society Vacuum Oil Company.

September 1950 Further researches on determination of chemical composition of oil shales. T. E. Dancy and V. Giebroyc. Institute of
October 1950 Petroleum Journal, vol. 36, no. 321,322; pages 593-603; October issue, pages 607-623. Determination of true, ultimate kerogen composition is difficult because of mineral content; enriching by acids (de-ashing) may attack kerogen; grinding with oil does not separate inorganic matter; no generally suitable method exists; kerogen studies by oxidation methods.

September 1950 Oil shale mining. E. D. Gardner and D. M. Sipprelle. Mechanical Engineering, vol. 72, no. 9, pages 701-6. Innovations & equipment in underground procedures in mine at Rifle, Colorado. Development by Bureau of Mines to demonstrate methods of an established cost for mining oil shale on commercial scale; illustrations.

September 1950 Shale retorting process verified by test run. Petroleum Refiner, vol. 29, no. 9, page 203. Continuous shale retorting process that has been developed by Union Oil Company of California; 50 tons per day plant now in operation; test run has completely verified commercial features of process.

September 1950 Extraction and refining of shale oil. B. Guthrie and L. Schramm. Mechanical Engineering, vol. 72, no. 9, pages 707-711, 732. Nature and characteristics of oil shales; retorting; description of thermal processing unit of shale oil refinery at Rifle, Colorado; commercial possibilities; illustrations.

October 1950 Some innovations in equipment for scaling high roofs and mine walls. B. C. Brown, F. D. Wright, H. J. Ballinger. U. S. Bureau of Mines - Report of Investigations No. 4739; supplemental plates. Methods at experimental oil shale mine near Rifle, Colorado, for placing men in position to scale loose from walls, pillars, and roofs of high stopes. Equipment includes boom type scaling rig, 27 feet above the floor; fork lift truck modified to provide remotely controlled working platform; platform mounted on telescoping tower to elevate men 65 feet.

October 1950 Shale oil as future source of energy in western states. S. H. McAllister. Petroleum Processing, vol. 5, no. 10, pages 1076-9. It is estimated that over 300 billion barrels of potential shale oil exist in Colorado alone, some of the deposits averaging about 26 gallons per ton; mining, retorting, and refining methods are being studied; several oil companies are interested; on basis of present data, shale oil represents best opportunity to supplementing supply of liquid fuels on the Pacific coast when needed.

November 1950 — Thermal decomposition study of Colorado oil shale. A. B. Hubbard and W. E. Robinson. U. S. Bureau of Mines - Report of Investigations No. 4744, 24 pages, supplemental plates. Shales were heated in absence of oxygen atmospheric pressure and measured; decomposition products obtained were gas, oil, and bitumen; specific reaction rates for thermal composition of kerogen were determined for each temperature study.

January 1951 — Oil from shale--is it coming soon? B. Skrotski. Power, vol. 95, no. 1, pages 71-74. Resources of oil shale in the U. S. and possibilities of producing oil from them. U. S. Bureau of Mines has set up demonstration processing plant at Rifle, Colorado to study problems of processing crude shale oil to yield about the same products as obtained from petroleum; retorting and refining of kerogen into oil products.

January 1951 — Oil shale research and process development. K. E. Stanfield and H. M. Thorne. Industrial and Engineering Chemistry, vol. 43, no. 1, pages 16-20. Description of research undertaken by U. S. Bureau of Mines to procure chemical, physical, and engineering data necessary for extracting oil from oil shale and refining shale oil into products meeting commercial specifications, and to provide data essential for development of appropriate processes and for design, construction, and operation of commercial plants. Bibliography.

January 1951 — Characteristics and utilization of oil shale and shale oil. H. M. Thorne, W.I.B. Murphy, J.S. Ball, K.E. Stanfield, and J. W. Horne. Industrial & Engineering Chemistry, vol. 43, no. 1, pages 20-27. Properties of oil shales, shale oils, and their products; results of major phases of research and process development work progress at Laramie, Wyoming station of the U. S. Bureau of Mines; properties of products obtained by retorting oil shale and refining shale oil by several different processes; properties of Green River oil shale from Colorado. Bibliography.

January 1951 — Shale oil refining. J. D. Lankford and C. F. Ellis. Industrial & Engineering Chemistry, vol. 43, no. 1, pages 27-32. Results of study of refining of Colorado crude shale oil by means of thermal cracking and chemical treatment processes which were carried out on demonstration plant at scale to explore variability of yield and quality of finished products, and of certain distillates which could be suitable as charge stocks for other refining processes; various gasolines and Diesel fuels have been produced.

January 1951 — Heat requirements for retorting oil shale. H. W. Sohns, L. E. Mitchell, R. J. Cox, W. I. Barnett, and W. I. R. Murphy. Industrial & Engineering Chemistry, vol. 43, no.1, pages 33-36. Study of the total heat necessary to retort Colorado oil shale to produce shale oils, accompanied by-products, under conditions that would exist in commercial practice; overall heat requirements for retorting Colorado oil shale measured above 77 degrees Fahrenheit, range from 105 Btu. per pound at 450 degrees F. to 356 Btu. per pound at 1100 degrees F. per 20 ton per gallon shale; other typical results.

January 1951 — Liquid fuels from oil shale. W. Q. Hull, B. Guthrie, and E. M. Sipprelle. Industrial & Engineering Chemistry, vol.43, no. 1, pages 2-15. Nature of oil shale and history of shale oil recovery; U. S. Bureau of Mines experimental oil shale mine & demonstration plant at Rifle, Colorado; discussions of its work directed toward development of satisfactory processes and techniques of commercial production of liquid fuel from oil shale; data on nature and characteristics of shale oil. Bibliography.

February 1951 — Oil shale mining. E. D. Gardner. Mechanical Engineering, vol. 73, no. 2, page 155. Discussion of paper indexed in
September 1950 — Engineering Index, 1950; page 800.

Feb. 21, 1951 — Shale oil effort. Oil & Gas Journal, vol. 49, no. 42, 137 pages. Attempt to produce oil from shale at Glen Davis, New South Wales abandoned; annual production of oil was 78,500 barrels at cost of 38½ per gallon; motor fuel can be imported for 11.7¢ per gallon.

April 1951 — Study of preheating Colorado oil shale. W. E. Robinson and A. B. Hubbard. U. S. Bureau of Mines - Report of Investigations No. 4787, 13 pages, supplemental plates. Study of drying and preheating effect on oil yield; Preheating oil shale with nitrogen reducing mixture had no effect upon oil or water yield. Oil yield decreased with increase in oxygen content of heating gases, increase in temperature of heating gas and heating time, and decrease in particle size of shales; increase in water yield resulted from oxidation of kerogen.

July 1951 — Improved process developed for retorting oil shale. Petroleum Processing, vol. 6, no. 7, pages 740-3. Gas combustion process of retorting oil shale is now used by U. S. Bureau of Mines Synthetic Fuel Program. Combustion, retorting, condensation of oil, and recovery of sensible heat from spent shale are all accomplished in a single vessel.

August 1951 — Equipment tested at the Bureau's oil shale mine. F.D. Wright, E. E. Burgh, H.J. Ballinger, B. C. Brown, L. Fieg. U. S. Bureau of Mines - Report of Investigations No. 4810, 13 pages and supplemental plates. New equipment for drilling vertical holes, cleaning blast holes, hauling explosives, and conditioning Diesel exhaust gas developed in Bureau's experimental oil shale mine near Rifle; equipment also applied in mines where room and pillar methods are employed; experience in testing; schematic drawings. Bibliography.

August 1951 — Oil shale mining developments in mining industry. E. M. Sipprelle and H. J. Ballinger. Mining Congress Journal, vol. 37, no. 8, pages 46-51. Description of the experimental mine in oil shale beds in Green River formation near Rifle, Colorado. Mine is operated by the U. S. Bureau of Mines to develop mining methods, equipment, and procedures, and to establish firm cost estimates for mining oil shales. It is estimated that the oil shale can be mined by underground methods, crushed, and conveyed to retorts for 60¢ per ton; details on equipment.

November 1951 — Properties of the Colorado oil shale. K. E. Stanfield, I. C. Frost, W. S. McAuley, and H. N. Smith. U. S. Bureau of Mines - Report of Investigations No. 4825, 27 pages, supplemental plates. Results of analytical studies on oil shale samples from mahogany ledge of Green River formation near Rifle; petrographic characteristics; modified Fisher assays as basis for comparing different oil shales; physical and chemical properties; coking tendency; gross heating value; organic content and composition of oil shale; sulfur and nitrogen oil shale; weathering of oil shales; photomicrographs; photographs.

January 1952 — Oil shale as fuel resource. C. Berg. Petroleum Engineer, vol. 24, no. 1, pages A-37-43. Deposit of Green River formation in Colorado, Utah, and Wyoming; Piceance Creek Basin covers 1,000 square miles; formation averages 25 gallons per ton and can yield 100 billion barrels of oil; technology of mining, retorting, refining of shale and shale oil; economic evaluation of possibilities of utilization; diagrams.

Feb.March, and May 1952 — Shale oil production and refining today. P. W. Sherwood. Petroleum Refiner, vol. 31,nos. 2, 3, and 5; February:pages 97-101; March: pages 134-138; May: pages 163-164. February: review of the oil shale occurrences in the U. S. with references to reserves and geology, mining, classification retorting. March: retorting processes for shale oil recovery which have been commercially established or which have shown favorable potential; externally heated and internally heated retorts. May: refining operations for converting recovered shale oil gasoline and Diesel oil; problem of emulsions; cracking shale oil; use of pot stills; facilities at Rifle, Colorado; hydrogenation of shale oil; liquid phase function; refining of shale oil products; gasoline from oil shale; cost of production.

March 1952 — Low cost underground methods developed for blasting and handling large tonnages. W. B. Lenhart. Rock Products, vol. 55, no. 3, pages 80-87, and 107. New types of quarry and mine equipment, and methods for handling large tonnages of oil shale; experimental work at Rifle, Colorado; report on investigation trips; drill rod test data; blasting research; lightweight scaling bars in use at oil shale mine. Flow diagram of experimental crushing plant.

April 1952 — Method of concentrating kerogen in Colorado oil shale by treatment with acetic acid and gravity separation. A. B. Hubbard, H. N. Smith, H. H. Heady, W. E. Robinson. U. S. Bureau of Mines - Report of Investigations No. 4872, 8 pages, 9 supplemental plates. Method of concentrating insoluble organic material, treating pulverized shale with dilute acetic acid; acid treated shales centrifuged in different liquid mediums; data on composition of kerogen in 78 gallon per ton Colorado oil shale and its concentrates; characteristics of oil shale sample.

Apr. 18, 1952 — Technique of shale oil recovery. C. M. Davis & J.M. Slezak. Petroleum Times, vol. 56, no. 1427, pages 306-7. Situation method or in situ method of oil recovery demands that minimum thickness of oil shale be 50 feet, kerogen content at least 5% and practical size of plant rated at 20,000 barrels daily; new method requires electric circuit with breaker, voltage controller, transformer, and measuring instrument; spacing of bore holes is related to thickness of formation; calculation of cost of recovery; reference to Ljungstrom method.

May 1952 — Pilot plant batch retorting of Colorado oil shale. W. E. Wells and J. R. Ruark. U. S. Bureau of Mines - Report of Investigations No. 4874, 19 pages. Heat carrying mediums used hot shale gas, superheated steam, and hot flue gas; effect of variables on oil yield, gas yield, and operatability; oil yields of 100% of Fisher assay have from 1600 to 1800 cubic feet of 300 Btu. gas per ton of shale obtained; Royester-retort pilot plant; gas circulation retorting; internal combustion retorting.

June 1952 — Prospecting in Piceance Creek Basin for oil shale. T. Ertl. Mining Engineer, vol. 4, no. 6, (Transportation) pages 601-4. Oil shale is found in northwestern Colorado and all members of the Green River series of the Eocene Age; assay of drill cores and cutting delineate area of 1,000 square miles that can yield 125 billion barrels of shale oil from plus-25 gallon per ton oil shale, or 500 billion barrels from plus-15 gallons per ton oil shale. Details on core drilling, logging, sampling, and assaying. Characteristics of equipment used.

January 1926

February 1926

March 28, 1926

May 1926

June 1926

September 1952 Engineering features of the Union Oil shale retort. H. C. Reid and C. Berg. American Society of Mechanical Engineers - Paper No. 52, PET-2, for meeting of Sept. 22-24, 1952; 7 pages, 5 supplemental plat Retorting of shale requires operation combining very good heat and fuel economy with low capital investment; to meet these demands Union Oil Company developed novel underfeed retorting method which employs countercurrent flow of shale and oil in kiln, utilizing bottom feed of solids; a design details : this unit and operating features.

September 1952 Mechanical design in oil shale retorting plants. L.H.Brakel. American Society of Mechanical Engineers - Paper No. 52, PET-10, for meeting Sept. 22-24, 1952; 14 pages, 8 supplemental plates. Design requirements for equipment for retorting oil shale; conditions for best heat economy through effective heat recovery; largest single element design is successful, economical handling of large quantities of particular kind of crushed solid through process; gas combustion process is most efficient by tests at the
1952 Bureau of Mines, Rifle, Colorado. Index in Engineering Index.

Sept.-Oct. 1952 Differential thermal study of Colorado oil shale. H. H. Heady. American Mineralogist, vol. 37, nos. 9, 10; pages 804-811. Differential thermal curves which selected oil shale samples showed endothermic dips in temperature range of conversion of organic material (kerogen) in oil shale to oil, gas, and organic residue; thermal curves also showed presence of calcite and/or dolomite.

Sept. 24, 1952 Off-site facilities of oil shale industry. W. F. Stone. American Society of Mechanical Engineers Journal - Paper No. 52--PET-20 for meeting of the Society of Mechanical Engineers on Sept. 20-24, 1952; 10 pages. Reference made to enormous deposits of oil in the semi-arid regions west of Continental Divide in Colorado, Utah, and Wyoming; efforts of Bureau of Mines oil shale demonstration branch experimental work on shale utilization; status of transportation, water supply, and other facilities for commercial development.

Nov. 14, 1952 Shale oil extraction techniques. J. Grindrod. Petroleum Times, vol. 56, no. 1442, pages 963-965. Comparison of oil shales in the U. S., Sweden, Scotland, and France; selection of mining method; method of oil shale extraction in U. S., Australia, and Sweden, F. Ljungstroem electrothermal method of drawing out oil vapors from shale; details in enclosed chart of Swedish oil company's plant at Kvarntorp; problem of application of Swedish method in Canada; diagrams.

1953 Thermal solution and hydrogenation of Green River oil shale. H. B. Jenson, W. I. Barnett, W.I.R. Murphy. U. S. Bureau of Mines Bulletin No. 533, 42 pages. Thermal solution in batch autoclave; study of process with semi-continuous unit; investigations with continuous unit; batch thermal solution with hydrogenation; separation of oil and spent shale; bibliography on thermal solution process.

March 1953 Oil shale in U. S. J. Grindrod. Mine & Quarry Engineering, vol. 19, no. 3, pages 72-80. Oil shale found in adjoining parts of Colorado, Utah, and Wyoming in the Green River formation is 3,000 feet thick and covers 16,500 square miles; lower horizon of Parachute Creek bed has average assay of 30 U. S. gallons per ton; experimental oil shale mine and plant using Fisher-Tropsch retort method; room and pillar method of mining is adopted; treatment of oil shale and permformance of retorting plant.

April 1953 Engineering features of the Union oil shale retort. H. C. Reed and C. Berg. American Society of Mechanical Engineers, (Transportation), vol. 75, no. 3, pages 453-457. Indexed in Engineering Index, 1952 page 694, from American Society of Mechanical Engineers Paper No. 52--PET 2 for meeting of September 22 - 24, 1952.

June 1953 Studies in shale oil--VII. Some miscellaneous studies. G.E. Mapstone, W. J. Chodkiewicz. Institute of Petroleum Journal, vol. 39, no. 354, pages 354-380. Investigation of shale tar bases present in Glen Davis cracked gasoline; determination of olefinic side chains; detection in indoles; new test for indoles based on formation of brownish purple color with quinoline treatment of crude shale oil with sulfuric acid for hydrocarbon type analysis; properties of coke and residuum from thermal cracking of shale.

August 1953 Theoretical consideration of heat transfer in gas-flow oil shale retort. C. J. Mains, A. Matzick. U. S. Bureau of Mines--Report of Investigations No. 4995, 11 pages, 12 supplemental plates. Method for calculation of heat transfer coefficient and temperature histories of gas and solid in gas-flow retort operating at equilibrium conditions; calculations presented to show application of method to conditions of actual run made in gas-flow retort; method is applicable to all heat exchangers characterized by continuous crossflow, gas-to-broken solid heat transfer.

December 1953 Note on modified Gray-King assay of oil shale. G. E. Mapstone. Institute of Petroleum Journal, vol. 39, no. 360, pages 848-850. Work carried out to provide quantitative data on effective cooling bath temperatures on recovery of lower boiling naphtha during shale assay.

February 1954 Liquid fuels from oil shale.--Critical review. A. C. Rubel. Journal of Petroleum Technology, vol. 6, no. 2, pages 9-11, 13, 15, 16, 19. Consideration of possibilities in developing oil shale deposits of Colorado which contain 100 billion barrels of recoverable shale oil; mining, crushing, and conveying, and retorting of oil shale; cost of operation; interest for new source of petroleum from point of view of National Defense.

March 1954 Oil shale retorting through application of fluidized-solids techniques. H. F. Wigton and B.E. Lauer. Chemical Engineering Progress, vol. 50, no. 3, pages 134-138. Details of improved retort design for production of shale oil; it is shown that finely ground oil shale can be completely retorted in fluidized bed at rapid rates under controlled conditions, with both raw and retorted shale remaining particulate and free flowing at all points of process; shale retorted supplies, field requirements for entire process; details of apparatus, procedure, cost, etc. Bibliography.

June 1954
July 1954 Oil shale, vast reservoir of energy. T. Ertl. Mining Congress Journal, vol. 40, no. 6 and 7, pages 74-76, 105. July issue: pages 24-27. Mining by underground room and pillar methods yields 150 tons per man day; characteristics and efficiency of commercial American oil shale retort; thermal processing, coking, viscosity breaking, and recycle cracking as elements of shale oil refining.

July 1954 Oil from shale. R. J. Cameron and B. Guthrie. Chemical Engineering Progress, vol. 50, no. 7, pages 336-341. Efforts towards development of oil shale retorting process adapted to type of oil shale and economic conditions in U. S.; while shale oil can be produced by simple pyrolysis, complex problems remain; successful process must have high unit capacity, efficient energy utilization, and must use little water; work which has led to construction and operation of actual plant. Bibliography.

October 1954 Oil yields of sections of Green River oil shale in Colorado, Utah, and Wyoming. 1945-1952. K. E. Stanfield, C. K. Rose, W. S. McAuley, W. J. Tesch, Jr. U. S. Bureau of Mines - Report of Investigations No. 5081, 153 pages. Oil yields presented as part of continued project to determine oil shale reserves in the U. S.; sorts of samples, method of collection, preparation, and analysis.

November 1954 Hydrogenation improves shale oil refinability. A. L. Foster. Petroleum Engineering, vol. 26, no. 12, pages C58-C60. Potential possibilities of Green River mahogany ledge formation in Colorado, Utah, and Wyoming; results of research dealing with oil shale refining and yields of products. Attention is drawn to the fact that first hydrogenation removes all impurities and is not improved by second hydrogenation.

December 1954 Design of underground mine openings, oil shale mine, Rifle, Colorado. R. H. Merrill. U. S. Bureau of Mines - Report of Investigations No. 589, 56 pages. Studies to determine structural design of production mine area of oil shale mine, Rifle, Colorado; safe pillar sizes, pillar contours, and optimum extraction ratios were calculated from elastic theory and physical properties of mine rock. Computed safe extraction ratio was 82%.

1955 Colorado oil shale, its geology and economic significance. T. Ertl. Tulsa Geological Society Digest, vol. 23, pages 98-106. Oil shale is found in the Piceance Creek Basin of northwestern Colorado; Parachute Creek member of Green River formation of Eocene Age is divided into lower oil shale zone and 500 feet thick upper oil shale zone, separated by marlstone containing little organic matter; upper zone contains richest oil shale and averages 15 gallons of oil per ton; mining, retorting, and beneficiation.

July 15, 1955 Oil shale developments in U. S. laboratory research. Iron & Coal Trades Review, vol. 171, no. 4553, pages 149-152. Oil shale analysis; retorting of oil shale; shale oil analysis and shale oil by-products studied by U. S. Bureau of Mines at Laramie, Wyoming research station, and experimental refinery at Rifle, Colorado.

October 1955 Oil shale mining program does two jobs. J. H. East, Jr. and C. K. Rose. Mining Engineering, vol. 7, no. 10, pages 525-529. Oil shale deposits of western Colorado contain 500 billion barrels of shale oil in 550 foot thick measure averaging 15 gallons per ton; mining done by room and pillar system; highly mechanized equipment is used; cost estimates; studies of mining systems; research on roof control, rotary drilling, and blasting.

November 1955 Development and preliminary operation of gas-combustion oil shale pilot retort. A. Matzick, J. R. Ruark, and M. W. Putnam. U. S. Bureau of Mines - Report of Investigations No. 5145, 56 pages. See also Petroleum Refiner, vol. 35, no. 7, pages 153-154. Bureau of Mines six ton per day pilot plant with continuous gravity feed retort for distilling oil from oil shale. Part of heat for retorting of shales was generated by burning recycled product gas in combustion zone within descending shale bed in retort; additional heat supplied by combustion of carbonaceous residue remaining in spent shale after oil has been distilled; desirable features of process and operating problems.

July 1956

1956 Mineral facts and problems; oil shale. S. Klosky. Bibliography, 37 titles. Full diagrams, map diagram. U. S. Bureau of Mines Bulletin No. 556, pages 577-594.

January 1956 Advancement in field production from oil shale. C. Berg. Chemical Engineering Progress, vol. 52, no. 1, pages 22J-65J. Technical considerations that led to realization of 20,000 tons per day shale retorting plant of Union Oil Company of California; retorting process on coking; upgrading heavy coker distillate; hyper-forming process; economics. Bibliography.

January 1956 Shale oil industry is on its way. C. H. Prien, J. W. Savage. Chemical Engineering Progress, vol. 52, no. 1, pages 16J-21J. Most commercially feasible shale area for initial development is 1,000 square miles of mahogany ledge in northwestern Colorado, where 100 foot thick measure of deposits, averaging 25 gallons of oil per ton of shale, presents known mineable reserve of 125 billion barrels of oil; nature of shale oil; refining and future development.

April 1956 Longwall mining of oil shale. M. J. Walton; D. O. Rausch. Colorado School of Mines Quarterly, vol. 51, no. 2, pages 71-81. Geology and structure of oil shale deposits; physical properties of oil shale samples from roof; mining methods; pack walls; boundary weakening; work cycle; rate of production and possible expansion.

March 1956 Specific gravity--oil yield relationships of two Colorado oil shale cores. J. W. Smith. Industrial and Engineering Chemistry, vol. 48, no. 3, part 1, pages 441-444. Relationship of specific gravity of mahogany zone oil shale to its oil yield per unit weight based upon analytical data on cores in two locations in Colorado.

May 20, 1956 Some Colorado shale oil bases. H. L. Lochte, H. W. H. Meyer. American Chemical Society Journal, vol. 78, no. 10, pages 2150-2153. Distillation, chloroform extraction of aqueous solutions of hydrochlorides and systematic fractional neutralization yielded Colorado shale oil base fractions from which quinoline and isoquinoline and metholhomologs were isolated from material boiling from 227-239 degrees centigrade, while similar separation of bases boiling from 264-290 degrees Centigrade yielded large amounts of 2, 3, 8-trimethylquinoline and unidentified picrates, but none of very stable $C_{16}H_{25}N$ base was found in California.

July 1956 Retort oil shale for chemicals. H. M. Thorne. Petroleum Refiner, vol. 35, no. 7, pages 155-160. Chemicals in oil shale which can be recovered as byproducts; composition of shale oils in low temperature retorting; hydrocarbon and non-hydrocarbon constituents; tar bases; composition of shale oils from high temperature retorting.

June

July 1956 Synthetic liquid fuels. Part II. Oil from oil shale. U. S. Bureau of Mines - Report of Investigations No. 5237, 80 pages. Mining development and oil shale resources in Colorado, Utah, and Wyoming; oil shale retorting and experiments at Rifle, Colorado; laboratory research on oil shale and shale oil processing at experiment station, Laramie, Wyoming.

July 1956 Union Oil Company of California bets heavily on shale oil. Petroleum Refiner, vol. 35, page 161. Performance of pilot plant near Grand Valley, Colorado, designed to handle shale ranging in size up to 6 inches; outlook for development of commercial unit.

July 1956 Union Oil Company shale oil plant. J. R. Pownall. Petroleum Engineering, vol. 28, no. 7, pages C50-C51. Experimental work at Brea, California research laboratories, studying method of making refined products from shale oil; retorting plant will handle 300 tons of shale per day; retort will be 40 feet high, weigh 150 tons, receive a shale charge at bottom forced in by 5½ ft. diameter piston; plant will include oil and gas recovery system, storage tanks, control house, and spent shale conveyor.

July 1956 When will shale oil compete with crude? Diagrams. Petroleum Refiner, vol. 35, pages 153, 154.

August 6, 1956 Gasoline price foreseen through new tax allowance plan to oil shale industry. Oil, Paint, and Drug Reporter, vol. 170, page 3.

September 1956 What Union of California is doing about shale oil. G.M.Wilson. World Oil, vol. 143, page 86.

November 1956 Description and operation of NTU retort on Colorado oil shale. J. R. Ruark, K.L. Berry, B. Guthrie. U. S. Bureau of Mines -- Report of Investigations No. 5279, 26 pages, two 40-ton capacity batch N.T.U. (Nevada-Texas-Utah) retorts used to investigate process variables of air rate, recycle gas rate, and shale particle size and grade; researchers concluded that recycle gas was not necessary for efficient operation of process; main operating difficulty was build-up of coke deposits in oil recovery system; after 6750 hours, equipment was in reasonably good condition.

December 1956 Analysis of crude shale oil. C.S. Allbright, R. E. van Meter, G. U. Dinneen, and J. S. Ball. U. S. Bureau of Mines - Report of Investigations No. 5286, 28 pages. Analysis of oil produced from Brazilian shale by different retorting methods and oils from high temperature retorting of Colorado oil shale in entrained solids retort.

December 1956/ January 1957 — Don't overlook oil shale. E. Trager. World Oil, vol. 143, no. 7, pages 194, 199-200; vol. 144, no. 1, pages 177-8, 182, 184, 187-8. Average daily consumption of oil in U.S. from 1956 to 1965 will be 10,700,000 barrels, which continued for ten years totals 39,055,000,000 barrels, while entire reserve is 30 billion barrels. Shortage may be met by 100 billion barrels reserve of recoverable shale oil in Colorado.

December 1,1956 — Is shale oil ready to compete? Business Week, pages 99-103.

1957 — Preliminary report on oil shale resources of Piceance Creek Basin, northwestern Colorado. J. R. Donnell, U. S. Geological Survey, Bulletin No. 1042-H, pages 255-271, map. Oil shale in Green River formation of Eocene Age underlies area of 1400 square miles in Rio Blanco and Garfield Counties, and yields from 45 to 15 gallons of oil per ton; oil shale zones range up to 2200 feet thickness; indicated and inferred reserves of oil in shale are rated at 1251.3 billion barrels.

January 1957 — Role of nucleation in oil shale retorting. M.W. Putman. Chemical Engineering Progress, vol. 53, no. 1, pages 33J-36J. Promotion of nucleation of oil vapor in gas stream rising through bed of irregularly shaped solids by seeding with sodium chloride or aluminum oxide have been found to simplify later recovery of oil by condensation; gas combustion process description; requirements for mist formation; self-nucleation phenomenon; sodium chloride nucleation; aluminum oxide nucleation.

January 1957 — Oil shale mining and retorting methods. F.L. Hartley and G. H. Hemmen. Mining Congress Journal, vol. 43, no. 1, pages 60-62. Outline of research dealing with mining, retorting, and refining of oil shale from Piceance Creek Basin, Colorado. Deposit can yield 500 billion barrels of oil.

Mar. 25, 1957 — Oil shale plan a favorite; proposal to lease the Rifle, Colorado experimental plant oil industry. Oil and Gas Journal, vol. 55, page 333.

April 1957 — Oil yields of sections of Green River oilshale in Colorado, 1952-1954. K. E. Stanfield, C.K. Rose, W. S. McAuley, and W. J. Tesch, Jr. U. S. Bureau of Mines - Report of Investigations, No. 5321, 132 pages. Oil yield from cores of 48 holes drilled during 1952 to 1954 in Green River formation, distributed over area of more than 1,000 square miles; date per volume basis for estimating oil shale resources and solving problems related to amounts and grades of oil shale obtainable from different locations by various methods of mining.

June 1957 Shale oil research--king-sized. Petroleum Processing, vol. 12, no. 6, page 77. New research installation retort at Grand Valley, Colorado has design capacity of three hundred tons of oil shale per day. In addition to conventional petroleum products that can be made from recovered shale oil, gas· coke, nitrogen, sulfur, and refinery gases will be recovered.

July 1957 Union puts shale oil plant on stream. Petroleum Refiner, vol. 36, no. 7, pages 222-226. Plant constructed at Grand Valley, Colorado includes retort, crushers, tramways, and other machinery needed for material handling; shale is mined from mahogany ledge; shale enters retort at bottom, hot gases from fire are drawn down through it by blowers; these gases change organic kerogen into oil and gases which are drawn from bottom of retort; reserves of shale contain estimated 100 billion barrels of oil.

1957 Guide book to geology of the Uintah Basin. Intermountain Association of Petroleum Geologists - 8th Annual Fuel Conference, 1957. 222 pages, $7.50. 40 papers by 45 authors dedicated to geomorphology, stratigraphy, and fossils, tectonics, development of oil and gas resources, oil shale, gilsonite, ozokerite, and phosphates of the Uintah Basin in Utah and Colorado.

September 1957 Recent developments in oil shale. A. Matzick, R. J. Cameron. World Petroleum Journal, vol. 28, no. 10, pages 68-71. Sinclair Oil and Gas Corporation developed in situ retorting which is similar to secondary recovery methods which involve underground combustion; gas injection wells and oil production wells are drilled into oil shale formation; gas passages are accomplished by injecting fluid under high pressure into wells under controlled conditions; advancing thermal wave heats shale and drives oil vapors to producing wells.

Aug. 26, 1957 Interest in shale oil heightens. Chemical and Engineering News, vol. 35, page 84.

Nov. 4, 1957 Huge shale beds revealed in new studies. Oil & Gas Journal, vol. 55, page 98.

1958 Index of oil shale and shale oil patents: 1946-1956 (Supplement to Bulletin 467, 468) U. S. Bureau of Mines - Bulletin No.574, part 1, 134 pages; part 2, 75 pages. Review of nearly 300 U. S. and 180 British patents that relate to retorting and distilling underground, refining, and utilization of oil shale and its products; largest single group of patents relates to fluidized handling of shale.

February 1958 Oil shale foundation. C. H. Prien. Chemical & Engineering Progress vol. 54, page 44.

Feb. 17, 1958 Shale oil, competitive with petroleum. F. L. Hartley. Oil & Gas Journal, vol. 56, page 73.

July 21, 1958 Can oil shale compete? Chemical & Engineering News, vol.36, page 65.

August 1958 Shale oil--nearest competitive value with domestic petroleum. E. P. Miller and R. J. Cameron. Journal of Petroleum Technology, vol. 10 pages 25-27.

September 1958-February 1959 Shale oil process employs solid to solid heating. World Petroleum, vol. 29, no. 10, page 90, 126. See also British Chemical Engineering, vol. 4, no. 2, pages 100-101. Application of aspeco process as pilot plant at Denver Research Institute of University of Denver; process accomplishes shale oil recovery by solid to solid heat transfer in horizontal rotating kiln. Metal or refractory steers employed for heat transfer; shale is heated to pyrolizing temperature of 1,000 degrees Fahrenheit, in absence of air; 2/3rds of organic material involved is converted to liquid shale oil.

October 1958 Oil shale retorting economical, says Denver Research Institute. Petroleum Refiner, vol. 37, page 212.

1959 Development and operation of experimental, entrained-solids oil shale retort. H. W. Sohns, E.E. Jukkola, and W.I.R.Murphy. U. S. Bureau of Mines - Report of Investigations No. 5522, 45 pages. Retort designed and operated as research tool to determine effects of temperature on quantity and quality of liquid and gaseous products; experiments made at about atmospheric pressure at temperatures of 1200-1800 degrees Fahrenheit, using shale assaying 50 gallons of oil per ton; gas production increased repidly with temperature increase, oils contain much larger quantities of aromatics.

1959 Evaluation of catalysts for hydrogenating shale oil. H. C. Carpenter and T. L. Cottingham. U. S. Bureau of Mines - Report of Investigations, No. 5533, 29 pages. Data compares results obtained with 17 different catalysts in hydrogenating to gasoline in single pass operation; yields and properties of gasolines differ considerably with different catalysts; molybdena alumina produced greatest gasoline yield; octane ratings, except in two cases, increased with higher reaction temperatures. Tables show material balances and liquid-product properties for different catalysts.

1959 Pilot plant operation of gas flow oil shale retort. P. Kalcevic, J. B. Lankford, U. S. Bureau of Mines - Report of Investigations, No. 5507, 34 pages. Crossflow gas to broken-solids heat exchanger with gas produced in shale retorting as heating medium; thinner shale bed improved yields, and increased heat flow produced heavier oil; retort workability limited by coke material forming

in exit gas stream and stoppage of shale bed by coking shales assaying 40 gallons per ton or more.

1959 Petrographic examination and chemical analyses of several foreign oil shales. H. N. Smith, J. W. Smith, W. C. Kommes. U. S. Bureau of Mines - Report of Investigations, No. 5504, 34 pages. Oil shale samples from Australia; Brazil; Canada, Manchuria, France, Scotland, New Zealand, Spain, Sweden, Thailand, Union of South Africa; data tabulated; grades and amounts of shale oil.

March 1959 Shale oil activities. R. J. Cameron, R. E. Gustafson. World Petroleum, vol. 30, no. 3, pages 66, 74, 77, 96, 97. Possibilities of atomic energy to reduce costs of mining and retorting; research and operation of pilot plant; expansion of Eastern Hemisphere commercial applications of shale oil.

January 1959-Studies in oil shale--further data on emulsion and sludges. G. E. Mapstone. Institute of Petroleum Journal, vol. 45, pages 16-17.

January 1959-Shale oil. F. L. Hartley. Petroleum Refiner, vol. 38, pages 197-199.

Feb. 16,1959-Atomic shale test one year away. R. S. Herbst. Oil & Gas Journal vol. 57, page 80.

June 1959 Exploitation of oil shale deposits by nuclear explosives. G. W. Johnson. Journal of Petroleum Technology, vol. 11, no.6, pages 20, 21. Experience with underground nuclear explosion and its effect on surrounding rocks; project to recover oil from shale; detonation of a few hundred kilotons could be carried out to produce 30 million tons of broken permeable shale; problem of exploitation of tar sands; use of nuclear explosions for loosening of tight formations to increase gas and oil flow, production of CO and H_2, and production of artificial aquifiers.

June 1959 Oil shale--energy for future. F.L. Hartley; C.S. Brinegar. World Petroleum Congress, Fifth Proceedings, New York, N.Y. section 2, pages 37-44. Discussion, pages 44-47. Significance of world oil shale deposits as related to conventional crude oil reserves; major research on oil shale; products available from oil shale are considered from both qualitative and quantitative standpoints.

June 22, 1959-Shale oil plant is proposed for Colorado. T. Ertl. Oil & Gas Journal, vol. 57, pages 72,73.

June 8,1959 Officials ridicule underground shale blast. Oil & Gas Journal, vol. 57, page 122.

August 1959 Application of atomic energy to petroleum reservoirs and oil shale deposits. C.C. Anderson. Diagrams. Petroleum Engineering, vol. 31, pages B-28-31.

1960 Oil yield and uranium content of black shales. E. E. Swanson. U. S. Geological Survey - Professional Paper No. 356-A, 44 pages. Some black shales contain as much as 100 times more uranium than other common sedimentary rocks, and they also contain organic matter that will yield oil when subjected to destructive distillation; such shales may be referred to as uraniferous oil shales and have been considered a potential source of both oil and uranium; oil yield and uranium determinations on 500 samples are reported.

1960 Oil yields of sections of the Green River oil shale in Colorado--1954-1957. K. E. Stanfield, J. W. Smith, H. N. Smith, W. A. Robb. U. S. Bureau of Mines - Report of Investigations No. 5614, 160 pages. Information on oil shales of Piceance Creek Basin and former tables of oil yield data and graphic logs from samples from 24 core holes and 27 wells drilled (1954-1957); in addition, oil yields of samples comprising maximum 15 gallons per ton section are tabulated for eleven wells; oil yields of core and drill cutting samples.

1960 Experiments in crushing Green River oil shale. A. Matzick, R. O. Dannenberg, B. Guthrie. U. S. Bureau of Mines - Report of Investigations, No. 5563, 64 pages.. Oil shale from the Green River formation, Colorado, is used for experiment. Properties important to crushing are: slab-forming tendency, resilience, slippery character of richer grades, and heterogeneous nature of average oil shale; results of 13 experiments on ten different crushers are reported; cost of crushing mine-run Colorado shale to minus three-inch size has been estimated as 12¢ to 17¢ per ton.

January 1961 Studies in shale oil, tar bases, and gum formation in shale gasoline. G. E. Mapstone. Bibliography. Institute of Petroleum Journal, vol. 47, pages 35-37.

December 1960 Electric log interpretation in exploring for stratigraphic traps in shaly sands. A. J. Slack and C. Otte. Bibliography. Maps. Diagrams. American Association of Petroleum Geologists - Bulletin 44, pages 1874-1894.

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ADDENDUM TO THE DECEMBER 1961 SELECTED OIL SHALE BIBLIOGRAPHY

1913 Geology & Petroleum Resources of the Debeque Oil Field. E. G. Woodruff. USGS Bulletin 531.

June 1914 The Oil Shales of Elko, Nevada. R. M. Catlin. American Institute of Mining & Metallurgical Engineers. Pages 1402 - 1404.

1915 Oil Shale of Northwest Colorado and Northeast Utah. Woodruff & Day. U. S. G. S. Bulletin 581.

1916 Gasoline from Shale, Oil Age V12, Page 16

Mar. 16, 1916 Oil Producing Shales Possess Future Value. The Oil and Gas Journal. V14, No. 41 Page 27.

Apr. 22, 1916 Future Gasoline Supply From Shale. Scientific American V. 114

Dec. 18, 1916 Vast Quantities of Oil May be Obtained from Distillation of American Shale. American Gaslight Journal, V. 105, Page 420.

1917 7th Annual Report, Director, Bureau of Mines to Secretary of the Interior. Page 106.

1917 Petroleum Shales. Chemical & Metallurgical Engineering. V. 19, Page 437.

1917 Oil Reserves of Black Shales of Eastern U. S. U.S.G.S. Bulletin 641 - L. G. Ashley.

Jan. 1917 Shale Beds Hold Future Supply of Oil - National Petroleum News. V. 8, Pages 19-20.

Sept. 1917 A New & Inexhaustible Source of Petroleum Supply. Railroad Redbook.

Dec. 20, 1917 Colorado Oil Shale Fields Are Vast. The Oil & Gas Journal. V. 16, No. 29, Page 32.

1918 8th Annual Report. Bureau of Mines.

1918 Oil Shale of Uinta Basin, Utah - U. S. Geological Survey Bulletin 6918 by D. E. Winchester.

Jan. 1918 Future Sources of Oil & Gasoline. General Electric Review by M. A. Allen. V. 21, Pages 73-77.

Jan. 1918 Railroad Redbook (Denver, Rio Grande & Western RR)
V. 35, Pages 33, 36, 38.

Jan. 18, 1918 The Oil Shale Industry in Colorado, Mining & Scientific Press.
R. L. Chase.

Feb. 1918 Billions of Barrels of Oil Locked Up in Rock. G. E. Mitchell.
National Geographic Magazine.

Mar. 28, 1918 Colorado, Utah and Nevada Oil Shales. The Oil & Gas Journal.
& Apr. 11, 1918

Apr. 1918 The Oil Shale Industries. V. 13, No. 2, School of Mines Quarterly.

June 1918 A New Process Treatment of Oil Shale. Railroad Redbook.
E. A. Sunderlin.

Jul. 15, 1918 Destructive Distillation of Oil Shales. Morrell & Egloff.
Chemical & Metallurigical Engineer. V. XIX

Aug. 9, 1918 Supply of Oil Available From Shale. Oil & Gas Journal.
& Aug. 16 J. C. Morrell & Egloff.

Sept. 1918 Colorado & Utah Oil-Shale . Railroad Redbook. H. H. Adkinson.
V. 35, Pages 5-7, 9, 11, 13, 15-18.

Oct. 1918 Colorado's Future as an Oil Producer. Colorado School of Mines
Quarterly. V. 13, No. 4.

Dec. 1918 Commercial Possibilities of the Oil Shale Industry in Colorado.
Railroad Redbook. W. C. Russell

1919 The Oil Shale Industry. American Mining Congress. V. C. Alderson. V. 23, Pages 616-633.

1919 Shale & Fuel Oil - Cheesebrough. Oildom. V. 10, No. 6, Page 42.

Jan. 1919 The Oil Shale & Its Development in the U. S. - D. E. Winchester. The Railroad Redbook.

Jan. 1, 1919 The Present Status of Oil Shales. Chemical & Metallurgical Engineering.

Feb. 1919 Some Concise Information on Oil Shale. Its Possibilities and Needs. The Railroad Redbook.

Feb. 28, 1919 General Information on Oil Shale. Oil & Gas Journal. V. 17, Page 52.

Mar. 1919 The Present Status of Oil Shales. Louis Simpson. Chemical & Metallurgical Engineering.

Mar. 1919 The Railroad Redbook. V. 36, Pages 281, 285.

Mar. 13, 1919 Oil & Gas News.

Apr. 1919 Commercial Treatment of Oil Shale. C. A. Revost. The Railroad Redbook.

May 10, 1919 Shale Oil as a Business Proposition. H. L. Wood. Scientific American. Vol. 120, Page 484.

June 1919 Economic Possibilities. Engineering & Mining Journal V. 88, Pages 150&196.

June 1919 Mountains of Oil in the West. Lester B. Colby. The Railroad Redbook.

Jul. 1919 Oil Shale and the Products of Its Distillation. Railroad Redbook.

Jul. 25, 1919 Expert Information On Oil Shales & Western Slope Deposits of Oil Shale Inspected. Joe Bellis. Oil & Gas Journal, Tulsa, Okla.

Jul. 25, 1919 The Oil Shale Industry. A. L. Pearse. Mining and Scientific Press.

Aug. 1919 Oil Shale - Its Possibilities. Chemical Age. NY.

Sept. 13, 1919 Investigation of the Oil Shale Industry. Engineering and Mining Journal.

Oct. 23, 1919 Distillation of Oil Shale in Germany. Engineering & Mining Journal.

Oct. 29, 1919 Quick Profits Shown to be Impossible in Shale Oil Recovery. National Petroleum News. V. 11, Pages 74-76.

Nov. 1919 Some Problems of the American Oil Shale Industry. M. J. Gavin. American Mining Congress. V. 23, Page 645.

Nov. 7, 1919 Shale Deposits in U. S. Rich in Oil. Jakosky & Sibley. Oil & Gas Journal. V. 18, Page 52.

Nov. 15, 1919 Treatment Costs of Oil Shale. Engineering & Mining Journal.

Nov. 19, 1919 Many Difficulties Attend Development of Shale Oil Industry. National Petroleum News. V. 11, Pages 75-78.

Dec. 1919 Oil Resources Limited. Chemical Engineer. V. 27, No. 12, Page 313.

Dec. 10, 1919 Oil Shales and the Merchant Marine. Chemical & Metallurgical Engineering.

Publishers

1920 The Oil Shale Industry. V. C. Alderson. Frederick A. Stokes Co. /

Jan. 1920 Use of Oil Shales. Chemical Engineer. V. 28, No. 1., Page 18.

Jan. 1920 The Railroad Redbook. V. 37, Pages 19, 21, 23, 25-27, 29, 31.

Jan. 1920 The Present Status of the Oil Shale Industry.

Feb. 1920 Where will----George Otis Smith. National Geographic Magazine. P. 181-202.

April 1920 Shale Oil and Its Refining. A. H. Low. Colorado School of Mines Quarterly. V. 15, No. 2.

April 3, 1920 Progress in Construction of Oil Shale Plants. Engineering & Mining Journal. V. 109, Page 812.

June 1920 Oil Shale and the Economic Importance. M. J. Gavin. Report of Investigations 2130 and 2152.

Jul. 1920 Railroad Redbook. V. 37, Pages 643, 647, 653.

Jul. 9, 1920 Oil and Gas Journal. V. 19.

Aug. 1920 Railroad Redbook. V. 37, Pages 723-725.

Aug. 1920 Utilization of Oil Shale. R. D. George. Mining & Metallurgy. Page 15.

Aug. 7, 1920 Mining and Scientific Press. V. 121.

Sept. 29, 1920 Record of Oil Shale Development in the U. S. - H. L. Wood. National Petroleum News. Page 33.

Nov. 13, 1920 Relation of the Petroleum Engineer to the Oil Shale Industry. Petroleum Times. V. 4, Page 493.

1921 Short Papers from the Cooperative Oil Shale Laboratory. Gavin & Sharp. State of Colorado Bulletin No. 1.

Jan. 1921 Railroad Redbook. V. 38, Pages 27-28.

July 13, 1921 Studies in Colorado Shale Oil. A. J. Fraubus. Chemical & Metallurgical Engineering.

Sept. 7, 1921 Studies in Colorado Shale Oils (Comments by R. R. Matthews) Chemical & Metallurgical Engineering.

July 1922 Commercial Oil Shale, What Is It? Colorado School of Mines Quarterly. V. 17 No. 3.

1923 The Railroad Redbook. V. 40, No. 1, Pages 9-22.

Jan. 1923 Oil Shale.A Resume for 1922. Colorado School of Mines Quarterly. V. 18, No. 1.

Jan. 1923 Supplement A. Colorado School of Mines.

May 1923 The Oil Shale Industry's Future. V. C. Alderson. Mining Congress Journal. V. 9, No. 5, Page 171.

1924 Shale Oil Produced Commercially. Petroleum Times. V. 12, Page 986.

May 1924 What Is Wrong With Oil Shales. G. R. Debeque. Chemical Age. V. 32, Pages 233-236.

July 1924 The Trumble Oil Shale Cycle District Plant. Colorado School of Mines Quarterly. V. 19, No. 3.

1925 Shale Oil. Ralph McKee. American Chemical Society Monograph 326 pages.

Feb. 1925 The Railroad Redbook. V. 42, Page 295.

Oct. 15, 1925 Oil Shale, Question of Economics. M. T. Gavin. Oil & Gas Journal. V. 24, Page 114.

1926 The Bowie-Gavin Process (Cracking Heavy Oil) Bureau of Mines Technical Paper 370.

1929 The Varves & Climate of the Green River Epoch. W. H. Bradley. U. S. Geological Survey - Professional Paper No. 158E.

1930 Construction & Operation of the Bureau of Mines Experimental Oil Shale Plant. M. J. Gavin & John S. Desmon 1925-27 - U. S. Bureau of Mines Bulletin 315.

June 1938 Oil Shale & Cannel Coal. A Brief Review of Work. A. J. Kraemer. U. S. Bureau of Mines.

1942 Senate Hearings - To Encourage Discovery of Oil and Gas on the Public Domain Oct. 1942. Pages 1524-1536.

Jan. 1944 Hydrocarbons of the Uinta Basin. Colorado School of Mines Quarterly. V. 39, No. 1.

Aug. 1946 European Shale Treating Practice. O'Dell & Baldeschoeder. U. S. Bureau of Mines Information Circular 7348.

1948 An Index of Shale Oil Patents - Simon Klosky. Bureau of Mines Bulletin 467.

1949 An Index of Shale Oil Patents - Simon Klosky. Bureau of Mines Bulletin 468.

Mar. 1950 Possibilities for Production of Liquid Fuels from Shale, Natural Gas & Coal. Petroleum Engineer.

July 1950 Waxes from Shale - Oil Wax Distillate. Bureau of Mines Report of Investigation 4708.

1950 Reporting Colorado Oil Shale - A Review of the Work of the Bureau of Mines by Cattell, Guthrie & Schramm - 2nd Oil Shale Conference July 1950 - Institute of Petroleum at Glasgow

1950 Investigations for Production of Oil Shale On A Commercial Scale - Institute of Petroleum at Glasgow 1950.

Feb. 1951 Synthetic Liquid Fuels Annual Report for 1950. Report of Investigations 4771.

Feb. 1951 Green River Oil Shale Reserves of NW Colorado. Carl Belser. Bureau of Mines Report of Investigations 4776.

May 1951 The Oil Shale Industries of Europe. Bureau of Mines Report of Investigations 4776.

Oct. 15, 1951 Subcommittee Report to National Petroleum Council Committee On Synthetic Liquid Fuels, Production Costs.

July 1952 Synthetic Liquid Fuels - Bureau of Mines Report of Investigations 4866.
Part II Oil from Oil Shale.

Aug. 1952 Analysis of Crude Shale Oil - Bureau of Mines Report of Investigations 4898.

Aug. 1954 Oil Shale Conference. Bureau of Mines. Adminstrative

Mar. 1955 Synthetic Liquid Fuels Annual Report 1954. Bureau of Mines Report of Investigations No. 5119.

Oct. 30, 1956 Oil Shale & Bituminous Sand-Union Oil Co. At Energy Resources Conference.

1957 Union Oil Shale Research Program Progress Report. F. L. Hartley.

1958 Oil Shale Mine, Rifle, Colorado, A Review of Design Factors. Report of Investigations 5429.

1958 Application of Nuclear Explosions to Oil Shale Utilization. Bureau of Mines publication.

Jul. 18, 1958 Shale Oil is Commercial Today. Petroleum Week. Page 72, 74, 76.

July 1959 Water Requirement for Oil Shale 1960-75. Cameron & Jones. Report to the State of Colorado.

Oct. 1959 Factors Controlling the Timing of a Shale Oil Industry. John G. Wells. The Mining Magazine.

1961 Composition of Shale Oil Naphtha. U. S. Bureau of Mines Bulletin 593.

1961 Ultimate Composition of Organic Material in Green River Oil Shales. Report of Investigations No. 5725.

1961 Tertiary, Geology and Oil Shale Resources of the Piceance Creek Basin. J. R. Donnell. U. S. Geological Survey Bulletin No. 1082-L.

1962 Analytical Method for Study of Thermal Degradation of Oil Shale. Report of Investigations No. 5932.

Jan. 1962 Estonian Oil Shale. Industrial & Engineering Chemistry.

1963 Comparison of Oil Yields from Core & Drill Cuttings. Report of Investigations No. 6299.

1963 Status & Problems of Colorado Oil Shale Development 1963.

Feb. 1963 Shale Oil - Petroleum Future Partner. American Institute of Mining & Metallurgical Engineers SPE 518.

Apr. 15, 1963 Interest in Shale Oil Recovery Grows Oil & Gas Journal.

1964 Index of Selected Gasification Patents Part III Bulletin 581, Bureau of Mines.

1964 Oil Shale Technology. A Review. Information Circular 8216.

July 1964 First Symposium on Oil Shale. Colorado School of Mines Quarterly. V. 59, No. 3.

Sept. 1964 Current Status of U. S. Oil Shale Technology. Industrial & Engineering Chemistry.

Oct. 1964 Interest Rises in Oil Shale . Chemical Engineer Progress.

Dec. 1964 Oil Shale Economics Discussed - Mining Engineering. V. 16, No. 12, Page 38.