

DEPARTMENT OF COMMERCE
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**BIBLIOGRAPHY OF PETROLEUM
AND ALLIED SUBSTANCES
1922 AND 1923**

BY
H. BRITTON



PRICE \$1.00

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1929

BIBLIOGRAPHY OF PETROLEUM AND ALLIED SUBSTANCES, 1922 AND 1923

By H. BRITTON

INTRODUCTION

This bulletin is the seventh in the series of petroleum bibliographies published by the Bureau of Mines, Bulletins 149, 165, 180, 189, 216, and 220 being compilations for the years 1915, 1916, 1917, 1918, 1919-20, and 1921, respectively. In this bulletin the same general plan of classification of references has been followed, but several additions have been made.

ACKNOWLEDGMENTS

Acknowledgment is made to the following organizations for the use of their libraries in the preparation of this bulletin: University of California, Stanford University, California State Mining Bureau, Union Oil Co. of California, Standard Oil Co. of California, and the Mechanics Mercantile Library of San Francisco; acknowledgment for their assistance is also made to H. H. Hill, C. P. Bowie, A. L. Foster, M. J. Gavin, H. C. Miller, E. B. Swanson, and Miss Louise Janssen, all of the Bureau of Mines, and to Miss Elizabeth H. Burroughs of the Union Oil Co. of California.

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SCHEME OF CLASSIFICATION

The scheme of classification followed in arranging the references is outlined below.

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260. REGER, D. B. Oil development in West Virginia during 1922. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1241, April, 1923, pp. 48-52. Production figures; drilling and modifications in drilling methods; refining. *See also* Nos. 2491, 2644, 2848.

TRANSPORTATION AND STORAGE.

See No. 3132.

REFINING.

261. NEAL, R. O., AND ST. PERROTT, G. The market for carbon black. Mt. States Min. Age, vol. 8, June, 1923, pp. 35-36. Brief account of manufacturing method used in West Virginia; manufacturing statistics.

STATISTICS, MAP.

See Nos. 164, 261; 318.

OTHER STATES (111.19).

MARYLAND.

TRANSPORTATION AND STORAGE.

See No. 3223.

PROPERTIES.

262. BIBBINS, A. B. Comparative study of some Maryland gases. Maryland Acad. Sci. Bull., vol. 1, 1922, pp. 47-48. Analyses of 12 gases from different localities. Chem. Abs., vol. 16, Nov. 20, 1922, p. 4050.

NEW JERSEY.

REFINING.

263. FANNING, N. O. The world's largest refinery at Bayonne, N. J. *Oil and Gas Jour.*, vol. 20, April 20, 1922, p. 84. Outlines distinctive features of plant and organization; photograph.

VIRGINIA.

GEOLOGY AND ORIGIN.

264. EBY, J. B. The possibilities of oil and gas in southwest Virginia as inferred from isocarbs. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, July-Aug. 1923, pp. 421-426. Concludes that the finding of petroleum is unlikely in this region.
265. NATIONAL PETROLEUM NEWS. Oil in Virginia well comes from Clinton, lying far out of order. Vol. 15, July 4, 1923, pp. 76, 78-80. Contains log of well; analysis of oil; geology: map; cross section showing geologic formations. *See also* *Eng. and Min. Jour.-Press*, vol. 116, July 7, 1923, p. 23.

REFINING.

See No. 508.

ILLINOIS FIELD (111.2)

ILLINOIS (111.20).

GEOGRAPHIC OCCURRENCE.

266. MYLIUS, L. A. Oil and gas development and possibilities in parts of eastern Illinois. *Illinois State Geol. Survey Bull.* 44, 1923, 64 pp. Sections recommended for tests in main producing area.
267. OIL AND GAS JOURNAL. Illinois oil and gas fields shown in State survey maps. Vol. 22, Nov. 15, 1923, pp. 112-113.
See also No. 190.

GEOLOGY AND ORIGIN.

268. COLLINGWOOD, D. M. Oil development in Illinois during 1922. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1241, April, 1923, pp. 33-38. Contains production chart, 1905-1922. Discusses development in oil fields and new oil horizons. Outlook for 1923. *See also* *Oil and Gas Jour.*, vol. 21, March 8, 1923, pp. 112-114.
269. ——— Oil and gas development in the vicinity of Jacksonville. Extract. *Illinois State Geol. Survey Bull.* 44, 1923, 30 pp. Discusses geology and location of oil-bearing horizons. Give structural maps and logs of wells. Considers production uncertain.
270. CURRIER, L. W. Geology of northeastern Adams County, Illinois. Extract. *Illinois State Geol. Survey Bull.* 43, 1922, 18 pp. Account of investigations made for the purpose of locating petroleum-producing structures. Stratigraphy, physiography, and geology.
271. MYLIUS, L. A. Oil and gas development and possibilities in parts of eastern Illinois. Extract, *Illinois State Geol. Survey Bull.* 44, 1923, 64 pp. Contains structural maps, logs, and a general description of structural conditions.
272. SHAW, E. W. *Carlyle-Centralia folio 216*. U. S. Geol. Survey, 1923. 10 pp. Topographic features and stratigraphy of region; description of oil-producing section.

273. WHEELER, H. A. The new Wamac oil pool in Illinois. Eng. and Min. Jour., vol. 113, Feb. 4, 1922, pp. 213-214. Tells of recent development in the Centralia district of Illinois and discusses prospects of production from the new "Petro" sand.
See also No. 103.

PROPERTIES AND THEIR DETERMINATION, REFINING, STATISTICS, MAP.

- See* Nos. 111, 190, 215, 3846, 3992, 4028, 4264, 7455; 3732; 3846, 4028, 7440, 7454; 318.

MID-CONTINENT FIELD (111.3)

OCCURRENCE

274. FARISH, W. S. Oil in the Southwest. Bull. Am. Petrol. Inst., vol. 3, Dec. 30, 1922, pp. 19-23. Estimates that one-half of United States' future production will come from the Southwest. *See also* Nat. Petrol. News, vol. 14, Dec. 13, 1922, pp. 33-35. Oil and Gas Jour., vol. 21, Dec. 14, 1922, pp. 94-98. Oil Weekly, vol. 27, Dec. 16, 1922, pp. 74, 76, 78, 80. Oildom, vol. 14, Jan. 1923, pp. 29-31, 36.
275. GALEY, T. M. History of the Mid-Continent oil field. Oil and Gas. Jour., vol. 22, Oct. 18, 1923, p. 56. Account of the bringing in of the first well and the subsequent development of the region.

GEOLOGY AND ORIGIN

276. MONNETT, V. E. Possible origin of some of the structures of the Mid-Continent oil field. Econ. Geol., vol. 17, May, 1922, pp. 194-200. A review of several theories advanced for explanation of causes of folding. States that folds similar to those in north Mid-Continent field occur from differential settling of strata upon an irregular surface or horizontal surface.
277. POWERS, SIDNEY. Reflected buried hills and their importance in petroleum geology. Econ. Geol., vol. 17, June-July, 1922, pp. 233-259. Map showing location of buried hills in Kansas, Oklahoma, Texas, and New Mexico; illustrated by cross-section views; discussion of geologic structure. *See also* Econ. Geol., vol. 18, Jan.-Feb., 1923, pp. 93-96.
278. WOODSON, MARLE. Danger of oil famine exists not? California Oil World, vol. 14, Feb. 9, 1922, pp. 1, 5. Discusses favorable structures of right geological age occurring throughout Mid-Continent and Rocky Mountain regions. Considers that other possible territories lie in Gulf Coast and Pacific Coast areas.
See also Nos. 103, 1909.

DEVELOPMENT

- See* Nos. 2059, 2383, 2602, 3022.

STORAGE

279. MORLEY, H. T. Evaporation losses in field storage tanks. Midwest Review, vol. 4, March, 1923, pp. 4-5, 13; April, pp. 2-3, 19. Methods of decreasing evaporation; data on evaporation losses obtained by investigations in the Rocky Mountain fields.
See also Nos. 3166, 3374.

PROPERTIES

280. HILL, H. H., DEAN, E. W., AND SMITH, N. A. C. Quality of Mid-Continent crude oil. Paper before West. Petrol. Ref. Assoc., March, 1922. *See also* Oil and Gas Jour., vol. 20, Mar. 17, 1922, pp. 82-86. Petrol. Ref., vol. 11, Mar. 16, 1922, pp. 13, 28-29. Nat. Petrol. News, vol. 14, Mar. 22, 1922, pp. 33-34, 37.

281. RATHBUN, J. B. Properties of crude oils. *Petrol. Age*, vol. 10, 1922, pp. 37-39. Gives data of physical properties and distillation tests for Louisiana, Texas, Oklahoma, and Kansas crudes.
282. TRIPLETT, GRADY. Contents of Mid-Continent crudes. *Oil Weekly*, vol. 27, Nov. 25, 1922, pp. 72-74. Gravity, percentage of gasoline and naphtha, and percentage of carbon residue in crude oils from Oklahoma, Kansas, northern Texas, northern Louisiana, and Arkansas fields.
- See also* Nos. 111, 1909, 3715.

REFINING AND REFINERIES

283. EGLOFF, GUSTAV. Cracking of Mid-Continent fuel oil. *Oil and Gas Jour.*, vol. 22, Oct. 4, 1923, pp. 188, 194, 196. Description of Dubbs process; products of distillation of fuel oil; fuel value of coke resulting from process.
284. GAMBRELL, J. B. Evolution of natural-gasoline industry. *Oil and Gas Jour.*, vol. 20, Feb. 24, 1922, pp. 60, 62, 64, 66, 68. Reviews development of industry in Mid-Continent field and gives list of plants in Texas, Kansas, and Oklahoma, showing daily production and type.
285. LEDERER, E. R. Dubbs cracking process. *Petrol. Times*, vol. 9, April 21, 1923, pp. 577-579. Description of process and plant; data of runs made with heavy Mid-Continent fuel oil, north Louisiana fuel oil, Mexican gas oil from Panuco crude and topped Panuco crude. Illustration.
- See also* Nos. 5574, 5579.

STATISTICS

286. THE MID-CONTINENT YEARBOOK, 1923. Development work—Mid-Continent field. Tulsa, Okla., Dec., 1923, p. 151. Monthly figures of drilling progress, showing completed, producing, dry, and gas wells.

DIRECTORY

See No. 284.

KANSAS (111.31).

OCCURRENCE.

287. MCCOY, A. W. Development in the petroleum industry in Kansas in 1922. *Trans. Am. Inst. of Min. and Met. Eng.*, Pamphlet 1241, April, 1923, pp. 12-13. Development and production of important pools. General survey of present conditions in various counties.
- See also* No. 2926.

GEOLOGY AND ORIGIN.

288. LOOMIS, HARVE. The Burkett-Seeley pool, Greenwood County, Kansas. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, Sept.-Oct., 1923, pp. 482-487. Notes that structure alone does not furnish enough evidence for determination of producing pools in Burkett-Seeley field. Analyses of sand samples determine location of pool; other observations.
289. LUPTON, C. T., LEE, WALLACE, AND VAN BURGH, L. R. Oil possibilities of western Kansas. *Bull. Am. Assoc. Petrol. Geol.*, vol. 6, March-April, 1922, pp. 69-87; discussion, pp. 87-90. Discusses topography, stratigraphy, and structure. Notes that Kiowa shale may be possible source of oil as it is black and rich in carbonaceous material; the Permian beds, although they offer no promise as a source of oil, have sands that could act as reservoirs; the Pennsylvanian and Mississippian sands may be reached at 4,000 and 5,000 feet. Includes geological map which shows location of seepages and wells. *See also* *Nat. Petrol. News*, vol. 14, July 19, 1922, pp. 67-68, 71-74.

290. NATIONAL PETROLEUM NEWS. Shallow fields of eastern Kansas in line for greater production. Vol. 15, May 2, 1923, pp. 119-120. Discusses new oil and gas districts opened near present producing area. Notes that gas lies below oil.
291. ——— Increasing activity in Greenwood results in discovery of new pools. Vol. 15, March 7, 1923, pp. 85-86. Brief description of geological structure of section; results of oil exploration.
292. RICH, J. L. Shoestring sands of eastern Kansas. Bull. Am. Assoc. Petrol. Geol., vol. 7, March-April, 1923, pp. 103-113. Description; theory of origin; production; methods of tracing shoestring formations. *See also* Oil and Gas Jour., vol. 21, March 29, 1923, pp. 106-108.
293. SHEA, E. F. Water conditions in the Urschel pool, Marion County, Kansas. Bull. Am. Assoc. Petrol. Geol., vol. 6, Sept.-Oct., 1922, pp. 426-443. History of development. Considers structure, producing horizons, production methods, character of oil, evidence of water invasion, methods of studying problem and handling well, and effects of water on production. Concludes that when handled rightly, wells which had water encroachment produced more than wells under gas pressure.
294. TRIPLET, GRADY. New Kansas well 125 miles from production. Oil Weekly, vol. 28, March 10, 1923, p. 24. Deals with wildcat well in Barton County. Brief description of the geological structure of this section. *See also* Petrol. Age, vol. 11, April 1, 1923, p. 92. *See also* No. 277.

DEVELOPMENT AND PRODUCTION.

See Nos. 293, 727, 2376, 2738, 2811, 2843.

PROPERTIES.

295. DEAN, E. W., COOKE, M. B., AND BAUER, A. D. Properties of typical crude oils from the producing fields of Kansas. Repts. of Investigations, Serial 2322, Bureau of Mines, Feb., 1922, 51 pp. Mimeographed. Analysis of 27 oils of intermediate-base type; results show "low contents of 'light ends' of the gasoline naphtha fractions and moderately high carbon residue figures."
296. PETROLEUM AGE. Crude oils. Vol. 10, Dec. 1, 1922, p. 39. Properties of Kansas crude oils.

STATISTICS.

See No. 164.

LEGAL REGULATIONS.

297. KERN, C. E. Estimated crude weight held not unreasonable. Oil and Gas Jour., vol. 21, July 20, 1922, pp. 97, 100. Notes decision of Interstate Commerce Commission which holds proposal to substitute actual weight for estimated weight per gallon in determination of freight rates on fuel-oil tank cars from Kansas, Texas, and Oklahoma fields to parts of Arizona, New Mexico, and Mexico, is unjustified.
298. ——— Pipe-line tender reduced to 10,000 barrels. Oil and Gas Jour., vol. 20, May 18, 1922, pp. 14, 102. Interstate Commerce Commission ruling upholds pipe-line rates from Kansas, Texas, and Oklahoma to Pennsylvania, but reduces quantity tendered for shipment from 100,000 to 10,000 barrels. *See also* Nat. Petrol. News, vol. 14, May 17, 1922, pp. 17-18.

MAP.

See No. 318.

LOUISIANA, NORTHERN (111.32).

GEOLOGY.

299. CRIDER, A. F. Relation of Upper Cretaceous to Eocene structures in Louisiana and Arkansas. *Bull. Am. Asso. Petrol. Geol.*, vol. 7, July-Aug., 1923, pp. 379-382. States that it is possible to determine whether or not folding in the Upper Cretaceous corresponds to folding in the Eocene if it can be determined whether the force which bent the Cretaceous folds occurred after the formation of the Eocene, and that no major erosional unconformities are present in the Eocene or point of contact of Eocene and Cretaceous.
300. HOLMAN, E., AND CAMPBELL, R. B. The Bellevue oil field, Louisiana. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, Nov.-Dec., 1923, pp. 645-652. General description; stratigraphy as established by well logs; structure; production. Considers addition to production possible from Blossom, Woodbine, and Trinity series.
301. HULL, J. P. D. Notes on the stratigraphy of producing sands in northern Louisiana and southern Arkansas. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, July-Aug., 1923, pp. 362-368. General description and survey of structure. *See also Oil and Gas Jour.*, vol. 21, April 5, 1923, pp. 106, 110-111.
302. HULL, J. P. D., AND SPOONER, W. C. A review of oil and gas pools in north Louisiana territory. *Bull. Am. Assoc. Petrol. Geol.*, vol. 6, May-June, 1922, pp. 179-192. Geology and structure in Louisiana-Texas-Arkansas field. Tells how surface indications have been used to locate large pools. Description of new pools in wildcat sections of this territory, evincing possibilities of production when unpromising surface conditions exist.
303. LOCKETT, A. M. Natural gas for New Orleans. *Proc. Louisiana Eng. Soc.*, vol. 7, Dec., 1921, pp. 218-230; discussion, pp. 231-241. "Discussion of Monroe gas field and use of the gas in New Orleans for fuel."
304. OIL WEEKLY. Deepest Louisiana well dry at 5,063 feet. Vol. 30, Aug. 11, 1923, pp. 59-60. Gives well log.
305. PONTON, G. M., AND WHITEHURST, J. W. The Spring Hill-Sarepta gas field, Webster and Bossier Parishes, Louisiana. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, Sept.-Oct., 1923, pp. 546-554. Considers geological features, gas and oil production, chemical properties of oil, and other possible producing horizons. Includes well logs.
306. SCOTT, W. W., AND STROUD, B. K. The Haynesville oil fields, Claiborne Parish, Louisiana. Louisiana Dept. of Conservation, *Bull.* 11, Jan., 1922, 26 pp. In cooperation with the U. S. Bureau of Mines. Deals with underground conditions and methods of operating in this field, the purpose of the report being primarily to aid the operators in their development problems, especially those encountered during the drilling of the wells.
307. STROUD, B. K., AND SHAYES, F. P. The Monroe gas field, Louisiana. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, Sept.-Oct., 1923, pp. 565-574. Gives history and geology of field, with description of pay sand. Considers water intrusion negligible. Tells of oil and gas production and estimates life of field.
308. WAGNER, PAUL. Bellevue field production shallowest from Nacatoch horizon. *Nat. Petrol. News*, vol. 14, Dec. 13, 1922, pp. 83-85. Reviews records of largest wells and history of prospecting in one of the most remarkable fields in America.

DEVELOPMENT AND PRODUCTION.

309. NATIONAL PETROLEUM NEWS. Coring done with rotary equipment in north Louisiana wildcat. Vol. 14, April 19, 1922, pp. 75-76. Description of rotary drilling practice in north Louisiana and Gulf Coast region where large holes are desirable and cores are taken only in parts of formations. *See also* No. 306.

STORAGE AND DISTRIBUTION.

See No. 3114.

PROPERTIES.

310. BELDRIC, GEORGE, AND BREITUNG, C. A. Gas production from the Spring Hill-Sarepta gas field, Webster and Bossier Parishes, Louisiana. Bull. Am. Assoc. Petrol. Geol., vol. 7, Sept.-Oct., 1923, pp. 555-557. Estimates gas resources of field. Describes physical properties.
311. NATIONAL PETROLEUM NEWS. United States makes Bellevue-field crude analysis. Vol. 14, May 17, 1922, p. 43. Properties of crude oil from Bossier Parish, Louisiana.
312. PETROLEUM AGE. Crude oil. Vol. 10, Dec. 1, 1922, p. 39. Properties of Louisiana crude oils.
313. WAGNER, PAUL. Smackover, Bossier, and Mirando crudes valuable chiefly for fuel. Nat. Petrol. News, vol. 14, Nov. 15, 1922, p. 27. Analyses of oils from Arkansas and Texas fields, including the Kosse field. *See also* Nos. 300, 305.

REFINING, STATISTICS.

See No. 285; 164, 5604.

LEGAL REGULATIONS, MAPS.

314. NATURAL GAS. Continue to make carbon black in Louisiana. Vol. 3, July, 1922, p. 52. Tells of new regulation allowing 15 per cent of gas to be used by carbon-black companies, the amount being subject to change by order of commissioner of conservation.
315. OIL, PAINT AND DRUG REPORTER. Louisiana sets rate pipe line may charge. Vol. 103, May 14, 1923, p. 48C. Discusses public service commission rate and regulations for transportation of oil via pipe lines.
316. PETROLEUM REFINER. Recent court rulings affecting oil rights. Vol. 12, Oct. 26, 1922, p. 7. Decisions on oil and gas lands by the Supreme Courts of Louisiana, Wyoming, and Montana, and District of Columbia Court of Appeals.
317. ——— To fight Louisiana tax. Vol. 11, July 13, 1922, p. 5. State Department of Conservation is given power to restrict operations of carbon-black industry in order to conserve natural gas.
318. U. S. GEOLOGICAL SURVEY. Recent publication of maps giving oil and gas fields in Louisiana, Kansas, Illinois, Oklahoma, Pennsylvania, Wyoming, West Virginia, and Kentucky.
319. WAGNER, PAUL. Trinity formation producing oil of 45° gravity in Pine Island district. Nat. Petrol. News, vol. 14, June 7, 1922, pp. 25, 32. Map showing wells in Caddo Parish, Louisiana, and their condition; analysis of oil; record of wells.

DIRECTORY.

See No. 7889.

OKLAHOMA (111.33).

See Nos. 318, 1808, 2060, 2061, 2066, 2231, 2926, 2948.

GEOLOGY.

- 320.** DENISON, A. R. The Robberson field, Garvin County, Oklahoma. Bull. Am. Assoc. Petrol. Geol., vol. 7, Nov.-Dec., 1923, pp. 625-644. Gives history, stratigraphy, and theory of structure. Discusses origin of oil, influence of structure upon production, and development methods. Estimates duration of production.
- 321.** EDSON, F. C. Notes on the Simpson formation, Oklahoma. Bull. Am. Assoc. Petrol. Geol., vol. 7, Sept.-Oct., 1923, pp. 558-563. Summary of information concerning the Simpson formation; petrographic study of samples from the Tahlequah area.
- 322.** GAMBRELL, J. B. Record of a great high-grade oil field. Oil and Gas Jour., vol. 21, Nov. 23, 1922, pp. 60-61. Stratigraphy of Tonkawa field.
- 323.** GARDNER, J. H. Rock distortion on local structures in the oil fields of Oklahoma. Bull. Am. Assoc. Petrol. Geol., vol. 6, May-June, 1922, pp. 228-239; discussion, pp. 239-243. Theory of significance of local distortion on folds, and application in distinguishing flexure and structure or folding where exposures are lacking.
- 324.** GIRTY, G. H., AND ROUNDY, P. V. Notes on the Glenn formation of Oklahoma with consideration of new paleontologic evidence. Bull. Am. Assoc. Petrol. Geol., vol. 7, July-Aug., 1923, pp. 331-347. A report of examination of the outcroppings of the formation, observations, and faunal evidences.
- 325.** GOLDSTON, W. L., jr. Differentiation and structure of the Glenn formation. Bull. Am. Assoc. Petrol. Geol., vol. 6, Jan.-Feb., 1922, pp. 5-23. Report of structure and stratigraphy of Glenn formation in southeastern Oklahoma; correlation of carboniferous deposits of this section of Oklahoma with those of north central Texas. See also Nat. Petrol. News, vol. 14, April 5, 1922, pp. 99-103.
- 326.** HARTLEY, BURTON. Certain relations between production and structure in northeastern Osage County, Oklahoma. Bull. Am. Assoc. Petrol. Geol., vol. 6, Sept.-Oct., 1922, pp. 464-471. States that although production bears some relation to structure, surface structure alone is not to be depended upon in this region as a guide to oil, as most of production is from synclines. It is suggested that geologists study early Pennsylvanian paleographic conditions as furnished by well logs.
- 327.** HINTON, A. F. Wewoka field on eve of bigger play; production holds up well. Nat. Petrol. News, vol. 15, Nov. 14, 1923, pp. 17-18, 20. Account of conditions in Oklahoma field; development; map of field showing location of wells; geology.
- 328.** ———. Hewitt's big well puzzles geologists; eight new wells starting. Nat. Petrol. News, vol. 15, June 20, 1923, pp. 30-32. Deals with general geological conditions in Oklahoma fields. Includes structure map.
- 329.** ———. Prevailing winds surely do prevail in Sayre, where the boom is on. Nat. Petrol. News, vol. 15, May 9, 1923, pp. 22-23. Map of Beckham County, Okla., showing completed and drilling wells; cross section of county showing logs of seven wells.
- 330.** HONESS, C. W. Geology of the southern Wichita Mountains of Oklahoma. Oklahoma Geol. Survey Bull. 32, part 1, April, 1923, 278 pp. Stratigraphy, structure, and physiographic history.
- 331.** ———. Geology of the southern Wichita Mountains of Oklahoma. Oklahoma Geol. Survey Bull. 32, part 2, April, 1923, 76 pp. Geography and economic geology. Occurrence of oil and gas. Structural map of southeastern Oklahoma and west central Arkansas showing location of asphalt deposits and prospective oil and gas areas.

332. HOPKINS, O. B., POWERS, SIDNEY, AND ROBINSON, H. M. The structure of the Madill-Denison area, Oklahoma and Texas, with notes on oil and gas development. U. S. Geol. Survey Bull. 736, 1923, part 2, pp. 1-33. Topography, stratigraphy, and structure; exploration and drilling records; development; oil possibilities and suggestions for future exploration. Map. Directions for drilling wells to prevent water intrusion. *See also* U. S. Geol. Survey Bull. 736-A, 1922, 33 pp.
333. HOWELL, J. V. Notes on the pre-Permian Paleozoics of the Wichita Mountain area. Bull. Am. Assoc. Petrol. Geol., vol. 6, Sept.-Oct., 1922, pp. 413-425. Deals with method of studying and correlating samples of subsurface cuttings for the purpose of solving some of the stratigraphic problems of the Paleozoic beds of southern Oklahoma. Description of formations.
334. ——— Some structural factors in the accumulation of oil in southwestern Oklahoma. Econ. Geol., vol. 17, Jan.-Feb., 1922, pp. 15-33. Detailed study of structural relations in the region south of the Arbuckle and Wichita mountains and north of the Red River.
335. KIRWAN, M. J., AND SWIGART, T. E. Engineering report of the Chickasha gas field. Issued by Bureau of Mines in cooperation with State of Oklahoma and Bartlesville Chamber of Commerce, May 1, 1923, 32 pp. Discussion of value of Chickasha gas field, stratigraphy, and structure; drilling methods; water exclusion methods; oil and gas analyses; development costs; transportation methods; operation and protection of gas wells; well logs; map.
336. MORGAN, G. D. A Siluro-Devonian oil horizon in southern Oklahoma. Oklahoma Geol. Survey, Circular 10, March, 1922, pp. 3-13. Pamphlet. Study of the Hunton limestone occurring at a shallow depth found to contain oil. Well logs of the four test wells.
337. OIL FIELD ENGINEERING. Lyons-Quinn structure. Vol. 24, May, 1922, pp. 138-139. Review of address by Emil Kluth before Tulsa Geological Society. Topographical features of Oklahoma field; stratigraphy and structure; surface indications of a closed structure; production.
338. OIL AND GAS JOURNAL. Structure of west Oklahoma said to have oil showings. Vol. 21, Oct. 12, 1922, p. 110. Describes geological features of formation extending from Caddo County, Okla. to Amarillo field, Texas.
339. ——— Survey of northern Oklahoma fields. Vol. 21, Sept. 7, 1922, pp. 108, 110, 112; Sept. 14, pp. 94-102; Sept. 21, pp. 94, 96-100; Sept. 28, pp. 86-87; Oct. 5, pp. 102, 104. General report of history, structure, development, production, and oil possibilities in Kay, Garfield, Noble, western Pawnee, western Osage, and Grant Counties.
340. ——— Log of Oklahoma's deepest oil well drilled by Gypsy Oil Co. Vol. 21, Aug. 24, 1922, p. 82. Log of well No. 1, White Mule Farm, Noble County, Okla.
341. ——— Lyons-Quinn structure described. Vol. 20, May 11, 1922, pp. 106-107. Discusses relation between the surface and subsurface structure of the Lyons-Quinn pool, Oklahoma. Description of producing sands; geography and irregular intervals occurring between structures.
342. OIL AND GAS NEWS. Logging Tonkawa's famous sands. Vol. 13, May 21, 1923, pp. 11-12. Records stratigraphy and gives a generalized geologic column of Tonkawa field.
343. REED, R. D. Some suggestions in regard to Pennsylvanian paleography in the Henryetta district, Oklahoma. Bull. Am. Assoc. Petrol. Geol., vol. 7, Jan.-Feb., 1923, pp. 50-57. Contours giving thickness of Booch sand. Discussion of character, relation, and theory of origin of Booch or Second Salt sand.

- 344.** ROARK, LOUIS. The Hewitt oil field, Carter County, Oklahoma. Proc. Indiana Acad. Sci., 1921. Indianapolis, 1922, pp. 211-220.
- 345.** ROSS, J. S. Preliminary report on petroleum engineering in the Tonkawa oil field. Issued by Bureau of Mines in cooperation with the State of Oklahoma, Feb., 1923, 36 pp. Mimeographed. General description of strata; drilling problems; tabulated data on the oil and gas wells. *See also* Oil Weekly, vol. 29, March 31, 1923, p. 87. Nat. Petrol. News, vol. 15, March 28, 1923, p. 72.
- 346.** ROUNDY, P. V., HEALD, K. C., AND RICHARDSON, G. B. Structure and oil and gas resources of the Osage Reservation, Oklahoma; Tps. 26 and 27 N., R. 12 E. U. S. Geol. Survey, Bull. 686-Z, 1922, pp. 395-420. Pamphlet. Describes stratigraphy and general structural features. Gives production, characteristics of oil, and gas analysis. *See also* Oil Weekly, Vol. 26, Sept. 16, 1922, pp. 16, 70, 72, 74, 76, 78, 80, 82, 84, 86.
- 347.** RUBEY, W. W. Progress report on a subsurface study of the Pershing oil and gas field, Osage County, Oklahoma. U. S. Geol. Survey Bull. 751-B, 1923-24, part 2, pp. 23-70. History of development; geography; geology; stratigraphy; structure; production statistics; analyses; favorable drilling sites. States that deeper drilling offers but slight possibility of finding large pool.
- 348.** SWIGART, T. E. Petroleum engineering in the Skull Creek oil pool, north-eastern Osage County, Okla. Repts. of Investigations, Serial 2450, Bureau of Mines, Feb., 1923, 9 pp. Mimeographed. Stratigraphy, description, and history of wells; tabulated data of oil and gas analyses; maps; engineering methods. *See also* Petrol. World (London), vol. 20, April, 1923, p. 140. Oil Field Eng., vol. 25, March, 1923, pp. 50-53. Bull. Am. Assoc. Petrol. Geol., vol. 7, Jan.-Feb., 1923, pp. 37-49. Oildom, vol. 14, April, 1923, p. 60. Oildom, vol. 14, Sept., 1923, p. 42.
- 349.** TRAGER, E. A. Underground stratigraphic characteristics of eastern Oklahoma. Am. Jour. Sci., vol. 5, Feb., 1923, pp. 140-146. Detailed correlations of stratigraphy.
- 350.** WAGNER, PAUL. Performance of edge well, Robberson pool, starts new activity. Nat. Petrol. News, vol. 14, Oct. 4, 1922, pp. 83-85, 87. Description of geological features in southern Oklahoma field; detail and reconnaissance map; production by leases.
- 351.** WHITE, DAVID, AND OTHERS. Structure and oil and gas resources of the Osage Reservation, Oklahoma. U. S. Geol. Survey Bull. 686, 1922, 427 pp. Describes geography, geological structure, and producing sands. Maps and well logs.
- 352.** WHITNEY, R. H. New field in Beckham County attracting general attention. Oil and Gas. Jour., vol. 21, May 24, 1923, pp. 18, 111-112. Gives structure and geography of region in Oklahoma; well log.
- 353.** WOOD, H. L. Oil structures, illustrated. Petrol. Age, vol. 10, Oct. 1, 1922, pp. 21-23. Survey of structural conditions in the Glenn pool, Cushing field, and Youngstown field, Oklahoma, as furnishing an example of oil structural conditions in United States.
- See also* Nos. 277, 2386.

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- See also* Nos. 348, 2067, 2385.

STORAGE, DISTRIBUTION.

355. OIL AND GAS JOURNAL. Jobber plan war on fire menace. Vol. 20, April 13, 1922, pp. 92-93. Safety rules and recommendations of Oklahoma Corporation Commission and oil companies for storing and distributing petroleum products.

See also No. 3343.

PROPERTIES.

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359. ——— Crude oil. Vol. 10, Dec. 1, 1922, p. 37. Properties of Oklahoma crude oils.

See also Nos. 346, 2067.

REFINING AND REFINERIES.

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361. NATIONAL PETROLEUM NEWS. Four large natural-gasoline plants building in Burbank field. Vol. 14, May 3, 1922, pp. 49-51, 53-54. Detailed description of plants and equipment; illustrations.

See also Nos. 5176, 5569, 5695, 5881, 5938.

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See also Nos. 164, 546.

LEGAL REGULATIONS.

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- 366.** The Mid-Continent Yearbook, 1923. Report of the Osage Oil and Gas Lessees Association. Tulsa, Okla., 1923, pp. 95-96. Contains rules and requirements for storing oil in the Osage Nation.
- 367.** NATIONAL PETROLEUM NEWS. Oklahoma pipe-line regulations upheld. Vol. 14, May 31, 1922, p. 40. Statute which makes all pipe lines common carriers is upheld by United States Supreme Court.
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- 369.** OIL WEEKLY. Oklahoma Supreme Court makes decision on tax. Vol. 28, Feb. 24, 1923, p. 87. Oil-well equipment is classed as temporary in income-tax returns.
- 370.** WALLACE, L. A. Oklahoma oil and gas. St. Louis, Mo., 1922. Compilation of Oklahoma laws relating to oil and gas; court decisions in Oklahoma; regulations of the Oklahoma Corporations Commission affecting oil and gas; digest of supreme court and Federal court cases on Oklahoma oil.
- See also* Nos. 297, 298, 355.

MAP.

- 371.** U. S. BUREAU OF MINES. Map of Tonkawa Field. Chamber of Commerce, Bartlesville, Okla.
- See also* No. 327.

ECONOMICS, DIRECTORY.

See No. 7798; 7891.

TEXAS, EASTERN, WESTERN, CENTRAL, NORTHERN (111.34).

See Nos. 2487, 2926.

GEOLOGY.

- 372.** BELL, H. W., AND KERR, J. B. Engineers' survey of Burkburnett. Oil and Gas Jour., vol. 20, March 24, 1922, pp. 78-81, 84-85; March 31, pp. 94, 96-100; April 6, pp. 92-100; April 13, pp. 100, 109-110, 117; April 20, p. 109. "Petroleum engineering in the Burkburnett field, Texas." History of development, underground structure and formations, cross sections, production data, costs.
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- 374.** CHENEY, C. A. Salt domes of northeastern Texas. Oil and Gas Jour., vol. 20, Jan. 6, 1922, pp. 82-83. Discussion of the origin and relationship of the salt domes of northeastern Texas to the area recently developed along the so-called Mexia anticline.
- 375.** DOBBIN, C. E. Geology of the Wiles area, Ranger district, Texas. U. S. Geol. Survey Bull. 736, part 2, 1922, pp. 55-69. Gives general development of region; topography; stratigraphy; structure, local and regional; producing horizons; well logs; structural map. *See also* Oil Weekly, vol. 26, Sept. 16, 1922, pp. 13-15, 88, 90, 92.
- 376.** FOHS, JULIUS, AND ROBINSON, H. M. Structural and stratigraphical data of northeast Texas petroleum area. Econ. Geol., vol. 18, Dec., 1923, pp. 709-731. A summary of five years' study of geology of this section, with report of information on structural and stratigraphic conditions by drilling. Discussion of the relations of fault and zone patterns to each other.

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382. ——— Ten sands producing in South Electra pool. Vol. 14, July 19, 1922, p. 75. Review of oil horizons in Texas field.
383. ——— History of Texas producing fields—relation to estimated reserve. Vol. 14, Mar. 15, 1922, pp. 67-68, 71. Brief tabular history of fields, divided into geological provinces.
384. OIL AND GAS JOURNAL. Scurry County, Texas, gives promise. Vol. 21, Feb. 15, 1923, pp. 82, 84. Describes briefly the geological structure and topography of Mitchell and Scurry Counties.
385. ——— Risks of the oil fields of north-central Texas. Vol. 20, March 31, 1922, pp. 106-107. Discussion of geological conditions and their bearing upon presence of oil, importance of determining the nature of the geological relations of the region.
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399. ——— Panhandle tests persistently put down in exploratory work for oil. Nat. Petrol. News, vol. 14, May 3, 1922, pp. 75-76, 78-79. Describes structural features of the Amarillo district. Gives development progress well log; data on past and present drilling operations.
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401. ——— Geologist's account of Mexia field. Oil and Gas Jour., vol. 20, Mar. 17, 1922, pp. 92-93, 96-97, 100-101. Quotes W. A. Reiter on the geology and potential value of field.
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DEVELOPMENT AND PRODUCTION.

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TRANSPORTATION AND STORAGE.

See No. 3098.

PROPERTIES.

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408. PETROLEUM AGE. Crude oil. Vol. 10, Nov. 1, 1922, p. 39; Nov. 15, p. 37; Dec. 1, p. 37. Properties of Texas crude oils.
409. ——— A study of Texas crudes. Vol. 9, May 15, 1922, pp. 16-17. Gives chemical and physical characteristics of Texas oils; products. *See also* *Petroleum Ref.*, vol. 12, Nov. 2, 1922, p. 7; Nov. 9, p. 5. *Oil Trade Jour.*, vol. 13, Dec., 1922, p. 62. *Oildom*, vol. 13, Dec., 1922, p. 54. *Petrol. Times*, vol. 8, Nov. 25, 1922, p. 786.
- See also* Nos. 3980, 4109, 5723.

REFINING.

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- See also* Nos. 5426, 5900, 5925.

UTILIZATION.

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STATISTICS.

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- See also* No. 164.

LEGAL REGULATIONS.

413. OIL, PAINT AND DRUG REPORTER. Texas oil tax is held constitutional. Vol. 103, June 18, 1923, p. 51. U. S. Supreme Court regards tax on wholesale oil products brought into State as no violation of interstate commerce rights.

See also Nos. 297, 298.

DIRECTORY.

See No. 7890.

OTHER STATES (111.39).

STATISTICS.

See No. 164.

ARKANSAS.

GEOLOGY.

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420. OIL ENGINEERING AND FINANCE. Geological characteristics and development of the El Dorado field (Arkansas). Vol. 2, Oct. 21, 1922, pp. 467-470. Discusses structure, theory of formation, oil horizon, character of oil, and possibility of oil occurrence elsewhere in State.
421. OIL AND GAS JOURNAL. Valuation data on the Smackover field. Vol. 22, July 19, 1923, p. 52. Graph representing the rate of decline in the production of oil wells; geology and structure.
422. OIL TRADE JOURNAL. Miller County, Ark., draws wildcatter's interest. Vol. 14, Oct., 1923, pp. 54, 56. Tells of structural and stratigraphical conditions on Priest and Gillespie locations. Account of exploration.
423. OIL WEEKLY. El Dorado field not on an anticline. Vol. 25, May 27, 1922, pp. 8, 11; June 3, p. 12. Notes that northern part of field is practically level, but that the other part has a dome. Gives theory of formation of oil deposit, structural features, and stratigraphy, and describes properties of oil.
424. ———. Some Arkansas wells are not deep enough. Vol. 25, April 29, 1922, pp. 10, 12, 47, 50. Reports that rotary drilling has been unsatisfactory in exploration in south-central Arkansas; core taking is advised. Discusses stratigraphy and possibilities of deeper sands. Includes well logs and cross section of El Dorado field structure.
425. PETERSON, F. P. Wildcat development work in Arkansas. Oil and Gas Jour., vol. 23, Dec. 27, 1923, pp. 70, 72, 116-118. Gives topography, structure, and stratigraphy of wildcat areas.
426. SHIRAS, TOM. Oil in Arkansas. Eng. and Min. Jour.-Press, vol. 114, Dec. 2, 1922, pp. 993-994. Geologic structure of oil-producing areas and development since discovery in 1920.
427. WAGNER, PAUL. El Dorado revival, plus Smackover flood, threatens crude market. Nat. Petrol. News, vol. 14, Nov. 22, 1922, pp. 23-24, 27-29. Map of Smackover field showing locations and development of wells. Production levels of Homer, Haynesville, El Dorado, and Smackover fields are illustrated.
428. WHITNEY, R. H. Miller County, Ark., will get play. Oil and Gas Jour., vol. 22, Oct. 18, 1923, pp. 122-123, 126. Favorable structures will be tested. Discusses geology and stratigraphy.

See also No. 301.

DEVELOPMENT AND PRODUCTION, PROPERTIES AND THEIR DETERMINATION, UTILIZATION.

See Nos. 415, 424, 432, 727; 313, 319; 417, 421.

LEGAL REGULATIONS.

429. THE MID-CONTINENT YEARBOOK, 1923. Conservation Rules and Regulations, State of Arkansas, Order No. 284. Tulsa, Okla., 1923, pp. 131, 133, 135, 137, 139, 141, 143. Regulations controlling waste of oil and gas, drilling, water shut-off, and keeping of records.
430. NATIONAL PETROLEUM NEWS. Arkansas commission rules in severance tax. Vol. 15, Aug. 1, 1923, p. 69. Rules pertaining to method of payment of severance tax.
431. OIL FIELD ENGINEERING. Arkansas has new drilling rules. Vol. 25, May, 1923, p. 119. Provisions include permission for deeper drilling and notice of abandonment.
432. OIL AND GAS JOURNAL. New Arkansas law avoids test suits. Vol. 22, Nov. 1, 1923, p. 111. Tells of new law which eliminates navy test formerly required and changes the boiling point to 140° and the end point to 450°.

- 433.** OIL WEEKLY. Here is what oil-field workers can do on Sunday. Vol. 30, Aug. 11, 1923, p. 64. Main points of agreement reached between officials of the Mid-Continent Oil and Gas Association and the representatives of the State of Arkansas. *See also* Nat. Petrol. News, vol. 15, Aug. 1, 1923, p. 66. Oil and Gas Jour., vol. 22, Aug. 9, 1923, p. 91. Natural Gas, vol. 4, Sept., 1923, p. 58.
- 434.** WAGNER, PAUL. Smackover production approximates 28 per cent of initial flow figures. Nat. Petrol. News, vol. 15, Feb. 7, 1923, pp. 69, 71-72. Considers production, logs of wells, and mudding problems. Includes map of Smackover field showing extent of production and development.
See also No. 417.

IOWA.

GEOLOGY.

- 435.** HAGER, D. S. Oil and gas prospects of Iowa. Oil and Gas Jour., vol. 21, March 1, 1923, pp. 86, 110-111, 114-115. Concludes that if oil and gas exists in commercial quantities, it is under the stratified rocks. Describes stratigraphical conditions, and discusses possibility of the existence of oil.

MICHIGAN.

GEOLOGY.

- 436.** NATIONAL PETROLEUM NEWS. Drilling second test in Michigan. Vol. 14, June 7, 1922, p. 83. Gives log of well at Seul Choix Point, upper Michigan Peninsula. Structure is well defined, but oil has not been found. Brief review of oil exploration in Michigan.
- 437.** ROBINSON, W. I. Geological factors affecting the search for oil and gas in Michigan, with results of drilling. Nat. Petrol. News, vol. 14, Sept. 6, 1922, pp. 71-72, 75-76. Notes that formations are identical with oil-producing strata of Ontario, Indiana, and Ohio, so that large part of State is considered favorable petroleum territory; however, certain structural features have made possible the escape of accumulated petroleum. Record of gas wells; oil well discoveries and records; character of Michigan formations.

UTILIZATION. *See* No. 7493.

MISSOURI.

GEOLOGY.

- 438.** WILSON, M. E. Occurrence of oil and gas in Missouri. Nat. Petrol. News, vol. 15, May 9, 1923, pp. 55-56. From Missouri Bureau of Geology and Mines, Report, vol. 16, 2nd ser., 1922, 284 pp. History of exploration; geology; well logs and structural maps.

UTILIZATION. *See* No. 7471.

WISCONSIN.

GEOLOGY.

- 439.** TWENHOFEL, W. H. The negligible oil possibilities of Wisconsin. Bull. Am. Assoc. Petrol. Geol., vol. 7, Nov.-Dec., 1923, pp. 653-660. Reports that, as a whole, Wisconsin offers little promise of commercial production; east of Richmond-Trenton contact in eastern part of State has slight possibilities. Considers location of suitable structures difficult because of heavy drift covering country.

GULF COAST FIELD (111.4)

GEOLOGY

440. MCGREAL, P. L. Heaving shales of Gulf pools unsolved problem of oil men. *Oil and Gas Jour.*, vol. 22, Aug. 9, 1923, p. 70. Engineering science has been unable to cope successfully with these shales, but as they contain evidence of oil and gas, a means will undoubtedly be found to render them productive.

DEVELOPMENT AND PRODUCTION

See Nos. 2024, 2607.

PROPERTIES

441. MCGREAL, P. L. Constituents of Gulf Coast crude. *Oil and Gas Jour.*, vol. 20, Mar. 31, 1922, pp. 90-91. Gives table showing results of refinery tests of some grades of coastal crude and results of laboratory analysis of three samples from Humble, Saratoga, and Sour Lake.
442. SMITH, N. A. C., BAUER, A. D., AND LE JEUNE, N. F. Properties of typical crude oils from the producing fields of southern Louisiana and southern Texas. *Repts. of Investigations, Serial 2416, Bureau of Mines, Nov., 1922, 69 pp.* Mimeographed. Seventh of a series of reports covering fields of the United States. Results of tests for gravity, sulphur, and gasoline. Reports low pour tests.

See also Nos. 111, 741.

LOUISIANA, COASTAL (111.41).

GEOLOGY.

443. BARTON, D. C. Occurrence of gypsum in the Gulf Coast salt domes. *Econ. Geol.*, vol. 17, Mar.-Apr., 1922, pp. 141-143. Remarks intended to supplement paper by D. H. Newland, "Geology of gypsum and anhydrite," *Econ. Geol.*, vol. 16, Sept.-Oct., 1921, pp. 393-404.
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545. KISTLER, W. F. My faith in Wyoming and Montana. Bull. Am. Petrol. Inst., vol. 3, Dec. 30, 1922, pp. 23–26. Discusses prospects of future production and estimates of potential production of the chief producing sections. *See also* Nat. Petrol. News, vol. 14, Dec. 13, 1922, pp. 33–35. Oil and Gas Jour., vol. 21, Dec. 21, 1922, pp. 94–97.
546. NATIONAL PETROLEUM NEWS. Leading geologists report oil prospects of Western Hemisphere. Vol. 15, Feb. 28, 1923, pp. 32A–32H. Contains papers giving oil development and production in 1922 of Oklahoma, Mexico, north and central Texas, Peru, Montana, eastern fields of United States, Venezuela, and Colombia.

LEGAL REGULATIONS, MAP.

547. GAS AGE-RECORD. Natural-gas decisions. Vol. 49, April 1, 1922, p. 406. Decision, by Montana commissioner, regarding depreciation and depletion requires allotment to stockholders of an annual sum, which will, if properly invested, amount to investment in plant; otherwise, when production is exhausted, investor would have only interest on investment.
548. WEAR, M. P. Our future oil—Montana. Petrol. Age, vol. 12, Sept. 1, 1923, pp. 22, 24. Discusses petroleum possibilities and outlook; production; map showing oil pools.
See also Nos. 316, 526.

UTAH (111.53).

OCCURRENCE.

549. GRIMES, O. J. Utah's oil fields. R. R. Red Book, vol. 39, Jan., 1922, pp. 251-253. General review of developments in the State. *See also* No. 489.

GEOLOGY.

550. CALIFORNIA OIL WORLD. San Juan Basin at junction of four States may have big future. Vol. 14, Nov. 23, 1922, pp. 1, 5. Considers favorable oil structures. Outlook for production. History of exploration and development in New Mexico and Utah region.
551. DOUGLAS, EARL. Oil problems in the Uinta Basin. Salt Lake Min. Rev., vol. 23, Jan. 30, 1922, pp. 13-14; Feb. 28, pp. 9-11; March 15, pp. 11-14; vol. 24, Apr. 15, pp. 17-18; Apr. 30, pp. 9-11; June 15, pp. 12-13; July 15, pp. 9-11; Aug. 30, pp. 11-14; Feb. 15, 1923, pp. 17-18; vol. 25, May 15, 1923, pp. 18-20. Discusses origin of oil which forms gilsonite and other hydrocarbons. Gives characteristics of wurzilite and its occurrence; occurrence of asphaltic hydrocarbons; evidence regarding petroleum furnished by oil shale. Discusses structures having petroleum possibilities; topography of region; anticlinal theory and its practical application. Laboratory analysis shows that fresh-water shales contain petroleum. Geographical chart of region.
552. EMERICK, E. B. Search for oil in San Juan country. Oil and Gas Jour., vol. 21, Apr. 12, 1923, p. 96. Brief description of topography and history list of important structures.
553. GRIMES, O. J. Review of the petroleum possibilities and developments, State of Utah. R. R. Red Book, vol. 39, Apr., 1922, pp. 513-515, 536.
554. HEIST, H. D. Geological position of test wells drilled in eastern Utah oil fields. Salt Lake Min. Rev., vol. 24, April 15, 1922, p. 19. Contains a geological map giving position of test wells and stratigraphy.
555. JENSON, J. B. Hydrocarbon wealth of the State of Utah; a comprehensive review of the situation. Salt Lake Min. Rev., vol. 25, Nov. 15, 1923, pp. 11-15. Description of deposits of oil shale, asphalt rock, ozokerite, elaterite, gilsonite, and coal. Gives production costs and tells of products and their uses.
556. ———. Utah shales soon to supplant waning petroleum supply; an argument for the industry and a boost for Utah. Salt Lake Min. Rev., vol. 25, Apr. 30, 1923, pp. 9-13. Discusses origin of western oil-shale deposits, estimated acreage of shale in Utah, and estimated yield in barrels.
557. MOORE, R. C. Stratigraphy of a part of southern Utah. Bull. Am. Assoc. Petrol. Geol., vol. 6, May-June, 1922, pp. 199-223; discussion, pp. 223-227. Deals with area examined in Kane, Garfield, and Wayne Counties. Geological and topographical maps of territory. *See also* California Oil World, vol. 14, Apr. 20, 1922, p. 2.
558. NATIONAL PETROLEUM NEWS. Dry holes show how Utah formations run. Vol. 14, Feb. 8, 1922, pp. 67-68. Gives log and correlation of deep tests drilled in Utah by the Ohio Oil Co.
559. OIL WEEKLY. Utah not being overlooked in prospecting. Vol. 31, Dec. 8, 1923, p. 19. Brief general description of structures in southeast Utah regarded as favorable to oil deposits.
560. ———. Southern Utah is possible oil-bearing section; find light crude. Vol. 25, Apr. 22, 1922, pp. 54, 56. Survey of oil possibilities and favorable structures.

561. PROMMEL, H. W. C. Geology and structure of portions of Grand and San Juan Counties, Utah. Bull. Am. Assoc. Petrol. Geol., vol. 7, July-Aug., 1923, pp. 384-399. Description of area in south-central Grand County and northern San Juan County. Discusses oil possibilities.
562. SLACK, E. G. Several domes in Four States area are promising for new oil fields. Nat. Petrol. News, vol. 15, April 18, 1923, p. 89. Survey of undrilled Pennsylvanian formations in structures in New Mexico, Utah, Arizona, and Wyoming. These formations are held to be as productive as the Dakota structure.
563. WAGNER, PAUL. Woodside test to be drilled in Utah whatever Farnham's outcome. Nat. Petrol. News, vol. 15, June 27, 1923, pp. 85-88, 91. Detailed description of structure and geological conditions. Tells of development and gives geologic map.

DEVELOPMENT AND PRODUCTION.

See No. 556.

PROPERTIES.

564. SHALE REVIEW. Oil shales of Utah carry twenty billion barrels of oil. Vol. 4, May-June, 1922, p. 4. Résumé of address by J. B. Jenson before Salt Lake Chamber of Commerce. Acreage and estimated production of shale oil of Soldier Summit, Uinta Basin, Watson and White River, and Naval Reserve shale districts; nomenclature of shale-oil industry.

See also Nos. 198, 551.

REFINING.

565. JENSON, J. B. Are we ready for the shale-oil industry? Salt Lake Min. Rev., vol. 23, Mar. 30, 1922, pp. 9-12. Discusses the importance and possibilities of the industry and estimates acreage of and products obtainable from Utah shales.
566. PETROLEUM TIMES. The oil-shale industry and its problems. Vol. 8, July 22, 1922, pp. 145-146. Deals with factors in mining and retorting of shale which affect oil yield and industrial costs. Map showing chief shale deposits of Utah; facts regarding Green River shale deposits.

See also Nos. 507, 508, 509.

MAP.

567. SLACK, E. G. New Mexico—the next light-oil field. Petrol. Ref., vol. 13, March 1, 1923, p. 9. Contains map which gives oil wells, gas wells, oil prospects, and well locations in southeastern Utah and northwestern New Mexico.

See also Nos. 509, 551, 566.

WYOMING (111.54).

See No. 318.

OCCURRENCE.

568. GOSLINE, W. H. Brief account of Wyoming and its oil. Union Oil Co. of California Bull. 22, Dec., 1922, pp. 3-7. Map showing Wyoming oil fields. Brief historical account of oil production and development. Daily production of representative fields.

See also Nos. 99, 588.

GEOLOGY.

569. COLLIER, A. J. The Osage oil field, Weston County, Wyoming. U. S. Geol. Survey Bull. 736, part 2, 1922, pp. 71-110. History, development, topography, and structural features of field. Description of physical and chemical characteristics of formations; conditions affecting production. Discussion of origin of oil and drilling methods. Estimated oil resources. Structural map. States that large percentage of oil is unrecoverable by present methods. *See also* U. S. Geol. Survey Bull. 736-D, 1922, pp. 71-110.
570. ENGINEERING AND MINING JOURNAL-PRESS. Petroleum possibilities in deep sands near Osage field, Wyoming. Vol. 116, Sept. 1, 1923, p. 376. Notes that anticlinal structure has been found north and northeast of Osage field; older formations are exposed so that region can be tested without deep drilling.
571. ESTABROOK, E. L. Faulting in Wyoming oil fields. Bull. Am. Assoc. Petrol. Geol., vol. 7, March-April, 1923, pp. 95-102. Discusses theories regarding relation of faulting to accumulation of oil, based upon observations in Elk Basin and Salt Creek fields, Wyoming. Notes that although large production had been obtained from wells located on faults in the Salt Creek field, production has also been obtained on locations some distance from surface indications of cropping. *See also* Oil and Gas Jour., vol. 21, Nov. 9, 1922, pp. 90, 92. Nat. Petrol. News, vol. 14, Nov. 15, 1922, pp. 79-81.
572. FATH, A. E. The age of the domes and anticlines in the Lost Soldier-Ferris district, Wyoming. Jour. Geol., vol. 30, May-June, 1922, pp. 303-311. States that the minor folds of the Lost Soldier-Ferris district which have to do with oil production are younger than the Rawlins uplift upon which they are superimposed, and were formed by different forces; the oil and gas of earlier fields was doubtless lost in minor folding which later occurred. Present oil and gas is probably result of dynamochemical action of folding forces, and it is likely that the present deposits are remains of vast original deposits.
573. GAMBRELL, J. B. Teapot Dome deal will aid industry. Oil and Gas Jour., vol. 20, April 27, 1922, pp. 7, 100-101. Contains section of geological map of Wyoming showing Salt Creek and Poison Spider fields and pipe-line connections.
574. INLAND OIL INDEX. Possibility of finding oil in deep sands near Upton, Wyoming. Vol. 8, Dec. 29, 1923, p. 10 (from Western County Gazette). Describes stratigraphical and structural conditions; discusses oil possibilities.
575. KRAMPERT, E. W. Oil fields of Rawlins-Lost Soldier district of Wyoming. Bull. Am. Assoc. Petrol. Geol., vol. 7, March-April, 1923, pp. 131-146; Nat. Petrol. News, vol. 15, March 14, 1923, pp. 35-43. History of oil development and production; describes geographical structure. Chart of rock formations. *See also* Inland Oil Index, vol. 8, Nov. 3, 1923, pp. 9-10.
576. OIL FIELD ENGINEERING. Coal and oil resources of the Hanna Basin, Carbon County, Wyoming. Vol. 24, April, 1922, pp. 99-101. Survey of formations and a discussion of those that may yield oil; considers possible oil structures.
577. OIL AND GAS JOURNAL. Fremont County, Wyoming, has Wall Creek possibilities. Vol. 21, Oct. 26, 1922, p. 96. Describes structural and geographical features of Pilot Butte field. Discusses oil possibilities.
578. ———. Production possibilities of Teapot Dome. Vol. 20, May 4, 1922, pp. 10, 109. Brief survey of geologic conditions. Estimated production. Map showing relation of Teapot Dome to Salt Creek field.

579. OIL TRADE JOURNAL. Bates Hole region, Wyoming, has oil potentialities. Vol. 14, Jan., 1923, pp. 62, 104. Four small domes discovered recently in this section. Describes geological formations; map.
580. OIL WEEKLY. May get it deeper near Osage, Wyo., field. Vol. 30, Sept. 8, 1923, pp. 55-57. Stratigraphy of Pump Creek anticline, Weston County, Wyoming, and its possibilities of oil production. Pump Creek structure map.
581. SALT LAKE MINING REVIEW. Fossil oil field, Wyoming. Vol. 25, April 15, 1923, pp. 22-23. Brief account of oil indications which warrant further exploration. Geology of Fossil area.
582. U. S. CONGRESS. SENATE. Naval reserve oil leases. Message from the President of the United States, June 7, 1922, 42 pp. Pamphlet. Printed as S. Doc. 210. 67th Cong. 2nd sess. Contains Executive orders, contracts for drilling wells on naval oil reserves of United States; structural maps and diagrammatic sketches of Salt Creek and Teapot Dome.
583. SLOANE, E. S. Petroleum possibilities of the Salt River field. Pamphlet issued by Salt River, Wyoming-Idaho Development Trust, Pocatello, Idaho. 1923, 8 pp. Discusses favorable structural conditions. Notes fossil and stratigraphic evidence. Bibliography.
584. SMITH, L. E. Teapot Dome falls far below estimates made before drilling began. Nat. Petrol. News, vol. 15, Aug. 29, 1923, pp. 21-22. Wells drilled to the second Wall Creek sand have encountered little gas pressure; production is average. Contour map.
585. ———. Natrona County structures afford good heavy-oil possibilities. Nat. Petrol. News, vol. 14, Aug. 9, 1922, pp. 45-46. Account of development and exploration in Poison Spider field, Wyoming. Describes black-oil producing structures; gives stratigraphy.
586. ———. Northern Carbon County assumes more importance in oil and gas. Nat. Petrol. News, vol. 14, July 26, 1922, pp. 35, 37-38. Stratigraphy and structure of Wertz, Lost Soldier, and Ferris fields, Wyoming; general geographical conditions; development conditions.
587. ———. Oil reserve in Salt Creek estimated more than half billion barrels. Nat. Petrol. News, vol. 14, July 19, 1922, pp. 37, 39-40, 43-44, 46. Considers stratigraphical conditions and development. Gives log of Salt Creek well; estimated future production.
588. TAYLOR, F. B. Oil romance of the Wyoming fields. Oil and Gas. Jour., vol. 21, June 1, 1922, pp. 14, 98-100. History of development. Compares oil horizons with those of Mid-Continent, Eastern, and California fields.
589. WASHBURN, C. W. The Teapot oil affair. Min. and Met., No. 186, June, 1922, pp. 7-9. Brief description of geology of Teapot Dome.
See also Nos. 496, 562, 581.

DEVELOPMENT AND PRODUCTION.

590. ESTABROOK, E. L. Production problems in the Grass Creek oil field. Min. and Met., Feb., 1922, pp. 65-66. Abstract of paper to be presented at meeting of Am. Inst. Min. and Met. Eng., New York, Feb., 1922. Brief account of geologic and production problems encountered in Grass Creek oil field, methods used in their solution, and results obtained. Published in full as separate pamphlet 1130-P, issued with Min. and Met., Feb., 1922, 8 pp. *See trans.* Am. Inst. Min. and Met. Eng., vol. 68, 1923, pp. 1130-1137.
See also No. 569.

TRANSPORTATION.

591. LORD, R. S. That pipe line from Ferris Mountain to Casper. *Natural Gas*, vol. 3, Feb., 1922, pp. 18-19, 59. Details of construction of line. *See also* No. 3094.

PROPERTIES.

592. TAYLOR, F. B. Wyoming asphaltic oils in big demand for road purposes. *Oil and Gas Jour.*, vol. 22, Sept. 27, 1923, p. 108. Oil from Lander field, Wyoming, Soap Creek field, Montana, and other fields in these regions is suitable for surface of roads.

REFINING.

593. FRANCIS, C. K. Development of natural gas and gasoline industry in Wyoming fields. *Nat. Petrol. News*, vol. 15, May 9, 1923, pp. 97-98, 100. Deals with refinery equipment and methods.
594. INLAND OIL INDEX. Carbon plant demonstrates. Vol. 8, Dec. 15, 1923, p. 12. Account of Wyoming plant producing gasoline and carbon black, which uses heat from gas combustion to generate steam and power for electricity in ice plant. *See also* Nos. 506, 513, 4835, 4859, 5578, 5721, 5936.

UTILIZATION, STATISTICS.

See Nos. 6032, 7490; 164.

LEGAL REGULATIONS, MAPS.

595. GUSTIN, WELLINGTON. Refining company responsible for escaping oil causing damage to overflowed lands. *Chem. and Met. Eng.*, vol. 27, Aug. 9, 1922, p. 257. Decision of district court in Wyoming holds refining company responsible for damage to property on basis of usable value as measured by loss in profits, or upon rental value of land.
596. OIL AND GAS JOURNAL. Carbon-black firms barred in Wyoming. Vol. 22, July 26, 1923, p. 121. Carbon-black manufacturers have abandoned their contest to legalize industry in Wyoming. *See also* *Oil, Paint and Drug Rep.*, vol. 104, July 23, 1923, p. 49. *Natural Gas*, vol. 4, Aug., 1923, p. 15.
597. OIL TRADE JOURNAL. Oil companies not liable for drilling dry hole. Vol. 14, June, 1923, p. 56. District court, Wyoming, decrees that drilling of a dry hole does not incur liability for damages to anyone. *See also* *Petrol. World (Los Angeles)* vol. 8, May, 1923, p. 54.
598. SMITH, L. E. Sixty days to see first completion by Mammoth Oil Co. *Nat. Petrol. News*, vol. 14, Aug. 16, 1922, pp. 35-37. Map of Teapot structure, Wyoming. Location of wells and leases. *See also* Nos. 316, 568, 569, 578, 579, 582.

OTHER STATES (111.59).

OCCURRENCE, STATISTICS.

See No. 99; 164.

ARIZONA.

OCCURRENCE.

599. BUTTER, G. M., AND ALLEN, M. A. Petroleum geology and prospecting *Univ. of Arizona Bull.* 116, *Oil Ser.* 4, Oct. 13, 1921, 45 pp. Discusses origin, refining, and properties of petroleum; structures and condition favorable and unfavorable to presence of petroleum. Part 2 deals with oil prospecting in Arizona.

GEOLOGY.

600. HAGER, DORSEY. Oil possibilities, Holbrook area, Arizona. *Min. and Oil Bull.*, vol. 8, Jan., 1922, pp. 23-26, 33-34; Feb., pp. 71-74, 81, 94; Mar., pp. 135-140. Describes conditions which would justify testing for oil, gives physiography of the area and sections showing stratigraphic relations, describes structure, and discusses possibilities. *See also* *Oil and Gas Jour.*, vol. 20, Dec. 16, 1921, p. 76.
601. U. S. GEOLOGICAL SURVEY. Erosion and sedimentation in the Papago country, Arizona. *Bull.* 730, 1922, pp. 19-90. A study of the topography and physiography of this arid region. Maps and views. *See also* *Min. and Oil Bull.*, vol. 9, Feb., 1923, pp. 124, 132.

See also No. 562.

UTILIZATION. *See* No. 6131.

IDAHO.

GEOLOGY.

602. BUWALDA, J. P. A preliminary reconnaissance of gas and oil possibilities of southwestern and southcentral Idaho. Idaho Bureau of Mines and Geol., Pamphlet 5, July, 1923. 10 pp.
603. KIRKHAM, V. R. D. Notes on the geology of eastern Bear Lake County, Idaho, with references to oil possibilities. Idaho Bureau of Mines and Geol., Pamphlet 7, Nov., 1923, 6 pp. Mimeographed. Deals with topographical and geological conditions. Description of Permian formations; correlation of these formations with oil and gas producing formations in other States. No definite conclusions concerning the presence of oil have been reached, except in noting that some of the rocks are of marine origin and of the same age as the oil-bearing formations of Wyoming and Montana.
604. ———. Petroleum possibilities of certain anticlines in southeastern Idaho. Idaho Bureau of Mines and Geol. *Bull.* 4, 1922, 36 pp. Pamphlet. Geological conditions and petroleum possibilities in certain areas of Bannock and Power Counties, Arbon Valley, Hawkins, the Mink Creek, Portneuf, and Rockland regions. States that parts of Power and Bannock Counties contain petroleum possibilities; Hawkins Basin, Mink Creek, and Portneuf offer little possibility of oil; Arbon Valley and Rockland have favorable structures. *See also* *Eng. and Min. Jour.-Press*, vol. 114, Oct. 28, 1922, p. 774.

LEGAL REGULATIONS.

605. SALT LAKE MINING REVIEW. Idaho Legislature enacts law designed to stimulate mining. *Vol.* 24, March 30, 1923, p. 18. Discusses decision that all mineral, gas, and oil deposits are reserved to the State, and can be acquired only through a lease from the State.

NEVADA.

GEOLOGY.

606. BALLIET, LETSON. Will oil be found in Nevada? *Oil Age*, vol. 20, Dec., 1923, p. 32. Account of favorable structures found at Coaldale, Columbus Marsh, and near Elko, Nev., which remain to be proved by drilling.

PROPERTIES. *See* No. 4264

NEW MEXICO.

OCCURRENCE.

607. MORONEY, J. J. The prospective oil field of New Mexico; its history and setting. *Nat. Petrol. News*, vol. 15, July 25, 1923, pp. 41-42, 44, 46. General survey of country and conditions, including the Hogback structure.

GEOLOGY.

608. DARTON, N. H. Geologic structure of parts of New Mexico. *U. S. Geol. Survey Bull.* 726, Part 2, 1922, pp. 173-275. Deals with structural and stratigraphic relations of the various sections of New Mexico. Maps and illustrations. Concludes that Carboniferous and Cretaceous areas of eastern part of State and Cretaceous areas in northwestern part, west of the Nacimiento uplift, offer best opportunities for oil. *See also* *Petrol. World*, vol. 19, Dec., 1922, p. 516. *U. S. Geol. Survey Bull.* 726, March, 1922, pp. 173-275.
609. NATIONAL PETROLEUM NEWS. Big companies active in San Juan Basin. Vol. 14, Dec. 27, 1922, pp. 43-44. Briefly describes grade of oil and geological structure. Gives logs of Mesaverde wells.
610. OIL AND GAS JOURNAL. Promising producer in interesting test in New Mexico field. Vol. 22, Sept. 27, 1923, pp. 116-117. Detailed log of new well in Eddy County, west of Texas Panhandle country.
611. OIL WEEKLY. Mid-West's New Mexico well may have been freak. Vol. 29, April 21, 1923, p. 60. Account of second well drilled on Hogback structure which proves dry at oil horizon.
612. WAGNER, PAUL. Unknown worth of acreage and drilling requirements held back sale. *Nat. Petrol. News*, vol. 15, Oct. 24, 1923, pp. 55-56. Brief history of tests on Hogback structure; contour map showing Hogback, Shiprock, Tocito, and Table Mesa domes.
613. WHITNEY, R. H. New Mexico likely to be well tested this year. *Oil Trade Jour.*, vol. 14, Feb., 1923, pp. 23-24, 98. General review of oil development in northwestern part of State, and description of important geological features.

See also Nos. 277, 550, 552, 562.

PROPERTIES.

614. MOUNTAIN STATES MINERAL AGE. San Juan oil gives high test. Vol. 8, May, 1923, p. 26. Analysis of oil from New Mexico well, which gives highest grade of oil ever produced in commercial quantities.
615. OIL AGE. The highest-gravity oil in the world. Vol. 20, Sept., 1923, pp. 30-31. Tells of oil from shallow wells in San Juan County, New Mexico, which ranges from 60 to 72° gravity and has paraffin base.
616. OIL WEEKLY. High-gravity well definitely opens field on Navajo lands in New Mexico. Vol. 30, Aug. 18, 1923, p. 28. Account of shallow well producing oil of 60° gravity from Hogback structure. Log of tests.

LEGAL REGULATIONS, MAP.

617. FANSHIER, K. J. Our future oil—New Mexico. *Petrol. Age*, vol. 12, Sept. 15, 1923, pp. 16, 18. Account of exploration. Map showing location of test wells and gas wells. Hope for future oil supply is placed in Navajo lands.
618. NATIONAL PETROLEUM NEWS. State reserves minerals. Vol. 15, Oct. 31, 1923, pp. 60. Mineral rights to be reserved by New Mexico on land added to the Navajo Reservation.

- 619.** OIL AGE. The San Juan Basin. Vol. 18, Dec., 1922, pp. 16-19. Location, description, and history of new oil field in New Mexico. Map.
- 620.** SHELL OIL COMPANY OF CALIFORNIA. New Mexico oil-land lease regulations. Field Activities Summary, vol. 2, June 15, 1923, pp. 147-148. State land-office regulations, effective June 18, 1923, cover rents, leases, and the filing of applications.
- See also* Nos. 567, 608.

NORTH DAKOTA.

GEOLOGY.

- 621.** ENGINEERING AND MINING JOURNAL-PRESS. Test well suggested in Nesson anticline in North Dakota. Vol. 115, June 16, 1923, p. 1074. Brief statement regarding favorable area for oil prospecting.
- 622.** NATIONAL PETROLEUM NEWS. Valuable guide to possible oil sands given by North Dakota log. Vol. 15, June 20, 1923, pp. 109-110. Analyses of drill cuttings; log of Blum No. 1 well in Ward County. Geologists consider that oil production is possible.
- See also* No. 542.

SOUTH DAKOTA.

GEOLOGY.

- 623.** HENLEY, C. H. Side lights on possibilities of oil around the Black Hills. Oil and Gas Jour., vol. 21, Oct. 19, 1922, pp. 82, 84; Nov. 2, pp. 98, 100. Describes structural and stratigraphical conditions; their bearing upon presence of petroleum.
- 624.** MOULTON, G. F. Oil and gas prospects in southern Perkins County. South Dakota Geol. and Nat. Hist. Survey, Circular 14, Dec., 1923, pp. 3-12. (Bull. Univ. of South Dakota, 23rd ser., No. 11. Dec., 1923.) Pamphlet. "Some general factors in oil accumulation as applied to South Dakota." Discussion of carbon ratio and structure. Concludes that stratigraphy and structure are favorable to presence of oil. Suggests site for drilling tests.
- 625.** ROWLEY, A. B. South Dakota may be center of wildcat work. Oil Weekly, vol. 26, Sept. 9, 1922, pp. 10-11. Survey of chief structures. Discusses conditions favorable to oil existence; oil indications; and unfavorable aspects.
- 626.** SCHOOF, J. F. South Dakota tests show interesting structure. Oil Trade Jour., vol. 14, Jan., 1923, pp. 56, 58, 60, 100. Topographical and geological description of Haakon County, South Dakota. Special reference to Plum Creek dome; sketch map of area.
- 627.** TOEPELMAN, W. C. The possibilities of oil in eastern Harding County. South Dakota Geol. and Nat. Hist. Survey, Circ. 12, March, 1923, 12 pp. (Bull. Univ. of South Dakota, 22nd ser., No. 4, Mar., 1923.) Considers geology and structure. Indications are unfavorable.
- 628.** WARD, FREEMAN, AND WILSON, R. A. Possibilities of oil in western Dewey County. South Dakota Geol. and Nat. Hist. Survey, Circular 9, Sept., 1922, 10 pp. Describes formation and structure. Summary of favorable and unfavorable features in the situation.
- 629.** WARD, FREEMAN. Geology of a portion of the Badlands. South Dakota Geol. and Nat. Hist. Survey, Bull. 11, 22nd ser., August, 1922, No. 6, 80 pp. A topographical and physiographical examination of this section of South Dakota, conducted for purpose of investigating possibility of oil. Maps and illustrations.

630. WILSON, R. A. The bearing of geologic features in South Dakota upon oil possibilities. *Bull. Am. Assoc. Petrol Geol.*, vol. 7, Sept.-Oct. 1923, pp. 507-516. Study of stratigraphy and structure. Account of exploration and development. Discusses natural gas and oil possibilities.
631. ——— The possibilities of oil in northern Dewey County. *South Dakota Geol. and Nat. Hist. Survey, Circular 10*, Dec., 1922, 7 pp. (*Bull. Univ. South Dakota*, 22nd ser., No. 14, Dec., 1922.) Considers topography and structure. Notes that knowledge of structure must be obtained to large extent from drilling. Discusses petroliferous shales found between the Dakota and Fox Hills sandstones of which the commercial value is unknown. *See also* review in *Nat. Petrol. News*, vol. 15, Feb. 14, 1923, pp. 81-84.
632. ——— The possibilities of oil in South Dakota. *South Dakota Geol. and Nat. Hist. Survey, Bull. 10*, 22nd ser., No. 3, Mar., 1922, 97 pp. Pamphlet. Discusses principles of petroleum geology, geologic features of South Dakota, and possible oil formations. Summary of favorable and unfavorable features; conclusions. Includes bibliography and maps.
633. WILSON, R. A., AND WARD, FREEMAN. The possibilities of oil in northern Ziebach County. *South Dakota Geol. and Nat. Hist. Survey, Circular 13*, April, 1923, 11 pp. (*Bull. Univ. South Dakota*, 22nd ser., No. 5, Apr., 1923.) Study of formations and structure. Notes presence of Lakota sandstones suitable for reservoir rocks if other conditions are favorable, but meager knowledge of lower formations is not encouraging.

See also No. 542.

LEGISLATION.

634. NATIONAL PETROLEUM NEWS. New South Dakota law hits unfair competition. *Vol. 15*, July 4, 1923, p. 47. Discussion of bill prohibiting delivery of kerosene and gasoline from one trade community to another

MAP.

See No. 629.

PACIFIC COAST FIELD (111.6)

OCCURRENCE

635. WHITE, DAVID. Third of world's estimated petroleum reserves tributary to Pacific. *Nat. Petrol. News*, vol. 15, May 30, 1923, pp. 85-86, 89-90. Survey of oil-producing regions on both sides of Pacific; estimate of resources.

GEOLOGY

See No. 278.

PROPERTIES

636. LANE, E. C. Survey of Pacific Coast petroleum products. Repts. of Investigations, Serial 2342, Bureau of Mines, April, 1922. Mimeographed. Data on tests of California gasolines, giving analyses of aviation gasoline (fighting grade), aviation gasoline (domestic grade), motor gasoline (Los Angeles, San Francisco) and petroleum spirits, turpentine substitute. Report of tests made to determine whether or not any difference exists between California crude oils and those of other regions of the United States.
637. LANE, E. C., AND LEJEUNE, N. F. Survey of Pacific Coast petroleum products. Part 3. Burning and fuel oils. Repts. of Investigations, Serial 2511, Bureau of Mines, Aug., 1923, 11 pp. Mimeographed. *See also* *Oil Eng. Power*, vol. 1, Nov., 1923, pp. 549-550.

See also Nos. 111, 636.

UTILIZATION

638. MARTIN, J. C., JR. The railway fuel problem of the Pacific Coast. *Mech. Eng.*, vol. 44, Oct., 1922, pp. 656-657. Concludes that oil-burning locomotive, more efficient than coal-operated engine, will probably be excepted when industrial use of oil is restricted for conservation purposes.

See also No. 7474.

STATISTICS

639. KERN, C. E. Fuel-oil problems of the Pacific Ocean. *Oil and Gas Jour.*, vol. 21, Oct. 26, 1922, pp. 80, 86. Gives statistics and resources.

ECONOMICS

640. U. S. FEDERAL TRADE COMMISSION. Report of the Federal Trade Commission on the Pacific Coast petroleum industry. Part 1, Production, ownership, and profits, publ., 1921; Part 2, Prices and competitive conditions, publ. 1922. Investigations made pursuant to S. Res. 138, 66th Cong., 1st session.

See also No. 7867.

CALIFORNIA (111.61).

See Nos. 2041, 2242, 2608, 2816, 6033.

HISTORY AND OCCURRENCE.

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749. HOFFMAN, J. R. The Ventura Refining Co.'s South Mountain gasoline plant. Bessemer Monthly, No. 198, June, 1922, pp. 2-5, 13. General description of plant. Illustrations.
750. SPRENGER, C. O. New refinery at Long Beach model of its kind. Oil Trade Jour., vol. 14, Aug., 1923, pp. 80-81. Distinctive features of plant of Crystal Petroleum Products Corporation. Illustrations.

751. UNION OIL COMPANY OF CALIFORNIA, BULLETIN. Oleum: Past and present. Vol. 1, Feb., 1922, pp. 7-14. Account of general conditions: Describes plant. *See also* Nos. 647, 713, 3287, 4567, 4765, 4796, 4913, 5024, 5054, 5091, 5412, 5568, 5584.

UTILIZATION.

See Nos. 6120, 6125, 6140, 6215, 7469, 7494, 7508, 7510.

STATISTICS.

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755. ——— California mineral production for 1922. Structural materials. Bull. 93, Sept., 1923, pp. 67-96. Contains report on asphalt production in California.
756. ——— A review of mining in California during 1921, with notes on the outlook for 1922. Preliminary Report No. 8, Jan., 1922. 69 pp. Includes review of the petroleum industry in 1921, by R. E. Collom.
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761. ——— California's proved oil and gas fields. Monthly chapter, Eighth annual report of State oil and gas supervisor, Aug., 1922, pp. 15-18. Survey of proved and developed acreage and undeveloped acreage of proved areas in California; also of proved lands and producing wells, 1916-1922. *See also* Oil and Gas Jour., vol. 21, Dec. 7, 1922, pp. 94-95. Oil Weekly, vol. 28, Feb. 10, 1923, pp. 11-12. Petrol. Times, vol. 8, Dec. 23, 1922, p. 943; vol. 9, April 14, 1923, pp. 517-518. Petrol. World (London), vol. 20, June, 1923, p. 248.

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763. ———. Résumé of oil-field operations in 1921. Monthly chapter, Seventh annual report of State oil and gas supervisor, Feb., 1922, pp. 8-12. Summary of production and development.
764. COLLOM, R. E., AND PARNES, R. M. California oil production and reserves. Monthly chapter, Ninth annual report of State oil and gas supervisor, Aug., 1923, pp. 5-23. Production of counties, 1900, 1920, 1922, June, 1923, and percentage of total production; oil recovered per acre to July, 1923, by fields, properties of California oil; other data.
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773. PETROLEUM TIMES. California's petroleum industry. (A brief review for 1922.) Vol. 9, Jan. 27, 1923, pp. 117-118. From California State Mining Bureau weekly press bulletin 375, Dec. 30, 1922, 5 pp. Pamphlet.

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778. UNION OIL COMPANY OF CALIFORNIA, BULLETIN. State oil statistics. Vol. 2, Aug., 1922, p. 21. Production, shipments, drilling wells, and prices, 1915-1922.
779. ——— State crude-oil production, storage, and prices, 1911-1923. Vol. 2, April, 1922, p. 21.
See also Nos. 117, 650, 691, 700, 729, 732, 787, 2984.

LEGAL REGULATIONS.

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781. ——— Court ruling important to oil industry. Vol. 16, Nov. 1, 1923, p. 5. Decree in superior court, Los Angeles, holds that oil or debris expelled by well onto property of another is a trespass and that penalties may be imposed accordingly.
782. ——— Permits for refineries hard to get. Vol. 15, June 28, 1923, p. 8. Data required by California Corporate Securities Act from applicants for oil refineries.
783. ——— Enough money must be held to drill well. Vol. 15, May 31, 1923, p. 4. Latest rulings of California State Corporation Department in regard to capitalization of oil companies. *See also* *Oil Age*, vol. 19, May 30, 1923, p. 21. *Oil Weekly*, vol. 29, June 9, 1923, p. 56. *Oil Age*, vol. 19, June 20, 1923, p. 2.
784. ——— General Pet. held liable for damage. Vol. 14, July 13, 1922, p. 6. Oil company is liable for losses caused by gusher.
785. ——— Oil equipment is personal property, court rules; not fixture on premises. Vol. 14, March 16, 1922, pp. 1-2. California Supreme Court decrees derricks, boilers, and such equipment may be moved by oil operators.
786. COLLOM, R. E. Cooperative supervision of oil-field operations. Monthly chapter, Ninth annual report of State oil and gas supervisor, Sept., 1923, pp. 5-7. Provisions for regulation of well drilling to insure the protection of adjoining property against water infiltration are provided in petroleum legislation of 1915.
787. ——— How department of oil and gas operates in State of California. *Petrol. Ref.*, vol. 12, Oct. 5, 1922, pp. 3-4. Scope of jurisdiction extends to supervision of water-shut-off tests. Operator must file notice with deputy

- supervisor of drilling, redrilling, deepening, or abandonment of a gas or oil well. Maintenance of department is by special tax on oil production and on oil lands. Discusses functions and regulations of State gas and oil department. Gives development and production statistics of California fields.
- 788.** MINING AND OIL BULLETIN. Legislation. Vol. 9, June, 1923, pp. 497-536. Discusses Senate Bill 461, which has passed California Legislature and is before the governor. Bill provides for departmental headquarters at Los Angeles with State mineralogist as business manager, for increase in personnel, and for inspection of wells on Sundays and holidays. *See also* California Oil World, vol. 15, June 21, 1923, p. 8.
- 789.** OIL WEEKLY. "Safety first" popular in California. Vol. 32, Dec. 29, 1923, pp. 19, 21, 23. Safety regulations of Industrial Accident Commission.
- 790.** ——— California Oil and Gas Commissioners uphold supplemental mudding order. Vol. 27, Dec. 9, 1922, p. 57. Mudding of bore before setting of cement at top of an oil or gas-bearing formation is required.
- 791.** PETROLEUM WORLD (LOS ANGELES). Must label low-grade gas. Vol. 8, Nov., 1923, p. 26. Los Angeles City Council has passed ordinance requiring that pumps dispensing low-grade gasoline or other petroleum products shall be labeled accordingly.
- 792.** ——— Distributors of oils and gasoline should be familiar with new tax law. Vol. 8, Sept., 1923, pp. 44-46, 48, 50. Text of California law for collection of new two-cent gasoline tax.

ECONOMICS.

- 793.** COLLOM, R. E. Overproduction and its cause. Min. and Oil Bull., vol. 9, Feb., 1923, pp. 108-109, 151. Reprint of California State Mining Bureau Press Bulletin 375, Dec. 30, 1922, 5 pp. Mimeographed. Summary of oil production in California in 1922. States that overproduction is the result of town lot and offset drilling.
- 794.** DELANEY, C. H. California's prosperity depends on future supplies of fuel. Jour. Elec. and Western Ind., vol. 48, April 1, 1922, pp. 272-274. Estimated petroleum resources in California based upon production and consumption statistics. Imported Coal and electrical power will be used to replace petroleum. *See also* Mech. Eng., vol. 44, Oct. 1922., pp. 655-656.
- 795.** DORWARD, D. JR. The marine-fuel problem of the Pacific Coast. Mech. Eng., vol. 44, Oct., 1922, pp. 657-659. Liquid and gaseous fuels have certain important advantages over solid fuel which will insure their demand; this will be met by efficiency in production, by imports, and by supplies from supplemental sources.
- 796.** ENGINEERING AND CONTRACTING. Operation of municipal asphalt plant of Los Angeles. Vol. 60, Nov. 7, 1923, pp. 954-955. Annual output of asphalt products of various kinds, municipal economies resulting from operation of plant.
- 797.** ENGINEERING AND MINING JOURNAL-PRESS. (Pacific Mining News.) Roy E. Collom, State Oil and Gas Supervisor of California, discusses status of the petroleum industry in California; financial and technical problems. Vol. 1, June, 1922, pp. 45-47. Summary of conditions in the oil-producing counties of California, need for development of new wells; estimated production of proved California lands.
- 798.** KILLICK, V. W. Is deep drilling a menace? Petrol. Age, vol. 12, July 15, 1923, pp. 13-14. Concludes that many wells may be deepened, as experience in California has proved that a greater amount and a better grade of oil is produced from deep-lying sands. *See also* Bol. Petról., vol. 16, July, 1923, pp. 5-8.

799. KOEBERLE, J. E. South America can not compete with California for years. *California Oil World*, vol. 15, July 26, 1923, p. 2. Considers distances of South American fields from coastal shipping facilities and from foreign markets; shipping costs.
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- See also* Nos. 766, 7880.

MAPS.

801. CALIFORNIA OIL WORLD. Latest map of Maricopa flat, showing leases made by big companies. Vol. 16, Nov. 22, 1923, p. 7.
802. ——— Map of Dominguez oil field. Vol. 15, Sept. 27, 1923. Supplement. Shows location of oil leases; drilling, producing, and gas wells.
803. CLUTE, W. S., AND PERRY, S. S. Map of the Maricopa district, South Midway oil field, Kern County, California, showing development and properties along the Thirty-five anticline. Supplement to *Mining and Oil Bulletin*, vol. 9, Dec., 1923.
804. FLOCKER, I. M. U. S. Naval reserves rich in oil. *California Oil World*, vol. 15, Jan. 18, 1923, pp. 1, 6. Contains map of Elk Hills Naval Reserve No. 1, and locations of operating companies. Brief general description of the country.
805. MINING AND OIL BULLETIN SUPPLEMENT. Map of oil fields and pipe lines of southern California. Vol. 9, May, 1923.
806. OILDOM. Map of producing fields of Los Angeles Basin. Vol. 14, July, 1923, p. 35.
- See also* Nos. 662, 733, 752, 767, 768, 772.

INDUSTRIAL RELATIONS.

807. KELLY, R. W. Industrial relations in the California petroleum industry. *Industry Illustrated*, vol. 2, June, 1922, pp. 22-24, 36, 38, 40-42, 44. Account of a centralized industrial relations department whose efforts have reduced labor turnover. Department provides for vocational and safety-first training, and directs housing and sanitation plans in fields, and also arranges entertainments and social diversions for employees.
- See also* Nos. 7900, 7902, 7904, 7905, 7906, 7907, 7910, 7912, 7913, 7914.

DIRECTORIES.

808. NATIONAL PETROLEUM NEWS. California natural-gasoline plants care for territory needs. Vol. 15, Jan. 24, 1923, p. 77. List of natural-gasoline plants in California, showing capacity and type of plant.
809. OIL TRADE JOURNAL. Petroleum refineries in California. Vol. 14, March, 1923, p. 100. List of refineries, giving their location and capacity.
- See also* Nos. 7894, 7895.

INSTITUTIONS.

810. THE RECORD (PACIFIC, ASSOCIATED AND AMALGAMATED OIL COMPANIES). Oil-production course at Fullerton Junior College, Fullerton, Calif. Vol. 4, April, 1923, pp. 10-11. A vocational course of studies useful to oil men has been arranged at hours convenient to workers.
811. ——— Petroleum chemistry course at Bakers' field. Vol. 4, March, 1923, pp. 12-13. Night course conducted at the Kern County Union High School dealing with origin, occurrence, production, transportation, and manufacture of petroleum and petroleum products.

WASHINGTON (111.63).**LEGISLATION.**

- 812.** ELLIS, WILLIAM. Inspection and taxation rights of States defined. California Oil World, vol. 15, Sept. 20, 1923, p. 7. Review of decisions affecting collection of fees for inspection of petroleum or its products in interstate commerce, with special reference to the case of Union Oil Co. of California vs. State of Washington and E. F. Benson.

MISCELLANEOUS (111.9)**PROPERTIES**

See No. 11.

ALASKA (111.91).**OCCURRENCE.**

- 813.** INLAND OIL INDEX. Oil possibilities of Alaska. Vol. 8, Nov. 24, 1923, p. 10. Brief description of geographical and geological conditions in the five oil regions of Alaska.
- 814.** PALMER, L. A. The Cold Bay oil field. Eng. and Min. Jour.-Press (Pacific Min. News), vol. 1, Oct., 1922, pp. 171-172. History, topography, and general conditions. Producing sands of one anticline of the two favorable structures are believed to have been drained.
- 815.** THOMPSON, A. G. Development of petroleum at Cold Bay, Alaska. Eng. and Min. Jour.-Press, vol. 114, Nov. 25, 1922, p. 950. Brief survey of oil indications on Alaska Peninsula. Analysis of oil from Anchorage seepage.
- 816.** U. S. BUREAU OF MINES. The Alaskan oil fields. Twelfth annual report of the Director of the Bureau of Mines. 1922, pp. 29-33. Résumé of developments at Katalla, Yakataga, and the Alaskan Peninsula.
- 817.** WAGNER, PAUL. Associated and Standard overcome Arctic handicaps on Alaska Peninsula. Nat. Petrol. News, vol. 15, June 6, 1923, pp. 87, 89-90, 92. Some of the difficulties encountered in establishing oil camps in Cold Bay region. Map, illustrations.

See also Nos. 635, 823.

GEOLOGY.

- 818.** BROOKS, A. H. A petroleum seepage near Anchorage. U. S. Geol. Survey Bull. 739-C, 1922, pp. 133-135. Reports that structural conditions are unfavorable to existence of oil; character of formations also precludes possibility of oil formation. Gives character of oil from seepage.
- 819.** CAPPS, S. R. The Cold Bay district. U. S. Geol. Survey Bull. 739-C, 1922, pp. 77-116. General conditions and topography, history, structure, stratigraphy, oil indications. Geologic and topographic maps. *See also* Oil Eng. and Fin., vol. 3, Jan. 27, 1923, p. 119.
- 820.** GEORGE, H. C. The Alaska oil fields. Eng. and Min. Jour.-Press, vol. 114, Dec. 30, 1922, pp. 1163-1167. *See* Reprint from Eng. and Min. Jour.-Press, 1923, 4 pp. Describes local conditions and general development in four of the oil regions of Alaska; geology. *See also* Oil and Gas Jour., vol. 21, Dec. 28, 1922, pp. 16, 101; vol. 21, Feb. 1, 1923, pp. 102-103, 108. Oil News, vol. 11, Feb. 5, 1923, pp. 40-41, 46-47. Petrol. Times, vol. 9, Jan. 27, 1923, p. 124; Feb. 10, pp. 189-192.

821. MARTIN, G. C. A supposed petroleum seepage in the Nenana coal field. U. S. Geol. Survey Bull. 739-C. Mineral resources of Alaska, 1921-C. Recent investigations of petroleum in Alaska, 1922, pp. 137-147. Reports that upon examination seepage was found to be coal-tar residue. *See also* Oil Age, vol. 18, Oct., 1922, pp. 18-22.
822. ——— Natural coal tar mistaken for oil residue. Bull. Am. Assoc. Petrol. Geol., vol. 6, July-Aug., 1922, pp. 293-302. Describes bituminous deposit in Nenana coal field, Alaska. Analysis of sample and geological evidence indicate that it is product of burned coal beds of region. *See also* Oil Weekly, vol. 26, Aug. 12, 1922, pp. 17, 84, 86, 88, 90.
823. ——— Preliminary report on petroleum in Alaska. U. S. Geol. Survey Bull. 719, 1921, 83 pp. Survey of petroleum indications in the Katalla, Yakataga, Cook Inlet, and Alaska Peninsula regions, as well as those on the Arctic Coast and in other sections. Describes geology and gives character of crude petroleum. *See résumé* in Salt Lake Min. Rev., vol. 24, Jan. 30, 1923, pp. 13-14.
824. MOFFIT, F. H. The Iniskin Bay district. U. S. Geol. Survey Bull. 739, Mineral resources of Alaska, 1921, pp. 117-132. Geology; stratigraphy; petroleum indications and exploration; geologic map.
825. NATIONAL PETROLEUM NEWS. Companies drilling on Alaska Peninsula are making slow progress. Vol. 15, Nov. 7, 1923, pp. 47-48. Reports development progress in the region of Portage Bay. Gives brief description of oil indications; history of exploration. Includes geologic map.
826. PARRY, F. G. Developments in Alaska Peninsula fields. Oil Weekly, vol. 27, Dec. 30, 1922, pp. 10-11, 78-79. Description of development work undertaken in Cold Bay region; general geological and structural features. Geologic map of Cold Bay section; map of Alaska showing oil fields.
827. PETROLEUM TIMES. Petroleum prospects in Alaska. Vol. 7, June 24, 1922, p. 907. Exploration and development of Alaska oil fields; structure.
828. SMITH, W. R., AND BAKER, A. A. The Cold Bay-Chignik district. U. S. Geol. Survey Bull. 755, Mineral Resources of Alaska, 1922, pp. 151-218. Detailed description of topographical and climatic conditions. Account of development and exploration; stratigraphy and structures; petroleum indications and possibilities. Maps.
829. WHITNEY, R. H. Alaskan Peninsula on eve of big oil activity. Oil Trade Jour., vol. 14, Jan., 1923, pp. 16-17, 106. Review of oil exploration and development in the Cold Bay, Wide Bay, and Iniskin Bay districts. Describes geology and topography of these sections.
830. ——— Expects next big field in Alaska. Oil and Gas Jour., vol. 21, Aug. 10, 1922, pp. 90, 92. Describes structural and stratigraphical conditions in region of oil seepages in Cold Bay district. Discusses development costs.

See also Nos. 813, 814.

DEVELOPMENT AND PRODUCTION, PROPERTIES.

See Nos. 815, 820.

LEGAL REGULATIONS, ECONOMICS, MAPS.

831. CALIFORNIA OIL WORLD. Alaska titles to surface and oil separated. Vol. 14, April 27, 1922, p. 5. Text of bill which grants title of surface rights to homesteader and withholds right to oil, gas, and coal title.
832. GENERAL LAND OFFICE. Identification of lands in Alaska. Circulars 672 and 845 amended Oct. 15, 1923. Decisions of the Department of the Interior relating to public lands, Circular 905, vol. 50, Aug. 1, 1923, to Dec. 31, 1924, p. 155.

833-834. GENERAL LAND OFFICE. Regulations governing oil and gas permits and leases in Alaska. Act of Feb. 25, 1920, Aug. 12, 1922. Decisions of the Department of the Interior relating to public lands, Circular 845, vol. 49, May 1, 1922, to July 31, 1923, p. 207.

835. U. S. GEOLOGICAL SURVEY. Complete map of Alaska which embodies all exploration work up to 1923.

See also Nos. 817, 1959.

OTHER STATES (111.99).

OCCURRENCE.

See No. 191.

REFINING.

836. TRIPLETT, GRADY. Dominating the oil industry. *Manufact. Rec.*, vol. 84, Nov. 29, 1923, p. 60. Survey of the oil production and refining industries of the Southern States. Gives petroleum reserves and outlook for development of industry.

ALABAMA.

GEOLOGY.

837. WHITNEY, V. T. A review of the search for oil in Alabama and Mississippi. *Oil and Gas Jour.*, vol. 21, Jan. 25, 1923, p. 90. Structure is favorable, but exploration has not been carried out to any extent.

FLORIDA.

OCCURRENCE.

838. GUNTER, HERMAN, AND COOKE, M. K. Geology of Florida and a résumé of the drilling for oil. *Nat. Petrol. News*, vol. 14, May 24, 1922, pp. 67-68, 71-72. History of oil exploration; geology; geologic map; map showing location of test wells. Reports that structure folding is slight and not favorable to accumulation of oil; oil showings have been reported in Lower Cretaceous, but commercial production is not known.

GEOLOGY.

839. MANUFACTURERS RECORD. The oil-drilling operations on the west coast of Florida. Vol. 83, Feb. 15, 1923, p. 88. Report by D. F. Conoley which tells of traces of oil found in test well at Oldsmar near Tampa, Florida.

840. OIL AND GAS JOURNAL. Oil possibilities in Florida being tested by drillers. Vol. 22, Nov. 1, 1923, pp. 114-115. Florida State Geological Survey reports structures and conditions favorable to existence of oil; geology is similar to that of Texas and Oklahoma.

See also No. 838.

PROPERTIES.

841. OIL AND GAS JOURNAL. Dr. Gray's interesting experiment. Vol. 22, Aug. 2, 1923, p. 119. Tests of Everglade soil from Florida yield fair quantity of oil of paraffin base.

See also No. 3817.

UTILIZATION.

See No. 5828.

LEGAL REGULATIONS.

- 842.** NATIONAL PETROLEUM NEWS. Oil-inspection fees in Florida collected in advance. Vol. 15, Oct. 3, 1923, p. 30. Reports that stamps are bought in advance and at end of month each company sends statement of gallonage sold with canceled inspection stamps.

MAP.

See No. 838.

GEORGIA.

GEOLOGY.

- 843.** PRETTYMAN, T. M. Occurrence of oil in small quantities basis of interest in Georgia. Nat. Petrol. News, vol. 14, Mar. 29, 1922, pp. 73-74, 77-78. Outlines progress made in attempting to develop oil in Georgia. Includes geological description of the coastal plain of Georgia.
- 844.** PRETTYMAN, T. M., AND CAVE, H. S. Petroleum and natural-gas possibilities in Georgia. Geol. Survey of Georgia, Bull. 40, 1923, 164 pp. Survey of structural features, petroleum seeps, and possibilities; topographical conditions. Description and discussion of formations. Contains geologic map of Georgia coastal plain. Discusses regions offering possibilities for oil and concludes that prospects for commercial quantities are not promising. See also Nat. Petrol. News, vol. 15, July 4, 1923, pp. 102, 109. Manufac. Rec., vol. 84, July 5, 1923, p. 102.

MASSACHUSETTS.

UTILIZATION. See Nos. 845, 7487.

LEGAL REGULATIONS.

- 845.** OIL, PAINT AND DRUG REPORTER. Massachusetts oil-burner rules approved as revised. Vol. 104, Nov. 5, 1923, p. 44A. Rules limiting amount of oil that may be stored for domestic use, and requiring that tanks be provided with safety devices and emergency equipment for fire fighting.

MISSISSIPPI.

GEOLOGY.

- 846.** ENGINEERING AND MINING JOURNAL. Possible indications of oil in Mississippi. Vol. 113, Feb. 11, 1922, p. 254. Summary of observations made by the U. S. Geological Survey and the Mississippi State Geological Survey.
- 847.** MORSE, P. F. Petroleum prospecting in Mississippi. Bull. Am. Assoc. Petrol. Geol., vol. 7, Nov.-Dec., 1923, pp. 684-695. Review of recent and early exploration and development, by counties. Notes that large percentage of wells drilled were on unfavorable structures. Considers exploration insufficient to test State.
- 848.** WAGNER, PAUL. Northeastern Mississippi formations such as to indicate oil possibilities. Nat. Petrol. News, vol. 14, Nov. 1, 1922, pp. 75-77. Correlates stratigraphy of Mississippi with that of Louisiana. Résumé of drilling tests in Mississippi. From U. S. Geol. Survey Professional Paper 112, 1919. "Upper Cretaceous floras of the eastern Gulf region in Tennessee, Mississippi, Alabama, and Georgia."
- 848a.** WILSON, M. E. Occurrence of oil and gas in Missouri. Nat. Petrol. News, vol. 15, May 9, 1923, pp. 55-56. From Bull. Missouri Bur. Geol. and Mines, 258 pp. History of exploration; geology; well logs and structural maps.

NORTH CAROLINA.

GEOLOGY.

- 849.** PRATT, J. H. Commercial production not likely to be developed in North Carolina. *Nat. Petrol. News*, vol. 14, Mar. 15, 1922, p. 77. States briefly geological reasons why it is not believed that petroleum in commercial quantities will be found in this State.

SOUTH CAROLINA.

GEOLOGY.

- 850.** TABER, STEPHEN. Time and money lost in South Carolina. *Nat. Petrol. News*, vol. 14, Mar. 15, 1922, pp. 77-78. Brief statement by the State geologist of the lack of evidence of oil in South Carolina.

REFINING AND REFINERIES.

- 851.** MANUFACTURERS RECORD. Big refining plant of Standard Oil Co. at Charleston, S. C. Vol. 82, Dec. 14, 1922, pp. 72-73. Description and illustration.

TENNESSEE.

OCCURRENCE.

- 852.** WHITNEY, V. T. Tennessee wells of old days were very prolific producers. *Oil and Gas Jour.*, vol. 21, Nov. 2, 1922, pp. 110-111. Some facts concerning early oil and gas development.

See also No. 191.

GEOLOGY.

- 853.** JILLSON, W. R. New shallow oil field believed to exist in northern Tennessee. *Oil and Gas Jour.*, vol. 22, Nov. 15, 1923, pp. 74, 100. Geology and topography of possible new oil field in Clay County.
- 854.** NATIONAL PETROLEUM NEWS. Geologist believes Tennessee may yet be important producing State. Vol. 15, May 16, 1923, pp. 93, 95. From paper before Feb., 1923, meeting of Am. Inst. of Min. and Met. Eng. Observes that southernmost limits of Appalachian field lie within State. Drilling below Chattanooga black shale recommended. Geological conditions favorable to oil deposits.

See also No. 217.

STORAGE AND TRANSPORTATION.

See No. 3438.

CANADA (112)

See also Nos. 1351, 5607, 7887.

OCCURRENCE

- 855.** ALLAN, J. A. Mining industry in Alberta in 1922. *Canadian Min. Jour.*, vol. 44, Jan. 12, 1923, pp. 41-42. Tells of bituminous sands occupying a large area in the McMurray district from which material for road construction has been obtained. Gives account of exploration for oil in various sections of Province; only production has come from Okotoks field. Gas field has been opened on Irma-Viking-Birch Lake monocline in central Alberta.

856. ARNOLD, RALPH. Oil development in Canada during 1922. *Trans. Am. Inst. Min. and Met. Eng.* Pamphlet 1241; April, 1923, pp. 63-65. Brief survey of possibilities of oil production in Alberta. *See also* *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1923, pp. 985-988.
857. ARNOLD, RALPH, AND ENGLISH, WALTER. Canada's oil reserves. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1172, July, 1922, 4 pp. Gives estimates for five areas of Canada made by comparing them to geologically similar districts in the United States where there has been enough development to prove fairly definitely what the ultimate resources will be; prospects are more favorable in western Provinces than in far north. Description of petroleum reserves of Rocky Mountain district of Alberta, British Columbia, and Mackenzie River region. *See also* *Ohio Gas and Oil Men's Jour.*, vol. 4, March, 1922, pp. 15-17. *Min. and Met.*, July, 1922, pp. 40-41. *Nat. Petrol. News*, vol. 14, March 1, 1922, p. 48C. *Eng. and Min. Jour.-Press (Pacific Min. News)*, vol. 1, Oct., 1922, p. 173.
858. CAMERON, A. E. Hay and Buffalo Rivers, Great Slave Lake, and adjacent country. *Canadian Dep't Mines, Summary Report, Mines Branch, 1921*, pt. B, pp. 1B-44B. Indications of oil and bituminous matter are plentiful enough about Great Slave Lake to warrant further exploration with the drill.
859. *Canadian Mining Journal*. Gas and petroleum in western Canada. Vol. 44, April 13, 1923, p. 283. Account of exploration, development, and production in Alberta in 1922. Exploration in Manitoba, Saskatchewan, and British Columbia has not yielded results.
860. COYNE, A. F. A. Origin of Alberta tar sands. *Petrol. Age*, vol. 9, April 15, 1922, pp. 22-23. The so-called Dakota sandstones of Athabasca River, McMurray region, are held to be a continuation of the nonpetroliferous Athabasca sandstone of the House River district impregnated by oil from House River anticline.
861. ELLS, S. C. Cretaceous shales of Manitoba and Saskatchewan, as a possible source of crude petroleum. *Canada Dept. Mines, Summary Report, Mines Branch, 1921*, pp. 34-41. Gives location of shale deposits, geology, physical properties, and analyses.
862. ———. Oil shales of Canada. (Summary and review of available information.) *Canada Dept. Mines, Summary Report, Mines Branch, 1921*, pp. 41-55. Survey of oil-shale deposits in Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, British Columbia, MacKenzie, and Franklin.
863. ESTLIN, E. S. Natural gas in Ontario. *Trans. Canadian Inst. Min. and Met.*, vol. 24, 1921, pp. 81-85. Gives volume and pressure of natural gas in the Kent field. Discusses extent of gas resources of Ontario; natural gas should be conserved to prevent exhaustion.
864. LAURISTON, VICTOR. Canadian pioneer recalls early days around oil springs. *Oil and Gas Jour.*, vol. 23, Dec. 20, 1923, pp. 154-155, 158. Account of discovery and development of Oil Springs field, Ontario.
865. ———. Three-year \$1,000,000 campaign near Arctic Circle abandoned. *Oil and Gas Jour.*, vol. 22, Sept. 27, 1923, p. 79. Reports that no oil has been found except in discovery well, which is still producing, but is not of commercial importance on account of transportation conditions.
866. MACLEOD, W. A. Economic mineral resources of northern Saskatchewan. *Canadian Chem. and Met.*, vol. 6, Feb., 1922, pp. 35-37. Review of a recent survey disclosing the presence of carbonaceous sands, oil shale, and possible liquid petroleum and natural gas.
867. MCQUEEN, A. M. Exploration for oil in western Canada. *Bull. Canadian Inst. Min. and Met.*, May, 1922, pp. 586-596. Account of oil exploration in northern Canada by the Imperial Oil Co., Ltd., during period 1916-1919.

868. NESS, JOHN. Canada's northern oil fields. *Oildom*, vol. 13, March, 1922, pp. 43-51. Paper before the third annual convention of the Nat. Gas and Petrol. Assoc. of Canada. Gives location of the fields, topography and natural resources, geology, and occurrence of petroleum. Discusses future prospects.
869. ——— The search for oil in the West. *Trans. Canadian Inst. Min. and Met.*, vol. 24, 1921, pp. 31-59. Review of report of the Imperial Oil Co., describing geological conditions in eastern Alberta and western Saskatchewan. Tells of petroleum indications and seepages and of bituminous deposits. Account of exploration and production.
870. OIL FIELD ENGINEERING. Oil from our northern neighbors. Vol. 24, July, 1922, pp. 208-209. Oil potentialities of Canada are considered. Describes possible oil regions, as well as those considered unfavorable to production of oil.
871. OIL WEEKLY. Oil strike reported in east-central Alberta. Vol. 31, Nov. 24, 1923, p. 38. Production of high-grade crude is obtained below Benton shale; strike is near Wainwright.
872. ——— First oil was found in Canada in 1857. Vol. 28, Jan. 20, 1923, pp. 82-86. History of oil production in Canada, and statistics for output since 1898; estimated 1922 production by districts.
873. OILDOM. Peace River field. Vol. 14, Feb., 1923, p. 40. Describes briefly the locality where indications of high-grade oil have been found by Dominion Government exploration parties.
874. PETROLEUM TIMES. Petroleum in Ontario. Vol. 10, July 7, 1923, p. 18. Discusses stratigraphy, producing fields, and production in crude oil, 1916-1920.
875. ——— The natural-gas resources of Alberta. Vol. 7, May 13, 1922, p. 654. Oil-bearing sands are at great depth in this region. Describes natural-gas fields and their development and economic importance.
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- See also* Nos. 635, 924, 1311, 1670.

GEOLOGY

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881. ——— Geological structure of the Mackenzie River region. *Canada Dept. Mines, Geological Survey Summary Rept.*, 1921, Pt. B, pp. 79B-90B. General and structural geology; geography; geological maps.

882. DRESSER, J. A. Diamond drill finds favorable showings on upper Peace River. *Nat. Petrol. News*, vol. 15, July 4, 1923, p. 101. Report of exploration carried on in British Columbia.
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884. ENGINEERING AND MINING JOURNAL-PRESS. Imperial Oil, Ltd.'s, search for petroleum in Canada. Vol. 115, Jan. 27, 1923, pp. 194-195. Exploration thus far reported unsuccessful. Logs of wells.
885. HOPKINS, O. B. Some structural features of the plains area of Alberta caused by Pleistocene glaciation. *Bull. Geol. Soc. Am.*, vol. 34, Sept. 30, 1923, pp. 419-430. Discusses evidence showing that deformation at Mud Buttes and other localities is superficial and bears no relation to the tectonic disturbances, and that the ice-sheet is responsible for the abnormally steep dips and local folds and faults.
886. HUME, G. S. The Wainwright oil and gas area, Alberta. *Canadian Min. Jour.*, vol. 44, Dec. 21, 1923, p. 1001. Brief description of structure; development and exploration.
887. ——— Geology of the Norman oil fields, and a reconnaissance of a part of Liard River. *Canada Dept. Mines, Geological Survey, Summary Rept.*, 1922, Pt. B, pp. 47B-64B. Study of topography, stratigraphy, and structure of Norman oil area. Contains geological maps. Gives progress in exploration, and survey of oil prospects. See résumé in *Canadian Min. Jour.*, vol. 43, Dec. 1, 1922, pp. 816-817.
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889. JOHNSTON, W. A. Geology of Fraser River Delta map-area. *Canada Dept. Mines, Geol. Survey Memoir* 135, 1923, 83 pp. Considers oil possibilities of lower Fraser Valley, British Columbia.
890. KINDLE, E. M. The Mackenzie River oil region. *Trans. Canadian Inst. Min. and Met.*, vol. 24, 1921, pp. 75-80. Considers climate, topography, and geology.
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892. OIL TRADE JOURNAL. Anglo-Persian plans new oil-shale project. Vol. 13, Jan., 1922, p. 50. States plans of the Anglo-Persian Oil Co. for oil-shale development in Pictou, Nova Scotia, and gives brief description of the deposits in the Pictou area.
893. OIL WEEKLY. Oil found in Wainwright, Canada, area; terrace structure not well defined. Vol. 32, Dec. 29, 1923, p. 40. Brief description of structure; conditions encountered by drilling.
894. ——— Gas sand in Wainwright district found at same level as that in Viking field. Vol. 29, May 12, 1923, p. 59. Results of drilling show evidence of a relation between Viking and Wainwright fields.
895. ——— New well in Canada makes good gas flow. Vol. 28, Feb. 17, 1923, p. 22. Review of official report of Dominion Government on producing well in Okotoks field. Several oil and gas horizons occur from the top of the Dakota formation to the base of the Kootenay. Structure of Turner valley. See also *Oil Trade Jour.*, vol. 14, March, 1923, pp. 46, 49.

896. OIL WEEKLEY. Canadian oil developments are quiet. Vol. 27, Dec. 23, 1922, p. 22. General geological conditions of Peace River district.
897. OILDOM. Predictions as to southern Alberta. Vol. 14, June, 1923, p. 11. Brief account of drilling operations in Medicine Hat district. States that gas flow is evidently from top of Dakota sands; indications are that great anticline has been cross folded. Estimates drainage area of field to be extremely great.
898. PETROLEUM TIMES. Norman oil field of Canada. Vol. 9, March 31, 1923, p. 454. Geology and development.
899. ——— Commercial development of the Alberta bituminous sands. Vol. 8, Nov. 18, 1922, p. 767. Gives origin of deposits and extent. Discusses methods of recovery of petroleum and use of products.
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902. SMITH, L. E. Eastern Alberta well's performance is big encouragement. Nat. Petrol. News, vol. 15, Dec. 5, 1923, pp. 59–61. Gives structure and stratigraphy in region of Birch Lake. Includes map giving important structural features.
903. SPIEKER, E. M. The petroleum geology of a part of the western Peace River district, British Columbia. Bull. Am. Assoc. Petrol. Geol., vol. 6, March–April, 1922, pp. 112–138. Considers geography, topography, stratigraphy, and structure of region. Gives description and names of structures considered as possible oil producers. Advice to geologists regarding transportation and living requirements.
904. STARKEY, T. W. Favorable opinion on oil prospects in Alberta. Oildom, vol. 13, Sept., 1922, pp. 25–26. Discusses conditions favorable to occurrence of oil in southern Alberta.
905. WILLIAMS, M. Y. Oil prospects in southern Alberta. Can. Min. Jour., vol. 44, Nov. 30, 1923, pp. 949–950. Describes geology of field tested near Coutts, Alberta. Report of exploration. Considers outlook hopeful because of quantity of gas and heavy oil in Colorado shale and Kootenai sand; it is likely that commercial production will be found in favorable structure.
906. ——— Reconnaissance across northeastern British Columbia and the geology of the northern extension of Franklin Mountains. Northwest Territories. Canada Dept. Mines, Geol. Survey Summary Rept., 1922, pt. B, pp. 65B–87B. Considers region of Franklin Mountains is unfavorable to occurrence of oil, as the shales and limestones have lost the protective covering by erosion.
907. WRIGHT, W. J. Geology of the Moncton map-area. Canada Dept. Mines, Geol. Survey Memoir 129, 1922, pp. 29–60. Geology of oil-shale deposits in New Brunswick and other regions; estimated extent of shale beds; production; analyses of samples from various deposits and quality of shale; description of experimental plant which employs Wallace process; detail maps of principal shale areas at Albert Mines and Rosevale (Baltimore area). See résumé in Canadian Min. Jour., vol. 44, Feb. 9, 1923, pp. 111–112. Petrol. Times, vol. 9, April 14, 1923, p. 524.

See also Nos. 857, 858, 860, 861, 868, 869, 874, 875.

DEVELOPMENT AND PRODUCTION

See Nos. 868, 899, 2743, 2745.

TRANSPORTATION AND DISTRIBUTION

908. KILPATRICK, R. B. Natural-gas distribution matters. *Gas Age-Rec.*, vol. 50, Dec. 23, 1922, pp. 877-878. Discusses methods of distribution in Canada.

PROPERTIES

909. CLARK, K. A. The bituminous sands of northern Alberta. Third Annual Report, Scientific and Industrial Research Council, Alberta, 1922, pp. 42-58. Describes method of separating bitumen from sand. Bituminous sands are not practicable for use in paving, but if bitumen can be economically separated from sand it can be marketed for paving material. Laboratory tests made with bituminized earth indicate that it is a good material for rural roads.
910. DAY, D. T. Torbanites of Nova Scotia. *Oil Eng. and Fin.*, vol. 3, 1923, pp. 37-42. Reports oil yield amounting to 38 to 60 gallons a ton, specific gravity 0.852; analysis of shale; comparison with Mexican crude oil.
911. ELWORTHY, R. T. Chemical products from natural gas. Canada Dept. Mines, Summary Report, Mines Branch, 1921, pp. 56-63. Uses for waste gas; analyses of gases from twelve Canadian fields; products.
912. ——— Nova Scotia torbanites. *Oil Eng. and Fin.*, vol. 3, 1923, pp. 508-510. Data on the study of kerogen at the temperatures of 300° to 550°.
913. MCCREADY, A. L. Test in Canadian Sweetgrass district gets oil showing. *Oil Trade Jour.*, vol. 14, July, 1923, p. 70. Reports slight showing of 29° oil, which is believed to come from Kootenai formation.
914. OIL ENGINEERING AND FINANCE. The torbanites of Nova Scotia. Vol. 3, Jan., 13, 1923, pp. 37-42. Comparison of Nova Scotia shales with those of New Brunswick. Gives extent of deposits and grade of shale.
915. OIL AND GAS JOURNAL. Athabaska tar sand enough to give all Canada good roads. Vol. 22, Aug. 16, 1923, p. 102. Fields of asphalt sands include large area; analysis of oil.
916. OIL WEEKLY. Looking for gas and find oil in Alberta; crude has asphaltic base and low gravity. Vol. 31, Dec. 1, 1923, p. 39. Oil in British petroleum well in Irma-Wainwright field is of about 18° gravity; production is placed at 200 barrels a day.
917. PITCHER, N. C., STANSFIELD, E., HOLLIES, R. T., CAMPBELL, W. P., McDONALD, W. L., AND ATKINSON, N. H. Fuels. Fourth Annual Report, Scientific and Industrial Research Council of Alberta, 1923, pp. 17-42. Includes a brief report on the calorific value of natural gas supplied to the city of Edmonton.
918. ROBB, C. A. A physical test on a natural (methane) gas well. *Trans. Roy. Soc. Canada*, vol. 17, 1923, sec. 3, pp. 103-109. Data of tests on wells at Ponoka, Alberta.
919. ROSEWARNE, P. V. Preliminary gasoline survey. Analyses of gasoline samples collected in Ottawa, Dec., 1922. Canada Dept. Mines, Summary Report, 1922, Mines Branch, No. 605, pp. 218-225. Gives graphical and tabulated data of results of analyses. Distillation range is regarded as a more important test than gravity. Discusses value of specific gravity and iodine value tests.

- 920.** SWINNERTON, A. A. Report on the treatment of oil shale from New Brunswick by the Ryan Oil Digestion process. Canada Dept. Mines, Summary Report, 1922, Mines Branch, No. 605, pp. 210-218. Gives detailed description of retort, products of distillation, report on tests and procedure, patent drawings, and conclusions.
- 921.** ——— Preliminary report on the investigation of oil shales. Canada Dept. Mines, Summary Report, Mines Branch, 1921, pp. 239-252. Study of methods of examining oil shales, with regard to amount and quality of oil obtained by each method. Tabulated data on distillation results from Alberta and Saskatchewan shales.
- See also* Nos. 111, 740, 861, 871, 876, 924, 4116, 4122, 4206, 5201.

REFINING AND REFINERIES

- 922.** ALDERSON, V. C. Review of foreign shale developments. Min. Cong. Jour., vol. 9, March, 1923, p. 94. Brief account of the shale industry in Canada, South America, Europe, Australia, and Africa. Bibliography.
- 923.** CLARK, K. A. The bituminous sands of northern Alberta. Fourth Annual Report, Scientific and Industrial Research Council of Alberta, 1923, pp. 59-72. Method of separation and diagram of plant; utilization in road construction.
- 924.** EMMONS, N. W. Natural-gas and petroleum resources of western Canada. Canadian Min. Jour., vol. 44, June 8, 1923, pp. 431-433; June 22, p. 477; July 20, pp. 544-545; Aug. 24, pp. 665-667; Sept. 14, pp. 721-725; Sept. 21, pp. 739-742; Oct. 12, pp. 796-799; Oct. 19, pp. 817-819; Nov. 16, pp. 901-902; Nov. 23, pp. 919-921. Location of gas fields; properties of gas; utilization of gas in natural-gasoline manufacture; operation of natural-gasoline plant, features of absorption, compression, and charcoal processes; manufacture of carbon black; facts concerning various processes; occurrence of helium, its recovery and uses.
- 925.** NEAR, W. P. Municipal asphalt plant at St. Catharines, Ont. Canadian Eng., vol. 42, March 7, 1922, pp. 279-280. Describes plant and equipment.
- See also* Nos. 507, 909, 4907, 5004, 5376.

UTILIZATION

See Nos. 899, 911, 915.

STATISTICS

- 926.** CANADIAN MINING JOURNAL. Final statistics, 1922, on petroleum and nonmetallics. Vol. 44, Oct. 26, 1923, p. 849. Production statistics by fields, 1922.
- 927.** ESTLIN, E. S. Natural gas in 1920; oil-field operations, 1920. Ontario Dept. of Mines, 30th Annual Report, vol. 30, 1922, pt. 5, 62 pp.
- 928.** OIL WEEKLY. Canadian production declined during 1922. Vol. 28, Feb. 10, 1923, p. 21. Production figures of Canadian fields for 1921 and 1922.
- 929.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Canadian oil production. Commerce Reports, Nov. 12, 1923, p. 433. Revised statistics for 1922; 1921 production. *See also* Canadian Chem. and Met., vol. 7, Nov., 1923, p. 282.
- See also* No. 52.

LEGAL REGULATIONS

- 930.** ——— Dominion Government Manual for operators under Oil and Gas Regulations. 403 Lancaster Bldg., Calgary, Alberta. Contains map of Alberta gas fields.

931. GAGE, E. W. Canada's new oil-lease legislation. *Oil Field Eng.*, vol. 24, July, 1922, p. 197. Modifications in the oil and gas laws of Feb., 1921, relating to duration of lease, rental terms, and development.
932. HARKNESS, R. B. Natural gas in 1921; Petroleum in 1921. Thirty-first Annual Report, Ontario Dept. of Mines, 1922, vol. 31, pt. 5, 82 pp. Regulations for the conservation of natural gas. Well records; production; map showing producing wells and wells that have ceased to produce.
933. NATIONAL PETROLEUM NEWS. Drilling in western Canada is lacking in profitable results. Vol. 15, March 7, 1923, pp. 57-58. Results of exploration for oil in western Canada; little encouragement of production on a commercial scale is offered. Map of tested sections.
934. NATURAL GAS. Natural-gas tribunal in Ontario. Vol. 3, Sept., 1922, pp. 9, 54, 56. Natural-gas act of 1922.
935. OIL AND GAS JOURNAL. Canada formulates regulations for new carbon-black plants. Vol. 22, Nov. 1, 1923, pp. 74, 82. Notes that permits to engage in carbon-black industry insure supply to consumers first.
936. OIL WEEKLY. Canada will permit manufacture of carbon black under restrictions. Vol. 31, Oct. 27, 1923, p. 38. Outline of main provisions of carbon-black regulations.
937. ——— To tax them before they get it in Canada. Vol. 30, July 28, 1923, p. 56. States that the Province of Alberta will tax, beginning August 1, mineral leases, including oil and gas leases, at the annual rate of 3 cents an acre.
938. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Amendment to the Canadian regulations pertaining to the leasing of petroleum and natural-gas rights. File No. 76429.

DIRECTORIES

939. CANADIAN MINING JOURNAL. Canada's oil refineries. Vol. 44, June 22, 1923, pp. 477-478. Data compiled by the Canadian Bureau of Statistics showing refineries, production, cost of operation, value of products, markets, and capital invested.
940. OIL ENGINE POWER. Fuel oil distribution in the Dominion of Canada. Vol. 1, Oct., 1923, p. 493. Tells of location of Canadian refineries and gives storage and production capacity of each.

MAP

941. OILDOM. Canadian oil development. Vol. 14, July, 1923, pp. 43-44. Map showing exploration work by Imperial Oil, Ltd.; account of progress.

ECONOMICS, INDUSTRIAL RELATIONS

See Nos. 857, 7903, 7908.

MEXICO (113)

See Nos. 2240, 2535, 2540, 2547, 2561, 7887.

OCCURRENCE

942. BOLETÍN DEL PETRÓLEO. Informe que rinde el inspector. J. Beltrán del Rio, del accidente ocurrido al pozo "Cacalliao Num. 2," de la Compañía Imperio. (Report of accident to well Cacalliao No. 2. of the Imperial Company.) Vol. 15, April, 1923, pp. 302-311. Historical résumé of the Panuco oil fields. Maps showing location of wells. Gives method of bringing well under control. Includes well logs.

943. **BOLETÍN DEL PETRÓLEO.** Informe sobre el campo petrolero de Cocuite, Veracruz. (Survey of Cocuite oil fields.) Vol. 13, June, 1922, pp. 461-471. Location and topographical features of region, petroleum indications; description of mud volcanoes and their relation to petroleum regions in several parts of the world.
944. ——— Algunos Pozos notables de la Gran Faja Petrólifera de la region de Tuxpan. Vol. 13, March, 1922, pp. 193-202. History of and data on the principal petroleum wells of Tuxpan fields; map showing the geographic location of wells.
945. ——— El futuro de la negocios petroleros de Mexico. (The future of the petroleum business in Mexico.) Vol. 13, Feb., 1922, pp. 100-113; discussion, pp. 113-117. Address of E. H. Doheny, before Am. Petrol. Inst., Dec., 1921. Deals with territory explored by the Pan American Petroleum Co. Tells of regions in which petroleum indications exist, and of geological and stratigraphical conditions. From Bull. Am. Petrol. Inst., Dec., 1921. *See also* Ind. Australian and Min. Stand., vol. 67, June 15, 1922, p. 1116; June 22, p. 1143. Min. and Oil Bull., vol. 8, April, 1922, pp. 190-195, 216. Le Courrier des Petroles, 4 ann., Aug. 25, 1923, pp. 2-3; Sept. 1, pp. 2-3. Salt Lake Min. Rev., vol. 24, May 30, 1922, pp. 10-13.
946. **LE COURRIER DES PÉTROLES.** Le développement de l'industrie pétrolière au Mexique. 3e Année, Sept. 2, 1922, p. 1. Survey of report of a group of engineers to government giving producing fields. Reports production.
947. ——— Le pétrole au Mexique. 3e Année, March 4, 1922, pp. 1-2. Estimated petroleum reserves by countries; survey of probable petroleum areas of Mexico; production, 1901-1920.
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1039. OIL, PAINT AND DRUG REPORTER. Rules which govern oil grants and concessions in Costa Rica. Vol. 103, Jan. 8, 1923, p. 45. Summary of the provisions of the decree. *See also* *Oil Weekly*, vol. 28, Jan. 13, 1923, p. 70. *Petrol. Times*, vol. 9, Feb. 10, 1923, p. 198. *Oildom*, vol. 14, Feb. 1923, p. 19.
1040. REDFIELD, A. H. Petroleum developments in Central America during 1922. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet No. 1241, April, 1923, pp. 66-71. Development and legislation in Guatemala, British Honduras, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama.

See also No. 1038.

GUATEMALA

OCCURRENCE

1041. LE COURRIER DES PÉTROLES. L'industrie pétrolière en Amérique Centrale. 4e Année, Dec. 15, 1923, pp. 1-2. General survey of petroleum possibilities and indications in the various provinces of Guatemala.
1042. LATOUR, F. S. Prospects of oil in Guatemala. *The Mid-Continent Yearbook*, 1923. Tulsa, Okla., 1923, pp. 25-27. Address before Internat. Petrol. Cong., Tulsa, Oklahoma, Oct., 1923. Considers stratigraphical conditions related to oil occurrence; economic conditions, development of petroleum industry; location of seepages and known deposits. *See also* *Nat. Petrol. News*, vol. 15, Oct. 10, 1923, p. 32F.

DISTRIBUTION

1043. FROST, A. C. Petroleum in Guatemala. Commerce Reports, Bur. For. and Dom. Comm., May 22, 1922, p. 492. Distribution methods.

REFINING

1044. PETROLEUM REFINER. Refined oil in Guatemala. Vol. 11, June 1, 1922, p. 7. Discusses use of refined oil, location of markets, and methods of distillation.

LEGAL REGULATIONS

1045. BOLETIN DEL PETRÓLEO. Ley de hidrocarburos. (Law relating to hydrocarbons.) Vol. 15, Jan., 1923, pp. 67-74. Text of Decree 1,214 of Guatemala relating to the exploration and development of petroleum lands.
1046. CALIFORNIA OIL WORLD. Latin America legislates for oil industry. Vol. 14, Mar. 30, 1922, p. 6. Contains reports from United States consuls on oil legislation in Guatemala, Ecuador, and Peru. *See also* Nat. Petrol. News, vol. 14, Mar. 29, 1922, pp. 83, 85.
1047. PAN AMERICAN UNION, BULLETIN. Legislation. Vol. 57, Dec. 23, 1923, pp. 621-625. "Guatemala. Petroleum claims. Decree 829 extends the term to July 1, 1924, for adjusting oil-land denunciations to the terms of the regulation of the hydrocarbon law, so that Guatemalans may have a better opportunity to develop oil fields."
1048. ——— Legislation. Vol. 56, Jan. 1923, pp. 87-89. Guatemala. Modifications of the petroleum law made by Decree 800.
1049. ——— Legislation. Vol. 55, Dec., 1922, pp. 619-621. Brief summary of the hydrocarbon law of June 3, 1922, of Guatemala.

HONDURAS**GEOLOGY**

1050. REDFIELD, A. H. The petroleum possibilities of Honduras. Econ. Geol., vol. 18, Aug., 1923, pp. 474-493. Summary of geological data relating to petroleum; oil indications.

NICARAGUA**ECONOMICS**

1051. WOOD, C. W. Why Nicaragua has been neglected. Oil and Gas Jour., vol. 20, Mar. 24, 1922, p. 56. Deals with general conditions and possibilities in Nicaragua.

PANAMA**OCCURRENCE**

1052. OIL AND GAS JOURNAL. Panama, Peruvian, and Venezuelan oil developments. Vol. 21, Feb. 22, 1923, pp. 106-107. From the Oil and Color Trades Journal (London). Discusses development in the oil industry, production, and controlling companies.

GEOLOGY

1053. PETROLEUM TIMES. Oil indications in the Republic of Panama. Vol. 7, March 25, 1922, p. 416. Describes favorable structures and oil and gas seeps in several regions of Panama.

STORAGE

See No. 3354.

LEGAL REGULATIONS

1054. LE COURRIER DES PÉTROLES. Panama, loi 57, du 1/6 Mars 1917, pétrolière. 3e Année, July 22, 1922, p. 3.
1055. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. New Panama petroleum law. Commerce Reports. No. 22, May 28, 1923, p. 572. Law 21 of 1923, amending Chapter 5, Title 5, Book 1, Panama Fiscal Code, permits exploitation of petroleum deposits in the Republic of Panama. Copies may be consulted by referring to file 92366 district and cooperative offices of Bureau of Foreign and Domestic Commerce.

SAN SALVADOR

LEGAL REGULATIONS

1056. LE COURRIER DES PÉTROLES. Le régime d'exploitation des gisements à San Salvador. 3e Année, July 1, 1922, p. 4. Text of decree relating to development of petroleum deposits.
1057. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. New mining code of San Salvador. (Spanish copy.) Copy may be obtained by referring to File No. 67641.

WEST INDIES (115)

OCCURRENCE

See No. 1033.

GEOLOGY

1058. PETROLEUM TIMES. Petroleum prospects in the West Indies. Vol. 8, July 8, 1922, p. 56. Stratigraphy and structure of known oil deposits.

LEGISLATION, MAP

See Nos. 1033; 1089.

BARBADOS (115.1)

GEOLOGY

1059. REDFIELD, A. H. Petroleum reserves of the West Indies. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1166, June, 1922, 6 pp. Paper presented at New York meeting, Feb., 1922. Discusses possible oil-bearing regions of Cuba, Haiti-Santo Domingo, and Barbados; location of promising areas; known structural characteristics of islands. States that lack of geological details concerning local conditions makes satisfactory estimates impossible. *See also* Nat. Petrol. News, vol. 14, March 1, 1922, pp. 48 E-48F. Min. and Met., June, 1922, p. 39. Trans. Am. Inst. Min. and Met. Eng., vol. 68, 1923, pp. 1082-1087; discussion, pp. 1088-1090.

REFINING AND REFINERIES

1060. REDFIELD, A. H. Oil development in the West Indies during 1922. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1241, April, 1923, pp. 72-75. Survey of production, development, and refinery conditions in Cuba, Haiti, Dominican Republic, Barbados, Curacao, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama, and British Honduras. *See also* Nat. Petrol. News, vol. 15, March 14, 1923, pp. 101-102. Oildom, vol. 14, June, 1923, pp. 43-44. Petrol. Times, vol. 10, July 21, 1923, p. 112, vol. 9, April 14, 1923, p. 528. Eng. and Min. Jour.-Press, vol. 115, March 3, 1923, p. 414.

CUBA (115.2)

See also No. 7273.

OCCURRENCE

- 1061.** MURIAS, E. S. Mineral resources of Cuba. Eng. and Min. Jour.-Press, vol. 114, July 29, 1922, pp. 197-198. Indications of petroleum.
- 1062.** OIL AND GAS JOURNAL. Peterson sees in Cuba possible oil country. Vol. 22, June 14, 1923, p. 108. Cuba is not of volcanic origin, but contains asphalt deposits and a few producing wells.
- 1063.** PETROLEUM TIMES. Petroleum prospects in Cuba. Vol. 8, Aug. 19, 1922, p. 270. Gives location of Cuban oil region; development.
- 1062.** PUTNAM, J. R. Cuba. Bur. For. and Dom. Comm., Suppl. Commerce Rpts., Trade and Econ. Rev., 1921, No. 34, p. 25. Asphalt deposits in Cuba and asphalt production.
- 1065.** ——— Cuba. Bur. For. and Dom. Comm., Suppl. Commerce Rpts., Trade and Econ. Rev., 1921, No. 34, p. 24. Production of petroleum in Cuba is slight. Extensive exploration has located valuable deposits in Bacuranao only, which has produced 800,000 gallons of first-grade oil.
- 1066.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Cuba. Suppl. Commerce Rpts., Trade and Econ. Rev., 1922, No. 51, pp. 14-15. Pamphlet. Brief report on petroleum production. Only producing wells are at Bacuranao, Havana; production to date has been 300,000 barrels. Oil has paraffin base with small amount of asphalt.

GEOLOGY, REFINING

See Nos. 1059; 1060, 1112.

TRINIDAD (115.3)

See also No. 7887.

OCCURRENCE

See No. 1175.

GEOLOGY

- 1067.** PETROLEUM TIMES. British Controlled Oil Fields, Ltd., and Trinidad. Vol. 8, Nov. 11, 1922, pp. 705-707. Describes favorable structures in Oropouche Lagoon on the Gulf of Paria. Report of exploration.
- See also* Nos. 1176, 1195.

DEVELOPMENT AND PRODUCTION

- 1068.** DAVIES, S. J. Notes on the control of oil wells and the use of screen on the Apex (Trinidad) oil field. Bull. Inst. Min. and Met. (London), Feb., 1923, pp. 9-14. Discussion of paper by H. C. B. Hickling in July number.
- 1069.** JUDD, H. A. Trinidad's famous pitch lake. Petrol. Times, vol. 7, April 15, 1922, pp. 501-502. History of commercial exploitation of asphalt deposit in Trinidad; description of excavation; treatment and shipment of asphalt.
- 1070.** THE LAMP. Production with pick and shovel. Vol. 5, Feb., 1923, pp. 10-17. Description of the asphalt industry on the Island of Trinidad. Shows map of island. *See also* Ohio Gas and Oil Men's Jour., vol. 5, April, 1923, pp. 13-19, 24-25.
- 1071.** OIL WEEKLY. Trinidad wells to have longer life. Vol. 24, Jan. 21, 1922, pp. 28, 32. Tells of the successful use of screen and the handling of tools under heavy pressure through an arrangement of stuffing boxes in a Trinidad well. *See also* Petrol. Times, vol. 7, Feb. 11, 1922, pp. 181-183.
- See also* Nos. 2544, 2562.

PROPERTIES

1072. PETROLEUM TIMES. Trinidad's petroleum industry. Vol. 7, Dec. 23, 1922, p. 930. Petroleum companies; characteristics of oil and gasoline; production in 1921.

See also Nos. 50, 305, 4240.

UTILIZATION

See Nos. 4233, 7468.

STATISTICS

1073. BAKER, H. D. Petroleum trade and industry in Trinidad. Commerce Reports, Bur. For. and Dom. Comm., Nov. 20, 1922, pp. 483-484. Production statistics, 1921, for asphalt and petroleum. *See also* Nat. Petrol. News, vol. 14, Nov. 29, 1922, p. 71.

1074. ——— British West Indies. Trinidad and Tobago. Bur. For. and Dom. Comm., Suppl. Commerce Repts., Trade and Econ. Rev., 1920-1921, 14 pp. Gives import and export figures for asphalt and petroleum.

1075. MINING JOURNAL. Petroleum industry of Trinidad. Vol. 139, Dec. 30, 1922, p. 1005. Discusses production, imports, and exports of petroleum products; character of local kerosene and gasoline; oil companies; storage.

1076. PETROLEUM TIMES. Trinidad's petroleum industry. Vol. 10, Aug. 25, 1923, p. 278. Official report of production and drilling 1920-1922.

1077. PETROLEUM WORLD. (LONDON). Official Trinidad oil report for 1921. Vol. 19, Oct., 1922, pp. 409-412. Development and production statistics for private and crown lands; report on each lease, crude-oil production, 1911-1921.

1078. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Petroleum production of Trinidad for 1922. Commerce Reports, Nov. 26, 1923, p. 560. Production figures for 1922; development progress.

MAP

See No. 1070.

OTHER ISLANDS (115.9)

ANTILLES

OCCURRENCE.

See No. 1124.

HAITI

GEOLOGY.

1079. MINING AND OIL BULLETIN. Possible oil resources in Haiti. Vol. 8, Dec., 1922, pp. 710-711. Notes geologic structure favorable to oil deposits.

1080. OIL NEWS. Petroleum in Haiti. Vol. 10, Feb. 5, 1922, pp. 41-42. Summary of geological reconnaissance made by the U. S. Geol. Survey. *See also* Oil Weekly, vol. 23, Nov. 19, 1921, pp. 48, 78-79.

1081. WOODRING, W. P. An outline of the results of a geological reconnaissance of the Republic of Haiti. Jour. Wash. Acad. Sci., vol. 13, April 4, 1923, pp. 117-129. Observes that Miocene rocks of Central Plain have structures favorable to accumulation of oil; small seepages exist; extent of deposits can be known only by tests.

See also No. 1059.

REFINING.

See No. 1060.

SOUTH AMERICA (120)

OCCURRENCE

1082. LE COURRIER DES PÉTROLES. Les immenses réserves pétrolifères de l'Amérique Latine. 4e Année, Aug. 4, 1923, p. 2. Survey of petroleum resources in South American countries, and list of chief companies engaged in exploiting them.
1083. FANNING, N. O. South America looming as oil producer. Oil and Gas Jour., vol. 21, July 27, 1922, pp. 11, 82. Survey of possibilities for petroleum production in the various countries of South America; exploration; legislation.
1084. OILDOM. Oil prospects in South America. Vol. 13, June, 1922, p. 12. Review of article by David White in New York Times. States that estimated oil resources in South America are twice those of United States at present time.
1085. WHITE, DAVID. El petróleo en la America Latina. (Petroleum in Latin America.) Bol. Petról., vol. 13, April, 1922, pp. 310-315. Survey of petroleum regions and estimated resources of petroleum.
1086. ———. El petróleo en la America del Sur. Bol. Petról., vol. 12, July, 1921, pp. 28-37. Estimated petroleum resources of South America. From Bull. Pan. Am. Union, July, 1921.
- See also* Nos. 186, 635, 1034.

DEVELOPMENT AND PRODUCTION

1087. SCHAILL, F. W. Drilling cost in South America. Oildom, vol. 13, June, 1922, p. 55. Recommends that first well on a property be equipped for thorough test of land. Explains essential points in camp construction and drilling preparations.

TRANSPORTATION AND STORAGE

See No. 3093.

PROPERTIES

1088. PETROLEUM AGE. Crude oil. Vol. 11, Jan. 1, 1923, p. 39. Properties of South American crude oils.
- See also* Nos. 77, 800, 1959.

LEGISLATION

1089. SCHÜSTER, EDWARD, AND FEUILLE, FRANK, JR. Oil laws of Latin America. Min. and Met., July, 1922, pp. 38-40. Abstract of paper given before Am. Inst. Min. and Met., New York, Feb., 1922. Survey of theory and practices upon which the petroleum laws of South and Central America and Mexico are based, and which govern subsoil rights. *See also* Trans. Am. Inst. Min. and Met. Eng., vol. 68, 1923, pp. 1061-1081. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1179, July, 1922, 21 pp.
1090. THOMPSON, J. W. Extracto de las leyes sobre petróleo de los países Latino Americanos. Bol. Petról., vol. 12, Dec., 1921, pp. 486-496. Legislation and laws pertaining to production and transportation of petroleum in Latin American countries. From Petroleum Laws of all America; Bureau of Mines Bull. 206, 1921, 645 pp.
- See also* No. 1083.

MAPS

1091. HUNTLEY, J. G. Outlook for the American crude-oil market is for upward trend. *Nat. Petrol. News*, vol. 15, Jan. 24, 1923, pp. 39-41. States that present overproduction will decline, but demand will continue to broaden. Map gives area favorable to petroleum deposits in South America.
1092. PETROLEUM TIMES. Annual report of the British Controlled Oil Fields, Ltd. Vol. 9, Jan. 6, 1923, pp. 5-9. Includes maps giving location of concessions being developed in South America and Central America, and of those under negotiation.

ARGENTINA (121)

OCCURRENCE

1093. BOLETÍN DEL PETRÓLEO. Yacimientos petrolíferos en la Republica Argentina. (Petroleum fields in the Argentine Republic.) Vol. 15, Aug., 1923, pp. 99-101. Account of development. Gives petroleum indications in Jujuy region.
1094. BRADY, G. S. The Mendoza-Neuquen petroleum fields. *Commerce Reports*, Bureau of Foreign and Domestic Commerce, March 6, 1922, pp. 573-574. Gives location of fields, characteristics of oil, account of present operations, and brief discussion of possibilities of fields.
1095. HUNTER, C. M. Les gisements de pétrole de la République Argentine. *Chim. et ind.*, Special Number, May, 1923, pp. 118-121. (Trans. Internat. Expos. of Combust. Liquids, Paris, Oct., 1922. Gives geologic and geographic occurrence of petroleum in Argentina; summary of exploration and development; production, 1908-1922; characteristics of petroleum of various fields. Includes map showing location of main fields. See résumé in *Petrol. Times*, vol. 9, May 12, 1923, pp. 667-668.
1096. KRÜGER, E. F. Argentinien, seine Erdölindustrie und ihre wachsende Bedeutung für den Aufschwung des Landes. *Petrol. Ztschr.*, Jahrg. 18, Sept. 20, 1922, pp. 1149-1164. Petroleum regions and possibilities in Argentina; economic aspects of the Argentine petroleum industry; production.
1097. LONDON TIMES TRADE SUPPLEMENT. Argentina's new staple. Comodoro Rivadavia and its future. Vol. 10, April 1, 1922, p. 46. Considers oil-bearing territories and transportation facilities. Notes that cost of production and transportation make Argentine oil an unsuccessful competitor of Mexican oil; more profitable exploitation is looked for in the South.
1098. PETROLEUM TIMES. The Argentina and its petroleum possibilities. Vol. 10, Aug. 18, 1923, pp. 239-240. Review of conditions and production in the four petroleum regions: Cacheuta, Neuquen, Comodoro Rivadavia, and the sub-Andine zone.
1099. POWERS, BRYANT. Following the drill at Comodoro Rivadavia. *Oil Weekly*, vol. 29, May 12, 1923, pp. 26-27, 70-71. History of oil exploration and production. Description of general conditions.
1100. REWALD, BRUNO. Die Petroleumquellen Argentinien. *Chem. Ztg.*, Jahrg. 46, March 28, 1922, p. 286. Survey of petroleum deposits in Argentina; general characteristics of oil; development.
1101. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Report on the Neuquen oil fields of Argentina and organization of the petroleum company, Cia Argentina de Exploraciones Mineras Huincul, S. A. Copy may be obtained by referring to file No. 10,730.

1102. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Argentine petroleum zones. Commerce Reports, Dec. 11, 1922, pp. 657-658. Brief résumé of a pamphlet in Spanish by J. E. Rassmuss on the development of the Argentine petroleum industry and its importance to world economy. (Refer to file 75641.) Deals with the six principal petroliferous regions of Argentina as outlined by the author.
See also No. 1176.

GEOLOGY

1103. BRADY, G. S. Argentine petroleum industry and trade. Bur. For. and Dom. Comm., Suppl., Commerce Repts., Trade and Inf. Bull. 81, 1923, 23 pp. Pamphlet. Data on consumption and importation of petroleum products, 1913, 1918-1920. Gives production statistics of Rivadavia fields, 1907-1922, list of refineries and oil corporations; development and general situation in Comodoro Rivadavia fields, and characteristics of oil. Discusses geological conditions in northern Argentine fields and describes deposits of asphalt, rafaelite, and shale. Legislation. *See also* Oil and Gas Jour., vol. 21, April 5, 1923, pp. 98, 100, 104. Le courrier des pétroles, 4e Année, June 30, 1923, p. 2. Petrol. World (London), vol. 20, July, 1923, pp. 269-270, 272-273.
1104. CRASS, FRITZ. Wasser-und Ölbohrung in Argentinien unter besonderer Berücksichtigung der 2000 M. Bohrung Alhuampa. Petrol. Ztschr., Jahrg. 19, Nov. 10, 1923, pp. 1103-1106. Log of well in northern Argentina.
1105. OIL AND GAS JOURNAL. Petroleum zones of the Argentine Republic. Vol. 21, Dec. 21, 1922, p. 89. Describes the six petroleum regions and various kinds of crude oil found. *See also* Bur. For. and Dom. Comm., Petroleum Div., Special pamphlet, File 75641. Petrol. World (London), vol. 20, March, 1923, p. 112.
1106. RIGAUD, F. Les régions pétrolifères de l'Amérique du Sud. La nature, July 29, 1922, pp. 61-64. Stratigraphy and formations of Argentina; account of exploration and development.
See also Nos. 1094, 1176.

DEVELOPMENT AND PRODUCTION

1107. HERMITTE, E. S. Petroleum mining in Plaza Huincul (Argentina). Mem. Dereccion Gen. de Mines, vol. 15, No. 3, 1921, pp. 3-13, 99-144. Discusses oil production, oil analysis, and the refining industry.
1108. MORGAN, H. H. Argentina. Bur. For. and Dom. Comm., Suppl. Commerce Repts., Trade and Econ. Rev., 1923, No. 12, 19 pp. Pamphlet. Contains summary of petroleum development by companies.
1109. ZUCAL, MANUEL. Exploitation of Comodoro Rivadavia oils. Ingenieria (Buenos Aires), vol. 27, Jan., 1923, pp. 16-21. Reviews development of field.
See also No. 1094.

TRANSPORTATION

1110. PAN AMERICAN UNION, BULLETIN. Submarine oil pipe line. Vol. 57, Dec., 1923, p. 607. Main features of construction of a submarine pipe line in Calita Cordoba, Argentina.

PROPERTIES

1111. NATIONAL PETROLEUM NEWS. Greater part of Argentine crude hardly equals light Mexican oil. Vol. 14, Nov. 8, 1922, p. 87. Physical and chemical properties of Comodoro Rivadavia and Neuquen crudes compared with Mexican light oil; general facts concerning field.
See also Nos. 1094, 1095, 1103, 1105, 1107.

REFINING AND REFINERIES

1112. **PETROLEUM REFINER.** How South Americans get their gasoline. Vol. 12, Aug. 17, 1922, p. 8. Survey of production and refining of petroleum in Argentina, Bolivia, Brazil, British Guiana, Chile, Colombia, Cuba, Equador, Paraguay, Uruguay, Peru, and Venezuela.

See also No. 4565.

STATISTICS

See No. 1103.

LEGAL REGULATIONS

1113. **HERMITTE, E. S.** Status of the petroleum question in Argentina. Address before the Second Argentine Nat. Eng. Cong., November, 1921. Translated, in part, in Commerce Reports, Bur. For. and Dom. Comm., January 30, 1922, pp. 268-269. *See also* Oil and Gas. Jour., vol. 20, Feb. 10, 1922, pp. 84-85.
1114. **HEROLD, S. C.** The Argentine petroleum situation. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1241, April, 1923, pp. 97-99. Gives development, production, and legal regulations.
1115. **U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE.** New Argentine petroleum reserve. Commerce Reports, Dec. 17, 1923, p. 742. Notes that all petroleum territory of Province of Santa Fe is reserved according to a decree signed by the governor.
1116. ——— Argentine petroleum decree. Commerce Reports, May 14, 1923, p. 444. Decree in Providence of Jujuy, framed to prevent speculation, limits area held under one grant and requires each claim to be worked with full crew and equipment. Decree may be consulted at district or cooperative office bureau by referring to File 8495. *See also* Le courrier des pétroles, 4e Année, July 21, 1923, p. 3.

See also No. 1103.

ECONOMICS

1117. **KRÜGER, E. F.** Argentinien, seine Erdölindustrie und ihre wachsende Bedeutung für den Aufschwung des Landes. Petrol. Ztschr., Jahrg. 18, Sept. 20, 1922, pp. 1149-1164. Discusses factors affecting production, present status of oil industry, and refining and transportation problems.

See also No. 1097.

MAP

See No. 1095.

BOLIVIA (122)

OCCURRENCE, PROPERTIES

1118. **HOLLAND, A. A.** Bolivia tiene una vasta zona de terrenos petrolíferos. (Bolivia has a vast zone of petroleum lands.) Bol. Petrol., vol. 13, April, 1922, pp. 328-331. Occurrence of petroleum; history of development; geological and general conditions; physical properties of oil; tariffs.

GEOLOGY

1119. **LE COURRIER DES PÉTROLES.** Le pétrole en Bolivie. 3^e Année, Sept. 30, 1922, p. 2. General features of the three petroleum regions of Bolivia; oil analyses; development companies operating in field.
1120. **LONGOBARDI, ERNESTO.** Petroleum reserves in Bolivia and the Argentine Republic. Bull. Pan Am. Union, vol. 57, July, 1923, pp. 16-24. Topographical, geological, and geochemical features of the sub-Andine region extending to Solta and Jujuy and Santa Cruz de la Sierra. Geological map.

See also No. 1118.

REFINING

See No. 1112.

LEGAL REGULATIONS

1121. BOLETÍN DEL PETRÓLEO. Ley del petróleo de la Republica de Bolivia. (Petroleum in the Republic of Bolivia.) Vol. 12, Nov., 1921, pp. 381-389. Text of petroleum law of June 16, 1921.
1122. SAAVEDRA, BAUTISTA. (The petroleum law of Bolivia.) Bol. Min. Soc. Nac. Minería, vol. 33, May, 1921, pp. 275-286.
1123. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Petroleum laws of Bolivia. Copy and translation contained in report No. 77312. Includes presidential decree of Oct. 25, 1922, and symposium of concession laws.
- See also* No. 1118.

BRAZIL (123)

OCCURRENCE

1124. RIGAUD, F. Le gisements de pétrole de l'Amérique du Sud. La nature, Sept. 9, 1922, pp. 174-176. Survey of oil possibilities and development in Brazil, Peru, Venezuela, and the Antilles.

GEOLOGY

1125. BRANNER, J. C. Oil possibilities in Brazil. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1164, June, 1922, 4 pp. Presented at New York meeting, Feb., 1922. Observes that Devonian and Carboniferous formations are not oil-bearing in Brazil. Discusses oil possibilities in the Permian, Tertiary, and Cretaceous formations. *See* abstract, Min. and Met., June, 1922, p. 37. Nat. Petrol. News, vol. 14, March 1, 1922, pp. 48I-48J. Trans. Am. Inst. Min. and Met. Eng., vol. 68, 1923, pp. 1057-1060.
1126. PETROLEUM TIMES. Oil shale and petroleum prospects in Brazil. Vol. 7, Jan. 21, 1922, p. 86. Review of article by H. E. Williams, Eng. and Min. Jour., Sept. 25, 1921. Location of shale deposits; geology; and analysis.
1127. TAVES, A. W. Brazil has good petroleum prospects. Oil and Gas Jour., vol. 20, June 8, 1922, pp. 7, 112-113. Stratigraphy; exploration; summary of mining law.

TRANSPORTATION, STORAGE, AND DISTRIBUTION

1128. ATLANTIC CONNECTING ROD. The Atlantic Refining Co. of Brazil. Vol. 15, Oct., 1922, pp. 3-24. Deals with marketing methods, and gives information and general conditions relating to distribution.
1129. BIRNFELD, W. DE C. Pernambuco as an oil-bunkering station. Bull. Pan Am. Union, vol. 57, Dec., 1923, pp. 574-579. Reports that quays and barges are equipped with pump and boilers for supplying ships with fuel oil.
1130. NATIONAL PETROLEUM NEWS. Most of oil imported into Brazil is distributed in containers. Vol. 15, Sept. 26, 1923, p. 81. Describes market and transportation conditions.

PROPERTIES

1131. OIL NEWS. Results of assay tests on Brazilian "turfa" made by the Bureau of Mines. Vol. 10, Dec. 5, 1922, p. 44. *See also* Oildom, vol. 14, Jan., 1923, p. 34. Oil Age, vol. 19, Feb. 7, 1923, pp. 11-12. Petrol. World, (London), vol. 20, April, 1923, p. 152.
- See also* Nos. 1126, 3962, 4071.

REFINING

See Nos. 1112, 1126.

UTILIZATION

1132. CAMERON, C. R. Alcohol as automobile fuel in Pernambuco, Brazil. Commerce Reports, Bur. For. and Dom. Comm., March 13, 1922, pp. 621-622. Gives reasons for the decline in use of alcohol fuel in Pernambuco, and discusses future of such a fuel for automobiles. See also Exhibit 48027, Bureau of Foreign and Domestic Commerce.
1133. LE COURRIER DES PÉTROLES. L'alcohol moteur au Brésil. 4e Année, Feb. 24, 1923, p. 2. Brief description of motor-alcohol industry in Brazil; estimates of annual consumption. Composition is: Alcohol, 55 per cent; ether, 44 per cent; and pyridine, 1 per cent.
1134. PETROLEUM WORLD (LONDON). Brazil. Vol. 20, March, 1923, pp. 112, 114. Formula for motor fuel proposed for manufacture in Recife.

LEGISLATION

See No. 1127.

CHILE (124)

TRANSPORTATION AND STORAGE

See No. 3183.

PROPERTIES

1135. OIL ENGINEERING AND FINANCE. Chilcan oil shale. Vol. 3, 1923, pp. 253-255. Results of analyses of shale samples from the Pular region.

REFINING

See No. 1112.

COLOMBIA (125)

OCCURRENCE

1136. LE COURRIER DES PÉTROLES. Un grand pays pétrolière. 4e Année, Aug. 4, 1923, pp. 1-2. Location of the five oil regions of Colombia. Account of exploration and development by companies holding concessions.
1137. ——— Les zones pétrolières colombiennes. 3e Année, Sept. 16, 1922, p. 4. List of oil regions and names of development companies operating in each field. List of American, Canadian, English, and Colombian companies.
1138. ——— Le pétrole en Colombie. 3e Année, June 24, 1922, pp. 2-3. Survey of petroleum regions and their development.
1139. GAMBA, F. P. The petroleum resources of Colombia. Petrol. World (Los Angeles), vol. 7, Jan., 1922, p. 7. Gives map showing location of known coal and oil deposits in Colombia.
1140. PETROLEUM TIMES. Petroleum activities in Colombia. Vol. 9, March 17, 1923, p. 396. Discusses geological structure; location of the five oil zones; present state of development.
1141. WASHBURNE, C. W., AND WHITE, K. D. Oil possibilities of Colombia. Min. and Met., No. 186, June, 1922, pp. 39-40. Abstract of paper presented before New York meeting, Am. Inst. Min. and Met. Eng., Feb., 1922. Observes that location of Colombia in respect to world's markets is almost ideal. Survey of oil indications and nine proved oil regions. See also Nat. Petrol. News, vol. 14, March 1, 1922, pp. 48K-48L. Oildom, vol. 13, Aug., 1922, pp. 23-25. Trans. Am. Inst. Min. and Met. Eng., vol. 68, 1923, pp. 1023-1031. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1168, June, 1922.

GEOLOGY

1142. HOWELL, GEORGE. The Caribbean oil region. *Petrol. Times*, vol. 9, June 16, 1923, pp. 904-905. Résumé of paper before Sixth Internat. Min. Conference. Geography and geology of the oil region lying in the northern sections of Colombia and Venezuela. General description of oil deposits. Contains oil analyses. *Oil Eng. and Fin.*, vol. 3, 1923, pp. 491-496.
1143. ———. Colombia; a land of vast mineral and petroleum resources. *Oil Eng. and Fin.*, vol. 1, July 1, 1922, pp. 801-804; July 8, pp. 861-864. Describes general conditions. Maps.
1144. HUNTLEY, L. G., AND MASON, SHIRLEY. Colombian oil fields. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1189, Sept., 1922, 9 pp. Describes geologic structure in two most promising petroleum regions of State. Gives commercial possibilities of petroleum production and discusses taxes on petroleum industry. Aerial map. *See also* *Min. and Met.*, 1922, pp. 55-56. *Petrol. World* (London), vol. 19, Oct., 1922, pp. 401-402, 404-406. *Oildom*, vol. 13, Nov., 1922, pp. 45-46. *Petrol. World* (Los Angeles), vol. 8, July, 1923, pp. 52, 54, 64-65. *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1923, pp. 1014-1022.
1145. PETROLEUM TIMES. Oil possibilities of Colombia. Vol. 8, Aug. 5, 1922, p. 196. Geological conditions, exploration, and development.
1146. ———. Petroleum prospects in Colombia. Vol. 7, Feb. 25, 1922, p. 276. Stratigraphy and favorable structures in regions considered as having oil possibilities. Exploration and development.
1147. STEPHAN, M. J. Oil areas of Colombia, S. A. *Petrol. Times*, vol. 9, May 26, 1923, pp. 745-746; June 2, pp. 785-788. Geology of oil regions. Map of oil zones.
1148. STUTZER, OTTO. Ueber Erdöllagerstätten in Magdalena-Tal. (Columbien). *Petrol. Ztschr.*, Jahrg. 19, May 1, 1923, pp. 407-412. Detailed description of five main oil regions in Colombia; stratigraphy and structures; development.

See also Nos. 1140, 1141, 1838.

PROPERTIES

1149. PETROLEUM WORLD (LONDON). Oil industry of Colombia. Vol. 19, June, 1922, p. 238. Brief account of exploration and development; properties of oil.

See also No. 1142.

REFINING, STATISTICS

See Nos. 1112, 546.

LEGAL REGULATIONS

1150. LE COURRIER DES PÉTROLES. Le pétrole Colombien. 3e Année, July 1, 1922, pp. 1-2. Review of law relating to development of hydrocarbon resources.
1151. OIL AND GAS JOURNAL. Colombian Congress amends oil statutes; some taxes reduced. Vol. 21, May 3, 1923, p. 122. Law 14, effective April 8, 1923, modifies Law 120, 1919. Outlines chief provisions of new law.
1152. PAN AMERICAN UNION, BULLETIN. Legislation. Vol. 57, July, 1923, pp. 76-78. "Colombia law on the exploitation of hydrocarbons. Law 14, of January 31, 1923, complements and amends Law 120 of 1919, governing the exploitation of hydrocarbons." Important feature is provision to renew leases for an additional 20 years. *See also* *Nat. Petrol. News*, vol. 15, March 21, 1923, p. 38. *U. S. Bur. For. and Dom. Com.*, Commerce Reports, March 12, 1923, p. 689. *Oil Weekly*, vol. 28, March 17, 1923, p. 24. *Oil and Gas Jour.*, vol. 21, March 15, 1923, p. 11.

1153. THOMPSON, J. W. Petroleum production in Colombia, S. A., with relation to recent petroleum legislation. *Ohio Gas and Oil Men's Jour.* vol. 4, April, 1922, pp. 27-28. Summary and discussion of main provisions of petroleum law.
1154. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Colombian petroleum legislation. *Commerce Reports*, June 26, 1922, p. 840. "Translation of Executive Decrees 646 and 647 of Colombian Government of May 11, which promulgate certain regulations to be dependent upon the provisions of the Law 120 of 1919, concerning exploitation of oil lands of Colombia. Refer to file No. 58732."

MAP

1155. SINCLAIR, J. H., AND HOPKINS, E. B. Oil development in Colombia during 1922. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1241, April, 1923, pp. 76-85. Production and operations of the chief oil companies. General conditions. Map, illustrations.
See also Nos. 1139, 1144, 1147.

DIRECTORY

See No. 1137.

ECUADOR (126)

OCCURRENCE

1156. LE COURRIER DES PÉTROLES. Le pétrole en Équateur. 3e Année, Sept. 2, 1922, p. 3. Brief account of petroleum occurrence in Ecuador.
1157. MARSTERS, V. F. Oil resources of Ecuador. *Min. and Met. Eng.*, July, 1922, pp. 37-38. Abstract of paper given before *Am. Inst. Min. and Met. Eng.*, New York, Feb., 1922. Summary of possible oil territory. *See also* *Nat. Petrol. News*, vol. 14, March 1, 1922, pp. 48G-48I. *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1923, pp. 1032-1037. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1174, July, 1922, 6 pp.
1158. PETROLEUM TIMES. Oil fields of Ecuador. Vol. 9, Feb. 24, 1922, pp. 263-264; March 3, p. 299. Contains map showing petroleum regions of the Gulf of Guayaquil, which are the Peninsula of Santa Elena, the Island of Puna, and the Province of El Oro. Largest seepages are at Santa Elena.
See also No. 1161.

GEOLOGY

1159. SINCLAIR, J. H., AND BERKEY, C. P. Cherts and igneous rocks of the Santa Elena oil field, Ecuador. Preprint of paper before the Canadian meeting, Aug., 1923. *Min. and Met.*, vol. 4, Aug., 1923, pp. 424-425. Petrology of Santa Elena district; map showing important formations. *See also* *Oil and Gas Jour.*, vol. 22, Aug. 23, 1923, p. 103. *Trans. Am. Inst. Min. and Met. Eng.*, No. 1270-M, Aug., 1923.

PROPERTIES

1160. NATIONAL PETROLEUM NEWS. Light-oil wells brought in in Ecuador. Vol. 15, Aug. 15, 1923, p. 107. Consular report of production and refining in the Santa Elena district; oil analysis.

REFINING, STATISTICS

See Nos. 1112; 1046, 1655.

LEGISLATION

1161. LE COURRIER DES PÉTROLES. Le pétrole en Équateur. 3e Année, Feb. 11, 1922, p. 3. Gives petroleum regions of Ecuador, legislation, and development companies.
1162. INTERNATIONAL PETROLEUM REPORTER. Ecuador new law loosely framed. Vol. 1, Jan. 11, 1922, pp. 11-12. "Text of the Ecuador Law of Deposits of Hydrocarbons."
1163. PAN AMERICAN UNION, BULLETIN. Legislation. Vol. 54, March, 1922, pp. 296-303. Contains outline of main provisions of the petroleum law of Ecuador.
- See also* No. 1046.

PERU (127)

OCCURRENCE

1164. BEDOYA, S. F. Petroleum in Peru. The Mid-Continent Yearbook, 1923. Tulsa, Okla., 1923, pp. 36-39. History of petroleum use and development in Peru. Contains main features of petroleum legislation. Gives production. *See also* Nat. Petrol. News, vol. 15, Oct. 10, 1923, pp. 32G-32H. Oil and Gas Jour., vol. 22, Oct. 11, 1923, pp. 74, 99. Petrol. World (London), vol. 20, Nov., 1923, pp. 472-473.
1165. BOLETÍN DEL PETRÓLEO. Informe sobre la situación petrolera del Perú, rendido a la Secretaria de Relaciones Exteriores por el Consulado de México en el Callao. (Report on the petroleum situation in Peru made to the ministry of foreign affairs by the Mexican Consulate at Callao.) Vol. 15, Jan., 1923, pp. 30-63; discussion, pp. 63-66. History of exploration and development of petroleum regions in Peru. Gives legislation, analyses of petroleum, and production, 1906-1919.
1166. BOSWORTH, T. O. Geology of the Tertiary and Quaternary periods in the northwest part of Peru. London, 1922, 434 pp. Notes that oil is found only in Tertiary rocks of coastal plain. Brief survey of geological conditions and production. Description of the littoral region; structural peculiarities. Brief description of conditions in the Zorritos, Lobitos, Cabo Blanco, Negritos, Lagunitas, and La Brea fields. Gives map showing location of fields. *See also* Petrol. World (London), vol. 19, Oct., 1922, pp. 406-408. Petrol. Times, vol. 8, Sept. 23, 1922, pp. 443-444. Oil Eng. and Fin., vol. 2, Nov. 18, 1922, pp. 597-599; Nov. 25, pp. 633-634.
1167. CHEMICAL TRADE JOURNAL AND CHEMICAL ENGINEER. The minerals of Peru. Vol. 70, March 17, 1922, p. 333. Notes that field near frontier of Ecuador is only one at present being exploited. Petroleum indications exist in Huanané district near Lake Titicaca and also east of the Cordillera.
1168. LE COURRIER DE PÉTROLES. Les gîtes petrolifères peruvians. 4e Année, Oct. 20, 1923, pp. 1-2. Historical review of exploration, development, and primitive uses of petroleum. Gives production, 1903-1922.
1169. ———. Le pétrole au Pérou. 3e Année, July 29, 1922, pp. 2-3; Aug. 12, pp. 2-3. Describes petroleum areas known as Zorritos, Tobitos, Restin, Negritos, Lagunitas, and La Brea. Discusses physical and chemical characteristics of oils from the various regions.
1170. DEUSTUA, R. A. El petróleo en el Perú. Bol. Petról., vol. 12, Nov., 1921, pp. 287-343; Dec., pp. 420-455. Describes petroleum regions of Peru. Detailed review of development and exploration from early times to present. Status of industry; analyses and properties of petroleum from the various fields; geology of fields and theory of origin of petroleum. Includes illustrations, map showing petroleum regions. Gives legislation.

1171. ENGINEERING AND MINING JOURNAL-PRESS. Oil in Peru, and the new petroleum law. Vol. 113, June 3, 1922, p. 969. Early and present-day development of oil seepages. Notes that exploitation privileges on a lease exist for 4 years, but may be extended for an indefinite period.
1172. LONDON TIMES TRADE SUPPLEMENT. Peru's petroleum resources. Vol. 11, Feb. 10, 1923, p. 503. Occurrence of petroleum in Peru. Gives production and legislation regarding concessions.
1173. MARSTERS, V. F. Oil resources of Peru. *Min. and Met.*, July, 1922, pp. 36-37. History of petroleum industry in Peru. Contains details of development in each field, location and area of possible oil-bearing regions in Peru, total production for period, 1896-1921, and estimated production from possible reserves. *See also* *Nat. Petrol. News*, vol. 14, March 1, 1922 pp. 480-481. *Oil and Gas Jour.*, vol. 21, Aug. 24, 1922, pp. 86, 88, 96-97. *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1923, pp. 1038-1051. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1173, July, 1922, 14 pp.
1174. MINING AND OIL BULLETIN. Petroleum in Peru. Vol. 9, Jan., 1923, pp. 26-27, 60. History and development of oil industry in Peru.
1175. PETROLEUM TIMES. The vanadiferous bitumens of Peru. Vol. 10, Sept. 22, 1923, p. 432. Occurrence and properties of mineral which serves as a fuel and is also the source of vanadic oxide.
1176. ——— The Peruvian petroleum industry. Vol. 9, June 9, 1923, pp. 843-844. History of oil production. Discusses geology. Gives production in Peru, Argentina, Venezuela, and Trinidad for 1918-1922.
1177. ——— Oil prospects in Peru. Vol. 7, March 25, 1922, p. 419. Development and production of oil resources in the Negritos, Lobitos, Zerritos, Pirin, and lesser fields.
- See also* Nos. 1052, 1124, 1190.

GEOLOGY

1178. MARSTERS, V. F. Reminiscences of a trip to Peru and her northern oil fields. *Rig and Reel Mag.*, vol. 5, June, 1923, pp. 1-3, 12-13. Oil-bearing formations in Peru; development and drilling difficulties; survey of undeveloped possibilities.
1179. OIL WEEKLY. Geology of oil fields in northwest portion of Peru. Vol. 27, Nov. 4, 1922, pp. 10-11. Description of formations in the Zorritos, Lobitos, and Cabo Blanco, Negritos, Lagunitas, and La Brea oil fields.
- See also* Nos. 1166, 1169, 1170, 1176.

DEVELOPMENT AND PRODUCTION

1180. FOWKS, A. E. Oil exploration in Peru. *Bull., Union Oil Co. of Calif.*, vol. 3, July, 1923, pp. 1-6. Describes primitive oil-production methods. Outlines exploration and development progress since 1870. *See also* *Oil Weekly*, vol. 31, Nov. 3, 1923, pp. 31, 33, 71.
- See also* No. 1178.

PROPERTIES

1181. OIL WEEKLY. Peruvian fields producing 3,500,000 barrels annually. Vol. 26, Sept. 16, 1922, p. 62. Discusses two grades of crudes produced—hot test and cold test; the higher crudes are similar in quality and yield to those of Pennsylvania fields.
- See also* Nos. 1165, 1169, 1170, 1175.

REFINING, UTILIZATION

See Nos. 1112, 1168.

STATISTICS

1182. MARSTERS, V. F. Petroleum industry in Peru during 1921. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1241, April, 1923, pp. 94-96. Production by fields during 1921-1922; legislation relating to petroleum concessions.
1183. PETROLEUM TIMES. Peru's oil resources and the Lobitos dividend. Vol. 9, June 2, 1923, p. 817. Gives crude-oil production in 1903, 1919, 1921, 1922, and output of petroleum products in 1910 and 1920.
- See also* Nos. 546, 1181.

LEGAL REGULATIONS, LEGISLATION

1184. DUNN, W. E. New Peruvian regulations governing petroleum concessions. (Translation.) Refer to Report 5044, Petroleum Division, Department of Commerce.
1185. JUST, MICHEL. La legislación petrolera en el Peru. (Petroleum legislation in Peru.) Bol. Petról., vol. 15, May, 1923, pp. 392-393. A summary of the regulations governing petroleum concessions.
1186. OIL AND GAS JOURNAL. Law of Peru governing exploration for petroleum. Vol. 21, March 15, 1923, p. 48. Deals with new Petroleum Law 4452, Jan. 2, 1922. *See also* Le courrier des pétroles, 4e Année, Feb. 10, 1923, p. 3.
1187. ——— Peruvian regulations. Vol. 21, Aug. 10, 1922, p. 101. Notes that Peruvian petroleum law requires detailed records of production and consumption to be kept by concessionaire.
1188. PAN AMERICAN UNION, BULLETIN. Legislation. Vol. 55, Oct., 1922, pp. 401-404. Provisions of Peruvian export tax.
1189. ——— Peru. Vol. 54, April, 1922, pp. 410-411. Contains a review of Petroleum Law 4452 of Jan. 2, 1922.
1190. SALOMON, O. V. Petroleum resources of Peru. Petrol. Times, vol. 9, Feb. 10, 1923, pp. 199-200. Account of Peru's unexploited oil deposits and the laws pertaining to the oil industry.
- See also* Nos. 1046, 1164, 1165, 1171, 1172, 1182.

MAPS

See Nos. 1166, 1170.

VENEZUELA (128)

OCCURRENCE

1191. ANSLINGER, H. J. Venezuela. Bur. For. and Dom. Comm., Suppl. Commerce Reports., Trade and Econ. Rev., 1923, No. 23, 11 pp. Pamphlet. Contains a survey of petroleum production and development during 1923.
1192. THE LAMP. Oil ventures in Venezuela. Vol. 4, April, 1922, pp. 17-22. Includes topography, survey of economic and general conditions, leases held by oil companies. Describes development of concessions. Map.
1193. OIL WEEKLY. Venezuela Government working with oil men. Vol. 31, Nov. 17, 1923, pp. 23, 25. History of development. Briefly describes geology. Gives provisions of petroleum law of 1922. Map showing holdings of development companies.
1194. SCHAILL, F. W. Venezuela to replace Mexico. Oildom, vol. 13, Nov., 1922, p. 45. Tells of development in Maracaibo Basin, Minnegrande. Reports that other proved districts are Reotoria and Reodeoro in State of Colon; Totuma district, Perija; Mara district, Buchicacoa, State of Falcon; and Aturine district, eastern Venezuela; oil indications exist in most of region north of Orinoco River.
- See also* Nos. 1052, 1124.

GEOLOGY

1195. ARNOLD, R., BRYAN, B., AND MACREADY, G. A. Petroleum resources of Venezuela. *Min. and Met.*, July, 1922, pp. 34-35. Abstract of paper before Am. Inst. Min. and Met. Eng., New York, Feb., 1922. States that Lake Maracaibo region offers greatest possibilities of oil production at a profit; other sections of country have not been tested, or the Cretaceous and Tertiary beds are deep lying. Gives gravity of Trinidad oil. Notes that the major production comes from lower Tertiary sands of anticlines. *See also* *Oildom*, vol. 13, Sept., 1922, pp. 37-39. *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1922, pp. 1052-1066; Pamphlet 1170, July, 1922, 5 pp.
1196. BRYAN, BARNABAS. Developments in western Venezuela and their significance. *Nat. Petrol. News*, vol. 14, Aug. 23, 1922, pp. 35, 37-38. Geology. Detailed description of development in region of Lake Maracaibo. Production.
1197. HUNTLEY, L. G. Venezuela will not repeat performance of Mexico, but has big future. *Nat. Petrol. News*, vol. 15, Sept. 19, 1923, pp. 51-52, 55-56, 59-60, 62-63. Outlines chief provisions of Venezuelan oil law. General survey of conditions affecting oil industry. Describes geology in Lake Maracaibo region. Includes well log. Gives development operations and companies.
1198. LEWIS, J. W. Oil developments in Venezuela during 1922. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1241, April, 1923, pp. 86-93. Gives production methods and recent geological information of importance. Map of Lake Maracaibo region showing situation of main oil concessions. States that region is considered one of most important oil reserves of Atlantic coast. *See also* *Nat. Petrol. News*, vol. 15, March 7, 1923, pp. 70, 73-74, 77-78. *Oildom*, vol. 14, April, 1923, pp. 47-49.
1199. NATIONAL PETROLEUM NEWS. Scope of present Venezuelan operations indicates big developments. Vol. 15, March 7, 1923, p. 69. General review of geographical conditions and oil industry in Venezuela.
1200. OIL TRADE JOURNAL. East Venezuela shows good possibilities. Vol. 14, June, 1923, pp. 13-14, 112. Brief survey of oil development and general geological conditions. Map of eastern Venezuela. Venezuelan petroleum law of 1922 may be obtained from American Minister at Caracas. *See also* *Le courrier des pétroles*, 4e Année, June 30, 1923, p. 2.
1201. SHERIDAN, J. F. Petroleum possibilities in Venezuela; exploration and actual development. *Oil, Paint and Drug Rep.*, vol. 104, Oct. 15, 1923, pp. 20, 44E. General conditions and difficulties connected with exploration and wildcatting. Geography of oil region. Gives oil companies, and development progress made by them. Contains government policies and proposed legislation. Map of oil holdings in Maracaibo Basin. *See also* *Petrol. Times*, vol. 10, Oct. 27, 1923, pp. 595-596; Nov. 10, pp. 681-683. *Petrol. World (London)*, vol. 20, Nov., 1923, pp. 470-471.
- See also* No. 1193.

DEVELOPMENT AND PRODUCTION

1202. FANNING, O. N. Details of the Venezuelan gushers. *Oil and Gas Jour.*, vol. 21, Jan. 18, 1923, p. 50. Deals particularly with La Rosa and La Paz wells. *See also* *Eng. and Min. Jour.-Press*, vol. 115, Feb. 10, 1923, p. 280. *Petrol. Times*, vol. 9, Feb. 3, 1923, p. 164. *Atlantic Conn. Rod*, vol. 16, March, 1923, pp. 38-40.

PROPERTIES AND THEIR DETERMINATION

See No. 1203.

REFINING

1203. EGLOFF, GUSTAV. The cracking of Venezuela fuel oil. *Petrol. World* (London), vol. 20, July, 1923, pp. 285-286. Analyses of crude oil and description of cracking apparatus.

See also No. 1112.

STATISTICS

1204. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Venezuela. *Suppl. Commerce Reports, Trade and Econ. Rev.*, 1923, No. 23, p. 11. Survey of petroleum production and development in 1923.
1205. OILDOM. 1922 petroleum production in Venezuela. Vol. 14, Dec., 1923, p. 19. Gives production for 1922—285,673 metric tons, compared with 215,000 metric tons in 1921, and 69,000 tons in 1920.

See also Nos. 546, 1655.

LEGISLATION

1206. LE COURRIER DES PÉTROLES. Au Venezuela promulgations d'une nouvelle loi du pétrole. 3e Année, Oct. 7, 1922, pp. 1-2. More favorable terms are allowed for exploration and leasing of petroleum lands.
1207. ——— Au Venezuela. 3e Année, Feb. 18, 1922, pp. 3-4. Summary of mining law of June, 1921; provision relating to petroleum development and exploration.
1208. KERN, C. E. Considerable activity in Venezuela. *Oil and Gas Jour.*, vol. 21, July, 20, 1922, pp. 88, 92. Brief review of legislation affecting and relating to oil development; taxation. Report of general conditions.
1209. OIL WEEKLY. New Venezuelan oil law more favorable. Vol. 26, July 29, 1922, p. 28. Concessions of 10,000 hectares are granted for 3-year terms, for exploration, subject to tax of 2 cents per hectare; during this period concessionaire may select portion for exploitation. Period of exploitation is 30 to 40 years. *See also* *Oil, Paint and Drug Rep.*, vol. 102, July 24, 1922, p. 43. *Oil and Gas Jour.*, vol. 21, Aug. 17, 1922, p. 62. *Petrol. Times*, vol. 7, June 10, 1922, pp. 837-838; June 24, pp. 911-912; July 8, pp. 71-72. *Oil Trade Jour.*, vol. 13, Aug., 1922, pp. 19-20. *Mining Jour. (London)*, 138, July 22, 1922, p. 565. *Petrol. World (London)*, vol. 20, Jan., 1923, p. 40.
1210. PETROLEUM REFINER. Venezuelan Congress passes more favorable laws. Vol. 11, July 27, 1922, p. 10. Outline of provisions relating to leasing and royalties.

See also Nos. 1193, 1197, 1200, 1201.

MAPS

1211. McEVoy, PATRICK. Venezuela magnet for big companies. *Oil Trade Jour.*, vol. 14, April, 1923, pp. 13-15, 24. Tells of companies holding concessions in Lake Maracaibo district, and development progress made by each. Gives map showing location of concessions.
1212. PETROLEUM TIMES. British-Controlled Oil Fields, Ltd. Vol. 7, April 29, 1922, p. 575. Map of Buchivacoa, Venezuela, oil fields.

See also Nos. 1192, 1193, 1198, 1200, 1201.

OTHER COUNTRIES (129)

GUIANA

REFINING

See No. 1112.

LEGAL REGULATIONS

1213. LE COURRIER DE PÉTROLES. Le régime légal des recherches de pétrole. 4e Année, Oct. 13, 1923, pp. 2-3. Review of article by Georges Léon. Bull. de l'Inst. de pétrole. Summary of legal regulations relating to petroleum exploration and development in Tunis, Morocco, Indo-China, Madagascar, French West Africa, New Caledonia, and Guiana.

PARAGUAY

REFINING

See No. 1112.

URUGUAY

OCCURRENCE

1214. BOLETÍN DEL PETRÓLEO. Los yacimientos petroliferos. Vol. 15, Feb., 1923, pp. 148-152. Account of investigation and exploration. Outlines development of petroleum industry in Uruguay.

REFINING

See No. 1112.

EUROPE (130)

OCCURRENCE

1215. MORRIS, H. C., AND WHITE, DAVID. The petroleum industry in Europe, Asia, and Africa in 1922. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1241, April, 1923, pp. 100-119. Development.

See also No. 43.

PROPERTIES, REFINING, UTILIZATION

See Nos. 5532; 4890, 5941; 6390, 6451.

AUSTRIA (131)

OCCURRENCE

1216. LE COURRIER DES PÉTROLES. La Haute-Autriche serait riche en pétrole. 4e Année, June 30, 1923, p. 3. Reports that gas has been discovered in Upper Austria near Boecklabruck; geological investigations have proved the existence of rich petroleum deposits.
1217. OIL WEEKLY. Few workable oil fields located in borders of Austrian Republic. Vol. 27, Oct. 21, 1922, p. 90. From Allg. oesterr. chem. tech. Ztg., Aug. 14, 1922. States that drilling has produced some oil in Upper Austria and Salzburg. Natural gas only has been produced in Lower Austria.
1218. PETRASCHECK, WILHELM. Das Vorkommen von Erdöl und Erdgas in Deutsch-Oesterreich. Petrol. Ztschr., Jahrg. 19, April 1, 1923, pp. 296-299. Account of occurrence of petroleum and natural gas in German-Austria.
1219. PETROLEUM ZEITSCHRIFT. Erdgas und Erdölbohrungen in Neider-und Ober Österreich. Jahrg. 19, June 20, 1923, pp. 613-617. Survey of gas and oil indications; development; gas analysis. See also Chem. Abs., vol. 17, Aug. 20, 1923, p. 2776.

GEOLOGY

1220. LETSÖ, LADISLAUS. Das Erdgasfeld von Sarmasel. *Petrol. Ztschr.*, Jahrg. 19, Jan. 10, 1923, pp. 33-41; Jan. 20, pp. 61-67; Feb. 1, pp. 93-97. Contains history, geology, and geological cross sections. Gives production equipment and data. Describes shafts, cementing methods, and operation of gas wells and gas field.
1221. PETROLEUM ZEITSCHRIFT. Erdgas and Erdölbohrungen in Nieder- und Ober Österreich. Jahrg. 19, June 20, 1923, pp. 613-617. Account of early exploration and development at Wollmannsberg, Stockerau. Statement of oil indications in Upper Austria.
1222. SCHUMMAN, R. Neue Studien über die Erdgasgebiete in Nieder-Österreich. *Petrol. Ztschr.*, Jahrg. 19, July 1, 1923, pp. 648-656; July 10, pp. 683-687. Discusses use of gravimeter, and gives formulas for use; stratigraphy; results of tests recorded by gravimeter.
- See also* No. 1870.

DEVELOPMENT AND PRODUCTION

See No. 1220.

PROPERTIES

1223. GAULT, H., AND BOISSELET, L. The presence of carbon monoxide in the natural gas from Pechelbronn (France). *Mat. grasses*, t. 14, 1922, pp. 6058-6060. Analysis of natural gas from Russia, Austria, France, and from some States in United States reveals presence of CO, which probably exists to some extent in all natural gas. Content of Pechelbronn gas, 2.08 per cent CO. Discusses CO as a possible indication of petroleum origin.
- See also* Nos. 1219, 4145.

REFINING

See No. 4901.

LEGISLATION

1224. KERN, C. E. Austrian oil industry has been subjected to many recent changes. *Oil and Gas Jour.*, vol. 21, Dec. 28, 1922, p. 64. States of Succession have compelled oil companies to take nationality of State in which their property is situated. Discusses petroleum syndicates.

FRANCE (132)

See also Nos. 2988, 4987, 7396.

OCCURRENCE

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1235. LAURET, M. R. (Our liquid fuel resources.) *Outillage* (Paris), t. 280, Oct. 7, 1922, pp. 1312-1317. Resources of France and colonies in petroleum, shale, alcohol, and coal.
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1237. ——— Petroleum matters in France. Vol. 8, Dec. 2, 1922, p. 833. Oil similar to that found in Pennsylvania has been produced in Loire-Inférieure.
1238. ——— Petroleum in France. Vol. 7, April 15, 1922, pp. 503-504. Survey of petroleum indications in France. Map showing location of oil discoveries.

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1242. GÉNIE CIVIL. Résultats des sondages exécutés en Ligmagne pour la recherche du pétrole. T. 83, Sept. 29, 1923, pp. 303-304. Report of structure, stratigraphy, and development. Well logs.
1243. GLANGEAUD, P. Le sondage pétrolifère de crouelle près de Clermont-Ferrand (Puy-de-Dôme). Compt. rend., t. 176, March 19, 1923, pp. 816-820. Geological and stratigraphical conditions; well log. Concludes that oil has accumulated, by migration, in the top of synclines in the Oligocene formation. *See also* Génie civil, t. 82, March 31, 1923, pp. 309-310.
1244. JOURNAL DU PÉTROLE. L'opinion de M. Glangeaud sur les gisements d'Auvergne. 22e Année, Sept., 1922, p. 5. Includes history, stratigraphy, and conditions of occurrence.
1245. OIL, PAINT AND DRUG REPORTER. Oil discovered in France. Vol. 103, May 7, 1923, p. 48B. States that oil region at Limagne, Basse-Auvergne, has sandy subsoil which it is estimated will produce 500 tons of oil per acre.
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See also Nos. 1227, 1230.

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1249. JOURNAL DU PÉTROLE. Pechelbronn. 22e Année, Oct., 1922, pp. 3-4. Recovery of oil from a ton of Pechelbronn sand, yield by pumping methods and by use of galleries, 1916-1922.
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1251. PETROLEUM TIMES. The oil mines at Pechelbronn. Vol. 8, Oct. 21, 1922, pp. 613-614. Describes Pechelbronn field and working methods; plan of part of field showing shafts and galleries; production figures, 1906-1921.
1252. THE LAMP. Mining oil in Pechelbronn. Vol. 6, Oct., 1923, pp. 11-12. History of oil production; production methods; structure.
1253. SCHERESCHESKY, P. Les sources de gaz naturel du Bugey. La nature, Jan. 7, 1922, pp. 1-5. An account of the drilling of three wells at Vaux-en-Bugey, on the Rhone near Lyons, and discussion of prospects. Brief review of foreign supplies of natural gas.
See also Nos. 2973, 2975, 2976, 2985, 2987, 2991, 2992, 2994.

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1255. KARAGNEL, ALBERTO. Los puertos petroleros franceses. Bol. Petról., vol. 16, Sept., 1923, pp. 196-203. Gives location of oil-bunkering facilities on the coasts of France, Algeria, and Tunis. Maps of ports, showing location of equipment.
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1258. LA CHRONIQUE INDUSTRIELLE. L'exploitation des gaz hydrocarbures de Vaux-en-Bugey par la Société d'Études et de Recherches Petrolifères. 46e Année, Nov. 10, 1923, pp. 3-4. Constituents of natural gas from Vaux-en-Bugey, Department of Ain.
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- See also* Nos. 1223, 1226, 1237, 1241, 1247, 1301, 3662, 3951, 3954, 3984, 3993, 4088, 4244, 7304, 7330.

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1267. FROST, WESLEY. New fuel mixture for tractors in France. *Commerce Reports, Bur. For. and Dom. Comm.*, June 19, 1922, pp. 750-751. States that tests of new fuel have been successful. Formula is: Gasoline, 900; alcohol at 95°, 100; cyclohexanol, 17.5; phenol, 37.5.
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LEGAL REGULATIONS, LEGISLATION

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1281. **JOURNAL DU PÉTROLE.** Modification à la loi de 1810 pour les mines de pétrole. 23e Année, March, 1923, pp. 6-7. Revision of law of 1810 provides that a grantee may extend concession to permit exploration for hydrocarbon products for which he is not concessionaire; however, if this right is not exercised within six months it is canceled. New provisions are added. *See also* Jour. du pétrole, 23e Année, Jan. 1923, p. 5.
1282. ——— Une importante modification à la loi 1810-1880. 22e Année, April, 1922, pp. 3-4. Regulations regarding exploration and leasing.
1283. **OIL AND GAS JOURNAL.** France organizing oil trust with government cooperation. Vol. 22, Nov. 29, 1923, p. 113. Importers are required to maintain a reserve of one-fourth the consumption of previous year; French petroleum policy.
1284. **SOCIÉTÉ D'ENCOURAGEMENT POUR L'INDUSTRIE NATIONALE, BULLETIN.** La composition des mélanges alcool-essence livrés au public (carburant national). T. 135, June, 1923, pp. 451-452. Decree of May 31, 1923, which fixes the composition of alcohol-gasoline mixtures and conditions of their delivery to the public.
1285. ——— L'importation en France des essences. T. 135, June, 1923, pp. 447-450. Text of law of May 30, 1923, providing for the administration of the law of February 28, 1923, pertaining to the importation of petroleum oils and similar products.
- See also* No. 1254.

ECONOMICS, MAP, ORGANIZATIONS AND INSTITUTIONS

See Nos. 7306, 7826, 1301, 7803.

GERMANY (133)

See No. 7887.

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See also No. 1290.

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See also No. 2986.

STORAGE, DISTRIBUTION

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1300. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Market for petroleum products in Germany. Commerce Reports, July 30, 1923, pp. 284-285. Production of petroleum products as compared with consumption; importing regulations; marketing methods. *See also* Oil, Paint and Drug Rep., vol. 104, July 30, 1923, p. 47.

See also No. 3273.

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- 1303.** HOLTHUSEN, W. (Existence of natural gas in Neuengamme near Hamburg.) *Gas u. Wasserfach*, Jahrg. 65, pp. 161-165, 179-182; *Jour. usines gaz*, vol. 46, 1922, pp. 140-142. Analysis of gas. *See also Chem. Abs.*, vol. 16, July 10, 1922, p. 2212.

See also Nos. 1286, 1287, 3975, 4227, 7268.

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See also Nos. 1301, 3777, 3780, 4894, 4995, 5049, 5659.

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See also Nos. 3975, 5005, 6318, 7160, 7397.

STATISTICS

- 1306.** PETROLEUM ZEITSCHRIFT. Die Mineralöle in der deutschen Handelsstatistik seit 1920. Jahrg. 19, May 1, 1923, pp. 413-420.
- 1307.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. German petroleum production in 1922. *Commerce Reports*, July 16, 1923, p. 174. Production, though largest since 1916, was only 45,044 tons, or about 0.04 per cent of world's production. Gives marketing methods, duties, and licenses. *See also Nat. Petrol. News*, vol. 15, Aug. 8, 1923, pp. 59-60, 63. *Le courrier des pétroles*, 4e Année, June 30, 1923, p. 3. *Jour. Soc. Chem. Ind.*, vol. 42, Dec. 7, 1923, p. 1200.

See also No. 1304.

LEGISLATION

- 1308.** SCHMALTZ, D. Die deutschen Schiffahrtsbestimmung über den Transport von Erdölproduction. *Petrol. Ztschr.*, Jahrg. 19, July 20, 1923, pp. 731, 733. Discusses regulations regarding transportation by water of petroleum and its products.
- 1309.** ZEITSCHRIFT DES BAYERISCHEN REVISIONS VEREINS. (Storing of inflammable liquids.) Jahrg. 26, June 30, 1922, pp. 100-102. Regulations in Bavaria regarding storage of petroleum and other inflammable liquids.

MAP

See No. 1301.

GREAT BRITAIN (134)

OCCURRENCE

- 1310.** ICKES, E. L. Recent exploration for petroleum in the United Kingdom. *Min. and Met.*, vol. 4, Oct. 1923, p. 528. Account of exploration and development; petroleum indications. Summary of paper to be presented at the Tulsa meeting of the Inst. of Petrol Tech., Oct., 1923. *See also Eng. and Min. Jour.-Press*, vol. 116, Oct. 20, 1923, p. 681.
- 1311.** IMPERIAL MINERAL RESOURCES BUREAU. Petroleum and allied products (1913-1919). London, 1924. 300 pp. Deals with petroleum resources of British Empire. Burma, the chief producer, yielded 61 per cent of output of Empire in 1921, but only 1.12 per cent of world's production.
- 1312.** MATIER, H. A. England has not abandoned hope of securing a home production of oil in commercial quantity. *Petrol. World (Los Angeles)*, vol. 8, Aug., 1923, pp. 21, 62-64. Results of exploration in the British Isles; economic importance of fuel oil to England.
- 1313.** OIL AND GAS JOURNAL. Deep drilling in England and Scotland has had poor results. Vol. 21, Nov. 30, 1922, p. 79. Review of annual report of the British Secretary of Mines, which gives exploration progress in Derbyshire, North Staffordshire, and Scotland.
- 1314.** OIL, PAINT, AND DRUG REPORTER. Oil discovered in England. Vol. 103, April 30, 1923, p. 41. Shale with large oil content occurs in Ryedale district, Yorkshire.
See also No. 1699.

GEOLOGY

- 1315.** BROMEHEAD, C. E. N. The oil horizons of England. *Geol. Mag.*, vol. 60, July, 1923, pp. 297-307. Summary and details of oil horizons which are held to be: Lower Carboniferous rocks of Derbyshire, coal measures in various fields, and Upper Jurassic or Lower Cretaceous strata, the Sussex Weald. Bibliography.
- 1316.** GIFFORD, H. P. W. The recent search for oil in Great Britain. *Trans. Inst. Min. Eng.*, vol. 65, Aug. 1923, pp. 221-247; discussion 247-250. History of operations in Derbyshire, North Staffordshire, and Scotland; production of petroleum products in United Kingdom, 1913-1918. Well logs. Production of Hardstoft well and analysis. *See also Petrol. Times*, vol. 9, June 16, 1923, pp. 877-880, 882-883. *Nat. Petrol. News*, vol. 15, Sept. 12, 1923, pp. 75-76, 79-81; Sept. 19, pp. 83-84, 87-90, 93.
- 1317.** HILLS, H. P. D. Structural conditions in the Edinburgh oil field. *Petrol. Times*, vol. 7, May 27, 1922, pp. 733-734. Contains cross section of oil field and structural map.
- 1318.** PETROLEUM TIMES. The question of liquid oil in Norfolk. Vol. 10, July 28, 1923, pp. 135-137. Report on the possibility of finding oil on the property of the English Oil Fields, Ltd. Describes geology and oil indications. There is little likelihood of oil being found in commercial quantities in Carboniferous formations of England.
- 1319.** ——— Drilling for oil in Derbyshire. Vol. 9, June 2, 1923, pp. 793-795. Map showing oil concessions to Duke of Devonshire. Log of Hardstoft well in this area, which is producing.
- 1320.** ——— Mineral oil in Scotland. Vol. 9, March 3, 1923, p. 306. Special Reports of the Mineral Resources of Great Britain, *Mem. Geol. Survey Scotland*, vol. 24. 1921-22, pp. 43-56. Geologic structure of the principal petroleum occurrences in Scotland; indications are found chiefly in coal deposits.

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1322. GOULD, FRANK. Oils and gasoline from shale in Scotland. *Manufac. Rec.*, vol. 84, Oct. 11, 1923, pp. 85-86. Account of Scottish shale industry; methods of mining and retorting shale.

TRANSPORTATION

1323. LONDON TIMES TRADE SUPPLEMENT. Welsh oil industry has new refinery at Swansea. Vol. 10, July 1, 1922, p. 317. Detailed description of transportation and refining system, and outlay of plant where Persian oil is treated.
1324. OIL ENGINEERING AND FINANCE. The oil ports of Great Britain. Vol. 4, Nov. 3, 1923, pp. 441-456; Dec. 1, pp. 515-521. Describes oil-handling facilities at Liverpool, Manchester, Portishead, and Avonmouth.
- See also* Nos. 3217, 3288, 3459.

PROPERTIES

1325. BRITISH ENGINEERING STANDARDS ASSOCIATION. Four special specifications for fuels of heavy-oil engines. 28 Victoria St., London, S. W.
1326. IMPERIAL INSTITUTE OF GREAT BRITAIN. Petroleum. London, 1921. 110 pp. Monograph. General discussion of characteristics of petroleum, its occurrence and refining. Production statistics by countries. Detailed consideration of sources of petroleum in British Empire and its dependencies. Contains information regarding the past, present, and future production of each country. Map.
1327. PETROLEUM TIMES. The crude oil of Scotland's well. Vol. 7, June 24, 1922, p. 889. Analysis of crude oil from well at D'Arcy, near Edinburgh.
1328. ——— Important strike of oil in Scotland. Vol. 7, May 13, 1922. pp. 649-650. Oil is similar to Hardstoft oil, but contains more paraffin and light oils.
1329. ——— Oil production in Derbyshire. Vol. 7, May 6, 1922, p. 613. Detailed analysis of Hardstoft crude petroleum.
- See also* Nos. 740, 1301, 1316, 1321, 3817, 3999, 4072, 4073, 4086, 4145, 4263, 4264, 4831.

REFINING AND REFINERIES

1330. AYKROYD, H. E. The significance of England's oil shales. *Petrol. Times*, vol. 7, April 29, 1922, p. 576. Possibilities of oil production from Norfolk shales and discussion of a method of removing sulphur.
1331. BROWNLIE, DAVID. Low-temperature carbonization in England. *Chem. and Met. Eng.*, vol. 26, Jan. 4, 1922, pp. 23-27. Survey of British practice in carbonization of coal at low temperatures. Detailed description of experimental plant of Low-Temperature Carbonisation, Ltd., at Barugh, near Barnsley.
1332. CANADIAN CHEMISTRY AND METALLURGY. Oil refining in Wales. Vol. 6, Sept., 1922, p. 209. Brief description of refining industry at Skewen, Swansea, Wales, where Persian oil is used.
1333. COULTER, L. J. Break theories in Britain. *Petrol. Age*, vol. 12, Sept. 1, 1923, pp. 13-14. Describes refining industry at Llandarcy, South Wales.
1334. LONDON TIMES TRADE SUPPLEMENT. Oil refining in Wales. The new works at Skerven. Vol. 10, July 22, 1922, *Eng. Soc.*, p. 181. Plan and description of refinery.

- 1335.** MATIER, H. A. With the opening of her new \$18,000,000 refinery at Llandarcy, operating on California crude, England takes another forward step in the world-wide petroleum program. *Petrol. World* (Los Angeles), vol. 8, Sept., 1923, pp. 18-20, 40. Main features of plant; general discussions of conditions in British refining industry; outlook.
- 1336.** PETROLEUM TIMES. The Anglo-Persian Company's new refinery. Vol. 8, July 1, 1922, pp. 5-12. General description of equipment and systems for transportation and refining of oil and provisions for protection from fire; plan of refinery at Llandarcy, Wales. *See also* *Nat. Petrol. News*, vol. 14, Sept. 13, 1922, pp. 37, 39-40.
- 1337.** ——— The Anglo-Persian Oil Company, Ltd. Vol. 7, June 17, 1922, pp. 849-851. General description of refinery, and some methods for treatment of oils.
- 1338.** SOCIETY OF CHEMICAL INDUSTRY, JOURNAL. Llandarcy refinery of the Anglo-Persian Oil Co. Vol. 42, May 18, 1923, pp. 482-486. Method of handling and refining Persian crude oil at refinery in Wales. Illustrations. *See also* Nos. 1301, 1322, 1323, 4831, 4847, 4873, 4878, 4889, 4894, 4906, 5017, 5022, 5025, 5034, 5055, 5043, 5047, 5044, 5045, 5046.

UTILIZATION

- 1339.** LE COURRIER DES PÉTROLES. Les carburants en Angleterre. 3e Année, Jan. 28, 1922, pp. 1-2. Report of Fuel Research Board upon the fuel resources and possibilities of the British Empire.
- 1340.** LONDON TIMES TRADE SUPPLEMENT. Substantial decline in prices. Vol. 10, Jan. 21, 1922, *Eng. Soc.*, p. 13. Production of English wells; progress of oil exploration in England; successful use of oil in replacement of coal for industrial and railway uses.
- 1341.** SOCIETY CHEMICAL INDUSTRY, JOURNAL. Fuel for motor transport. Second Memorandum by the Fuel Research Board, Department of Scientific and Industrial Research, London, 1921, 16 pp. Vol. 41, Jan. 16, 1922, p. 13R. Discusses possibility of producing alcohol as an alternative for petrol. Tells of various products which yield 95 per cent of alcohol per ton and gives number of gallons per ton yielded by each. Considers other resources existing in British Dominions and Colonies. *See also* Nos. 6066, 6237, 7289, 7302, 7337.

STATISTICS

- 1342.** THOMPSON, A. B. Good prospects for British oil. *Ind. Australian and Min. Stand.*, vol. 67, Jan. 26, 1922, p. 173.
- 1343.** TOWLES, J. K. Petroleum trade and industry of the United Kingdom. Department of Commerce, Trade Information Bull. 80, Jan. 29, 1923, 18 pp. Pamphlet. Production; imports and importing companies; marketing methods; legal regulations.

LEGAL REGULATIONS, LEGISLATION

- 1344.** LE COURRIER DES PÉTROLES. La législation anglaise concernant la pollution des eaux par l'huile. 3e Année, Dec. 9, 1922, p. 3. British legislation regarding pollution of navigable waters by oil and transshipping of oil by night.
- 1345.** KERN, C. E. La exclusión de las compañías Americanas en territorios Británicos. *Bol. Petról.* vol. 15, May, 1923, pp. 394-397. Review of laws and conditions affecting exploration of petroleum land by Americans.
- 1346.** MARINE ENGINEERING. British regulations against the discharge of oil into navigable waters. Vol. 27, Nov., 1922, pp. 727-728. From Transportation Div., Dept. of Commerce, Washington, D. C. Rules and penalties relating to discharge or transfer of oil on navigable waters.

- 1347.** OIL AND GAS JOURNAL. British oil pollution act effective Jan. 1. Vol. 21, Oct. 5, 1922, p. 84. Law provides penalties for escape or discharge of oil from ships or land into navigable waters, and forbids transfer of oil by night.
- 1348.** OIL WEEKLY. New regulations for drilling in England. Vol. 26, Sept. 2, 1922, p. 14. New regulations give oil rights to land owners, and licenses to drill will be granted to companies or individuals who have leased property.
- 1349.** SKINNER, R. P. Oil pollution legislation in Great Britain. Commerce Reports, Bur. For. and Dom. Comm., Oct. 2, 1922, p. 22. Résumé of law and penalty for the prevention of pollution of navigable waters.
- 1350.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. British regulations for bulk storage of petroleum products, issued April, 1921. Refer to file No. 69480.

ECONOMICS

- 1351.** CUNNINGHAM-CRAIG, E. H. Empire resources in oil. Canadian Min. Jour., vol. 44, Dec. 14, 1923, pp. 982-983. Discusses importance and value of torbanite deposits as source of fuel oil.
- See also* No. 5001.

MAP

See No. 1301.

POLAND (135)

See also Nos. 2600, 7887.

OCCURRENCE

- 1352.** LE COURRIER DES PÉTROLES. L'industrie polonaise du pétrole. 4e Année, Sept. 22, 1923, pp. 3-4. Present state and review of development of Galician oil fields; location of principal fields; refining industry; cross section from Schodnica-Mraznica-Boryslaw regions.
- 1353.** FRIEDL, KARL. Future of the Galician petroleum industry. Oil Eng. and Fin., vol. 2, 1922, pp. 353-358. Geological description of Galician oil fields; oil contents of various sections. Notes indications of undiscovered oil deposits in Galicia. Chem. Abs., vol. 16, Dec. 10, 1922, p. 4332.
- 1354.** PETROLEUM WORLD (LONDON). Poland. Vol. 20, April, 1923, pp. 148-149. Estimated oil deposits of Polish Carpathian region, and production in the Boryslaw-Tustanowice district of Galicia.
- 1355.** POLISH PETROLEUM OFFICE, GEOLOGICAL DEPARTMENT. Les gisements pétrolières et les eaux souterraines en relation avec la géologie de Boryslaw. Bull. 5. Krakow, 1922. Gives extent of Polish oil fields, names of oil zones, and possible future production. *See also* Petrol. World (London), vol. 19, Feb., 1922, p. 82.
- 1356.** ROYAL SOCIETY OF ARTS, JOURNAL. Mineral-wax production in Poland. Vol. 71, Aug. 10, 1923, pp. 671-672. Only commercial deposits of ozokerite are in Poland, chiefly in Boryslaw region, Galicia; physical properties; production and export figures. *See also* Chem. Trade Jour. and Chem. Eng., vol. 71, Sept. 8, 1922, p. 290.
- 1357.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Mineral-wax production in Poland. Commerce Reports, July 31, 1922, p. 309. The only commercial deposits of ozokerite occur in Boryslaw district, Galicia; production.
- See also* No. 1699.

GEOLOGY

- 1358.** FRIEDL, KARL. Die regionale Verteilung des Erdöls in der galizischen Sandsteinzone. Petrol. Ztschr., Jahrg. 19, June 1, 1923, pp. 527-534. Survey of oil occurrence in Galician sandstone strata.

- 1359.** FRIEDL, KARL. Zur Deutung der westgalizischen Erdölvorkommen. *Petrol. Ztschr.*, Jahrg. 19, March 1, 1923, pp. 185-191. Describes petroleum regions of the Carpathians in western Galicia. Discusses geology and theory of origin. Region described is bounded on east by Sambor and Turka and on west by Krakau and Neumarkt. States that production comparable with that of Boryslaw fields is not likely.
- 1360.** ——— Die Entstehung des karpathischen Erdöls. *Petrol. Ztschr.*, Jahrg. 18, July 20, 1922, pp. 893-903. Describes oil horizons; observations concerning occurrence of petroleum in Carpathian region. Presents theory that Menilite shale is original source of petroleum of this section. *See review in Le courrier des pétroles, 3e Année, Nov. 25, 1922, pp. 2-3.*
- 1361.** HENTZE, E. Beiträge zur Kenntnis der "Oelschiefer." *Petrol. Ztschr.*, Jahrg. 18, Oct. 10, 1922, pp. 1233-1247. Economic importance of oil shales in general; geological conditions relating to occurrence; geologic map giving shale deposits in region of Baltic Sea. Characteristics and properties of kukkersite.
- 1362.** THE LAMP. Poland, a land of human interests. Vol. 6, June, 1923 pp. 17-25. Outlines economic and general conditions in Poland. Discusses geological conditions in oil fields. Gives production methods. Map and illustrations, *See also Oil News, vol. 11, July 20, 1923, pp. 37-38, 45. Oil and Gas Jour., vol. 22, July 26, 1923, pp. 20, 114-115.*
- 1363.** PETRASCHKE, WILHELM. Neue Erfahrungen and Richtlinien zur Erdölgeologie in den Karpathen. *Petrol. Ztschr.*, Jahrg. 18, Aug. 1, 1922, pp. 933-936. Describes structural conditions in region of Boryslaw oil fields. Observations show that tuffit deposits may be taken to indicate Miocene anticlines and used for basis of determining depth of Miocene formation.
- 1364.** RICHOUX, GEORGES. Les pétroles galiciens. *Chim et ind., Special Number, May, 1923, pp. 97-114.* (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922). History of petroleum development in Galicia; map showing the location of fields, geology, pumping and refining practices, illustrations.
- 1365.** ROMER, E. Le pétrole des Carpathes polonaises, par Jan Nowak. Dislocations transverses et directions tectoniques des Carpathes polonaises, par K. Tolwinski. *Travaux géographiques, liv. 6, 1922, pp. 49-78.* Geology of the Polish Carpathians.
See also Nos. 1352, 1353, 1355, 1370.

DEVELOPMENT AND PRODUCTION

- 1366.** MILLAR, ALBERT. Galicia and its petroleum industry. *Jour. Inst. Petrol. Tech.*, vol. 8, July, 1922, pp. 312-341; discussion, pp. 342-348. General survey of petroleum industry in eastern and western Galicia. Gives history, geology, methods of deemulsification, production and refining statistics, laws, transportation and storage, and physical properties of petroleum products. Maps. *See also Petrol. Times, vol. 7, April 15, 1922, pp. 511-512; April 22, p. 556. Oil and Gas Jour., vol. 20, May 4, 1922, pp. 94, 96, 98, 100. Mining Jour. (London), vol. 137, April 22, 1922, p. 301; May 6, pp. 336-337; May 13, p. 359; May 20, p. 382; May 27, p. 404.*
- 1367.** NICLOUX, GEORGES. Galician petroleum. *Chim. et ind. Special Number, May, 1923, pp. 97-114.* Describes Galician oil field and production methods.
See also Nos. 2211, 2579.

TRANSPORTATION AND STORAGE

See No. 1366.

PROPERTIES

- 1368.** BARTOSZEWICZ, STEFAN. Petroleum industry in Poland. *Petrol. Times*, vol. 9, Jan. 20, 1923, pp. 79-82. Gives properties of oil in different districts, and the production for 1919-1921. Map showing location of oil districts and wells.
- 1369.** FORMÁNEK, JAROSLAV. (Benzine and mineral lubricants.) Tr. from the German by Charles Salter. London, 1921, 256 pp. Describes methods of handling oil in the Galician fields and refineries. Gives testing methods. Chapters include: Judging mineral lubricating oils; Properties and uses of fuels; Consumption and efficiency of various fuels in internal-combustion engines; Safe storage of gasoline and benzol, brown coal, shale, and peat-tar products.
- 1370.** FRIEDL, KARL. Geologische Betrachtungen zu den analysen von galizischen Erdölen. *Petrol. Ztschr.*, Jahrg. 19, May 10, 1923, pp. 452-454. Effect of geological conditions on the properties of Galician petroleum. Analyses of oils from upper and lower strata show oil from lower strata to be heavier, richer in paraffin, and more deficient in gasoline.
- 1371.** ROSNER, L. Verarbeitung und Analysen von galizischen Spezial-Erdölen. *Petrol. Ztschr.*, Jahrg. 19, April 1, 1923, pp. 291-296. Properties and analyses of Bitkow, Mraznica, Rowne, and Wankowa crudes; products; tabulated data.

See also Nos. 1356, 1366.

REFINING

- 1372.** FITZ, I. Zur Modernisierung der polnischen Erdölbetriebe. *Petrol. Ztschr.*, Jahrg. 19, Aug. 1, 1923, pp. 765-767. An account of production and refining methods recently introduced into Poland.

STATISTICS

- 1373.** BARTOSZEWICZ, STEFAN. The Polish oil industry. *Petrol. Times*, vol. 10, Sept. 29, 1923, p. 466; Oct. 13, p. 526. General survey of refinery output and production of fields; recent exploration and development.
- 1374.** ——— Oil industry in Poland. *Petrol. Times*, vol. 9, March 24, 1923, pp. 417-418. Production statistics by districts for 1921-1922; production and exportation statistics of petroleum products for 1921-1922. See also Commerce Reports, Bur. For. and Dom. Comm., April 23, 1923, pp. 242-243.
- 1375.** PETROLEUM REFINER. The Polish petroleum industry. Vol. 12, Jan. 25, 1923, pp. 3-6. Present status of petroleum industry in the Boryslaw, Drohobycz, Jaslo, and Stanislawow fields; production of Galicia, 1907-1921.
- 1376.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Polish petroleum industry in 1922. *Suppl. Commerce Reports, Trade Inf. Bull.* 135, Aug. 13, 1923, 9 pp. Pamphlet. Review of general conditions in petroleum industry; production statistics by localities and by months, 1921, 1922. Ozokerite production, 1890-1922.
- 1377.** ——— Poland. *Suppl. Commerce Reports, Trade and Econ. Rev.*, 1922, No. 39, pp. 25-27. Pamphlet. Statistics of petroleum, natural gas, and ozokerite.

See also Nos. 1357, 1366.

LEGAL REGULATIONS, LEGISLATION

- 1378.** BARTOSZEWICZ, STEFAN. The decrease in Poland's crude-oil production. *Petrol. Times*, vol. 7, May 20, 1922, p. 692. Notes that Boryslaw-Tustanowice region is falling off in production and suggests that development of new fields is means of remedying situation. Gives terms of exploration grants by Government.
- 1379.** LE COURRIER DES PÉTROLES. L'accord Franco-Polonais relatif aux industries du naphte. 4e Année, Sept. 22, 1923, pp. 1-2. Provisions of Polish-French petroleum treaty. Map showing petroleum districts of Poland.
- 1380.** ——— Ordonnance polonaise relative au séquestre du pétrole. 3e Année, Sept. 9, 1922, p. 5. Ordinance relating to royalties; deliveries at present are suspended.
- 1381.** LE TALLEC, PAUL. The petroleum industry in Poland. *Oil and Gas Jour.*, vol. 21, Oct. 19, 1922, pp. 94, 96, 98. Contains terms of concession granted by Polish Government for exploration and exploitation of oil lands; largest part of land is owned by Government. Surveys present conditions. *See also Oil Trade Jour.*, vol. 13, Dec., 1922, pp. 46, 48, 94.
- 1382.** OIL WEEKLY. Polish Government to make large oil concessions. Vol. 26, Sept. 23, 1922, p. 74. Approximately 5,000 acres will be leased to an applicant; drilling must be started during second year. Government is to receive a percentage of all oil; lease is for 25 years but may be extended. *See also Oil and Gas Jour.*, vol. 21, Oct. 5, 1922, p. 116. *Oil Age*, vol. 18, Oct., 1922, p. 24.
- 1383.** PETROLEUM TIMES. The oil industry in Poland. Vol. 9, June 23, 1923, p. 942. Law has been passed which gives the State first right to purchase royalty oil from royalty owners. *See also Oil, Paint and Drug Rep.*, vol. 104, Aug. 13, 1923, p. 48. *Nat. Petrol. News*, vol. 15, Aug. 22, 1923, p. 42.
- 1384.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Obligatory sale of crude oil to Polish state refinery. *Commerce Reports*, No. 36, Sept. 3, 1923, p. 621. Statute, effective May 1, requires that producers state amount of production and furnish other data to State Oil Bureau which must signify whether or not it will buy the production; if it does not purchase, the oil is then available for general market.
See also No. 1366.

ECONOMICS

- 1385.** OIL WEEKLY. Production in Poland now below refinery capacity as country continues decline. Vol. 30, Aug. 25, 1923, p. 16. Slow development and declining production in old wells has reduced output. Discusses part played by foreign capital. Suggests that reform policy of Government would foster development.
- 1386.** WIDOMSKI, STANISLAW. Poland's oil industry. *Rig and Reel Mag.*, vol. 5, May, 1923, pp. 2-4. Economic importance of Polish petroleum resources and outlook for future development.

DIRECTORY

- 1387.** LE COURRIER DES PÉTROLES. Les capitaux français dans l'industrie polonaise du pétrole. 4e Année, Sept. 22, 1923, pp. 5-12. List of oil companies and of refineries in Galicia.

MAPS

See Nos. 1362, 1364, 1368.

RUMANIA (136)

OCCURRENCE

- 1388.** LE COURRIER DES PÉTROLES. Richesses pétrolifère de la Roumanie. Supplement, 3e Année, Sept. 23, 1922, 4 pp. Production in Rumania, 1868-1892, 1920, 1921. Discusses Rumanian oil fields and general condition of industry.
- 1389.** ROTTEN, HENRY. The Rumanian petroleum industry. Rig and Reel Mag., March, 1922, pp. 10-13. General review of the industry; statistics.

GEOLOGY

- 1390.** CUNNINGHAM-CRAIG, E. H. The riddle of the Carpathians. Jour. Inst. Petrol. Tech., vol. 9, Aug., 1923, pp. 274-276. States that salt domes in this region afford opportunities for study of their origin and formation, evidences of vertical and tangential pressures, and the relation of petroleum to salt. Solution of these problems will simplify the location of oil fields. Address at Oil Conference of the Sixth Internat. Min. Exhib., London, June, 1923. Abstract in Petrol. Times, vol. 9, June 9, 1923, p. 833.
- 1391.** HAYNES, W. P. Geological work in the Carpathians. Bull. Am. Assoc. Petrol. Geol., vol. 6, Nov. Dec., 1922, pp. 523-532. Summarizes topography and geology. Tells of extent of current geological examinations. Geological maps and tables.
- 1392.** MASON, S. L. The Rumanian oil fields. Oil Trade Jour., vol. 14, Nov., 1923, pp. 64, 66, 80, 82. Paper before Am. Assoc. Petrol. Geol., Los Angeles, Sept., 1923. Notes that conditions in Rumanian oil fields are similar to those in Gulf Coast salt dome regions. *See also* Petrol. Times, vol. 10, Nov. 17, 1923, pp. 693-696.
- 1393.** PETRASCHECK, WILHELM. Neue Erfahrungen und Richtlinien zur Erdölgeologie in dem Karpathen. Petrol. Ztschr., Jahrg. 18, Aug. 1, 1922, pp. 933-936. General description of geological formations of this region. Tuffite strata appear to occur in the deepest part of the thick and uniform Miocene layers. States that evidence contained in the tuffite leads to discovery of anticlines in the Miocene.
- 1394.** VOITESTI, I. P. The petroleum deposits in the Carpathian regions. Petrol. Times, vol. 9, June 16, 1923, pp. 901-903. Résumé of paper before Sixth Internat. Min. Conference. Describes petroleum formations and their relation to salt domes; petroleum is believed to have migrated and accumulated in porous rocks of suitable structure.
- 1395.** VOITESTI, I. P., AND TRAUTH, FRIEDRICH. Grundzüge der Geologie Rumäniens mit besonderer Berücksichtigung der Östlichen Karpathen. Petrol. Ztschr., Jahrg. 18, May 10, 1922, pp. 533-539; May 20, pp. 582-589; June 1, pp. 643-649; June 10, pp. 691-695; June 20, pp. 752-761; July 1, pp. 798-804; July 10, pp. 858-861. Study of structure; structural map. Gives geological history. Bibliography.
- See also* Nos. 1818, 1819, 1887.

DEVELOPMENT AND PRODUCTION

- 1396.** THE LAMP. Petroleum in Rumania. Vol. 5, Oct., 1922, pp. 11-17. Discusses economic conditions, drilling methods, and equipment. Gives production, 1910, 1921, and development companies. *See also* Gas Industry, vol. 17, Feb., 1923, pp. 45D-53.
- 1397.** OIL AND GAS JOURNAL. Rumanian oil industry of present day. Vol. 21, Nov. 16, 1922, pp. 11, 104-107. Status of production and refining conditions; production problems.

1398. OIL AND GAS JOURNAL. Rumania offers fertile oil territory. Vol. 20, May 25, 1922, pp. 14, 114. Review of statement by J. F. Mason. Account of general conditions, drilling methods, and regulations.
1399. PETROLEUM REFINER. Interesting description of how oil wells are dug in Rumania. Vol. 12, Nov. 30, 1922, p. 5. Practices employed in sinking wells by hand.
1400. STAUSS, K. Die Rohöl-Emulsion von Tzintea. Petrol. Ztschr., Jahrg. 19, April 10, 1923, pp. 327-331. Treatment and methods of handling crude-oil emulsion from a Rumanian field.
- See also* No. 2982.

STORAGE AND TRANSPORTATION

1401. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Exportation of petroleum products from Constantza, Rumania. Commerce Reports, No. 20, May 14, 1923, p. 444. Tells of storage tanks owned and rented by Government in addition to privately owned facilities.

PROPERTIES

1402. OIL TRADE JOURNAL. Refining of Rumanian crude oil analyzed. Vol. 14, Nov., 1923, p. 68. From report to Inst. of Geol. Products of Rumanian crude oil; refinery production statistics.
1403. PREDESCU, C. (A study of the illuminating power of Rumanian kerosene.) Bull. sec. sci. acad. Roumanie, vol. 7, 1921, pp. 49-73. Data on photometric and spectrophotometric experiments. *See also* Chem. Abs., vol. 16, June 10, 1922, p. 1860, 1861.
- 1404-1405. SCHMITZ, EDMOND. (Rumanian petroleums.) Mat. grasses, vol. 14, 1922, pp. 6214-6219, 6236-6238, 6264-6265, 6295, 6297, 6324, 6326; vol. 15, 1923, pp. 6386-6387. Analyses.
- See also* Nos. 50, 1389, 4105.

REFINING AND REFINERIES, UTILIZATION

See also Nos. 5422, 5513; 6135.

STATISTICS

1406. JOHNSTON, LOUIS. Rumanian oils. Oil Eng. and Fin., vol. 3, Jan. 13, 1923, pp. 19, 20. Production statistics.
1407. REDFERN, G. Rumanian petroleum production in 1921. Commerce Reports, Bur. For. and Dom. Comm., Mar. 20, 1922, pp. 700-701. Gives production, export figures, and brief general review of conditions.
- See also* Nos. 1389, 1396, 1402, 1410.

LEGAL REGULATIONS AND LEGISLATION

1408. BIGELOW, D. F. Rumanian petroleum industry in 1921. Bur. For. and Dom. Comm., Suppl. Commerce Reports, Trade Inf. Bull. 45, July 10, 1922, 11 pp. Pamphlet. Refinery and production statistics. Number and distribution of wells. Data on imports and exports. Legal regulations. Directory of chief operating companies and their output, 1920-1921.
1409. LE COURRIER DES PÉTROLES. La Roumanie pétrolifère. 4e Année, Oct. 27, 1923, pp. 1, 2. Contains map of Rumanian oil region.
1410. ——— Victoria. (Société anonyme française pour l'exploitation, l'industrie, le commerce, et le transport du pétrole.) 3e Année, Jan. 7, 1922, pp. 1-4. Supplement. Map showing property under development in Rumania; production data.

1411. JOHNSTON, LOUIS. The Rumanian petroleum industry. *Petrol. Times*, vol. 9, July 7, 1923, pp. 5-8. Official report for 1922; production, development, and legislation.
1412. PETROLEUM TIMES. Rumania's new oil regulations. Vol. 9, June 16, 1923, p. 888. Petroleum prices and export regulations revised in new constitution. *See also* *Nat. Petrol. News*, vol. 15, Aug. 8, 1923, p. 95.
1413. STEINER, G. Field man must be university graduate here. *Oil Weekly*, vol. 31, Dec. 22, 1923, pp. 13-14. Conditions in the Rumanian fields; government regulations regarding development. *See also* *Bol. Petról.*, vol. 16, Dec., 1923, pp. 390-392.
1414. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Rumania's important new legislation. *Commerce Reports*, No. 16, April 16, 1923, pp. 151-152. Reports that underground resources have been nationalized by provision in new constitution; rights already held are subject to a new mining law yet to be framed. *See also* *Petrol. Times*, vol. 9, March 31, 1923, pp. 445-446.
1415. ———. New Rumanian regulations available. *Commerce Reports*, No. 11, March 12, 1923, p. 689, File 84,259. Regulations specify proportions of domestic refinery production for export and for home consumption, and fix maximum price for the sale of the latter. *See also* *Petrol. Times*, vol. 9, Feb. 3, 1923, p. 153.

See also No. 1398.

MAP

1416. PETROLEUM TIMES. The oil fields of Rumania. Vol. 10, Sept. 22, 1923, pp. 409-410. Brief survey of development of oil industry in Rumania; map of main oil region.

RUSSIA (137)

See also Nos. 5512, 7887.

OCCURRENCE

1417. ALDERSON, V. C. Oil shale in Russia. *Colorado Sch. of Mines Quart.*, vol. 17, Oct., 1922, p. 15. Location of five known deposits of commercial importance. Deposit at Ostaschkow is most accessible; analyses. *See also* *Petrol. Times*, vol. 8, Nov. 25, 1922, p. 796. *Min. Cong. Jour.*, vol. 8, Oct., 1922, p. 990. *R. R. Red Book*, vol. 39, Nov., 1922, pp. 987-989.
1418. BALL, S. H. Nonmetallic mineral wealth of Russia. *Eng. and Min. Jour.-Press*, vol. 114, Dec. 2, 1922, pp. 985-989. Includes description of petroleum, coal, and peat resources of Russia.
1419. HIMMELFACT, A. J. (Gas deposits in the northern portion of Taurida Province and the exploitation thereof.) *Petrol. Shale Jour. (Russia)*, vol. 111, 1922, p. 187; *Jour. Inst. Petrol. Tech.*, vol. 9, June, 1923, p. 157A. Gas, composed chiefly of methane, was encountered while drilling water well; tests will be necessary to establish importance of area. Crimean gas fields (Perekop Isthmus, Sivash, and Kertch), are believed to be a part of the above field.
1420. VON ANTROPOFF, A. Die Ölschieferlager und die Ölschieferindustrie in Estland. *Ztschr. angew. Chem.*, Jahrg. 35, Nov. 10, 1922, pp. 647-651. Location and origin of oil-shale deposits; properties analysis, uses, and distillation methods. Maps and illustrations.
1421. VON ZUR MÜHLEN, L. Die Verbreitung der Ölschiefer im östlichen Teile des europäischen Russlands. *Petrol. Ztschr.*, Jahrg. 18, Dec. 20, 1922, pp. 1477-1482. Description of and important facts concerning the oil-shale regions of eastern Russia; analyses.

GEOLOGY

1422. JAHN, J. J. Ueber die Erdölvorkommen in Karpatho-Russland. *Petrol. Ztschr.*, Jahrg. 18, Aug. 20, 1922, pp. 1029-1035. History of development, and stratigraphical conditions in the regions of Luga and Jasina. Describes properties of the oil. *See also* *Chem. Abs.*, vol. 17, Jan. 10, 1923, p. 204.
1423. MADGWICK, T. G. Some aspects of the occurrence of oil in Russia. *Jour. Inst. Petrol. Tech.*, vol. 9, Feb., 1923, pp. 2-32. Geology of the Caucasus, Baku, Terek, Georgia, Transcaspia, and Turkestan, Emba, Volga, and Ukhta oil districts. *See also* *Petrol. World* (London), vol. 20, Jan., 1923, pp. 32-36. *Mining Mag.*, vol. 28, Feb., 1923, pp. 117-121; March, pp. 181-183. *Petrol. Times*, vol. 8, Dec. 23, 1922, pp. 923-924; Dec. 30, 1922, pp. 975-977. *Chem. Trade Jour. and Chem. Eng.*, vol. 71, Dec. 15, 1922, p. 738.
1424. PETROLEUM AND OIL-SHALE INDUSTRY (MOSCOW). (Outline of the transactions of the geological section of the First All-Russian Congress of oil operators.) Vol. 3, No. 7-8, pp. 383-422. "Articles dealing with Ural, Terek, Kuban, Transkaspian, Ferghana, Ukhta, and Volga districts."
1425. ——— (Paper and debates on question of organization.) Vol. 3, Nos. 7-8, pp. 368-382. "Symposium of the following articles: Draft of regulations to prevent invasion by water of oil-bearing strata to be enforced in producing oil fields; I. N. Strizhoff: Report on activities of geological and development section of 'Azneft,' and organization and methods of investigating oil wells; M. V. Abramovitch: Report on carrying out of oil-field investigation program; instructions on preparation of sections and well records; discussions (in Russian)."
- See also* Nos. 1541, 1880.

DEVELOPMENT AND PRODUCTION

1426. LE COURRIER DES PÉTROLES. La situation actuelle de l'industrie pétrolière de l'île de Tchéléken. 3e Année, Nov. 4, 1922, pp. 2-3. Development and production of ozokerite deposits.
1427. INSTITUTION OF PETROLEUM TECHNOLOGISTS, JOURNAL. Shales and phosphorites in east of the Volga River and "Syrt" region. Vol. 9, April, 1923, pp. 118A-119A. Abstract of paper by A. Rozanov before First All-Russian Congress, Jan., 1922. Report on examination of deposits, and conclusions regarding suitable production methods.
1428. PETROLEUM ZEITSCHRIFT. Ueber die bergmännische Gewinnung des Erdöles in Russland. Jahrg. 19, Dec. 10, 1923, pp. 1242-1243. Report on progress and development of oil mining in Russia.
1429. SVMINOFF, V. C. Russian drilling methods. *Rig and Reel Mag.*, vol. 5, Oct., 1923, pp. 4-5; Nov., pp. 2-3. Russian percussion drilling or pole-tool system is still used in majority of operations, but rotary and cable drilling are being introduced. Primitive cementing methods; tools. Illustrations.
- See also* Nos. 1425, 2810, 2873.

PROPERTIES

1430. EGLOFF, GUSTAV. The cracking of Tarakan crude oil. *Petrol. World*, vol. 20, June, 1923, pp. 235-241. Chemical properties of Tarakan oil; apparatus used in conducting the Dubbs process; data on results. Illustrations and diagrams.
- 1431-1432. INSTITUTE PETROLEUM TECHNOLOGISTS, JOURNAL. Examination of Volga shale. Vol. 9, April, 1923, p. 119A. Analysis.

- 1433.** PETROLEUM AGE. Crude oil. Vol. 10, Dec. 15, 1922, p. 37. Properties of Russian crude oils.
- 1434.** VALGIS, V. K. (On the utilization of nitrogen contained in Russian shales). Petrol. and Oil-Shale Ind. (Moscow), vol. 4, 1923, pp. 88-97. "Experiments with two specimens of shale from Weimarn and Volga in order to determine distribution of nitrogen in products of their dry distillation, and conditions giving maximum percentage of ammonia."
- See also* Nos. 50, 1223, 1417, 1421, 3572, 3731, 3735, 3789, 4109, 4113.

REFINING

- 1435.** INSTITUTION PETROLEUM TECHNOLOGISTS, JOURNAL. Treatment of petroleum with special reference to Grozny conditions. Vol. 9, April, 1923, pp. 105A-106A. Abstract of paper by M. Markovitch before First All-Russian Petroleum Congress, Jan., 1922. Describes methods of extracting benzine from crude petroleum by condensation or compression after blowing through inert gas; method is employed for debenzination of petroleum in field to prevent loss of lighter constituents while in storage.
- See also* Nos. 1430, 3652, 5265, 5374, 5428, 5758, 5761.

UTILIZATION

- 1436.** OIL AND GAS JOURNAL. Russia to use schist. Vol. 22, July 19, 1923, p. 96. Considers schist used as fuel and for production of paraffin and ichthyol.
- See also* Nos. 6031, 7245.

STATISTICS

- 1437.** BUBLEINKOV, O. (Oil industry.) Mining Jour. (Russia), vol. 98, June-Sept., 1922, pp. 324-326. "Statistics. *See also* article on oil shale as fuel in Volga region, pp. 326-327."
- 1438.** KERN, C. E. Soviet report on condition of Russian petroleum industry. Oil and Gas Jour., vol. 21, March 8, 1923, p. 52. From official Soviet reports received by the Department of Commerce. Review of conditions and production in the oil districts of Russia. Deals with Grozny, Emba, Baku, and Surakhani fields. Total output has increased 20 per cent; Baku produces 65 per cent of total. *See also* Petrol. Times, vol. 9, March 3, 1923, p. 322. Commerce Reports, Bur. For. and Dom. Comm., March 5, 1923, pp. 613-614. Oil and Gas Jour., vol. 21, April 19, 1923, p. 117. Atlantic Conn. Rod. vol. 16, April, 1923, p. 39.
- 1439.** OIL ENGINEERING AND FINANCE. Russia's oil production in 1922. Vol. 3, Jan. 13, 1923, pp. 20-21. Statistics.
- See also* Nos. 1444, 1655.

LEGAL REGULATIONS, LEASING

- 1440.** LE COURRIER DES PÉTROLES. Conditions normales de concessions de terrains pétrolifères accordées par la République fédérative des Soviets de Russie. 3e Année, May 13, 1922, pp. 5-9. Leasing regulations of Soviet government.
- 1441.** INTERNATIONAL PETROLEUM REPORTER. Russian Soviet fixes rules for concessions. Vol. 1, Jan. 11, 1922, p. 31. Conditions of official decree of Dec. 9, 1921, governing petroleum concessions.
- 1442.** KOVALEVSKI, S. A. (Materials for the development of regulations for protection of oil deposits from water seepage.) Russian Oil Jour., Oct., 1923, pp. 53-56.

1443. SALT LAKE MINING REVIEW. Mining regulations in Russia recently adapted and promulgated. Vol. 25, Oct. 30, 1923, pp. 13-14. Summary of important provisions concerning exploitation and leasing. *See also* Oil and Gas Jour., vol. 22, Nov. 1, 1923, p. 109. Petrol. World (London), vol. 20, Dec., 1923, p. 515.
1444. SCHWARZ, ROBERT. Der Kampf um die russischen Erdölfelder. Petrol. Ztschr., Jahrg. 18, June 10, 1922, pp. 695-704. Deals with chief Russian oil fields. Gives production for 1913, 1919, 1920, 1921. Regulations controlling concessions.

ECONOMICS

1445. SELDES, J. Ist Boryslaw-Tustanowice noch produktionsfähig? Petrol. Ztschr., Jahrg. 19, Nov. 10, 1923, pp. 1106-1110. Discusses possibilities of further production and of opportunities offered by oil-shale deposits. *See also* No. 1425.

MAP

1446. LE COURRIER DES PÉTROLES. Répartition des régions pétrolifères russes. 3e Année, May 13, 1922, p. 4. Review of development conditions of the Russian oil fields. Includes maps giving their location.

OTHER COUNTRIES (139)

See also No. 7887.

ALBANIA

GEOLOGY

1447. NOWACK, ERNST. Das albanische Erdölgebiet. Petrol. Ztschr., Jahrg. 19, March 20, 1923, pp. 255-269. Detailed description of geological structure with respect to its bearing upon occurrence of petroleum.
1448. ——— Die Erdölvorkommen in Albanien. Petroleum Ztschr., Jahrg. 19, Jan. 10, 1923, pp. 41-42. Brief discussion of asphalt and oil indications; economic and general conditions in country.

BELGIUM

TRANSPORTATION AND DISTRIBUTION

1449. OIL NEWS. Pure oil in Belgium and Holland. Vol. 10, June 20, 1922, pp. 30-31, 44. Describes marketing and transportation methods.
1450. ——— Belgium's oil industry crowded. Vol. 10, June 5, 1922, pp. 47, 60. Storage and distribution methods. Particulars regarding petroleum companies and legal regulations. *See also* No. 1451.

LEGAL REGULATIONS

1451. CROSS, S. H. Petroleum trade and industry in Belgium. Commerce Reports, Bur. For. and Dom. Comm., April 24, 1922, pp. 205-206. Storage and distribution methods; petroleum companies operating in Belgium; legal restrictions; refineries. *See also* No. 1450.

BULGARIA

DISTRIBUTION, TAXATION

1452. KEMPER, G. H. Bulgarian trade in petroleum products. Commerce Reports, Bur. For. and Dom. Comm., Dec. 11, 1922, p. 658. Methods of importation, and sales methods; taxation.

CZECHOSLOVAKIA

OCCURRENCE

1453. BOUCHAL, J. L. Petroleum trade and industry of Czechoslovakia. Commerce Reports, Bur. For. and Dom. Comm., June 19, 1922, p. 736. Oil deposits, imports, and distribution methods.
1454. LE COURRIER DES PÉTROLES. En Tchecoslovaquie. 3e Année, June 3, 1922, pp. 1-2. Report of exploration progress and oil indications.
1455. FRIEDL, KARL. Die Erdöllagerstätten der tschechoslowakischen Republik regionalgeologisch betrachtet. Petrol. Ztschr., Jahrg. 19, April 20, 1923, pp. 376-381. Location of deposits. Geology, development and production; analyses. *See also* Chem. Abs., vol. 17, July 10, 1923, p. 2358.
1456. JAHN, J. J. Der Stand der Erdölgewinnung in die tschechoslowakischen Republik. Petrol. Ztschr., Jahrg. 19, Jan. 1, 1923, pp. 9-12. Survey of present development conditions in the several oil fields.
1457. JAHN, J. J. AND SCHNABEL, E. Die Erdöllagerstätten der tschechoslowakischen Republik, regional-geologisch betrachtet. Petrol. Ztschr., Jahrg. 19, Nov. 20, 1923, pp. 1165-1170. Survey of possibilities of petroleum occurrences by regions. Opinion concerning Friedl's theory of petroleum origin and relation of geological formations of region to origin petroleum.
1458. JAHN, J. J. Ueber das Asphalt-Vorkommen bei Strecno an der Waag unweit Sillein (Slowakei). Petrol. Ztschr., Jahrg. 19, March 10, 1923, pp. 219-220. Location of deposits of dolomite rock. Reports analysis showed bitumen content of 6.00 per cent. *See also* Chem. Abs., vol. 17, June 10, 1923, p. 2047. Petrol. Times, vol. 9, March 17, 1923, p. 382.
1459. KAVAN, J. Le pétrole brut en Tchéco-Slovaquie. Chim. et ind., Special Number, May, 1923, p. 122. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Geographic occurrence; properties of petroleum; theory concerning the origin of Czechoslovakian petroleum; uses.
1460. LANDA, S. Les schistes bitumineux à Cypris. Chim. et ind., Special Number, May, 1923, p. 433. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Occurrence of oil shale in Bohemia; physical and chemical properties; results of distillation. Observes that oil is brown and solidifies at 16°. *See also* Petrol. Ztschr., Jahrg. 19, May 20, 1923, p. 501.
1461. PETROLEUM ZEITSCHRIFT. Das Erdöl in der Tschechoslowakei. Jahrg. 18, Feb. 1, 1922, pp. 114-116. Survey of petroleum development in Czechoslovakia.

GEOLOGY

1462. FRIEDL, KARL. Zur Frage der tschechoslowakischen Erdöllagerstätten. Petrol. Ztschr., Jahrg. 19, Dec. 1, 1923, pp. 1210-1213. Discusses article by Jahn and Schnabel, and support of writer's statement regarding petroleum possibilities.

See also Nos. 1455, 1463.

TRANSPORTATION AND STORAGE

See No. 1453.

PROPERTIES

1463. JAHN, J. J., AND SCHNABEL, E. Ueber das naphtaführende Terrain von Turzovka in den weissen Karpathan. Petrol. Ztschr., Jahrg. 18, April 20, 1922, pp. 441-447. Physical and chemical properties of crude samples; describes oil as of Pennsylvania type, having no asphalt, very little sulphur, and paraffin base. Gives well logs, stratigraphy, and structure. Illustrations. *See also* Chem. Abs., vol. 16, Sept. 20, 1922, pp. 2199-3200.

1464. KAVAN, J. Le lignite du sud de la Bohême et sa gazéification. Chim. et ind., Special Number, May, 1923, p. 465. (Trans, Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Volume and analysis of gas obtained for generation of electric power.
1465. PETROLEUM WORLD (LONDON). Czechoslovakia. Situation of the oil industry. Vol. 20, April, 1923, pp. 149-150. Physical properties and analysis of Gbely crude oil.
1466. SCHULZ, FERDINAND. Sur le boghead tertiaire de la Bohême. Chim. et ind., Special Number, May, 1923, p. 464. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Theory of origin; analysis; products of carbonization.
1467. ———. Analysen der tschechoslowakischen Erdöle. Petrol. Ztschr., Jahrg. 18, March 20, 1922, pp. 321-323. From Rept. Fuel Tech. Inst. Czech. Polytech. High School, Prague, 1921. Geological occurrence of oil. Describes color, viscosity, and other characteristics. Observes that Miocene oils of Gbely and Hodonin belong to type of Louisiana crudes of St. Martin and Calcasieu Parishes. Eocene crudes of Bohuslavice, Turzovka, and Mikovd are similar to Pennsylvania paraffin base crudes, having a high per cent of gasoline and kerosene. Gbely crude has no paraffin; Hodonin crude is free from asphalt. *See also* Chem. Abs., vol. 16, Sept. 20, 1922, p. 3199; vol. 17, June 10, 1923, p. 2045. Jour. Soc. Chem. Ind., vol. 41, April 29, 1922, p. 281A.
- See also* Nos. 1455, 1458, 1459, 1460, 7322.

UTILIZATION

See Nos. 1459, 7317.

LEGISLATION

1468. LE COURRIER DES PÉTROLES. Les lois minières en Tchécoslovaquie. 3e Année, July 29, 1922, p. 2. Discusses main provisions of law.
1469. PETROLEUM ZEITSCHRIFT. Die Standard Oil Company in der tschechoslowakischen Republik. Jahrg. 18, April 10, 1922, pp. 401-409. Contains treaty with Czechoslovakian Government for development of petroleum resources.
- See also* No. 7258.

DENMARK

UTILIZATION

See Nos. 6128, 7187.

ESTHONIA

OCCURRENCE

1470. ALBRECHT, C. H. Development of Esthonian oil-shale industry. Commerce Reports, Bur. For. and Dom. Comm., May 8, 1922, pp. 357-358. Extent of deposits; distillation for market; analysis. *See also* Petrol. World (London), vol. 19, July, 1922, p. 279.
1471. LE COURRIER DES PÉTROLES. Du pétrole en Esthonie. 4e Année, June 9, 1923, p. 5. States that naphtha deposits have been found on the island of Oesel.
1472. ———. Les gisements de schistes bitumineux en Estonie. 3e Année, June 10, 1922, p. 2. Main deposits, development, production.
1473. DAY, D. T. Oil shale in Esthonia. Oil Eng. and Fin., vol. 3, April 21, 1923, pp. 505-507. Extent of deposits. Products of Esthonian shale. Production, 1922.

1474. DE JARNY, M. E. Note sur les dépôts de schiste esthoniens. *Chim. et ind.*, Special Number, May, 1923, pp. 429-432. Occurrence of deposits; description and analyses; characteristics of kukkersite and treatment; distillation of schist; composition of crude oil. Description of Government distillation plant.
1475. OIL WEEKLY. Oil is produced on island of Dago off coast of Esthonia. Vol. 27, Oct. 28, 1922, p. 76. General conditions; oil indications have been found, but remain to be proved as commercial deposits. Gives maps showing location of island.
1476. PETROLEUM TIMES. Esthonian oil-shale fields. Vol. 9, April 28, 1923, p. 596. Shows concessions for production of oil shale.
1477. ——— The discovery of oil in Esthonia. Vol. 8, Sept. 30, 1922, pp. 501-502. Occurrence of oil on island of Dagden is established. Account of discovery of oil and its character; other indications of oil.
1478. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Esthonia oil shale. *Suppl. Commerce Repts., Trade and Econ. Rev.*, 1922, No. 54, pp. 28-29. Gives extent of deposits, status of shale-oil industry, and production of shale oil.

GEOLOGY

1479. CUNNINGHAM-CRAIG, E. H. Kukkersite, the oil shale of Esthonia. *Jour. Inst. Petrol. Tech.*, vol. 8, July, 1922, pp. 349-359; discussion, 359-375. Properties and characteristics of Esthonian oil shale. Gives topography, geology, analyses, and discusses origin. *See also* *Petrol. Times*, vol. 7, May 13, 1922, pp. 673-674; May 20, pp. 697-698; *Petrol. World* (London), vol. 19, June, 1922, pp. 255-259.
- 1479a. VON ANTROPOFF A. Die Ölschieferlager und die Ölschieferindustrie in Estland. *Ztschr. angew. Chem.*, Jahrg. 35, Nov. 14, 1922, pp. 647-651. Geology and geography of shale deposits; map showing location. Analyses and illustrations. Discusses distillation of oil, gas production, and uses.

DEVELOPMENT AND PRODUCTION

1480. PETROLEUM TIMES. Shale-oil distillation in Esthonia. Vol. 9, Feb. 17, 1923, p. 236. Esthonian shale oil is not adapted to cracking process, and is treated by adding hydrogen to crude oil until completely saturated hydrocarbons are obtained. Development and production of shale deposits described.

See also No. 1479a.

PROPERTIES

1481. ALDERSON, V. C. Esthonian prizes for oil-shale furnaces. *Colorado Sch. of Mines Quart.*, vol. 17, July, 1922, pp. 17-18. Chemical composition of Esthonian shale according to several analyses.
1482. ANTHOINE, A. (Note on the bituminous schists of Esthonia.) *Ann. soc. géol. Belg.*, vol. 45, 1922, pp. 224-226; *Rev. géol.*, vol. 4, 1923, p. 439. "Volatile matter varies from 45 to 55 per cent." Elementary analyses. Thickest bed is 2.5.
1483. KOGERMAN, P. N. (Chemical composition of the Esthonian Middle Ordovician oil-bearing mineral kukkersite.) Dorplat, 1922. 25 pp. Pamphlet. *Jour. Soc. Chem. Ind.*, vol. 41, Oct. 31, 1922, p. 799A. Estimated supplies of Esthonian oil shale, which, however, is not a real shale. Review of kukkersite investigations since its discovery. Chemical properties. *See also* *Petrol. Times*, vol. 8, Sept. 9, 1922, pp. 389-390; Oct. 7, pp. 535-536. *Chem. Abs.*, vol. 16, Dec. 10, 1922, p. 4336.

- 1483a. NARBUTT, J. (The isolation of organic substances in Esthonian oil shales.) *Ztschr. angew. Chem.*, Jahrg. 35, 1922, pp. 238-239. Method of obtaining sample of organic matter, and description of its properties. *See also Chem. Abs.*, vol. 16, Aug. 10, 1922, p. 2598. *Jour. Soc. Chem. Ind.*, vol. 41, June 30, 1922, p. 452A.
1484. PETROLEUM TIMES. Oil-shale developments in Esthonia. Jan. 27, 1923, vol. 9, pp. 127-128. Analysis of composition of "kukkersite" is given. Compares heat-producing qualities of the shale with other fuels. Gives production, 1918-1921.
1485. ——— The chemical properties of Esthonian shales. Vol. 7, June 3, 1922, pp. 777-778. Includes discussion of their fuel values and other uses.
1486. RINNE, EDWIN. Brennschiefer und Schieferölgewinnung in Estland. *Petrol. Ztschr.*, Jahrg. 18, Dec. 10, 1922, pp. 1141-1144. Types of kukkersite, their occurrence, physical and chemical properties and products. Mining costs.
- See also Nos.* 1470, 1474, 1477, 1479, 1668, 4256.

REFINING, LEASING

1487. MOUNTAIN STATES MINERAL AGE. Modified Scotch type in Esthonia. Vol. 8, Nov., 1923, p. 27. States that large deposit situated on the Gulf of Finland may be mined by steam shovel. Title of deposits is vested in Government, but concessions will be granted to nationals and foreigners.
1488. SCHNEIDER, W. Yield of tar and bitumen from Esthonian oil shale (kukkersite). *Gesell. Abh. Kenntn. Kohle*, 1920, Jahrg. 5, pp. 69-75; *Chem. Zentralb.*, 1922, Jahrg. 93, Bd. 4, 1044. Describes method of distillation and results. *See also Jour. Soc. Chem. Ind.*, vol. 4, Jan. 5, 1923, p. 5A. *Chem. Abs.*, vol. 17, June 20, 1923, p. 2189.
- See also Nos.* 1478, 4845.

UTILIZATION

1489. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Use of oil shale in Esthonia. Vol. 67, Mar. 9, 1922, p. 495. Record of remarkable progress.

STATISTICS, LEGISLATION, MAPS

See Nos. 1473, 1479a, 1487.

FINLAND

TRANSPORTATION, DISTRIBUTION, LEGAL REGULATIONS

1490. DAVIS, L. A. Petroleum trade of Finland. *Commerce Reports, Bur. For. and Dom. Comm.*, June 26, 1922, pp. 839-840. Method of import and distribution; sales methods; legal regulations.

HOLLAND

TRANSPORTATION, DISTRIBUTION, LEGAL REGULATIONS

1491. MAHIN, F. W. Petroleum trade and industry of the Netherlands. *Commerce Reports, Bur. For. and Dom. Comm.*, July 3, 1922, pp. 32-33. Importing companies; sales methods, legal restrictions, and import duties.

HUNGARY

OCCURRENCE

1492. OIL AND GAS JOURNAL. Hungary seeks oil and makes contract with Anglo-Persian. Vol. 22, Aug. 16, 1923, p. 114. Tells of presence of oil deposits on Hungarian Plain, as well in Muhr, Budapest, and other regions. Grant is for 75 years; Government receives 33 per cent of oil.

- 1493.** OIL AND GAS JOURNAL. Hope for Hungarian oil and gas fields is ebbing. Vol. 20, April 13, 1922, p. 93. Reports that drilling at Hortobagy and Keckemet is to be abandoned. Drilling at Kurd Csibrak and Letenye Pudafa have given gas; the latter well showed a slight trace of oil.

GEOLOGY

- 1494.** LETSÖ, LADISLAUS. Das Erdgasfeld von Sarmasel. Petrol. Ztschr., Jahrg. 19, Jan. 10, 1923, pp. 33-41; Jan. 20, pp. 61-67; Feb. 1, pp. 93-97. Detailed description of geology of region, production methods, and utilization. Tabulated data of gas analysis, yield, and production costs.
- 1495.** TRAUTH, FREDERICK. Zur Frage der Entstehung der Erdöllagerstätten. Petrol. Ztschr., Jahrg. 19, April 10, 1923, pp. 331-334. Discusses origin of petroleum structures in Carpathians and factors influencing accumulation of oil.

TRANSPORTATION, DISTRIBUTION

- 1496.** KEMP, E. C. Petroleum trade and industry of Hungary. Commerce Reports, Bur. For. and Dom. Comm., July 17, 1922, pp. 169-170. Importing companies; sales methods and terms, legal regulations, and storage capacity.
- 1497.** PETROLEUM REFINER. Hungarian refiners will welcome crude-oil aid. Vol. 11, July 27, 1922, p. 23. State has refineries, but oil is imported in tank cars or barges; barrels and drums are not used.

LEGAL REGULATIONS

See Nos. 1492, 1496.

ITALY

OCCURRENCE

- 1498.** FENOGGIO, MASSIMO. (Researches on Italian petroleums.) Ann. chim. applicata, vol. 13, 1923, pp. 80-96. Occurrence and chemical and physical properties of petroleums from (1) Neviano dei Rossi, Parma; (2) Rivanazano, Pavia; (3) Ripi, Roma; (4) S. Giovanni Incarico, Caserta. See also Chem. Abs., vol. 17, Nov. 20, 1923, p. 3781.
- 1499.** MAGDALENA, LEO. El petróleo en Italia. (Petroleum in Italy.) Bol. Petról., vol. 15, April, 1923, pp. 311-316. Survey of petroleum indications in Province of Catania, Sicily. Map; oil analyses.
- 1500.** OIL AND GAS JOURNAL. Hundreds of wells drilling in Italy in search for oil. Vol. 22, Nov. 15, 1923, p. 122. Gives drilling costs and oil regions. Consumption exceeds production; condition is unlikely to change.
- 1501.** ——— Asphaltic rock in Italy. Vol. 22, Aug. 16, 1923, p. 117. Brief review of article in Milan journal telling of deposits of asphaltic rocks in Syracuse, Sicily, and Abruzzi which may prove source of fuel.
- 1502.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Petroleum industry of Italy. Commerce Reports, Nov. 5, 1923, p. 349. States that oil development has reached highest point in Italy in central part in locality of Emilia. Discusses drilling, transportation; and machinery costs. Gives characteristics of oil regions.
- 1503.** ——— Petroleum development in Italy. Commerce Reports, No. 18, April 30, 1923, pp. 307-308. Reports regions containing promising petroleum deposits. Outlines progress in development and production.

GEOLOGY

- 1504.** GIGNOUX, M. (The geological structure of the petroleum fields of northern Italy.) Mat. grasses, vol. 15, 1923, pp. 6494-6496.

DISTRIBUTION

1505. KEBLINGER, WILBUR. Petroleum trade of Fiume district. Commerce Reports, Bur. For. and Dom. Comm., Aug. 28, 1922, p. 605. Kinds of containers for petroleum products; legal restrictions on trade.

PROPERTIES

1506. CASTELLI, GAETANO. (The asphaltic mines of Ragusa.) Rassegna Min. Met. Chim., vol. 58, 1923, pp. 136-141. Production of asphalt from deposits in Sicily. Analyses; uses.
1507. CIUSA, R., AND VOIS, R. (Fossil wax of Monte Falò.) Gazz. chim. ital., vol. 52, pt. 1, 1922, pp. 135-136. Physical and chemical properties of wax. *See also* Jour. Soc. Chem. Ind., vol. 41, May 15, 1922, p. 320A.
1508. LE COURRIER DES PÉTROLES. La standardisation des huiles et graisses en Italie. 4e Année, June 16, 1923, p. 5. Minimum flash point of 150° in a closed vessel determined by Pensky apparatus is established as standard.
1509. FENOGLIO, M. (Petroleum from Montechino-Velleia (Italy).) Giorn. chim. ind. applicata, vol. 4, 1922, pp. 565-570. Describes physical properties and results of tests of petroleum from most productive region of Emilia. *See also* Jour. Soc. Chem. Ind., vol. 42, March 2, 1923, p. 172A.

See also Nos. 1498, 1499.

UTILIZATION

See Nos. 1506, 7339.

STATISTICS

1510. DOMINIAN, LEO. Oil from bituminous schists in Italy. Commerce Reports, Bur. For. and Dom. Comm., Oct. 16, 1922, p. 153. States that 3,150 tons of oil were obtained from schists in 1921. An oil yield of 3.5 per cent was obtained from Turin schist.
1511. NATIONAL PETROLEUM NEWS. Italy's production small. Vol. 14, Sept. 6, 1922, p. 88. Annual production and consumption figures.

ECONOMICS

1512. LE COURRIER DES PÉTROLES. Une politique italienne du pétrole. 4e Année, Aug. 25, 1923, pp. 1-2. Exploration and development conducted by Government in past, and program for future work; same privileges will be accorded to foreigners as to Italian nationals.

See also No. 1505.

LATVIA**DEVELOPMENT AND PRODUCTION**

1513. STIFEL, I. Die Lettenmethode und ihr Anwendung. Petrol. Ztschr., Jahrg. 19, April 1, 1923, pp. 302-303. Lettish drilling methods.

DISTRIBUTION

1514. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Petroleum trade of Latvia. Commerce Reports, No. 19, May 7, 1923, pp. 382-383. Reports that distribution facilities are very limited; one refinery is said to be operating largely on American crude oil.

MONTENEGRO**OCCURRENCE, GEOLOGY, PROPERTIES**

1515. PETUNNIKOFF, G. Über eine Erdöllagerstätte in Montenegro. Petrol. Ztschr., Jahrg. 19, Dec. 20, 1923, pp. 1275-1278. Location of oil deposit; geographical and geological conditions. Analysis of oil. Deposits are result of hydration. Discusses deep-lying deposits.

See No. 1301.

NORWAY

PORTUGAL

LEGISLATION

1516. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Portuguese lands available for research. Commerce Reports, No. 22, May 28, 1923, p. 572. Reports that districts of Aveiro, Coimbra, Leiria, Santarem, Lisbon, and Faro have been declared free for registration for petroleum exploration by Decree 8677 of Portuguese Government.

SPAIN

OCCURRENCE

1517. FOX, H. S. Spanish trade in petroleum products. Supplement, Bur. For. and Dom. Comm., Trade Inf. Bull. 72, Oct. 16, 1922, 28 pp. Pamphlet. Gives production, petroleum possibilities, legal regulations, and markets.
1518. OIL TRADE JOURNAL. American interests begin drilling in Spain. Vol. 14, May, 1923, pp. 19, 112. Brief report of oil indications and regions. Summary of laws pertaining to petroleum exploitation. See also Petrol. Times, vol. 9, May 26, 1923, p. 750.
1519. ——— Spain gives promise of good oil production. Vol. 13, May, 1922, pp. 19–20. Topography and oil indications in northern Spain.

GEOLOGY

1520. GAVALA, JUAN. (Shale in Spain.) Bol. Inst. Geol. España, vol. 42, 1921, p. 265; Bull. Imperial Inst., vol. 19, 1921, p. 549. Describes a deposit of bituminous shale; estimate of reserves. Chem. Abs., vol. 16, Sept. 10, 1922, p. 2830.
1521. OIL ENGINEERING AND FINANCE. The oil fields of Spain. Vol. 3, Jan. 13, 1923, pp. 11–13. Geology; oil horizons.

DEVELOPMENT AND PRODUCTION, PROPERTIES

See Nos. 1517, 1520; 7275.

LEGISLATION

1522. OIL WEEKLY. Oil companies exempt from taxes in Spain. Vol. 30, July 14, 1923, p. 64. Royal decree of Dec. 5, 1922, exempts from surface taxes, under certain conditions, owners and concessionaires of oil lands. See Commerce Reports, Bur. For. and Dom. Comm., Jan. 29, 1923, No. 5, p. 293. Translation of decree may be obtained from petroleum division or district or cooperative offices of the bureau by referring to file No. 81970.
- See also Nos. 1517, 1518.

SWEDEN

DISTRIBUTION, LEGAL REGULATIONS

1523. SHOLES, W. H. Petroleum market in western Sweden. Commerce Reports, Bur. For. and Dom. Comm., Oct. 30, 1922, pp. 276–277. Importing and distributing methods; containers; legal restrictions of sale of petroleum products.

PROPERTIES

1524. HOLMBERG, BROR. (Bituminous shale.) Teknisk Tid., vol. 52, 1922, pp. 563–565, 609–611. "An address in which are presented some data relating to the examination of samples of shale, coal, and other mineral deposits from a district in Sweden." Chem. Abs., vol. 16, Nov. 20, 1922, p. 4055.

See also No. 4257.

REFINING

- 1524a. CHEMISCHE INDUSTRIE. Die Gewinnung von Schieferöl in Schweden. Jahrg. 46, Dec. 15, 1923, p. 670. Brief review of oil-shale retorting in Sweden; method and production; costs of plant and equipment.

UTILIZATION

See Nos. 6063, 7404.

SWITZERLAND**DISTRIBUTION**

1525. HOLLAND, PHILIP. Swiss import trade in petroleum products. Commerce Reports, Bur. For. and Dom. Comm., Sept. 25, 1922, p. 868. Methods of import and distribution.

TRANSYLVANIA**GEOLOGY, PROPERTIES**

1526. SIEVERS, E. G. Natural gas in Transylvania. Natural Gas, vol. 4, Dec., 1923, pp. 26, 34, 59. Geology in natural-gas fields; development of natural-gas resources; estimated resources; chemical properties; industrial uses; economic importance.

UTILIZATION, STATISTICS

1527. LE COURRIER DES PÉTROLES. L'exploitation du gaz mineral en Transylvanie. 3e Année, June 24, 1922, p. 4. Production; domestic uses.

YUGOSLAVIA**OCCURENCE**

1528. LE COURRIER DES PÉTROLES. Le pétrole en Yougo-Slavie. 4e Année, May 19, 1923, p. 3. Oil deposits are found in all parts of Yugoslavia. Locations of chief deposits.
1529. OIL WEEKLY. Yugoslavia asks for share of oil interests. Vol. 30, July 14, 1923, p. 36. Petroleum legislation. States that encouraging evidences of oil abound in State.
1530. PRITZBUER, — Le lignite en Serbie. Chim. et ind., Special Number, May, 1923, pp. 461-463. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Occurrence of lignite deposits in Serbia. Chemical and physical properties of products of distillation. Map showing mineral resources of Serbia and Balkan countries.

GEOLOGY

1531. VINDA, V. J. Petroleum investigations in Yugoslavia. Petrol. Times, vol. 7, May 13, 1922, pp. 659-661. Account of exploration of Austrian and Yugoslovakian Governments. Geologic map showing drilling wells and chief formations.

TRANSPORTATION, DISTRIBUTION

1532. PATTON, K. S. Petroleum trade of Yugoslavia. Commerce Reports, Bur. For. and Dom. Comm., Oct. 9, 1922, pp. 94-95. Importing and distribution methods; petroleum companies.

LEGISLATION

- 1533.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. A translation of the new Yugoslavia petroleum law. Commerce Reports, Jan. 1, 1923, p. 31. Report by Candler Cobb, London, may be obtained from the petroleum division of the Department of Commerce.
- 1534.** LE COURRIER DES PÉTROLES. La recherche du pétrole en Yougoslavie. 4e Année, April 14, 1923, pp. 1-2. History of production; primitive methods employed at present; legislation governing concessions.
- See also* Nos. 1529, 1531.

ASIA (140)

OCCURRENCE

See also Nos. 43, 635, 1215.

PROPERTIES

- 1535.** PETROLEUM AGE. Fuel oil. Vol. 11, Jan. 1, 1923, p. 37. Properties of Asiatic fuel oils.

See No. 166.

ECONOMICS

CHINA (141)

OCCURRENCE

- 1536.** CHU, T. O. Areas in China considered as potential oil-bearing territory. Nat. Petrol. News, vol. 15, Oct. 24, 1923, pp. 77-78. Delivered during the Internat. Petrol. Cong., Tulsa, 1923. Survey of known oil regions; extent of development; analysis.
- 1537.** LE COURRIER DES PÉTROLES. Du pétrole au Tonkin. 4 Ann., Jan. 20, 1923, p. 3. Notes petroleum indications in Indo-China, as well as in the neighboring Chinese province of Tse-Chouan.
- 1538.** DEBAUQUIS, M. Les combustibles minéraux indochinois. La nature, June 23, 1923, pp. 390-391. Indications in Tonkin, Indo-China, are not regarded as of great commercial importance, but deposits in lower Mékong, Cochín-China, considered as part of the Burmese and Siamese sands, are held to be extensive and valuable for exploitation.
- 1539.** KERN, C. E. China's infant petroleum industry. Oil and Gas Jour., vol. 20, May 25, 1922, pp. 96-97. Possible oil territory of China is large, but unsettled political conditions and unfavorable laws have retarded development. Exploration in Shensi and other northern provinces revealed traces of oil at shallow depths, but none deeper; the small domestic production comes from this province. Exploration by foreign companies in other regions was unsuccessful.
- 1540.** OCKEL, R. Die Ölindustrie Japans und der Mandschurei. Chem. Ztg., Jahrg. 46, June 20, 1922, pp. 550-551. General description of development of oil industry in Japan and Manchuria.

See also No. 1543.

GEOLOGY

- 1541.** BLACKWELDER, ELIOT. Petroleum resources of China and Siberia. Min. and Met., No. 187, July, 1922, pp. 41-42. Abstract of paper before Am. Inst. Min. and Met. Eng., New York, Feb., 1922. Geological evidences offer little prospect of large oil production in China; Siberia, Sakhalin, and the Caspian provinces, when developed, may yield as much as Russia south of the Caucasus. Nat. Petrol. News, vol. 14, March 1, 1922, pp. 48P-48R. Trans. Am. Inst. Min. and Met. Eng., vol. 68, 1923, pp. 1105-1109; discussion pp. 1109-1111. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1177, July, 1922.

See also No. 1538.

DEVELOPMENT AND PRODUCTION

- 1542.** ENGINEER. Chinese brine wells. Vol. 133, March 24, 1922, pp. 319-321. Describes primitive drilling methods employed in China. Illustration of drilling tools, bailer, and fishing tools.
- 1543.** OIL AND GAS JOURNAL. Chinese drilled for oil 2,000 years ago. Vol. 22, June 14, 1923, p. 50. Describes primitive methods and equipment. Tells of unique source of motive power for drilling, furnished by men jumping upon a spring board.

PROPERTIES

See Nos. 1536, 4264.

STATISTICS

- 1544.** INDUSTRIAL AUSTRALIAN AND MINING STANDARD. China's share of world's mineral and metal output. Vol. 67, Mar. 2, 1922, p. 416. Includes petroleum statistics.

See also No. 53.

LEGAL REGULATIONS

- 1545.** PETROLEUM TIMES. Petroleum prospecting in China. Vol. 9, Feb. 10, 1923, p. 209. Petroleum and salt exploitation are Government monopolies; prospectors have little chance of receiving grants.

See also No. 1213.

INDIA (142)

OCCURRENCE

- 1546.** NATIONAL PETROLEUM NEWS. Indian fields to be factor for years to come. Vol. 15, Oct. 10, 1923, p. 86. Survey of development and oil possibilities in Burma, Assam, and Punjab oil regions.
- 1547.** OIL AND GAS JOURNAL. Burma area not extended. Vol. 22, Aug. 16, 1923, p. 102. Report of Burmah Oil Co. shows that development work progressed, but exploration work was not successful.
- 1548.** PETROLEUM TIMES. Oil-shade deposits in Burma. Vol. 9, May 19, 1923, p. 714. Location of oil-shale fields; geology.
- 1549.** ——— The oil fields of Burma and India. Vol. 7, April 29, 1922, pp. 595-596. Occurrence of oil in various localities; characteristics; production data.
- 1550.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. The oil fields of India and Burma. Commerce Reports, Sept. 24, 1923. p. 818. Brief review of producing fields, and outlook for future production.
- 1551.** ——— India. Suppl. Commerce Reports, Trade and Econ. Rev., 1922, No. 34, p. 43. Production of oil from Burma, Assam, and Punjab oil fields in 1922. *See also* Petrol. World (London), vol. 20, Nov., 1923, p. 462.
- 1552.** WADIA, D. N. Deposit of bitumen in a lava cavern in Bombay. Proc. 7th Indian Sci. Cong., vol. 6, 1920. Deposit of bitumen is believed to have been carried from the tuffs and ashes by water.

See also Nos. 1311, 1699.

GEOLOGY

- 1553.** Fox, C. S. Occurrence of bitumen in Bombay Island. Rec. Geol. Survey India, vol. 54, 1922, pp. 117-128. Analyses of basalt and pitch. Source is believed to have been sedimentary beds into which dolorite sill was intruded.

- 1554.** GREGORY, J. W. Geological relations of the oil shales of southern Burma. *Geol. Mag.*, vol. 60, April, 1923, pp. 152-159. Fossils, origin, and stratigraphical evidence identify shales as probably belonging to Pliocene age. The well-defined spheroidal yellow bodies of the Scotch and Australian shales were absent although there was abundance of material from which they could have been formed. Fresh-water fossils were also found. *See also* *Min. Jour.*, vol. 139, Feb. 24, 1923, p. 145.
- 1555.** PASCOE, E. H. The Punjab oil occurrences with regard to petroleum origin. *Petrol. Times*, vol. 7, Feb. 11, 1922, pp. 187-188. Stratigraphy and structure of oil in other than the Nummulitic formations. Account of exploitation of oil deposit at Khaur, refining industry has been established. Oil possibilities exist in the Dhulian area in the same region. *See also* *London Times Trade Supplement*, vol. 9, Feb. 18, 1922, Eng. Sec., p. 445.
See also No. 1548.

DEVELOPMENT AND PRODUCTION

- 1556.** MCCARTHY-JONES, C. Electrifying Yenangyaung (Burma) field. *Oil and Gas Jour.*, vol. 21, Aug. 10, 1922, pp. 14, 102-103. Details of installation of power system comprising generators and transformers with low tension feeders to individual wells.
See also No. 2380.

PROPERTIES

- 1557.** PETROLEUM TIMES. The Burmese oil shales and their exploitation. Vol. 10, Dec. 1, 1923, p. 774. Tests of oil shales from deposits in the Thauingyin Valley near the Siamese border yield from 33 to 45 gallons of oil and 48 pounds of ammonium sulphate per ton. Describes Crozier retort built to serve requirements of Burma oil shale.
- 1558.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Crude petroleum production on the Assam oil fields. *Commerce Reports*, No. 28, July 9, 1923, pp. 109-110. Production of petroleum in Assam and Badarpur fields; properties of oil. Refinery production and shipments. *See also* *Nat. Petrol. News*, vol. 15, July 18, 1923, pp. 91-92. *Oil and Gas Jour.*, vol. 22, Oct. 4, 1923, pp. 214-215.
See also Nos. 1549, 1553, 1554, 3592, 3950.

REFINING

See Nos. 1555, 1558, 4840.

STATISTICS

- 1559.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Crude petroleum production. *Commerce Reports*, No. 25, June 18, 1923, p. 754. Production in 1922 of oil fields in Japan, British India, Dutch East Indies, and British Borneo.
- 1560.** WEDDELL, A. W. India. *Bur. For. and Dom. Comm., Suppl. Commerce Repts., Trade and Econ. Rev.*, 1921, No. 32, pp. 27-28. Petroleum output and trade, 1920-21.
See also Nos. 52, 53, 1549, 1551, 1558.

JAPAN (143)

See also No. 7887.

OCCURRENCE

- 1561.** CLEMENTS, J. M. Petroleum resources of Japan. *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1923, pp. 1097-1104. Discusses history, oil regions, geology, and grade of oil. Gives depth and methods of production, and petroleum resources. Map. States that development in Sakhalin is

- retarded by severe climate and inaccessible location. *See also* Min. and Met., July, 1922, pp. 42-43. Nat. Petrol. News, vol. 14, March 1, 1922, pp. 48-O, 48-P. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1176, July, 1922, 8 pp.
1562. GREEN, G. B. Real oil fields in Japan. Petrol. Age, vol. 12, Nov. 1 1923, pp. 22, 63, 65. Tells of organization of industry, production, and distribution. Surveys important fields. Reports that conservation practiced. *See also* Petrol. World (London), vol. 20, Dec., 1923, pp. 501-502.
1563. INTERNATIONAL PETROLEUM REPORTER. Japanese find new field on island of Kyushu. Vol. 1, April 5, 1922, p. 27. Reports extensive oil deposits of high quality.
1564. OIL AND GAS JOURNAL. Japan's production and oil consumption, told by a Japanese. Vol. 22, Sept. 27, 1923, p. 117. Production area is largely on western coast of main island; oil ranges from heavy asphalt to high-grade paraffin.
1565. OIL, PAINT AND DRUG REPORTER. Historical résumé of the petroleum industry in Japan. Vol. 101, March 28, 1922, p. 87. Existence of oil and pitch were recorded in 668 A. D., and drilling for oil was started in 1613. Summary of modern development and progress in petroleum industry.
1566. OIL WEEKLY. Oil has been produced in Japan 300 years. Vol. 29, April 28, 1923, pp. 25-27. Early methods of production. Gives yearly production, 1908-1922; geology; and grade of oil. Map showing location of oil districts.
- See also* Nos. 1540, 1701.

GEOLOGY

1567. PETROLEUM TIMES. Katsurane oil field of Japan. Vol. 9, Jan. 27, 1923, p. 122. Geological structure of this district and mudding methods.
1568. ——— The petroleum resources of Japan. Vol. 8, Aug. 26, 1922, p. 304. Production and development of Japanese oil fields; stratigraphy.
1569. TAKAHASHI, J., AND YAMANOUCHI, NOBUO. (Study of the Torinosu limestone containing petroleum.) Jour. Geol. Soc. Tokyo, vol. 29, 1922, pp. 401-410, 447-470. Oil is contained in small cavities of limestone; calcite and asphalt are also found in fissures. Origin of oil is probably kerogenous limestone by geodynamical action. Rock analyses.
1570. TAKAHASHI, J. (Microglobulites in the oil-measure shales of Japan.) Jour. Geol. Soc. Tokyo, vol. 29, 1922, pp. 56-61; Japan. Jour. Geol. Geog., vol. 1, p. 19A. Fine globules found in oil-measure shales are not spores but are of iron sulfide composition, leading to conclusion that shales belong to organogenetic rocks formed under anærobic conditions.
- See also* Nos. 1561, 1566.

DEVELOPMENT AND PRODUCTION

1571. OIL WEEKLY. Japan's oil industry probably hard hit. Vol. 30, Sept. 8, 1923, pp. 24-26. Primitive production methods; introduction of American drilling methods and scientific location of formations by geologists; gravity of oil. Map of Japan showing location of oil districts.
1572. QUEENSLAND GOVERNMENT MINING JOURNAL. Success of the mudding method in Japan. Vol. 24, Nov. 15, 1923, pp. 427-428. From article by K. Uyeno in Petrol. Times, Japan. How water shut-off is accomplished in the Katsurane field where several oil sands are found.
1573. TAKANO, ICHISUKE. When Japan goes after oil. Rig and Reel Mag., vol. 5, July, 1923, pp. 3-4. Describes primitive production methods. States that under present conditions oil areas will soon reach limit of production and new methods will be required if unexploited indications are to be developed.
- See also* No. 1567.

STORAGE AND DISTRIBUTION

1574. FAULKNER, PAUL. California oil for Mitsui supply service at Yokohama. *Pacific Mar. Rev.*, vol. 20, Sept., 1923, p. 437. Description and capacity of oil storage tanks. California oil is supplanting Borneo oil because of superior qualities for bunker oil and general industrial fuel.

PROPERTIES

1575. OHNO, T. (Composition of Japanese natural gas.) *Jour. Chem. Ind. Japan*, vol. 25, 1922, pp. 783-788; *Jour. Soc. Chem. Ind.*; vol. 41, Oct. 31, 1922, p. 799A. Analyses of gases from several Japanese fields.
1576. TAKAHASHI, J. (The marine kerogen shales from the oil fields of Japan.) *Tohoku Imp. Univ. Sci. Repts.*, vol. 1, Aug., 1922, pp. 63, 156. "Contribution to study of origin of petroleum."
1577. ——— (Siliceous shales in the oil measures of Japan.) *Jour. Geol. Soc. Tokyo*, vol. 29, 1922, pp. 17-27; *Japan Jour. Geol. Geog.*, vol. 1, pp. 19-20A. Account of chemical and petrographical examination of shales, occurring in lower part of Japanese oil measures.
1578. TANAKA, YOSHIO, AND NAGAI, SHOICHIRO. Naphthenic acids. 1. Isolation of petroleum acids and pure naphthenic acids from waste lyes of neutral distillate refining. *Jour. Am. Chem. Soc.*, vol. 45, March, 1923, pp. 754-756; *Jour. Chem. Ind. Japan*, vol. 25, 1922, pp. 1031-1044. Describes method by which methyl esters, obtained by esterification of crude naphthenic acids, were redistilled and treated until the pure naphthenic acids were colorless and odorless. *See also* *Jour. Soc. Chem. Ind.*, vol. 41, Dec. 30, p. 973A; vol. 42, May 11, 1923, pp. 391A-392A. *Brennstoff-Chem.*, Bd. 4, Aug. 1, 1923, p. 236.
1579. YAMADA, NOBUO. (On the contents of helium and other constituents in Japanese natural gas.) *Tokyo Imp. Univ., Rept. of Aeronaut. Research Inst.*, vol. 1, Oct., 1923, pp. 171-186. Analytical and sampling methods; results of experiments.

See also Nos. 1563, 1564, 1566, 4120.

STATISTICS

1580. PETROLEUM WORLD (LONDON). Japan, 1922 production and refining. Vol. 20, Aug., 1923, p. 329. Production and refining figures of the several fields, 1921-1922; total output of refined oils for period.
1581. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Petroleum products trade of Japan for 1922. *Commerce Reports*, No. 34, Aug. 20, 1923, p. 482. Import figures, 1913, 1921, 1922; exports in 1922.

See also Nos. 52, 53, 1559, 1561, 1568.

LEGAL REGULATIONS

1582. DICKOVER, E. R. Petroleum trade of Kobe, Japan. *Commerce Reports*, *Bur. For. and Dom. Comm.*, Dec. 11, 1922, p. 658. Legal restrictions relating to the petroleum industry; refining and importation of petroleum products.
1583. OIL AND GAS JOURNAL. Kobe is Japan's largest user of products of oil. Vol. 21, Dec. 28, 1922, p. 199. Reports that Japanese laws for storing and handling of inflammable liquids are complicated.

MAPS

See Nos. 1561, 1566, 1571.

OTHER COUNTRIES (149)

See No. 53.

ISMID**OCCURRENCE, PROPERTIES, REFINING, MAP**

- 1584.** HANSGIRG, F., AND SANDER, B. Die Bitumenmergel von Ismid in Kleinasien. *Petrol. Ztschr.*, Jahrg. 19, June 10, 1923, pp. 576-585. Bituminous marl deposits in Asia Minor. Map showing location. Structural conditions; distillation apparatus; products. Includes analyses of the three kinds of marl: (1) Bare marl; (2) oil marl; (3) oil shale. *See also* *Jour. Soc. Chem. Ind.*, vol. 42, Aug. 17, 1923, p. 757A.

MESOPOTAMIA**OCCURRENCE**

- 1585.** OIL ENGINEERING AND FINANCE. The Mesopotamia oil fields. Vol. 3, Feb. 17, 1923, pp. 197-205. History of concessions.
- 1586.** OIL WEEKLY. What about Mesopotamia's oil prospects? Vol. 26, Sept. 23, 1922, pp. 34-35. Review of oil indications from early times. Recent exploration and development. Gives map showing location of oil seepages and asphalt deposits and anticlines.
- 1587.** PETROLEUM REFINER. Oldest oil field in world is at last to be developed. Vol. 12, Nov. 2, 1922, p. 7. Occurrence of petroleum in Mesopotamia; type of oil.
- 1588.** PETROLEUM TIMES. The petroleum fields of Mesopotamia. Vol. 8, July, 15, 1922, pp. 109-110. Stratigraphical and geological conditions occurring in the four principal oil fields. Maps showing location of oil and asphalt deposits.
- 1589.** PETROLEUM WORLD (LONDON). Oil resources of Mesopotamia. Vol. 20, April, 1923, pp. 160-162. Review of article by E. H. Pascoe, "Geological notes on Mesopotamia, with special reference to occurrences of petroleum:" *Mem. Geol. Surv. India*, 1922, p. 48. Surveys oil-bearing strata and oil indications. *See also* *Petrol. Times*, vol. 9, March 17, 1923, p. 384.

See also No. 1590.

GEOLOGY

- 1590.** MILNER, H. B. Mesopotamia. *Mining Mag.*, vol. 27, Aug., 1922, pp. 87-90. Survey of geology; petroleum resources.

See also No. 1586.

PROPERTIES, MAPS

See Nos. 1587, 1586, 1588.

PALESTINE**TRANSPORTATION, DISTRIBUTION**

- 1591.** SOUTHARD, A. E. The petroleum trade of Palestine. *Commerce Reports*, Bur. For. and Dom. Comm., May 29, 1922, pp. 556-557. Methods of import and distribution.

PROPERTIES

See No. 4220.

REFINING

- 1592.** PETROLEUM REFINER. Market for oil in Holy Land. Vol. 11, June 8, 1922, p. 6. Brief account of primitive distillation methods.

PERSIA

OCCURRENCE

5198. *THE LAMP*. Where civilization was cradled. Vol. 5, Dec., 1922, pp. 9-19. General conditions in Persia. Reports that oil resources are to large extent unexplored and undeveloped. Map showing refinery and oil seepages. *See also* *Oil and Gas Jour.*, vol. 21, Jan. 18, 1923, pp. 11, 103-106.
1594. *PETROLEUM TIMES*. The petroleum industry of Persia. Vol. 9, June 23, 1923, p. 923. Difficulties and conditions encountered in the development of oil fields in southwestern Persia.
1595. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Petroleum operations in the Red Sea region. *Commerce Reports*, Jan. 29, 1923, p. 292. Brief discussion of possibilities. Account of exploration and development. *See also* *Oildom*, vol. 14, Feb. 1923, p. 63.
1596. WINKLEHNER, IOAN. The history of the petroleum of the Persian Gulf. *Ann. des mines de Roumanie (Bucarest)*, vol. 3, March 3, 1923, pp. 283-285; March 10, pp. 312-313. Problems confronting Persian Oil Co. in establishing oil industry.
1597. ——— Petroleum in the Persian Gulf. *Ann. des mines de Roumanie (Bucarest)*, vol. 6, Jan., 1923, pp. 27-35. "Oil indications and exploration in southern Persia."

GEOLOGY

1598. *OIL WEEKLY*. Petroleum and the Far Eastern question. Vol. 27, Nov. 11, 1922, pp. 12-13, 16. Brief description of petroleum geology in Persia; survey of oil possibilities. Map giving location of concessions.

STATISTICS, MAPS

See Nos. 1655, 1593, 1598.

LEGISLATION

1599. *OIL AND GAS JOURNAL*. Persian oil lands open to Americans by Parliament act. Vol. 23, Dec. 6, 1923, p. 125. Rights to develop petroleum, asphalt, and natural gas will be granted to an approved American oil company. Other provisions of act.

RUSSIA

OCCURRENCE

1600. *LE COURRIER DES PÉTROLES*. Les concessions pétrolifères offerts par les Soviets. 3e Année, Aug. 5, 1922, pp. 2-3. Conditions and production in Baku, Grozny, Oural-Emba, Kouban, and Turkestan.
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- See also* Nos. 1423, 1541, 1605, 1607.

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TRANSPORTATION

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PROPERTIES

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UTILIZATION

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MAPS, ECONOMICS

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PROPERTIES, REFINING

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TRANSCAUCASIA

UTILIZATION

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LEGAL REGULATIONS, MAPS

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AFRICA (150)

OCCURRENCE, PROPERTIES

See Nos. 43, 1215; 3965.

COUNTRIES (151)

ALGERIA

OCCURRENCE

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- 1638.** ——— Petroleum in northern Africa. Vol. 7, Jan. 24, 1922, pp. 913-914. Petroleum production and prospects in Tunis, Constantine, Algiers, Oram, and the Protectorate of Morocco. Map showing location of chief deposits.
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TRANSPORTATION AND STORAGE

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PROPERTIES

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STATISTICS

See Nos. 52, 1637.

LEGAL REGULATIONS

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MAPS

See Nos. 1633, 1634.

BELGIAN CONGO

LEGAL REGULATIONS

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GEOGRAPHIC OCCURRENCE

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EGYPT

OCCURRENCE

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- See also* Nos. 1648, 1650, 1651, 3568.

STATISTICS

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GOLD COAST

UTILIZATION

- See* No. 7385.

MADAGASCAR

OCCURRENCE

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GEOLOGY

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PROPERTIES

See Nos. 1661, 1664.

LEGAL REGULATIONS

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See also Nos. 1213, 1661.

MAP

See No. 1659.

ECONOMIC RESOURCES

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MALTA

PROPERTIES

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MOROCCO

LEGISLATION

See No. 1213.

ORANGE FREE STATE

GEOLOGY, PROPERTIES

1669. SOUTH AFRICA MINING AND ENGINEERING JOURNAL. The oil occurrences on the farm Madrid. Vol. 34, Nov. 3, 1923, pp. 154, 156. Geology of oil-bearing region in Orange Free State on Baustoland border. Analyses of oil. Estimate of required development.

PORTUGUESE EAST AFRICA

PROPERTIES

See No. 1678.

SOUTH AFRICA

OCCURRENCE

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GEOLOGY

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PROPERTIES

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- See also* No. 1675.

REFINING

See Nos. 4902, 4903.

UTILIZATION

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- See also* Nos. 1273, 6246, 7328, 7329, 7338, 7380, 7401.

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MAP

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TUNIS**OCCURRENCE, PROPERTIES**

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LEGISLATION

See No. 1213.

WEST AFRICA**GEOLOGY**

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UTILIZATION, LEGISLATION

See Nos. 7395, 1213.

OCEANIA AND MALAYSIA (160)

See Nos. 166, 1213, 1326, 1351, 1559, 1670.

AUSTRALIA (161)

See Nos. 4250, 7295.

OCCURRENCE

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1692. ENGINEERING AND MINING JOURNAL-PRESS. Oil prospecting in Tasmania. Vol. 115, June 30, 1923, p. 1160. Deals with oil-shale deposits in the Mersey Valley. Gives analysis. States that appraisal of field is satisfactory from geological engineering standpoint.
1693. FERRIN, A. W. Oil deposits in Australia. *Commerce Reports, Bur. For. and Dom. Comm.*, May 1, 1922, p. 298. Results of petroleum exploration in Queensland. Notes that promising petroleum indications occur in New Guinea and the Kimberley district.
1694. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Oil prospecting in West Australia. Vol. 68, Nov. 2, 1922, p. 786.
1695. JENSEN, H. I. Oil in Queensland. *Ind. Australian and Min. Stand.*, vol. 69, May 10, 1923, p. 749. From *Brisbane Courier*. Discusses oil indications and regions where conditions are favorable.
1696. JONES, L. J. Notes on petroleum and natural gas and the possibilities of their occurrence in New South Wales. *New South Wales Dept. Mines Geol. Surv., mineral resources*, No. 31, 1921, 48 pp. Discusses origin of petroleum and natural gas, their allied hydrocarbons, occurrence, exploration, and production. Review of exploration and discussion of petroleum possibilities in New South Wales.
1697. LONDON TIMES TRADE SUPPLEMENT. Oil shales. Australasia and North America. Vol. 9, Jan. 7, 1922, p. 328. Occurrence and description of shale deposits; analyses of samples from several localities.
1698. OIL TRADE JOURNAL. Many indications of oil reported in south Australia. Vol. 13, Aug., 1922, pp. 60-61, 120. Survey of oil indications; results of exploration.
1699. ——— Russian oil prize attracts many competitors. Vol. 13, June, 1922, pp. 52, 54. Brief report of oil indications and production in Australia, Scotland, England, Poland, Afghanistan, and Punjab.
1700. PETROLEUM TIMES. Oil shales of Australia. Vol. 9, Jan. 13, 1923, p. 46. Abundant deposits exist in Tasmania, New South Wales, Western Australia, and also in New Zealand.
1701. PETROLEUM WORLD (LONDON). Oil resources of the Pacific region. Vol. 20. Dec., 1923, pp. 494-495. Reviews of papers presented at the Geological Section, Pan Pacific Congress, Sydney, N. S. W. Discusses prospects of oil in Australasia, New Zealand, Japan, Philippine Islands, New Guinea, and Papua.

1702. REID, A. M. Natural oil in the State of Tasmania. Ind. Australian and Min. Stand., vol. 70, Sept. 27, 1923, pp. 473-475. Discusses extent of possible oil territory. Gives geology of Mersey Valley; origin of oil. Includes map and cross section.
1703. RIG AND REEL MAGAZINE. Australia gives up a long oil hunt. Vol. 5, May, 1923, p. 1. Brief summary of oil exploration and unsuccessful results. *See also* No. 1311.

GEOLOGY

1704. BEDFORD, RANDOLPH. Existence of natural gas and possibly petroleum in Queensland. Nat. Petrol. News, vol. 14, Mar. 22, 1922, pp. 69-70. Gives geological evidence. Account of previous study and attempted development in Queensland.
1705. DAVIES, H. C. Western Australian oil indications. Petrol. Times, vol. 7, May 27, 1922, p. 738. States that drilling has disclosed traces of oil. Commercial production is unlikely.
1706. DE HAUTPICK, E. Oil geological sketch map of Australia. Ind. Australian and Min. Stand., vol. 70, Dec. 6, 1923, p. 865. Map which shows coal, lignite, oil-shale, and torbanite deposits.
1707. ——— Oil geological sketch map of Tasmania. Ind. Australian and Min. Stand., vol. 69, Feb. 1, 1923, p. 170. *See also* vol. 70, Sept. 27, p. 472. Shows areas containing oil possibilities and lists holders of prospecting permits.
1708. ——— Oil geological sketch map of Victoria. Ind. Australian and Min. Stand., vol. 68, Nov. 2, 1922, p. 769. Based on work of the Geological Survey of Victoria.
1709. ——— Commercial oil in Australia. Ind. Australian and Min. Stand., vol. 68, Oct. 26, 1922, pp. 729-730. Discusses geological conditions of southwestern Australia. Theory of origin of oil in deposits of vegetable matter and sediment. *See also* Mining Jour. (London), vol. 139, Dec. 9, 1922, pp. 920-921; Dec. 16, pp. 941-944.
1710. ——— Oil prospects in Australia. Mining Jour. (London), vol. 137, June 17, 1922, pp. 456-457; June 24, pp. 476-477; July 1, pp. 500-501. Description of geological conditions with respect to their bearing upon occurrence of petroleum. Results of exploration. Concludes that Mersey Valley offers favorable indications of large production.
1711. ——— Commercial oil in Australia. Ind. Australian and Min. Stand., vol. 67, March 16, 1922, p. 505; May 4, pp. 828-829; May 11, pp. 866-867; vol. 68, Oct. 26, pp. 729-730; Nov. 2, p. 770; Nov. 9, pp. 809-810. Discusses oil possibilities in Mersey River district and in Tasmania. General geology; coals, sapropelites, and oils. Genetic problems affecting search for oil in new regions. Nature and degree of metamorphism of sapropelitic deposits; stage of carbonization of the organic matter in the oil-bearing formations; thickness of sedimentary formation; geological structure; conclusion.
1712. ENGINEER. Search for oil in Australia. Vol. 134, Aug. 4, 1922, p. 116. Brief account of exploration, oil indications, and oil-shale deposits.
1713. ENGINEERING AND MINING JOURNAL-PRESS. Oil prospects in Western Australia. Vol. 114, Aug. 12, 1922, p. 288. Résumé of report on oil prospects in Ord-Negri River and East Kimberley district, western Australia, by D. J. Mahony, Victoria Geol. Survey. Oil is believed to have come from structure of Negri series.

1714. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Notes on the occurrence of oil on the shore of the Australian Bight. Vol. 70, Sept. 6, 1923, p. 361. Theory concerning occurrence of petroleum on east coast of the great Australian Bight. Discusses geological conditions. Cross section of Nullarbar Basin.
1715. ——— Petroleum possibilities in Victoria. Vol. 70, Aug. 2, 1923, p. 188. Résumé of lecture by W. Baragwanath before Soc. Chem. Ind., Victoria, Australia. Discussion of geological conditions, carbon ratio, and results of exploration.
1716. ——— Geologist's report on oil concessions at Tewantin (Q.). Vol. 70, July 5, 1923, p. 28. Report of H. I. Jensen to Queensland Oil Concessions, Ltd. Gives geology, well log, and oil possibilities.
1717. ——— Geological impressions of Elcho Island. Vol. 69, May 31, 1923, p. 881. Brief report of oil indications and conditions favorable to occurrence of petroleum.
1718. ——— Deep boring for oil in Tasmania. Vol. 69, May 17, 1923, p. 792. Oil indications and geology in Mersey Valley.
1719. ——— Search for oil in Gippsland. Vol. 67, March 2, 1922, p. 419. Petroleum indications at Traralgon in gas from Running Creek. Illustrations.
1720. JENSEN, H. I. Migration of oil in the Walloon series north of Roma. Queensland Govt. Min. Jour., vol. 24, May 15, 1923, pp. 171-172. Conclusions regarding location of oil in Walloon sands.
1721. ——— The oil prospects in the Lower Walloon strata of western Queensland. Queensland Govt. Min. Jour., vol. 23, June 1922, pp. 226-227. Notes that structural and stratigraphical conditions are favorable to accumulation of oil. Considers gas, shale, and torbanite as indications of petroleum. Carbon ratio of coals of Walloon series brings area within possibilities of oil production.
1722. ——— Supposed oil manifestations of the Enniskillen range. Queensland Govt. Min. Jour., vol. 23, April 15, 1922, pp. 157-159; May, pp. 185-188. Gives stratigraphy. Discusses oil possibilities of Tambo-Blackall and Tambo-Barcaldine districts. Geological sketch map of Tambo district.
1723. ——— Relation of the oil regions of the world to the continental shelves of ancient continents. Queensland Govt. Min. Jour., vol. 23, Jan., 1922, pp. 19-20. Lecture before the Royal Society of Queensland. Map of world showing chief oil fields supposed to be result of deltaic and shore line deposits. Discusses physiographic and geologic similarity of conditions in Gulf Coast oil fields to conditions on Gulf of Carpentaria, Australia.
1724. LONDON TIMES TRADE SUPPLEMENT. Western Australian oil search. Vol. 10, April 15, 1922, p. 85. Brief report of geological examination of Kimberley field.
1725. MEUDELL, G. D. The Australian Bight. Ind. Australian and Min. Stand., vol. 70, Aug. 23, 1923, p. 303. Discusses geological conditions in central Australia and their bearing upon occurrence of petroleum. Tells of evidence of presence of petroleum, and favorable indications. *See also* California Oil World, vol. 15, Sept. 6, 1923, p. 6.
1726. MOORE, ARTHUR. Does oil exist in Queensland? Queensland Govt. Min. Jour., vol. 24, Dec. 15, 1923, p. 463. From Brisbane Courier. Notes that geologic conditions in Queensland are similar to those producing oil fields in various parts of world.
1727. MORTON, C. C. South Moreton geology. Queensland Govt. Min. Jour., vol. 24, July 14, 1923, pp. 244-249. Describes geology with reference to petroleum possibilities. Geologic map and cross sections. *See also* Ind. Australian and Min. Stand., vol. 70, July 26, 1923, p. 151.

- 1728.** PETROLEUM TIMES. Further facts regarding Australian petroleum prospects. Vol. 10, Oct. 27, 1923, p. 598. Describes geological evidence favorable to existence of petroleum. States that seepages and boring results also indicate its presence.
- 1729.** ——— Petroleum possibilities in Australia. Vol. 10, Oct. 20, 1923, p. 583. Oil indications are discussed in papers presented at Science Congress, Sydney.
- 1730.** ——— The petroleum prospects of Western Australia. Vol. 8, Dec. 30, 1922, p. 978. Outlines geography and structural conditions in Western Australia. Indications favorable to oil are found in several regions. Review of an article by de Hautpick.
- 1731.** ——— Oil activities in Queensland. Vol. 8, Aug. 26, 1922, p. 300. Gives stratigraphy in region of Roma and Beaudesert, structural conditions in western Queensland favorable to existence of oil, and carbon ratio of Walloon coals in favorable indications.
- 1732.** ——— The search for oil in Australia. Vol. 7, May 6, 1922, p. 616. Review of geological report of formations in northwest Australia and the oil possibilities afforded.
- 1733.** PETROLEUM WORLD (LONDON). Australia; oil prospecting in the North and Northwest. Vol. 19, July, 1922, p. 304. Observes that only permo-carboniferous formation has possibility of oil.
- 1734.** ——— Oil and gas prospects in Australia. Vol. 19, April, 1922, p. 156. Survey and conclusions regarding oil occurrence in Queensland, Western Australia, and New South Wales.
- 1735.** QUEENSLAND GOVERNMENT MINING JOURNAL. The search for oil. Vol. 23, Oct., 1922, pp. 387-388. Oil in Dunn's bore, Beaudesert, Queensland, is believed to have migrated from some distance. Recommends examination of structure to determine favorable site for test.
- 1736.** REID, J. H. Petroleum prospects in Beaudesert districts. Queensland Govt. Min. Jour., vol. 23, Nov. 15, 1922, pp. 431-432. Stratigraphy and structure of region between Beaudesert and Boonah, Queensland, Australia. Gives geological map and cross sections of structures in this district. Discusses oil possibilities.
- 1737.** SAINT-SMITH, E. C. Boring for oil at Wolston. Queensland Govt. Min. Jour., vol. 24, Feb. 15, 1923, pp. 56-60. Describes formations in region near Brisbane. Gives petroleum possibilities and well log.
- 1738-1739.** STREVVENS, J. L. Williamstown oil. Ind. Australian and Min. Stand., vol. 70, Aug. 2, 1923, p. 168. *See also* p. 188. Discusses characteristics of oil from Victoria. Describes geological conditions of occurrence. *See also* Nos. 1692, 1693, 1695, 1698, 1702, 1898.

DEVELOPMENT AND PRODUCTION

- 1740.** PETROLEUM TIMES. Search for oil in Australia. Vol. 9, April 21, 1923, p. 573. Drilling at Roma has disclosed evidence of oil and an enormous gas pressure. Method of extinguishing gas-well fire. *See also* Eng. and Min. Jour.-Press, vol. 115, Feb. 3, 1923, p. 239. Petrol. Times, vol. 9, Feb. 10, 1923, p. 209.
- 1741.** PETROLEUM WORLD (LONDON). Drilling methods in Queensland. Vol. 20, March, 1923, pp. 127-128. Letter telling of equipment adapted to tropical climate and transportation. Review of pole-drilling operations.
- 1742.** ——— Queensland oil prospects. Vol. 19, Dec., 1922, p. 502. Oil from six bores found to be heavy. Failure of wells to produce attributed to method of drilling with bore filled with water. *See also* Nos. 1744, 2022.

DISTRIBUTION

1743. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Oil-fuel depot for steamers. Vol. 68, July 27, 1922, p. 150. Tells of oil-bunkering facilities established at Port Melbourne.

PROPERTIES

See Nos. 740, 1689, 1738, 1742, 1997, 4264, 4267.

REFINING AND REFINERIES

1744. FELL, D. A. Australian oil-shale industry now in commercial operation. Nat. Petrol. News, vol. 14, May 3, 1922, pp. 89-90, 93. Gives history, present scope, methods, and products.
1745. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. The search for oil. Vol. 67, Jan. 5, 1922, pp. 20, 25; April 27, pp. 781-782. Deals with refining for shale oil and petroleum and natural-gas resources in New South Wales. Gives official report on Montajup prospects: South Australian Oil Wells Co., Victas Oil Shale Co., Ltd., Pallinup Oil and Shale Co., N. L., Adelaide Exploration Co. in Tasmania. Illustrations. Guide for prospectors. Discusses anticlinal theory. Considers other sources of oil supply.
1746. JONES, C. L. Oil-shale distillation in situ in New South Wales. Chem. and Met. Eng., vol. 26, Feb. 1, 1922, p. 196. Tells of successful experiment being carried on with rich kerosene shale of New South Wales.
1747. MEUDELL, G. D. Oil from shale. Ind. Australian and Min. Stand., vol. 69, June 28, 1923, pp. 1052, 1066. Discusses possibilities of shale-oil production from oil-shale deposits of Australia; equipment required for mining shale.
1748. PETROLEUM TIMES. Oil-shale developments in Australia. Vol. 7, Jan. 7, 1922, p. 20. Brief account of developments at Joadja, New South Wales.
1749. THWAITES, R. E. Production of liquid fuels from oil shale and coal in Australia. Inst. Sci. and Ind. (Melbourne), Bull. 24, 1923, 62 pp. Surveys oil resources of world. States that no crude oil is produced in Australia and known oil-shale deposits are small; coal offers greatest promise of supplying fuel oil.

UTILIZATION

1750. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Australian motor fuel. Vol. 67, Apr. 13, 1922, p. 686. Successful demonstration proves its value.
1751. ——— Australian motors driven by Australian fuels. Vol. 67, Apr. 13, 1922, p. 686.

See also No. 7297.

STATISTICS

See No. 53.

LEGAL REGULATIONS, LEGISLATION

1752. LE COURRIER DES PÉTROLES. Les permis de recherches en Australie 4e Année, Oct. 13, 1923, p. 4. Outline of provisions in Australian petroleum law of July 5, 1923.
1753. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Shale-oil bounty. Vol. 68, Oct. 19, 1922, p. 683. Tells of bill passed in Federal Parliament in 1917 providing for payment of bounty on shale oil produced in Australia.
1754. NATIONAL PETROLEUM NEWS. Foreigners kept out of Australian fields. Vol. 14, May 10, 1922, p. 18. Provisions of ordinance for regulation of oil development in northern Australia.
1755. PETROLEUM TIMES. The search for oil in Australia. Vol. 10, Dec. 15, 1923, p. 840. Provisions contained in the new petroleum bill. See also California Oil World, vol. 16, Nov. 29, 1923, p. 6.

1756. QUEENSLAND GOVERNMENT MINING JOURNAL. The search for oil. Vol. 24, Oct. 15, 1923, pp. 364-365. Provisions of Queensland petroleum bill pending in the Queensland Parliament.

MAP

1757. DE HAUTPICK, E. Oil geology. Ind. Australian and Min. Stand., vol. 68, Oct. 5, 1922, p. 601. Sketch map of Western Australia based on work of the Western Australian Geol. Survey, with explanation.
See also Nos. 1706, 1707, 1708, 1722.

BORNEO, JAVA, AND SUMATRA (162)

See also No. 7887.

OCCURRENCE

1758. BLUETT, H. A. N. Petroleum in the Dutch East Indies. *Petrol. Times*, vol. 8, Sept. 2, 1922, pp. 337-339; Sept. 9, pp. 375-376. Production of various petroleum products in Java and Madura, 1919-1920; recent oil discoveries; crude oil production, 1913, 1918-1920, in Sumatra, Java, and Dutch Borneo; refinery and storage facilities. List of petroleum concessions and their production of oil and gas in 1920. Describes fields in northern and southern Sumatra, Java, and Dutch Borneo. *See also* *Petrol. World* (London), vol. 19, Oct., 1922, pp. 413-414, 416, 418, 420.
1759. BOLETÍN DEL PETRÓLEO. Produccion de petróleo en las Indias Orientales Holandesas. Vol. 16, Dec., 1923, pp. 392-395. Occurrence of petroleum in Borneo, Sumatra, and Ceram. Legislation and regulations. Contains map showing location of chief oil regions and fields.
1760. COUMBE, A. T., jr. Petroleum production and trade of the Dutch East Indies. *Bur. For. and Dom. Comm., Trade Inf. Bull.* 111, June 25, 1923, 24 pp. Pamphlet. Reports production. Surveys possible fields and reserve supplies. Gives legal regulations, refineries, and marketing methods. Contains petroleum map of Dutch East Indies and Borneo showing location of refineries, proved oil fields, and prospective oil fields. *See also* *Nat. Petrol. News*, vol. 15, July 18, 1923, pp. 97-98, 100-102. *Eng. and Min. Jour.-Press*, vol. 116, July 28, 1923, p. 156.
1761. THE LAMP. Petroleum in the Dutch East Indies. Vol. 5, June, 1922, pp. 9-14. Describes topographic and general conditions in islands of Malay Archipelago. Gives oil regions, map, and development by companies. *See also* *Petrol. Times*, vol. 8, Aug. 12, 1922, pp. 225-228.
1762. MINING JOURNAL (LONDON). Oil fields of the Dutch Indies. Vol. 138, Sept. 9, 1922, p. 686. Particulars of various oil fields situated in the regions of northern Sumatra, southern Sumatra, and Dutch Borneo.
1763. NETHERLANDS CHAMBER OF COMMERCE IN NEW YORK. Petroleum in the Netherlands East Indies. *Holland and Her Colonies*, vol. 2, Jan., 1923, pp. 4-8. Deals with four most important producing districts and their output.
1764. OIL WEEKLY. One of richest oil fields on an island. Vol. 27, Oct. 21, 1922, pp. 72, 74. General description of field and oil production on island of Tarakan off coast of Borneo.
1765. REDFIELD, A. H. Petroleum in Borneo. *Econ. Geol.*, vol. 17, Aug., 1922, pp. 313-349. Discusses early development. Survey of production. Gives production figures, 1910, 1920, for Dutch and British Borneo and East Indies. Describes structural features and oil-bearing regions of Koetei, Tarakan, and British Borneo. Notes character of oil. Bibliography.

GEOLOGY

1766. BROUWER, H. A. The major tectonic features of the Dutch East Indies. Jour. Wash. Acad. Sci., vol. 12, April 4, 1922, pp. 172-185. Includes a study of older trend line and main trend lines in younger stage of mountain building.
1767. PETROLEUM TIMES. The Dutch East Indies oil region. Vol. 10, Aug. 4, 1923, p. 176. Structural features of the Sanga Sanga field in the Koetei petroleum region. Describes types of oil produced.
1768. ——— Petroleum in British Borneo. Vol. 8, Nov. 18, 1922, p. 765. Survey of favorable structures, oil indications, exploration, and oil production.

TRANSPORTATION, DISTRIBUTION

1769. STARRETT, H. P. Market for petroleum products in Dutch East Indies. Commerce Reports, Bur. For. and Dom. Comm., June 19, 1922, pp. 936-937. Methods of import and distribution. Deals with refineries. Gives regulations regarding storage.
- See also* No. 1760.

PROPERTIES

1770. CHAVANNE, G. The constituents of the fraction of a Borneo petroleum which distills between 27 and 81°. Bull. Soc. chim. Belg., vol. 31, 1922, pp. 331-364. Analysis of gasoline containing all the possible isomerides of hexane and all hydrocarbons derived from cyclopentane and cyclohexane. *See also* Chem. Abs., vol. 17, Aug. 20, 1923, p. 2777. Jour. Soc. Chem. Ind., vol. 42, March 2, 1923, p. 173A.
- See also* Nos. 50, 111, 1767.

STATISTICS

1771. OIL, PAINT AND DRUG REPORTER. Royal Dutch oil output in East Indies gained in 1922. Vol. 104, Aug. 13, 1923, p. 47. Production figures by fields.
1772. REDFIELD, A. H. Petroleum developments in the East Indies during 1922. Trans. Am. Inst. Min. and Met. Eng., Pamphlet 1241, April, 1923, pp. 120-127. Production, development, and exploration.
1773. STARRETT, H. P. Production of mineral oil in the Dutch East Indies. Commerce Reports, Bur. For. and Dom. Comm., Jan. 2, 1922, p. 26. Gives production figures, by districts, for the years 1917, 1918, 1919, and 1920, in metric tons.
- See also* Nos. 53, 1655, 1758, 1765.

LEGAL REGULATIONS

1774. OIL AND GAS JOURNAL. Stringent oil laws in Dutch East Indies. Vol. 22, July 12, 1923, p. 96. Only Dutch nationals or inhabitants of the Netherlands East Indies may obtain permits for exploration or concessions.
1775. U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Regulations governing gasoline shipments in Batavia harbor. Commerce Reports, No. 19, May 7, 1923, p. 382. Ruling that ships discharging gasoline may have only one boiler fired and must have tow tugs alongside in order to leave harbor immediately in case of fire.
- See also* No. 1769.

DIRECTORY, MAPS

- See* Nos. 1758, 1759, 1760, 1761.

NEW GUINEA (PAPUA) (163)**OCCURRENCE**

1776. ENGINEER. Oil in New Guinea. Vol. 133, June 23, 1922, p. 704. Brief report on oil discoveries and possibilities.
1777. PETROLEUM TIMES. Petroleum in New Guinea. Vol. 7, April 8, 1922, p. 476. Descriptive account of surface occurrence of oil in regions of Hallikamak River, Matapan.
- See also* No. 1701.

GEOLOGY

1778. SAMMONS, THOMAS. Search for oil in New Guinea. Commerce Reports, Bur. For. and Dom. Comm., July 10, 1922, p. 102. Examination of petroleum indications of former German New Guinea in Eitape and Madang districts discloses unfavorable geological conditions. Australian mining legislation relating to former German New Guinea does not permit private exploitation of shale and petroleum deposits. *See* Eng. and Min. Jour.-Press, vol. 114, July 1, 1922, p. 26. Oil and Gas Jour., vol. 21, July 13, 1922, p. 76.

PROPERTIES

1779. PETROLEUM AGE. Crude oil. Vol. 10, Dec. 15, 1922, p. 39. Properties of Papuan (New Guinea) crudes.

LEGAL REGULATIONS, LEGISLATION

1780. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Development of New Guinea. Vol. 67, June 1, 1922, p. 1022. Ordinances for mandated territory; right to prospect for shale, petroleum, and mineral oils is reserved exclusively to the crown.
1781. QUEENSLAND GOVERNMENT MINING JOURNAL. Coal and oil in New Guinea. Vol. 24, Dec. 15, 1923, p. 468. Provisions of amended regulations regarding the prospecting for coal and mineral oil in New Guinea.

NEW ZEALAND (164)**OCCURRENCE**

1782. PETROLEUM TIMES. Petroleum prospects of New Zealand. Vol. 7, Feb. 18, 1922, p. 236. Petroleum indications. Characteristics of seepage oil and shales.
- See also* No. 1701.

GEOLOGY

1783. BENSON, W. N. An outline of the geology of New Zealand. Jour. Geol., vol. 30, Jan.-Feb., 1922, pp. 1-17. Based on the writer's presidential address before the geological section of the Australian Association for the Advancement of Science, 1921.
1784. PETROLEUM TIMES. Petroleum prospects in New Zealand. Vol. 10, Dec. 1, 1923, p. 776. Survey of petroleum and oil-shale indications in New Zealand. Analysis of oil samples from several districts.

PROPERTIES, REFINING

1785. EASTERFIELD, T. H., AND McCLELLAND, NORMAN. New Zealand mineral oils. Jour. Soc. Chem. Ind., vol. 42, Sept. 28, 1923, pp. 936-938. Oils are obtained from distillation of peat and shale and by drilling. Description of products and fractions obtained from the various oils.
- See also* Nos. 1782, 1784.

PHILIPPINES (165)

OCCURRENCE

1786. **PETROLEUM TIMES.** Petroleum in the Philippines. Vol. 10, Sept. 1, 1923, p. 328. Survey of oil indications existing on the various islands of the Philippine group.
1787. **PRATT, W. E.** Possible petroleum resources of Philippine Islands. *Min. and Met.*, No. 187, July, 1922, p. 42. States that petroleum indications have been found in the islands of the Philippine group, and exploration is progressing on the Bondoc Peninsula, Tayabas Province. Discussion of oil possibilities. *See also* *Nat. Petrol. News*, vol. 14, March 1, 1922, pp. 48J, 48L. *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1923, pp. 1091-1096. *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1175-P, July, 1922, 6 pp.
- See also* No. 1701.

GEOLOGY

1788. **SMITH, W. D.** Geologic reconnaissance of the Pidatan oil field, Cotabato Province, Mindanao. *Philippine Jour. Sci.*, vol. 20, Jan., 1922, pp. 23-42. Gives geography and geology, details regarding oil seep, analysis, uses, and development. Contains cross section of seep and sketch map of region. Includes directions for organizing exploration; illustrations.
1789. ——— Petroleum and residual bitumens. Philippine Bureau of Science, Mineral Resources of the Philippine Islands for 1919, 1920. Manila, 1922, pp. 55-64. States that shales in Vigo River region on Bondoc Peninsula are main source of oil production in Philippines. Surveys favorable oil structures and petroleum indications of islands. Describes physical and chemical properties of petroleum and natural bitumens.
- See also* No. 1787.

PROPERTIES

See Nos. 1788, 1789, 4238.

UTILIZATION

1790. **COLE, H. I.** Industrial alcohol production and uses in the Philippines. *Chem. Age*, vol. 30, Nov., 1922, pp. 489-492. Sources of alcohol; alcohol and alcohol blends for motor fuels; cost of plant; operating costs.
- See also* No. 7279.

LEGAL REGULATIONS, MAP

1791. **CALIFORNIA OIL WORLD.** Philippine oil regulations simplified. Vol. 14, March 30, 1922, p. 2. States that regulations unfavorable to wildcatting have been withdrawn; under territorial law, subsoil rights must date from grant by Spanish throne, otherwise they belong to the Philippine Government. *See also* *Nat. Petrol. News*, vol. 14, March 29, 1922, p. 95.
1792. **PHILIPPINE BUREAU OF SCIENCE.** The Mineral Resources of the Philippine Islands for the years 1919 and 1920. 1922, pp. 65-70. Amendments to rules and regulations governing leasing of petroleum lands, and rules and regulations covering the granting of exclusive rights of geological exploration for petroleum or other mineral oils and gas under Act 2932, Philippine Legislature.
1793. ——— Map of Philippine Islands showing location of oil indications. The Mineral Resources of the Philippine Islands for the years 1919 and 1920, 1922, plate 2, p. 70.

- 1794.** U. S. BUREAU OF FOREIGN AND DOMESTIC COMMERCE. Impetus given oil industry in the Philippines. Commerce Reports, No. 18, April 30, 1923, p. 308. Among important amendments made recently to petroleum drilling and exploration regulations are those allowing increase in area of land grants and the right to take a homestead on parts of concessions granted for exploration. *See also* Oil Weekly, vol. 29, May 12, 1923, p. 41.

OTHER ISLANDS (169)

TIMOR

OCCURRENCE

- 1795.** OIL WEEKLY. Rich oil deposits on Isle of Timor discovered by Australian soldier. Vol. 26, Aug. 19, 1922, p. 91. Notes that Timor, an island between Java and the Philippines, owned by Portugal and Holland, has promising oil seepages.

GEOLOGY AND ORIGIN (200)

See No. 4857.

GENERAL AND MISCELLANEOUS GEOLOGY (210)

- 1796.** INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Notes on petroleum geology. Vol. 67, May 4, 1922, p. 855.
See also No. 1391.

STRATIGRAPHIC DISTRIBUTION (220)

- 1797.** CLAPP, F. G. The occurrence of petroleum. Chapter from "A handbook of the petroleum industry," by D. T. Day. New York, 1922, pp. 1-166.
- 1798.** FRIEDL, KARL. Die regionale Verteilung des Erdöls in galizischen Sandsteinzone. Petrol. Ztschr., Jahrg. 19, June 1, 1923, pp. 527-534. Discusses geology and tectonics.
- 1799.** PRICE, W. A. General formulae for the determination of thickness and depth of strata. Econ. Geol., vol. 17, Aug., 1922, pp. 370-381. Formula is "applicable only to traverse lines along which dip and strikes of the strata are approximately constant."
- 1800.** PYHÄLÄ, EWALD. Die stratigraphische und regionale Verbreitung des Erdöls mit Berücksichtigung der Entstehung desselben. Petrol. Ztschr., Jahrg. 19, Nov. 20, 1923, pp. 1159-1165. Notes occurrence of oil in formations of various periods and countries. Gives theories of origin. Contains map showing seismic regions of world and includes evidence in support of theory that petroleum originates from distillation of metallic carbides in interior of the earth. *See also* Petrol. Times, vol. 10, Dec. 22, 1923, p. 883.
- 1801.** VAUGHAN, T. W. On the relative value of species of smaller foraminifera for the recognition of stratigraphic zones. Bull. Am. Assoc. Petrol. Geol., vol. 7, Sept.-Oct., 1923, pp. 517-530. Describes species of foraminifera identified in formations of Pliocene, Miocene, and Oligocene periods. Small foraminifera are found to be of least value of any group considered for stratigraphic zoning. Includes bibliography.
- 1802.** WOOD, C. W. "Farmer's sand" oilfield's best producer. Oil and Gas Jour., vol. 21, June 15, 1922, pp. 9, 104. Account of famous pools which were discovered by deeper drilling after first sand became exhausted.
See also Nos. 26, 249, 343, 1867.

PHYSICAL AND CHEMICAL CHARACTERISTICS OF OIL-BEARING ROCKS (230)

1803. GILMAN, C. H. Microscopic studies of diamond-drill cores and their results. *Oil and Gas Jour.*, vol. 21, Nov. 2, 1922, p. 96. Account of finding a large well in territory regarded as unproductive by use of a microscope, magnifying 1,000 times, to study formations.
1804. OIL NEWS. Panorama of petroleum. Vol. 11, March 5, 1923, p. 38; May 5, pp. 38-39; July 5, p. 39; Aug. 5, p. 41-42. Contains theories of petroleum origin and migration. Discusses relation of fossils to oil deposits. Gives stratigraphy.
1805. RAKUSIN, M. A. Ueber die Wahrscheinlichkeit der Gegenwirkung zwischen Schwefel und den festen Paraffinen in den Erdölführenden Regionen. *Petrol. Ztschr.*, Jahrg. 18, May 20, 1922, pp. 581-582. Describes experiment with Cheleken paraffin. Concludes that at depths where temperature is 200° C. deparaffination may occur; at higher and cooler strata the sulphur does not attack wax, and oil will have smaller sulphur content than wax oil. *See also* *Oil News*, vol. 10, Dec. 20, 1922, p. 32. *Petrol. World* (London), vol. 19, July 1, 1922, p. 303. *Chem. Abs.*, vol. 16, Sept. 20, 1922, p. 3200. *Jour. Soc. Chem. Ind.*, vol. 41, July 15, 1922 pp. 492A-493A.
1806. ——— (Adsorption processes in the naphtha-producing regions of the earth.) *Kolloid Ztg.*, Jahrg. 30, 1922, pp. 168-176. "Of the three methods of adsorption, mixt. filtration, and infusion, the natural adsorption processes which occur in the petroleum areas certainly proceed according to the method of filtration. The other types are not excluded. The velocity of absorption varied with the method used but the final result was independent of the method. A high carbonization const. (coeff. of polarimetric opacity) shows that the petroleum has been well filtered and at the same time is evidence of the character of the stone through which the petroleum has passed. The properties of the petroleum are determined to a large extent by the amorphous structure of the oil-producing stone." *See also* *Chem. Abs.*, vol. 16, June 20, 1922, p. 2026. *Bull. Acad. Sci. Russie*, 1919, pp. 1143-54.
1807. SKIRVIN, O. W. Experimental study of the invasion of oil into a water-wet sand. *Econ. Geol.*, vol. 17, Sept., 1922, pp. 461-469. Describes materials, methods, and results of a series of experiments conducted to determine the relation of physical properties of crude oil, water, and sand, and the process of accumulation of oil in sands of varying textures and porosities, it was found that larger pores contain invading fluid, either water or oil, as the case may be. *See also* *Eng. and Min. Jour.-Press*, vol. 114, Oct. 14, 1922, p. 686. *Petrol. Times*, vol. 9, Feb. 3, 1923, p. 160. *Queensland Govt. Min. Jour.*, vol. 24, April 15, 1923, pp. 141-142.
1808. WROBLEWSKI, ADAM. Sand structure and oil production. *Oil and Gas Jour.*, vol. 20, April 13, 1922, pp. 94, 98-99. Considers relation of sand structure to production. Study of origin and types of sand. Discusses Bartlesville sand in Cushing field. Diagrams and tabulated data. *See also* Nos. 958, 1297, 1569, 1577, 1820, 1835, 1864, 1872, 1885, 1923.

GEOLOGIC STRUCTURE (240)

1809. BERTHELOT, C. Le congrès et l'exposition des combustibles liquides. *Rev. métal.*, 20e Année, Feb., 1923, pp. 112-129. Discusses occurrence and distillation of petroleum schist, lignite, alcohol, vegetable oils, tar, and benzols. Describes tar-distillation apparatus.

1810. DE HAUTPICK, E. New ideas on oil geology. *Ind. Australian and Min. Stand.*, vol. 67, March 23, 1922, p. 554; June 8, pp. 1051-1052; vol. 68, Oct. 12, pp. 648-649; Oct. 19, pp. 685-686. "A mortal blow to the anticlinal theory." Underground storage. Discussion of experiments conducted at Stanford University for purpose of investigating conditions under which disseminated oil will migrate through the sands up low dips. *See also Min. Jour.*, vol. 139, Nov. 18, 1922, pp. 859-860.
1811. ENGINEERING AND MINING JOURNAL-PRESS (PACIFIC MINING NEWS). Local section discusses faults. Vol. 2, July, 1923, pp. 200-201. Modern views regarding faults in oil fields hold that they are not always an unfavorable indication, but must be considered in relation to other geological conditions. Report of discussion held at San Francisco section, Am. Inst. Min. and Met. Eng.
- See also Nos. 17, 326, 457, 715, 1222, 1803, 1812.*
1812. HARDEL, M. J. A. Petroleum: Its occurrence and exploitation. *Ind. Australian and Min. Stand.*, vol. 67, Jan. 19, 1922, p. 106; Feb. 2, pp. 201-202. (A paper prepared for the *Annales des mines* by M. J. A. HardeI, Chief Engineer of Roads and Bridges, France. Abstracted and translated by P. Burbidge, A. S. T. C., Melbourne.) Gives origin and geology. Account of prospecting and exploitation. Drilling methods. Illustrations.
1813. HIGGINS, D. F. Determination of dip and strike from any two components, and the inverse problem. *Econ. Geol.*, vol. 18, Jan.-Feb., 1923, pp. 26-52. Contains three methods of solution: (1) Descriptive geometry; (2) mathematics; (3) a set of diagrams for formulas derived in (2) to be applied to problems arising in field work.
1814. HILL, E. A. Geological notes on oil structures. San Francisco, 1922. 85 pp.
1815. HINTZE F. F. Oil accumulation in relation to periods of folding. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, Jan.-Feb., 1923, pp. 58-66. Discusses theory holding that period in which structures were formed is to directly related existence of oil. Illustrations.
1816. ICKES, E. L. Similar, parallel, and neutral surface types of folding. *Econ. Geol.*, vol. 18, Sept., 1923, pp. 575-591. Discusses causes, characteristics, and important features of three simple types of folds occurring with petroleum deposits. *See also Tran. Am. Inst. Mining and Met. Eng. Pamphlet 1279*, Oct., 1923, 23 pp.
1817. JONES, L. J. Petroleum and natural gas. *Ind. Australian and Min. Stand.*, vol. 67, March 9, 1922, p. 467; March 16, p. 511; March 23, p. 571; March 30, pp. 599-600. Account of origin, occurrence, prospecting, and drilling. Discusses petroleum and allied hydrocarbons.
1818. KRAUS, MAXMILIAN. Oil deposits and the tectonics of vertical pressure. (With special reference to the oil fields of the Rumanian Pliocene.) *Jour. Inst. Petrol. Tech.*, vol. 9, Aug., 1923, pp. 276-287. Before Oil Con., Sixth Internat. Min. Exhib., London, June, 1923, Discusses principles of tectonics of vertical pressure and characteristics of resulting structures. Describes structures caused by vertical pressure in the South Carpathians of Rumania and their relation to oil deposits. *See also Petrol. Times*, vol. 9, June 9, 1923, pp. 833-835.
1819. ——— Vertikaldruck-Tektonik (logarithmische Spirale) und Oellagerstätten. *Petrol. Ztschr.*, Jahrg. 19, Feb. 20, 1923, pp. 147-156. Theory and conclusions regarding tectonic pressure, and development of Rumanian vertical pressure anticlines. Illustrations.

1820. LAJOUS, L. F. Condiciones geologicas necesarias para la formacion y conservacion del petr6leo. Bol. Petr6l., vol. 16, Dec., 1923, pp. 357-368. Describes structural and stratigraphical conditions favorable to accumulation of oil. Conditions in various American fields.
1821. MERTIE, J. B., JR. Analysis of structure below an unconformity. Econ. Geol., vol. 17, Nov., 1922, pp. 572-574. Method of interpreting structural data available from an unconformable relationship of geologic data.
1822. MILSOM, D. How oil accumulates. Queensland Govt. Min. Jour., vol. 24, 1923, pp. 49-50. Considers influence of capillary action. Explains formation of oil-bearing structures and their relation to seepages and surface indications.
1823. PETROLEUM TIMES. Salt-dome structures and their significance. Vol. 9, April 7, 1923, p. 486. Advances theory of origin which supposes domes to be result of tectonic action on deeply bedded deposits.
1824. ——— Formation of oil-bearing structures. Vol. 7, June 17, 1922, p. 872. Notes that structure of oil strata is influenced by differential settling of various types of strata which when compacted produce depressions or elevations according to composition.
1825. ——— Natural distillation of petroleum. Vol. 7, May 20, 1922, p. 696. Oils of highest grade are usually found in regions where organic deposits have been metamorphised to a large degree. Theory of formation of lighter oils; application to gas and oil occurrence in Appalachian field.
1826. PETROLEUM WORLD (LONDON). Diapyrism and the faulting of strata. Vol. 20, Feb., 1923, p. 65. From article by Yovanovitch in *La revue p6trollifere*. An explanation of diapyrism, illustrated by figures showing stratic folds.
1827. QUEENSLAND GOVERNMENT MINING JOURNAL. The natural cracking of petroleum. Vol. 23, Sept., 1922, p. 361. Discusses relation of geodynamic alteration of region to character of oil.
1828. SMITH, W. S. T. The determination of dip and strike. Econ. Geol., vol. 17, May, 1922, pp. 206-213. Contains three methods for use in determination of dip and strike of plane "when indication from the horizontal of the trace of plane in two different vertical sections is known."
1829. VON GAL-SCALE, J. The anticlinal structure and the position of crude oil in it. Petrol. Times, vol. 7, May 6, 1922, pp. 635-636. Occurrence of dry holes on an anticline is explained by theory that disturbance has taken place between oil beds and oil has been lost, but may be found outside of structure.
1830. WOLF, A. G. Origin of salt domes. Eng. and Min. Jour.-Press, vol. 115, March 3, 1923, pp. 412-414. Advances theories to explain cause of salt domes.
- See also* Nos. 276, 277, 292, 353, 387, 419, 447, 496, 539, 599, 943, 1370, 1393, 1394, 1745, 1842, 1867, 1873, 1896, 1905, 1906, 1949, 1950.

MAPPING (241)

1831. BLOESCH, EDWARD. Remarks on subsurface contouring. Bull. Am. Assoc. Petrol. Geol., vol. 6, July-Aug., 1922, pp. 317-322. Best method of working out a subsurface structure is based upon structure contours on a certain horizon close to the producing zone and should not be separated from this zone by an unconformity; if several of these exist it is a good plan to contour different subsurface horizons. Illustration of structure correlation by means of well records.

1832. COX, G. H., DAKE, C. L., AND MUILENBURG, G. A. Field methods in petroleum geology. New York, 1921. 305 pp. Describes structural features relating to occurrence of petroleum. Explains map making.
1833. FOWKS, A. E. The aeroplane in the oil fields. Bull. Union Oil Co. of California, vol. 3, Dec., 1923, pp. 16-17. Aeroplane has facilitated the mapping of oil field, and by delivery of tools has been means of eliminating delay.
1834. HENSON, F. R. S. The use of the hand auger in geological mapping. Jour. Inst. Petrol. Tech., vol. 9, Dec., 1923, pp. 478-482. Describes use of hand auger for obtaining samples of undisturbed beds beneath the surface, for stratum contouring, and for examining minor structural features.
1835. LAHEE, F. H. Field geology. New York, 1923. 651 pp. Contains chapters on porosity and causes and conditions of folding. Discusses fixed carbon ratio of coals. Explains well logs, their correlation, and use in mapping subsurface structure.
1836. MARTIN, F. O. Geologic reconnaissance by hydroplane. Union Oil Co. of California Bull. 32, Oct., 1923, pp. 15-17. Account of using hydroplane in Colombia for map making and for a general survey of topography.
1837. WARNER, C. A. Warner's field mapping for the oil geologist. New York, 1921. 143 pp.
See also Nos. 192, 7733.

PATENT.

1838. SHEPPARD, W. H. Geological fault guide. United States patent 1,425,705, Aug. 15, 1922.

ORIGIN, THEORIES (250)

1839. BOLETÍN DEL PETRÓLEO. Geología del petróleo. Vol. 14, Aug., 1922, pp. 115-125. Review of theories of origin and occurrence of petroleum. Illustrations.
1840. BRENNSTOFF-CHEMIE. Naphthene in ihrem Verhalten gegen die Dehydrogenisationskatalyse. Beitrag zur Aufklärung der Natur des Erdöls. Bd. 4, Dec. 15, 1923, p. 379. Review of an article by Zelinsky, Ber. Deut. chem. Gesell., Jahrg. 56, 1923, p. 1718. (4.7.) Discusses evidence of origin of petroleum obtained by observations made in producing synthetic petroleum by distillation of oktanaphten with natrium.
1841. HÖFER-HEIMHALT, HANS. Zur Entstehung des Erdöls. Petrol. Ztschr., Jahrg. 19, March 1, 1923, pp. 191-192. Theories regarding origin of petroleum and formation of petroleum products.
1842. MILSOM, D. Theory of petroleum. Queensland Govt. Min. Jour., vol. 23, 1922, pp. 394-397, 436-438, 481-483. Review of theories of origin. Discusses accumulation of oil and gas. Considers favorable and unfavorable geological structure.
1843. PECKHAL, E. (The genesis of oil.) Russian Oil Jour., June-July, 1923, pp. 74-77.
1844. QUEENSLAND GOVERNMENT MINING JOURNAL. The origin of petroleum. Vol. 24, June 15, 1923, pp. 200-201. Summary of conclusions of various investigators regarding origin of petroleum, as given in "Das Erdöl und seine Verwandten," by H. Höfer-Heimhalt.
1845. TROPSCH, H. Über die Distillation von Natriumstearat und Oleat unter vermindertem Druck und über die Entstehung des Erdöls. Brennstoff-Chem., Bd. 3, Jan. 15, 1922, pp. 26-27. "Distillation of sodium stearate and oleate under diminished pressure, and the origin of petroleum." "

1846. VON. HÖFER, HANS. Zur Entstehung des Erdöls. Chem. Ztg., Jahrg. 46, April 8, 1922, p. 317. Oils are classified as methanol, naphthenol, and naphthmethanol. Mentions chief occurrences of these different classes. Naphthenol is believed to have been formed at a later geologic period than the other two. *See also* Chem. Abs. vol. 16, July 10, 1923, p. 2099.
1847. WEEKS, W. G. The origin of oil shales. Oil Eng. and Fin., vol. 3, 1923, pp. 643-644. Discusses Jones's theory. *See also* Nos. 10, 26, 36, 600, 723, 1320, 1459, 1466, 1569, 1576, 1696, 1711, 1804, 1817, 1825, 3757, 3790, 4121, 4215, 4291.

INORGANIC (251)

1848. BALLIET, LETSON. The genesis of petroleum. Oil Age, vol. 20, Nov., 1923, pp. 10, 12, 49-50; Dec., pp. 10-12, 54. States that hydrogen and carbon are disassociated from other elements at about 2,000° C. and combine with each other at lower temperatures to form hydrocarbons. Discusses inorganic theory of petroleum origin. Regards organic theory as inapplicable except to Carboniferous age. Discusses questions concerning the inorganic theory, and relation of earthquake and volcanic action to petroleum origin. *See also* Bol. Petról. vol. 16, Dec., 1923, pp. 369-374.
1849. ——— A study in oil deposits. Oil Age, vol. 20, Oct., 1923, pp. 10, 12. Holds theory that hydrocarbons are in continuous process of formation, possible because of conditions favorable to proper combination of hydrogen and carbon.
1850. ——— The genesis of ore deposits. Salt Lake Min. Rev., vol. 25, July 30, 1923, pp. 22-24; Sept. 30, pp. 18-22. Considers that heat and pressure are factors in formation of oil; conditions similar to those under which gold and other metals were formed were responsible for the combining of carbon and hydrogen in various proportions to form petroleum and related products. Theory of accumulation. Describes structure. Illustrations. *See also* Oil and Gas Jour., vol. 22, Oct. 18, 1923, pp. 124-125.
1851. CALCAGNI, G. (A new hypothesis on the origin of natural combustibles.) Gazz. chim. Ital., vol. 52, 1, 1922, pp. 87-93. Theory is presented that coal, petroleum, and gas were formed from combination of elements upon the earth when it cooled from its vapor stage. Abstract in Jour. Soc. Chem. Ind., vol. 41, May 15, 1922, p. 318A.
1852. CORTESE, E. (Theories on mineral oils.) Rassegna Min. Met. Chim., vol. 58, 1923, pp. 51-60. Holds mineral origin of petroleum. Discusses various theories explaining existence of salts with hydrocarbons. *See also* Chem. Abs., vol. 17, July 20, 1923, p. 2407.
1853. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Theories of the inorganic origin of petroleum. Vol. 68, Dec. 14, 1922, p. 1040.
1854. PERRY, E. S. Composition of oil and gas. Petrol. Age, vol. 11, March 15, 1923, pp. 17-18. Observes that various chemical combinations of hydrogen and carbon make possible many hydrocarbon compounds.
1855. PETROLEUM AGE. How was petroleum formed? Vol. 12, Aug. 15, 1923, p. 26. States that petroleum analysis supports theory of origin from iron, in that iron distillate and natural petroleum contain no trace of oxygen, while fish oil distillate shows trace of oxygen. Considers theory of origin from coal improbable, as distillate is tar.
1856. PETROLEUM TIMES. Theories of the inorganic origin of petroleum. Vol. 8, Sept. 23, 1922, pp. 441-442. Review and critical discussion of early theories of inorganic origin of petroleum.

1857. *PETROLEUM TIMES*. The origin of petroleum; the molecule theory. Vol. 8, July 15, 1922, pp. 87-88. Theoretical grouping of atoms in oils from various sections of the world give evidence in support of inorganic origin of petroleum. Discusses organic theories.
1858. RAMSAY, W. Note on petroleum. *Jour. Soc. Chem. Ind.*, vol. 42, June 29, 1923, pp. 287T-288T. Discusses possibility of nickel as a catalyst in origin of petroleum. Gives nickel content of oils from various sections of the world. Comment regarding theory of seaweed as origin. *See also Oil and Gas Jour.*, vol. 22, May 31, 1923, p. 101. *Bol. Petról.*, vol. 15, June, 1923, pp. 423-425.
1859. SALE, A. J. The radioactive origin of petroleum. *Oil Age*, vol. 19, June 20, 1923, pp. 14-17; July, pp. 23-24. Explains author's theory of atomic decomposition as origin of certain oils.
- See also* No. 1800.

ORGANIC (252)

1860. BLUMER, E. *Die Erdöllagerstätten: Grundlagen der Petroleumgeologie*. Stuttgart, 1922. 442 pp. Maintains that origin of petroleum is wholly organic and that large quantities are now in process of formation.
1861. LE COURRIER DES PÉTROLES. Du pétrole par les huiles végétales et animales. 4e Année, Aug. 11, 1923, p. 2. Data on experiments with vegetable and animal oils which produced petroleum.
1862. ———. Les pins font-ils du pétrole? 3e Année, Feb. 4, 1922, p. 2. Review of lecture by M. Hentze, Hamburg. Discusses possibility of producing petroleum from resinous materials.
1863. CUNNINGHAM-CRAIG, E. H. Recent researches bearing upon the origin of petroleum. *Jour. Inst. Petrol. Tech.*, vol. 9, Oct., 1923, pp. 344, 350; discussion, pp. 350, 367. Summarizes evidence supporting vegetable origin of petroleum. Discusses carbonaceous phases of main petroleum fields and possibility that organic deposits, such as coral, limestone, fish-bed, or shell-bed, will yield petroleum upon hydrogenation, as will coal. Notes evidence contained in torbanite. *See also Petrol. Times*, vol. 10, Oct. 13, 1923, pp. 521-522; discussion; pp. 522-524. *Min. Jour.*, vol. 143, Oct. 20, 1923, pp. 784-785; *Gas World*, vol. 79, Oct. 13, 1923, pp. 327-328; *Oil and Gas Jour.*, vol. 22, Nov. 8, 1923, pp. 62, 135.
1864. D'ADRIMONT, R. Note on the genesis of hydrocarbons and their localization in certain zones of the earth's crust. *Jour. Inst. Petrol. Tech.*, vol. 9, Aug., 1923, pp. 287, 291. Read before Oil Conference of the Sixth Internat. Mining Exhib., June, 1923. States that factors which determine whether organic compounds shall be petroleum or coal are (1) proportion of cellulose to fatty matter; (2) rate of oxidation; (3) pressure, temperature, and time. Faulting is responsible for migration.
1865. DE HAUTPICK, E. Sun energy the source of oil. *Mining Jour. (London)*, vol. 142, Aug. 18, 1923, pp. 631, 632; Aug. 25, pp. 646-647. Discusses chemical reaction of sun upon vegetable matter as a factor in formation of petroleum. *See also Petrol. Times*, vol. 10, Oct. 13, 1923, p. 528. *Ind. Australian and Min. Stand.*, vol. 70, July 12, 1923, pp. 47-48. *Queensland Govt. Min. Jour.*, vol. 24, Dec. 15, 1923, p. 464.
1866. ELSCHNER, C. Kalifornisches Naturgas vegetabilischen Ursprungs. *Petrol. Ztschr.*, Jahrg. 19, May 10, 1923, pp. 456-457. Geology of Owens Lake region compared with Cretaceous formations of Egypt, Syria, and Palestine which produce oil, gas, and asphalt. Three distinct clay strata exist which are separated by gas sands. Gas is almost pure CH_4 and contains no H_2S .

1867. HÖFER-HEIMHALT, H. Die Entstehung der Erdöle. *Petrol. Ztschr.*, Jahrg. 18, Nov. 1, 1922, pp. 1301-1302. Review of author's book "Das Erdöl und seine Verwandten." Discusses theory that geological age of formations in which petroleum is produced influences the type of oil; tectonic influence upon quality of oil. States that all petroleum is of fatty origin and was formed at relatively low temperature and high pressure; variations in the controlling factors of production cause different products. Among American petroleum paraffin oils are oldest and naphthene oils youngest. *See also* *Jour. Soc. Chem. Ind.*, vol. 42, Jan. 5, 1923, p. 5A. *Petrol. Times*, vol. 9, Mar. 31, 1923, p. 452. *Oil and Gas Jour.*, vol. 21, May 3, 1923, p. 58. *Petrol. Times*, vol. 8, Dec. 2, 1922, pp. 827-828. *Le courrier des pétroles*, 4e Année, Aug. 4, 1923, p. 3.
1868. JONES, J. C. Suggestive evidence on the origin of petroleum and oil shale. *Oil Eng. and Fin.*, vol. 3, 1923, pp. 443-444, 452. Oil-shale deposits in Nevada are found to be fresh water muds containing spores, algae, and other vegetable matter. Petroleum originates from sand and calcareous muds, containing a large percentage of organic material deposited in salt water.
1869. MACFARLANE, J. M. Expounds theory of fish origin of oil. *Oil and Gas Jour.*, vol. 22, Oct. 18, 1923, pp. 79, 82. Great schools of fish are believed to have formed oil-shale deposits, if they were covered over; if oil escaped and floated away on water, it was later deposited with mud particle in sediment. *See also* *Oildom*, vol. 14, Nov., 1923, pp. 14-15.
1870. LA NATURE. Les pétroles des Siliciens. Nov. 10, 1923, pp. 141, 142. (Supplement.) Theory of petroleum origin. States that chemical analysis gives evidence of organic origin.
1871. OIL AND GAS JOURNAL. Fish source of oil says U. P. professor; supply inexhaustible. Vol. 22, Oct. 4, 1923, pp. 220-221. Theory holds that petroleum deposits may be located on basis of animal origin. *See also* *Oil Age*, vol. 14, Oct., 1923, p. 7
1872. OSBORNE, C. B. A theory to account for occurrence of oil in the vesicular cavities of igneous intrusions. *Oil Age*, vol. 19, May 30, 1923, p. 14. Existence of oil explained by fact that heat from molten lava penetrating shale distilled petroleum, which would be drawn into vesicular cavities as intrusion cooled. Abstract of paper before Am. Assoc. Petrol. Geol., Denver, 1922.
1873. PERRY, E. S. Origin of oil and gas. *Petrol. Age*, vol. 11, March 1, 1923, pp. 17-18. Discusses theory of organic origin of oil and explains anticlinal theory.
1874. PETROLEUM TIMES. The bearing of recent discoveries on the origin of petroleum. Vol. 10, Dec. 29, 1923, pp. 917-918. Discusses evidence furnished by hydrogenation in liquefaction of coal and artificial hydrogenation of products.
1875. ——— The "carbon ratio" in petroleum geology. Vol. 10, Aug. 4, 1923, p. 172. Evidence supports David White's theory of occurrence of petroleum by determining degree of metamorphism of sedimentary petroliferous rocks. Considers carbon ratio of coal as an indication. *See also* *Queensland Govt. Min. Jour.*, vol. 24, Oct. 15, 1923, p. 366.
1876. ——— The raw material of petroleum formation. Vol. 8, Dec. 30, 1922, p. 960. Suggests that organic rocks are the source of petroleum; salt retards decay and carbonization of organic matter, thus allowing for its transformation into petroleum.
1877. ——— The natural "cracking" of petroleum. Vol. 8, July 15, 1922, p. 107. States that quality of petroleum is affected by dynamic influences.

1878. PETROLEUM WORLD (LOS ANGELES). Have scientists at last hit upon the correct theory as to the origin of petroleum? Vol. 7, July, 1922, pp. 13-14. Theory considers the radiolarian, a microscopic marine organism, as a possible source of petroleum.
1879. PYHÄLÄ, EWALD. Zur Genesis des Erdöls. *Petrol. Ztschr.*, Jahrg. 19, May 20, 1923, pp. 495-499; June 1, pp. 535-539. Engler-Höfer theory supersedes economic theories, carbide theory. Results of laboratory tests indicate hydrocarbons may form high molecular compounds at relatively low temperatures, indications of vegetable origin. Reviews work of Mendelejeff, Moison, and others in connection with the carbide theory. Includes data and experiments. Abstract in *Jour. Soc. Chem. Ind.*, vol. 42, Aug. 3, 1923, p. 699A.
1880. ——— Ein Beitrag zur Genesis des Erdöls. *Petrol. Ztschr.*, Jahrg. 18, Sept. 1, 1922, pp. 1069, 1073. Analysis shows presence of N in form of amino acids, but it is unlikely that animal fats were important in the formation of petroleum. Reports results of treatment of acid sludge from Baku petroleum. Bases obtained from filtration of Surachany oil through froleidine and treated with sulphuric acid were hydrogenized derivatives of pyridine and quinoline, and were probably taken up from organic matter. *See also* *Jour. Soc. Chem. Ind.* vol. 41, Oct. 31, 1922, p. 799A. *Chem. Abs.*, vol. 17, Feb. 10, 1923, pp. 372-373.
1881. QUEENSLAND GOVERNMENT MINING JOURNAL. The origin of petroleum. Vol. 24, Sept. 15, 1923, pp. 339-340. Evidence supporting organic theory of petroleum origin.
1882. ——— The raw material of petroleum formation. Vol. 24, March 15, 1923, p. 85. Theory of organic origin of petroleum.
1883. ——— Relationship between coal and petroleum. Vol. 23, Aug., 1922, p. 323. Review of theory by J. Wanner in Glückauf that petroleum is distilled from coal and therefore is possibly being produced continuously by this process. Similarity of petroleum to products of coal distillation is evidence in favor of theory. *See also* *Petrol. Times*, vol. 7, June 24, 1922, p. 896.
1884. RAE, C. C. A possible origin of oil. *Trans. Am. Inst. Min. and Met. Eng.*, vol. 68, 1923, pp. 1112-1119; discussion, pp. 1119-1120; *Trans. Am. Inst. Min. and Met. Eng.*, Pamphlet 1132, Feb., 1922, 4 pp. Gives evidence upon which conclusion is based that an intermediate organic compound is present between stage of complex plant compounds and petroleum hydrocarbons; chemical factors in formation of petroleum; humus acid theory. *See also* *Petrol. World (London)*, vol. 19, May, 1922, pp. 210-211. *Oildom*, vol. 13, April, 1922, pp. 42, 44. *Bol. Petról.*, vol. 13, May, 1922, pp. 375-378.
1885. ——— Organic material of carbonaceous shales. *Bull. Am. Assoc. Petrol. Geol.*, vol. 6, July-Aug., 1922, pp. 333-341. Observes that origin of shales and petroleum has in some cases been found to be organic matter deposited by streams and subsequently converted into oil by heat, pressure, and catalytic agents. Value of identifying petroleum-forming constituents of the ulmohumic ground mass as a means of identifying various types of carbonaceous shales as source of petroleum.
1886. THIESSEN, R. Probable mother substance of petroleum. *Nat. Petrol. News*, vol. 15, Jan. 3, 1923, p. 47. Holds theory that bituminous rocks are probable source of petroleum. Discusses properties of the five classes of bituminous shales.
1887. VOITESTI, I. P. The mode of appearance of the petroleum deposits in the Carpathian regions with general considerations on the genesis of the petroleum and the salt of the actual deposits. *Jour. Inst. Petrol. Tech.*, vol. 9, Aug., 1923, pp. 291-300; discussion, pp. 301-311. Advances theory

that petroleum is distilled from organic substances by heat and pressure, and migrates to porous rocks of deeper formations or of anticlinal domes; universal occurrence of petroleum in rocks of all kinds which have fissures or are porous is supporting evidence.

- 1888.** WHITE, DAVID, AND STADNICHENKO, T. Some mother plants of petroleum in the Devonian black shales. *Econ. Geol.*, vol. 18, April-May, 1923, pp. 238-252. Identification of two fossil plants of the Upper Devonian. *See also* Nos. 673, 743, 1554, 1570, 1709, 1858, 1904, 4277, 4278.

ACCUMULATION (260)

See also Nos. 17, 1815, 1842.

OIL AND GAS RESERVOIR PRESSURES (260.1)

- 1889.** MILLS, R. VAN A. Natural gas as a factor in oil migration and accumulation in the vicinity of faults. *Repts. of Investigations, Serial 2421, Bureau of Mines, Dec., 1922, 6 pp.* Mimeographed. Escape of gas and water through fault fissures has produced currents which are largely responsible for migration of oil. Presented also before the Am. Assoc. Petrol. Geol. *See also* Ohio Oil and Gas Men's Jour., vol. 5, Jan., 1923, pp. 25-29. Oil and Gas Jour., vol. 21, Jan. 25, 1923, pp. 132-133. Bull. Am. Assoc. Petrol. Geol., vol. 7, Jan.-Feb., 1923, pp. 1-13. Oil Field Eng., vol. 25, Feb., 1923, pp. 38, 40-41. Oil Age, vol. 19, April 25, 1923, pp. 14-17. Bol. Petról., vol. 15, May, 1923, pp. 347-351.
- 1890.** PETROLEUM WORLD (LOS ANGELES). How gas causes the migration of oil near faults. Vol. 8, Jan., 1923, p. 52. Theory of oil and gas migration; observations.
- 1891.** ROPES, L. S. The distillation of oil shale. *Eng. and Min. Jour.*, vol. 113, Jan. 28, 1922, pp. 155-156. Deals with possibilities of further study of effect of gas upon segregation of oil from oil sands, suggested by article by G. A. Thiel, "Gas an important factor in oil accumulation," *Eng. and Min. Jour.*, vol. 109, Apr. 10, 1920, pp. 888-889.
- 1892.** SALE, A. J. Radioactive sand bars. *Oil Age*, vol. 20, Sept., 1923, pp. 27-29; Oct., pp. 29-31, 44. Presents theory holding that source of radioactive action is ocean bed from which a force termed as a "molecular breeze" is continuously exerted; other evidence.
- 1893.** VON GAL-SCALE, J. The migration of oil. *Petrol. Times*, vol. 7, Jan. 21, 1922, p. 83. Gives little value to theory of oil migration, but holds that disturbance of earth is cause of oil movement and escape from place of origin. Three causes of oil migration are earth movements, hydraulic pressure, and gas pressure. *See also* Ind. Australian and Min. Stand., vol. 68, July 20, 1922, p. 103.

See also No. 1902.

MIGRATION (260.2)

- 1894.** BARTHOLOMEW, G. W. Oil migration. *Inland Oil Index*, vol. 8, Nov. 10, 1923, pp. 1, 3. Suggests that direction of oil migration is determined by flow of underground water, which deposits oil in porous rocks and sands and accumulates it in domes; by this theory it is possible to estimate the "feeding territory" of a structure or to judge the possibility of the presence of oil in a region.
- 1895.** COOK, C. W. Study of capillary relationships of oil and water. *Econ. Geol.*, vol. 18, March, 1923, pp. 167-172. Description of apparatus and method used in test. States that capillary theory of migration of oil is open to doubt.

1896. DE HAUTPICK, E. New ideas in oil geology. *Mining Jour.*, vol. 139, Nov. 25, 1922, pp. 880-881. Water pressure forces oil through sands more certainly than gas pressure alone. Gas bubbles in water facilitate rate of migration of oil. Australian drilling has proved fallacy of anticlinal theory. Gives scientific principles for location of oil deposits. *See also* *Petrol. Times*, vol. 8, Dec. 9, 1922, p. 871.
1897. DODD, H. V. Some preliminary experiments on the migration of oil up low-angle dips. *Econ. Geol.*, vol. 17, June-July, 1922, pp. 274-291. Description of tests to determine migration of oil through sand under various conditions and forces; observations and conclusions; buoyancy alone is not sufficient to cause migration up low or moderate dips.
1898. JENSEN, H. I. Migration of oil in the Walloon series, Queensland. *Petrol. Times*, vol. 10, Aug. 4, 1923, p. 184. Percolating water is believed to have forced oil and gas from lower Walloon into Upper Bundamba rocks.
1899. MRAZEC, —. Petroleum deposit waters. *Petrol. Times*, vol. 8, Sept. 2, 1922, p. 340. Discusses origin of primary deposit waters; theory that they are filtration waters containing salt from saliferous rocks is not supported.
1900. PETROLEUM TIMES. Accumulation of petroleum in pools. Vol. 10, July 7, 1923, p. 26. Summary of various theories concerning the movement and accumulation of petroleum.
1901. ———. Petroleum deposit waters. Vol. 8, Sept. 2, 1922, p. 340. Holds theory that petroleum waters are not infiltration waters; reasons. *See also* *Oil News*, vol. 11, March 5, 1923, pp. 32, 52.
1902. RICH, J. L. Further notes on the hydraulic theory of oil migration and accumulation. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, May-June, 1923, pp. 213-225. Suggests that migration is caused by movement of underground water carrying with it globules of gas and oil; accumulation is brought about by segregation of lighter particles in suitable structures and strata which are sufficiently porous. *See also* *Nat. Petrol. News*, vol. 15, July 11, 1923, pp. 75-76, 79, 81, 83-84.
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1904. SOMERS, R. E. Origin, migration, and accumulation of petroleum. *Eng. and Min. Jour.-Press*, vol. 115, Jan. 13, 1923, pp. 66-69. Believes organic origin probable. Capillary attraction main cause of migration. Accumulation began gravitationally while rocks were uncemented and pores were large.
1905. VON GAL-SCALE, J. Are structures essential to the presence of crude-oil deposits? *Petrol. Times*, vol. 7, May 20, 1922, pp. 715-716. Theory in explanation of failure of structures to produce oil; seepages indicate disturbance of oil deposits rather than evidence of migration. *See also* Nos. 1690, 1804, 1807, 1810, 1889, 1890, 1893, 1908.

RESERVOIRS FOR OIL AND GAS (260.3)

1906. DALLONI, MARIUS. La géologie du pétrole et la recherche des gisements pétrolifères en Algérie. *Publ. de la Faculté des Sciences de l'Université d'Alger*. Algeria, 1923, 328 pp. Theories pertaining to the accumulation of petroleum in reservoirs and sands, etc. Describes favorable oil regions and petroleum indications. Gives stratigraphy and structure.
1907. DE HAUTPICK, E. New ideas in oil geology. *Ind. Australian and Min. Stand.*, vol. 67, June 1, 1922, pp. 1007-1008. A study of underground storage.

1908. GARNER, H. L. Accumulation of petroleum in underground reservoirs. *Inland Oil Index*, vol. 8, Dec. 22, 1923, p. 4. Holds theory that oil is carried in currents caused by meeting of warm salt water and cold fresh water until it reaches the peak of a dome; there it remains, for its specific gravity is so much less than water that it is impossible for it to be carried down with the water.
1909. GREENE, F. C. Origin of oil in northern Mid-Continent. *Oil and Gas Jour.*, vol. 21, May 17, 1923, pp. 18, 111-112. Discusses occurrence of oil and of its absence in spite of favorable indications. Describes grades of oil in various pools.
1910. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Natural-gas reservoirs. Vol. 69, May 17, 1923, pp. 787-788. A study of characteristics of natural reservoirs. Tells of exploitation of gas fields in the United States. Discusses drilling methods.
1911. TRAUTH, FRIEDRICH. Zur Frage der Entstehung der Erdöllagerstätten. *Petrol. Ztschr.*, Jahrg. 19, April 10, 1923, pp. 331-334. Conditions under which petroleum occurs in the Carpathians: (1) "Flyschoid" rock from whose organic materials hydrocarbons are formed; (2) impervious rock which prevents escape of gas and liquid; (3) extreme faulting and oil in peak of anticlines; (4) series of smaller anticlines below the upper anticlines.
1912. VON GAL-SCALE, J. Pools, beds, or streams of oil? *Petrol. Times*, vol. 7, April 22, 1922, p. 560. Theory of oil pool is disproved by fact that production of wells drawing from same pool differs in quantity; occurrence is usually in beds of different capacities.
- See also* Nos. 1900, 1906.

APPLIED GEOLOGY (270)

1913. ARNOLD, RALPH. Two decades of petroleum geology, 1903-1922. *Bull. Am. Assoc. Petrol. Geol.*, vol. 7, Nov.-Dec., 1923, pp. 603-624. A survey of development and progress in petroleum industry. Discusses the part of science in furthering this advancement. Outline of future work.
1914. COLLOM, R. E. Prospecting and testing for oil and gas. *Bull. 201, Bureau of Mines*, 1922, 170 pp. Detailed discussion of indications of oil and gas deposits and the minerals, rocks, and soil deposits which are associated with them. Gives contract specifications preliminary to drilling, drilling methods, and records and logs. Analysis and identification of core samples. Explains methods and importance of testing, and gives methods of shutting out water. Maps, illustrations. *See also* *Petrol. World* (London), vol. 20, March, 1923, pp. 93, 94, 96-100. *Oil and Gas Jour.*, vol. 21, Feb. 8, 1923, pp. 106-107; Feb. 15, pp. 86, 88. *Oil Field Eng.*, vol. 25, Feb., 1923, pp. 35-36. *Queensland Govt. Min. Jour.*, vol. 24, Nov. 15, 1923, p. 428. *Bull. Pan. Am. Union*, vol. 57, July, 1923, pp. 25-30. *Bol. Petról.*, vol. 16, Aug., 1923, pp. 79-82.
1915. ELLISON, R. S. What the oil company expects of the geologist. *Bull. Am. Assoc. Petrol. Geol.*, vol. 6, Nov.-Dec., 1922, pp. 516-522. Gives scope of duties and reports. *See also* *Oil and Gas Jour.*, vol. 21, Nov. 16, 1922, pp. 101-103.
1916. HACKFORD, J. E. The significance of the interpretation of the chemical analyses of seepages. *Jour. Inst. Petrol. Tech.*, vol. 8, April, 1922, pp. 193-206; discussion, pp. 206-213. States that analysis of gases indicates the character of oil; quality of oil is influenced by structure from which it is produced, as well as mode of formation. Contains analyses of oils from salt domes of the Isthmus of Tehuantepec. Considers oil analyses as means of determining structure. *See also* *Petrol. Times*, vol. 7, Feb. 18, 1922, pp. 239, 240.

1917. HAGER, DORSEY. Practical oil geology. New York, 1919. 250 pp. "Contains the information essential to the man engaged in petroleum production. It covers thoroughly the essential facts relating to the occurrence of oil and its extraction."
1918. HEALD, K. C. The oil industry's stake in geological research. The Mid-Continent Yearbook, 1923. Tulsa, Okla., 1923, pp. 28-31. Urges organized geologic research and cooperation in research.
1919. ——— Work of geologists is most important. Oil and Gas Jour., vol. 22, Oct. 4, 1923, p. 58. Geologist's skill is required to locate obscure structures and to prevent drilling in regions from which oil has probably escaped.
1920. ——— The National Research Council and oil geology. Bull. Am. Assoc. Petrol. Geol., vol. 7, Sept.-Oct., 1923, pp. 467-472. How the National Research Council and Am. Assoc. Petrol. Geol. may cooperate to obtain accurate and precise information concerning oil geology.
1921. JENKINS, J. H. Oil executives and geology. Oil News, vol. 10, Dec. 20, 1922, pp. 35-36. Regards geologist as essential part of oil development. Time is needed by geologist for study; he should not become a mere scout. Bull. Am. Petrol. Inst., vol. 3, Dec. 30, 1922, pp. 35-36. Oil Weekly, vol. 27, Dec. 23, 1923, pp. 86-88. Ohio Gas and Oil Men's Jour., vol. 4, Dec., 1922, pp. 7-9. Petrol. World (Los Angeles), vol. 8, March, 1923, p. 56.
1922. JONES, G. W., YANT, W. P., AND BUXTON, E. P. Gaseous content of ground waters as an aid to the petroleum and natural-gas prospector. Repts. of Investigations, Serial 2553, Bureau of Mines, Dec., 1923, 15 pp. Mimeographed. Hydrocarbon content of water indicates existence of petroleum or gas in region. Describes apparatus for and method of analysis. Gives formulas. Data on tests of samples from various localities.
1923. MILNER, H. B. An introduction to sedimentary petrography. London, 1922. 125 pp. "Treats particularly of principles, practice, scope, and limitations of correlation of sediments by means of 'heavy' mineral concentrates, a factor of proved geological importance, particularly in modern oil-field development."
1924. NATIONAL PETROLEUM NEWS. Says geologists' association is stabilizing influence. Vol. 15, Oct. 3, 1923, pp. 85-86. Résumé of address by A. C. McLaughlin at Am. Assoc. Petrol. Geol., Los Angeles, 1923. Work of petroleum geologist has two phases, that of correlating work within proved area and that of exploring wildcat areas. See also Min. and Oil Bull., vol. 9, Oct., 1923, pp. 896, 921. Oil Weekly, vol. 31, Oct. 13, 1923, pp. 33, 67-69.
1925. ——— How the geologically trained scout operates in oil industry. Vol. 15, Feb. 28, 1923, p. 85. Value of geological training to an oil scout.
1926. ——— Geologists draft code of ethics to safeguard their profession. Vol. 14, Mar. 15, 1922, p. 22. Résumé of code recommended by the American Association of Petroleum Geologists, March, 1922.
1927. PALACIOS, IGNACIO, AND WEGENER, FRANCISCO. Procedimientos modernos para la investigacion del subsuelo, incluidos los mantos de petroleo y de agua y yacimientos minerales. (Modern methods of determining subsoil resources.) Bol. Petról., vol. 15, May, 1923, pp. 352-353. Brief outline of methods of determining geological conditions in a region.
1928. ROBINSON, J. F. Practical oil and gas geology. Ohio Gas and Oil Men's Jour., vol. 4, Sept., 1922, pp. 10-12. Facts and conditions relating to occurrence and production of oil which a driller should know.

- 1929.** UNION OIL CO. OF CALIFORNIA, BULLETIN. The geologist and his work. Vol. 2, March, 1922, pp. 3-7. An explanation for the layman of the part played by the geologist in oil development.
- 1930.** VON HÖFER, HANS. Das Wasser in den Erdölfeldern. Petrol. Ztschr., Jahrg. 18, Feb. 20, 1922, pp. 201-206. Discusses the properties of invading water and its relation to oil occurrence.
- 1931.** WRATHER, W. E. The geologist and the oil industry. Oil Weekly, vol. 25, April 15, 1922, pp. 10, 30. Geologist's duties are to select suitable drilling sites and to map subsurface structure; his judgment is valuable in tax matters. Discusses factors relating to subsurface conditions.
- See also* Nos. 1817, 1835, 1894, 2046, 2063, 2066, 2604.

DETERMINATION OF OIL AND GAS FIELDS (270.1)

- 1932.** BLUM, ANTHONY. Petroleum, where and how to find it. Chicago, 1922. 367 pp. Facts and information concerning petroleum production; statistics.
- 1933.** HARLEY, J. P. Notes on the association of saline concentrations and oil. Oil Eng. and Fin., vol. 3, Jan. 13, 1923, pp. 14-16. Relation of salt to origin and occurrence of petroleum.
- 1934.** LAHEE, F. H. Field methods in petroleum geology. From "A handbook of the petroleum industry," by D. T. Day. New York, 1922. Vol. 1, pp. 167-201.
- 1935.** MONNETT, V. E. Topographic criteria of oil-field structure. Bull. Am. Assoc. Petrol. Geol., vol. 6, Jan.-Feb., 1922, pp. 37-41. Comments on the danger of using purely topographic evidence for location of oil fields. Reviews physiographic laws governing relation of surface features to rock position. Concludes that topographic evidence offered by streams, hills, and escarpments should be used only in reconnaissance work, and where other evidence is lacking should not be deemed sufficient for favorable report of region.
- 1936.** NATIONAL PETROLEUM NEWS. Marland uses paleontology to establish fracture zone across Limon Hacienda. Vol. 15, May 16, 1923, p. 97. Opinions of two geologists concur on existence of fault lines. Study of cretaceous fossils will assist in locating high structures.
- 1937.** ——— Microscope aids California geologist to reduce cost of drilling operations. Vol. 14, Oct. 11, 1922, p. 67. Detection of marine life enables geologist to locate shales and to direct water shut-offs, thereby increasing production of well.
- 1938.** OILDOM. Interior salt domes may yield oil. Vol. 14, Feb., 1923, p. 59. Briefly discusses the possibility of finding oil in salt domes. *See also* Oil Eng. and Fin., vol. 111, Jan. 27, 1923, p. 119.
- 1939.** PERRY, E. S. When geology falls down. Petrol. Age, vol. 11, May 1, 1923, pp. 23-24. Some reasons why oil is not always found in favorable geological locations.
- 1940.** ——— Choosing likely territory. Petrol. Age, vol. 11, April 15, 1923, pp. 28, 29. Fundamental principles to be observed in the selection of drilling sites.
- 1941.** ——— How geology goes after oil. Petrol. Age, vol. 11, April 1, 1923, pp. 19-20. Methods used by geologists in determining location of oil deposits.
- 1942.** ——— Geology a recent science. Petrol. Age, vol. 11, Feb. 15, 1923, pp. 18-19. Application of geology to oil prospecting. Describes geological formations.

1943. *PETROLEUM TIMES*. Geologic assistance in petroleum prospecting. Vol. 9, June 9, 1923, p. 846. Geologic age of rocks and structure are important considerations; if formations have been greatly disturbed it is unlikely that oil has been retained.
1944. ——— Surface indications of petroleum. Vol. 7, April 29, 1922, p. 578. Discusses evidence and conditions indicating presence of petroleum.
1945. SCHMITZ, EDMOND. The presence of carbon monoxide in the natural gas from petroleum. *Mat. grasses*, vol. 14, 1922, pp. 6157-6160. Carbon monoxide in natural gas is found to be due to decomposition of naphthenic acids. Conclusions are that where natural gas contains CO petroleum will be found, though not in large quantities: presence of natural gas without CO does not always indicate presence of petroleum, but if petroleum is found there will be larger quantities. *Chem. Abs.*, vol. 16, Sept. 20, 1922, p. 3193.
1946. SMITH, L. E. Application of geology to the petroleum and natural-gas industry. *Bessemer Monthly*, No. 206, Feb., 1923, pp. 1-4. A nontechnical article describing some of the indications which aid the geologist in locating oil deposits.
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1948. ZIEGLER, VICTOR. *Popular oil geology*. Second edition. New York, 1920. 171 pp. Fundamental principles of oil geology and important principles governing the examination of oil lands.
See also Nos. 102, 277, 599, 1390, 1953, 2819.

INSTRUMENTS AND APPARATUS (270.2)

1949. LÁSKA, V. Ueber die Bearbeitung der Drehwagenmessungen. *Petrol. Ztschr.*, Jahrg. 19, June 20, 1923, pp. 612-613. Discusses method and apparatus for measuring subsurface structures.
1950. ——— Eine Bestätigung der Ergebnisse der Drehwage durch direkte Bohrungen. *Petrol. Ztschr.*, Jahrg. 19, June 1, 1923, pp. 539-540. Method and instrument for measuring geological structures to determine a favorable drilling location; successful results obtained by method.
1951. MCGREAL, P. L. Paleontologists now employed to delimit Gulf saline domes. *Oil and Gas Jour.*, vol. 23, Dec. 6, 1923, p. 121. Exploration is carried on with a light rotary drill and examination of fossils discloses nature of structure; if fossils are out of place an uplift is indicated, or if they are in right location, the chances for oil are slight.
1952. OIL AGE. Scientific oil-finding instrument. Vol. 20, Nov., 1923, p. 54. Describes mineral indicator based on theory that mineral deposits, including oil, have magnetic attraction for their kind, and by instrument observations, triangulation, and mathematical calculation their location can be ascertained.
1953. PANYITY, L. S. *Prospecting for oil and gas*. New York, 1920. 249 pp. Equipment and methods of present-day oil exploration.
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1955. WAGNER, EMANUEL. Prospecting with the Eötvös balance. *Eng. and Min. Jour.-Press*, vol. 116, Oct. 6, 1923, pp. 583-589. Operating principles of apparatus which detects invisible structures and deposits in the earth's crust by measuring the force of gravity.

1956. WAGNER, PAUL. Seismographic system for exploration of underground formations. *Nat. Petrol. News*, vol. 15, April 11, 1923, p. 87. Review of paper by David White before Am. Assoc. Petrol. Geol. Describes instrument which records photographically the wave lengths produced by artificial disturbances of earth's crust, making it possible to determine the nature of formations. *See also* *Bol. Petról.*, vol. 15, June, 1923, pp. 421-423.
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See also Nos. 395, 2055.

PATENT.

1958. ERDA GESELLSCHAFT FÜR WISSENSCHAFTLICHE ERDERFORSCHUNG, AND AMBRONN, R. Devices for detecting and locating masses of dissimilar electric conductivity in the earth. British patent 181,731, Oct. 3, 1923.

DEVELOPMENT AND PRODUCTION (OIL AND GAS) (300)

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1961. HILL, H. H. Research on petroleum. *Trans. Am. Inst. Chem. Eng.*, vol. 15, pt. 2, 1923, pp. 59-64; discussion, pp. 64-66. Paper read at Washington meeting, Dec. 5, 1923. Account of investigations by Bureau of Mines of production and refining problems.
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See also Nos. 7770, 7779, 7780.

DRILLING (METHODS, TOOLS, AND EQUIPMENT) (310)

1965. BROWN, C. H. Fishing tool. *Sci. Am.*, vol. 129, Nov., 1923, p. 346.
1966. BROWN, C. W. Fishing under reamer lugs and the necessary equipment. *Oil Field Eng.*, vol. 25, May, 1923, pp. 116-117. Methods for recovery of tools; advantages of fishing tool called "devil's pitchfork." Explains how difficult fishing jobs are facilitated.

1967. CALIFORNIA OIL WORLD. Use of acid ends 15-month fishing job. Vol. 16, Nov. 22, 1923, p. 2. Tells of using sulphuric acid and nitric acid to break up limestone and wires in which tools are embedded. Use of soda ash to neutralize acid and to prevent injury to drilling tools.
1968. ——— Perilous feat is performed successfully. Vol. 14, June 15, 1922, p. 8. Driller descends 110 feet into well in order to facilitate fishing for lost bushing.
1969. COPP, W. W. A method for loosening frozen casing or drill pipe with oil. Nat. Petrol. News, vol. 14, April 19, 1922, pp. 69-70, 72. Deals with use of oil to overcome friction. Describes method of introducing oil. Gives theory action and data on use in several wells. *See also* Eng. and Min. Jour.-Press, vol. 113, April 8, 1922, p. 583.
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1972. OIL WEEKLY. Proper fishing tools as pumping necessity. Vol. 29, June 16, 1923, p. 25. Repeated pulling of tubing increases tendency toward leaking, which increases pumping costs and reduces production. It is important to have fishing tools of a suitable design.
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1975. ROWLEY, A. M. "Sixth sense" acquired by the driller. Oil and Gas Jour., vol. 21, Feb. 1, 1923, pp. 11, 117. Tools, cable, beam, and engine have a language which must be interpreted. *See also* Bol. Petrol., vol. 15, Feb., 1923, pp. 119-123.
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CONTROL OF LARGE WELLS AND WELLS ON FIRE (315)

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DISPOSAL OF REFUSE (331.4)

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GAS AND VAPORS (332)

See No. 2968.

TESTING AND METERING (332.1)

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GATHERING SYSTEMS (332.2)

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COMPRESSORS AND CONDENSERS (332.3)

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SEPARATION FROM OIL OR WATER (GAS TRAPS AND BLEEDERS) (332.4)

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- 2916.** WIRSHING, HERBERT. Gas and oil separator. United States patent 1,440,197, Dec. 26, 1922.

PRODUCTIVENESS OF OIL AND GAS WELLS AND LANDS (340)

- 2917.** AMBROSE, A. W. Research in petroleum. *Bull. Am. Petrol. Inst.*, Dec. 30, 1921, pp. 32-34. Deals with fundamental problems for solution in oil industry. Discusses larger recovery of oil from sands and manufacture of motor fuels. *See also* *Min. Jour.* (London), vol. 136, Jan. 21, 1922, pp. 47-48.

NATURAL FACTORS (341)

- 2918.** U. S. GEOLOGICAL SURVEY. Old oil fields come back. Press notice 13718, Oct. 26, 1922. Deeper drilling in old fields discovers producing sands. Report on deep drilling operations in Texas, Oklahoma, Kansas, and Pennsylvania. *See also* *Oildom*, vol. 13, Dec., 1922, p. 52. *Oil Eng. and Fin.*, vol. 2, p. 600.
- See also* No. 1928.

GAS AND GAS PRESSURES (341.3)

- 2919.** CALIFORNIA OIL WORLD. Overdrilling destroys gas. Vol. 15, July 19, 1923, p. 7. States that close drilling decreases natural-gas pressure and necessitates pumping of wells.
- 2920.** LAYNE, M. E. Why the deeper oil sands should be drained first. *Petrol. World* (Los Angeles), vol. 8, April, 1923, p. 52. States that water invasion from below producing sands is greater menace than from upper sands; gas pressure should be conserved to maintain production.
- 2921.** PETROLEUM TIMES. The function of gas in oil production. Vol. 10, Aug. 25, 1923, p. 276. Gases under pressure in oil sands are in more or less liquid state and absorbed in oil; when released they carry with them light condensable hydrocarbon vapors; when pressure is relieved the expanding gas escapes and moves the oil with it.

ARTIFICIAL FACTORS, STIMULATION OF PRODUCTION (342)

- 2922.** DABELL, A. F. Better production methods. Jour. Inst. Petrol. Tech., vol. 8, Jan., 1922, pp. 50-55; discussion, pp. 55-66. Discusses regulation of production, results of application of exhausters, and advantages of air and of water in recovering oil from exhausted wells. *See also* Petrol. World (London), vol. 19, Jan., 1922, pp. 5-6, 8. Petrol. Times, vol. 7, Jan. 7, 1922, p. 14.
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- 2925.** WOLCOTT, E. R. Increasing the yield of oil wells. United States patent 1,457,479, June 5, 1923.

MECHANICAL (342.1)

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SPACING OF WELLS (342.2)

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- 2928.** OIL WEEKLY. Evils of town lot drilling pointed out in bulletin of Bureau of Mines. Vol. 31, Nov. 10, 1923, p. 31. Discusses reasons for close drilling and undesirable features of the system. Tells of fields which have been exhausted thereby; spacing varies for different fields.
- 2929.** PETROLEUM AGE. How many acres to a well? Vol. 12, Nov. 15, 1923, p. 48. States that spacing must be regulated according to conditions in individual fields; production losses occur when spacing is too wide as well as when spacing is close.
- 2930.** PETROLEUM TIMES. Losses due to delay in oil drilling. Vol. 9, March 24, 1923, p. 416. Decrease in production of adjacent wells attributed to draining of oil deposits by wells previously drilled.
- 2931.** ——— Overdrilling of oil fields. Vol. 7, Feb. 18, 1922, p. 228. Discusses harmful effects.
- See also* No. 712.

STIMULATION OF PRODUCTION (342.4)

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DECREASE OF PRESSURE (342.41)

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INCREASE OF PRESSURE BY AIR OR GAS (342.42)

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USE OF WATER (342.43)

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RECORDS, MAPS, AND STATISTICS (343)

See No. 7752.

GRAPHIC AND OTHER RECORDING METHODS (343.1)

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ESTIMATING CONTENT OF OIL AND GAS LANDS (344)

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WASTES AND CONSERVATION (350)

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- See also* Nos. 211, 354, 1914, 2473, 2542, 2546, 2587, 2812, 2845, 2901, 7790.

MINING SOLID BITUMENS (360)

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SAFETY (370)

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- 3029.** NATIONAL PETROLEUM NEWS. Develops safety slide. Vol. 14, Nov. 29, 1922, p. 69. "Guy-wire slide" is designed to enable worker to escape from derrick in case of emergency.
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- 3031.** ——— Improved bull-wheel dog prevents accidents. Vol. 7, Feb., 1923, p. 38. Plans of device which prevents bull rope from catching on dog.
- 3032.** ——— Petroleum section tabulation. Vol. 6, July, 1922, p. 31. Accident statistics for 1921.
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FINANCIAL (APPRAISEMENTS, ROYALTIES, CONTRACTS, COSTS, PRICES) (390)

- 3044.** BRADLEY, O. W. Evaluation of casing-head gas. *Trans. Am. Inst. Min. and Met. Eng.* Preprint 1253-P, July, 1923; *Min. and Met.*, vol. 4, July, 1923, pp. 358-359. Abstract of paper presented at Canadian meeting, August, 1923. Valuation of gas should be proportional to its productivity; price of raw casing-head gasoline a factor in price calculations. Casing-head gasoline industry permits fair profit when leases are owned and oil is also produced, or when manufactured in refineries producing blending materials and having adequate marketing facilities.
- 3045.** BROWN, R. W. The practical valuation of oil lands. *Oil and Gas Jour.*, vol. 22, June 21, 1923, pp. 19, 124; June 28, pp. 102-104; July 5, pp. 122-124; July 12, pp. 106-107; July 19, pp. 118-119; July 26, pp. 24, 98, 100; Aug. 2, pp. 126-127; Aug. 9, pp. 106-108; Aug. 16, pp. 90, 92; Aug. 23, pp. 113-114. Advance chapters of book to be published by the author entitled: "The Valuation of Oil Lands." Discusses factors considered in valuation and purposes of valuation. Method of plotting production decline curve, applicable to wells flowing under gas pressure. Methods of valuation of undeveloped property. Factors controlling prices must be considered when predicting prices. Definition of terms and valuation of oil equipment. Calculating tables.
- 3046.** LE COURRIER DES PÉTROLES. L'évaluation des gisements pétroliers. *3e Année*, Dec. 23, 1922, pp. 6-7. Deals with factors which must be considered in estimating the value of petroleum fields.
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- 3049.** DOWLING, E. J. Net income from operated oil lease within meaning of 1921 law. *Nat. Petrol. News*, vol. 15, March 14, 1923, pp. 85-86. A method of computing overhead in case the United States Internal Revenue rules that it may be included in development expense.
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- 3071.** WALLACE, W. H. Trend of future oil prices as basis for appraisal of property. Nat. Petrol. News, vol. 14, Aug. 16, 1922, pp. 67, 69. Factors entering into determination of future oil prices; graphical method of arriving at price.
- 3072.** WILLRICH, E. G. An analysis of the elements entering into appraisal of oil properties. Nat. Petrol. News, vol. 14, May 3, 1922, pp. 97, 99. Discusses amount of recoverable oil, market price of oil, and production costs.
- 3073.** WILSON, M. D. The geologist vs. the Federal income tax. Oil Weekly, vol. 31, Dec. 8, 1923, pp. 23, 25, 49. Paper presented at Am. Assoc. Petrol. Geol., Los Angeles, Sept., 1923. States that appraisal curve or production curve is used to determine amount of recoverable oil in a tract of land when estimating depletion deduction; value of oil reserve and development costs are based upon data of geologist.
- 3074.** WOOD, H. S. Establishing the value of oil and gas leases as of March 1, 1913. Nat. Petrol. News, vol. 14, Oct. 18, 1922, pp. 43, 45, 47. "Explanation of methods used in United States Treasury Department in arriving at valuations of oil and gas properties." Presented at New York State Oil Producers Assoc., Sept. 27, 1922.
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TRANSPORTATION, STORAGE, AND DISTRIBUTION (400)

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- See also* Nos. 1959, 7770, 7780.

TRANSPORTATION (410)

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- See also* No. 5949.

PIPE LINES (OIL OR GAS) (411)

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- See also* Nos. 367, 2901, 3320.

CONSTRUCTION AND MAINTENANCE (411.1)

- 3080.** ACETYLENE JOURNAL. Oxyacetylene welding of oil-carrying pipe lines. Vol. 25, July, 1923, pp. 20, 24-25. Notes greater resistance to strain offered by welded joints. Tells of provision for expansion and contraction.
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- 3082.** BRIDGE, A. F., AND THOMPSON, M. B. Brazed joints for cast-iron gas mains. Gas Age-Rec., vol. 52, Dec. 8, 1923, pp. 699-703. Describes successful tests upon copper and bronze brazed joints on cast-iron pipe; cost was much less than that of preheating and annealing joints.
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- 3085.** CABOT, T. D. Line capacities. Natural Gas, vol. 4, May, 1923, pp. 52, 56. Outlines simple method of determining size of pipe line required for transportation at certain rate of speed.

- 3086.** CLARK, E. A. Concrete tunnel conveying oil pipe line. *Eng. World*, vol. 23, Nov., 1923, pp. 273-274. Describes inverted siphon used under canal to carry pipe lines from several States to refineries at Whiting and East Chicago. Ind.
- 3087.** ENGINEERING AND CONTRACTING. Tunnel construction for carrying oil pipe line under canal. Vol. 60, Oct. 17, 1923, pp. 830-832. Details of construction of "inverted siphon crossing under Indiana Harbor Canal at East Chicago, Ind., built for Sinclair Pipe Line Co." Sectional plan of tunnel. Illustrations.
- 3088.** GRIEFE, A. W. H. Gas distribution. *Am. Gas Jour.*, vol. 116, Feb. 18, 1922, pp. 155-158. Methods of installing joints and connections. Illustrations.
- 3089.** GRIFFIN, J. T. Compressed air for cleaning gas piping. *Compressed Air Mag.*, vol. 27, July, 1922, pp. 195-198. Methods of removing accumulations and obstructions from gas lines by low pressure and by high pressure. Describes equipment.
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- 3093.** KEEFE, J. C. Submarine lines at South American ports. *Bull. Union Oil Co. of California*, vol. 1, Jan., 1922, pp. 16-20. Problems of construction and laying of insulated pipe line. Pumping and distribution methods. Photographs.
- 3094.** LORD, R. S. Laying 90 miles of 10-14 inch main. *Gas Age-Rec.*, vol. 49, Feb. 11, 1922, pp. 165-167. Detailed description of laying natural-gas pipe line from south-central Wyoming to Casper. Illustrations.
- 3095.** LUNDELL, R. A. Reducing the labor item in laying gas pipe. *Compressed Air Mag.* vol. 27, Sept., 1922, pp. 255-258. Use of pneumatic tools reduces cost of laying gas main. Illustrations.
- 3096.** MCGREERY, JAMES. How metal flumes are eliminating waste in California oil fields. *Petrol. World (Los Angeles)*, vol. 8, May, 1923, pp. 34, 44. Observes that cost of construction and material are small; advantages are that this type of oil transportation prevents escape of oil and is convenient for arroyos or swamps. Illustrations.
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- 3101.** OIL WEEKLY. Makes pipe cut for angle welding an easy problem. Vol. 30, July 7, 1923, p. 75. Specially designed wire rings for the cutting of right-angle joints. Illustrations.

- 3102.** PARSONS, F. W. High-pressure gas transmission. *Gas Age-Rec.*, vol. 49, March 11, 1922, pp. 287-290. Welded pipe lines permit of higher pressure in transmission, which is an economy.
- 3103.** PETROLEUM AGE. New river clamp. Vol. 11, Feb. 15, 1923, p. 84. Details of a welding box sealed with lead, which prevents leakage and dispenses with usual bulky clamp; especially adapted for laying pipe line across streams.
- 3104.** SCHAPHORST, W. F. A valuable chart for the oil-field man. *Oil Field Eng.*, vol. 25, May, 1923, pp. 102-103. How to find the "average radius of bends that should be given to common forms of pipe bends."
- 3105.** VON MAUR, J. D. Methods and cost of laying gas main with new joint. *Eng. News-Rec.*, vol. 89, Oct. 5, 1922, p. 572. Tells how deep-bell joint is packed with cement and jute; large bell holes facilitated work. Gives costs per foot and total costs. Diagram of joints.
- 3106.** WAGNER, N. E. Development of pipe-line welding. *Oil and Gas Jour.*, vol. 22, Nov. 22, 1923, pp. 28, 32. Paper at convention of International Acetylene Association. Describes methods of welding ells and tees and forged steel flanged connections. Discusses installation of lines under railroad crossings and reinforcement of river lines. Reports that welding of seams has been satisfactory, as no leaks have resulted. *See also* *Nat. Petrol. News*, vol. 14, Nov. 29, 1922, pp. 35, 37-38, 41, 48.
- 3107.** WHITTAKER, E. A. Practical applications of gas welding. *Engineering*, vol. 116, Nov. 2, 1923, pp. 571-572. Abstract of paper before Institution of Welding Engineers, Oct. 10, 1923. Discusses welding methods for various purposes.
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PROTECTION AGAINST CORROSION (411.11)

- 3108.** BERTELSMANN, WILHELM. Chemical attack of gas conduits and gas apparatus. *Het. Gas*, vol. 42, 1922, pp. 142-148. Deterioration of cast-iron gas pipes layed in clay or gypsum is caused by local electric currents passing from the graphite particles to the pure iron causing anodic oxidation. Discusses action of stray currents and insulation of pipes.
- 3109.** CONRAD, W. R. Present-day tars for pipe coatings. *Eng. News-Rec.*, vol. 88, June 1, 1922, p. 913. States that pipe-coating tars should contain a large proportion of heavy mineral oils and should be free from acids.
- 3110.** FARMER, JOHN. Painting pipe lines. *Nat. Gas Ind.*, vol. 16, June, 1922, bet. pp. 184-185. Method of applying a priming and secondary coat; characteristics of desirable asphalt or petrolastic cement for second coat.
- 3111.** GEIGER, C. W. Portable pipe-wrapping machine for gas pipes. *Am. Gas Jour.*, vol. 119, Nov. 10, 1923, pp. 533-541. Machine used to coat pipes with asphalt and felt or asphalt and paper coverings.
- 3112.** LANCE, C. C. New leading process for piping and steel plates. *Power*, vol. 57, March 27, 1923, pp. 482-483. Account of successful tests with steel pipe lines coated with lead.
- 3113.** MURPHY, W. M. Protection of steel pipe from corrosion. *Natural Gas*, vol. 4, June, 1923, pp. 6-7, 46, 48. Protective measures for iron and steel pipes against stray electrical currents, abrasion, and disintegration. Tells of precautions to be taken in the laying of pipe lines. *See also* *Gas Ind.*, vol. 17, June, 1923, pp. 204-206.
- 3114.** NATIONAL PETROLEUM NEWS. Cementing staves off pitting of pipe lines. Vol. 14, April 19, 1922, p. 55. Pitting of pipe lines laid through Louisiana marshes is believed to be caused by decayed vegetation; application of cement stops this deterioration.

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- 3116.** POLLITT, A. A. The causes and prevention of corrosion. London, 1923, 230 pp. *See* review, London Times Engineering Supplement, vol. 12, Aug. 25, 1923, p. 570. Deals briefly with theory and causes of corrosion. Methods of controlling corrosion and protective measures.
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- 3118.** REDDINGTON, H. R. Protection of pipe from corrosion. Gas Age-Rec., vol. 50, Dec. 30, 1922, pp. 891-893. Paper presented at York meeting of Pennsylvania Gas Assoc. Discusses uses of various types of protective coatings and their adaptability to various soil conditions. Explains application of coatings.
- 3119.** TANNER, C. L. To stop damage from electrolysis. Natural Gas, vol. 3, June, 1922, p. 82. Method for preventing deterioration of pipe by electrolysis.
- See also* No. 3084.

STATION EQUIPMENT (411.2)

- 3120.** BEADLE, W. N. Centrifugal pumps adapted to pipe-line use. Oil Weekly, vol. 31, Dec. 1, 1923, pp. 21, 23, 31. Describes centrifugal pumping system which has been found more satisfactory than a reciprocating system. Illustrations.
- 3121.** MECHANICAL ENGINEERING. Engineering and industrial standardization. Vol. 45, Jan., 1923, pp. 76-77. Code for identification of piping systems; colors as indicators of class of material transported in pipe systems.
- 3122.** MILAM, J. S. Consistent use of radiophone proves advantages over wire line. Nat. Petrol. News, vol. 15, Feb. 21, 1923, pp. 67-68. Discusses use of radiophone for operation of a pipe-line system. Compares installation, maintenance, and operation costs of the radiophone with those of wire telephone. *See also* Bol. Petrol., vol. 16, July, 1923, pp. 8-9.
- 3123.** OIL ENGINE POWER. Oil-pumping stations on Humphreys pipe line, Texas. Vol. 1, Sept., 1923, pp. 429-430. Describes pumping-station equipment.
- See also* Nos. 3027, 3081, 3091, 3140.

PATENT.

- 3124.** MITCHELL, HARBOUR. Neck or nozzle connection for pipe lines. United States patent 1,457,183, May 29, 1923.

LINE EQUIPMENT AND TOOLS (411.3)

- 3125.** GOLDEN, A. W. Cleaning out a pipe line with a go-devil. Oil and Gas Jour., vol. 21, Aug. 24, 1922, pp. 101-102. Expansion and contraction of surface pipe lines and accumulation of paraffin were problems of early pipe-line systems; scraper traps are required in pipe lines for placing and removing paraffin scrapers. *See also* Oil Age, vol. 18, Sept., 1922, pp. 30-32.
- 3126.** MOELLER, WILLIAM, JR. Pipe-straightening machine. Natural Gas, vol. 3, June, 1922, pp. 80, 82. Description and illustration of invention designed to straighten bent pipe.

- 3127.** OSBORN, O. J. Pipe-turning iron and trench horse. *Natural Gas*, vol. 4, Nov., 1923, p. 30. Illustration of equipment used in installation of pipe lines.
- 3128.** PETROLEUM REFINER. How pipe lines are scraped and cleaned of obstruction. Vol. 12, Dec. 7, 1922, p. 4. Deals with problems of expansion and contraction occurring in the operation of first pipe lines. Discusses solution of paraffin troubles. Illustration of "go-devil."
- 3129.** SOCIETY OF AUTOMOTIVE ENGINEERS, JOURNAL. Reports of divisions to standards committee. Vol. 4, June, 1923, pp. 565-585. Fuel and lubrication pipe fittings—compression type (proposed S. A. E. recommended practice.) *See* pp. 581-582.
- 3130.** THOMPSON, M. R. Tapping large gas mains under heavy pressure. *Natural Gas*, vol. 4, Nov., 1923, pp. 30, 34. Illustration of tapping machine; directions for use.
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PATENT.

- 3131.** WHITNEY, N. D. Valve for oil systems. United States patent 1,425,429, Aug. 8, 1922.

MAIN LINES (411.31)

- 3132.** KOEH, F. J. The most elaborate long-distance gas-piping system on earth. *Am. Gas Jour.*, vol. 117, July 22, 1922, pp. 72-75. Describes devices and methods employed in carrying gas from West Virginia fields to Cincinnati.

OPERATIONS (411.4)

- 3133.** ANDERSON, A. H. Naphthalene deposits and their removal. *Am. Gas Jour.*, vol. 117, Sept. 23, 1922. Gasoline is introduced into main under pressure to flush pipes of naphthalene. *See also* *Oil News*, vol. 11, Jan. 5, 1923, p. 32.
- 3134.** CARNEY, B. R. Some bad practices found in gas distribution. *Gas Age-Rec.*, vol. 52, Dec. 22, 1923, pp. 767-768. Deals with care and operation of distribution mains.
- 3135.** DIEHE, J. Flow of gas through orifice meter. *Natural Gas*, vol. 4, July, 1923, pp. 23, 56, 60. Discusses various ineffectual methods used to stop pulsating of gas flow. Recommends placing in the main line a deadener or reservoir large enough to absorb shock, and thus permit a steady flow to pass to meter.
- 3136.** DURAND, W. F. *Hydraulics of pipe lines.* New York, 1921. 271 pp. Treatment and discussion of problems arising in connection with pipe lines and pipe-line flows. Does not deal with descriptive or structural phases of subject.
- 3137.** KNACK, FRANK. Apparatus for testing gas piping. *Natural Gas*, vol. 4, May, 1923, p. 44. Automobile valve and tire pump is used for testing or bagging a line, as gas cock does not hold.
- 3138.** LUBRICATION. Flow of oil in pipes. Vol. 8, April, 1922, pp. 45-48. Discusses recent developments in method of calculating pressure required to force oil through pipes of different sizes. One formula has been found sufficient for all conditions if constant is varied according to a fairly definite law. Includes tables and formulas.
- 3139.** NOWERY, N. M., AND ZUBERBIER, R. J. Modern operation of compressor stations. *Natural Gas*, vol. 4, Jan., 1923, pp. 19, 48-49. Discusses problem of increasing compressing units at stations when rock pressure becomes insufficient. From paper before South Central Gas Association Convention. *See also* *Gas Ind.*, vol. 17, Jan. 1923, pp. 29-30.

- 3140.** OIL ENGINE POWER. Thirty-three Diesels for pipe-line pumping. Vol. 1, Jan., 1923, pp. 6-11. Describes general features of pipe line extending from Whiting, Ind., to Houston, Tex. Explains operation of pumping stations and pipe line. Describes oil engines. Map showing location of pipe lines, pumping stations, proposed extensions, and refineries of the Sinclair Pipe Line Co., the Sinclair Refining Co., and the Standard Oil Co. of Indiana.
- 3141.** WAGNER, PAUL. Pipe line used to transport raw natural gasoline. Nat. Petrol. News, vol. 15, Dec. 19, 1923, p. 58. Tells of success of piping in California where the country is comparatively level and slightly down grade; this condition gives no opportunity for emanation of gases which might collect in high parts of line.
- See also* Nos. 105, 2492, 2870, 3391, 3533.

LOSSES (411.5)

- 3142.** FAULKNER, H. H. Suggests method for solving problem of gas-line leakage. Oil and Gas Jour., vol. 22, Aug. 16, 1923, pp. 86, 92. States that meter test is unsatisfactory except when results are taken for considerable period. Describes pressure system, which has been found satisfactory.
- 3143.** OIL WEEKLY. Welded connections gain favor in Oklahoma. Vol. 30, July 14, 1923, p. 74. Leaking of couplings prevented by welding; methods.

RECORDS, MAPS, AND STATISTICS (411.6)

See Nos. 96, 3423.

FINANCIAL, COSTS (411.7)

See Nos. 3098, 3102, 3105.

TANK CARS AND TANK WAGONS (412)

- 3144.** BREWSTER, C. S. Shipping asphalt. Atlantic Conn. Rod, vol. 15, Sept., 1922, pp. 1-8. Methods and equipment for filling and emptying tank cars and containers.
- 3145.** BUREAU OF EXPLOSIVES. Thawing ice in bottom outlets of tank cars. 19-6060, Dec. 15, 1922. B. E. Accident Bull. 58, Jan., 1923, p. 5. Recommends use of hot burlap and steam for thawing frozen outlets. Careful inspection should be made to detect cracks in outlet chamber. *See also* Nat. Petrol. News, vol. 15, Feb. 21, 1923, p. 68.
- 3146.** DAVIS, AUGUSTINE, JR. Delivering fuel oil by truck. Oil News, vol. 10, Nov. 20, 1922, pp. 43-44. Points out that speed and cleanliness are advantages of tank truck delivery. Discusses types of trucks and equipment.
- 3147.** ———. Underground and truck tanks. Oil News, vol. 10, Oct. 5, 1922, p. 48. Gives information on correct material and construction methods.
- 3148.** PETROLEUM ZEITSCHRIFT. Ablassvorrichtungen bei Spezialtransportwagen für Petroleum, Benzin, Oel, Spiritus, und Melasse. Jahrg. 18, Jan. 1, 1922, pp. 14-16. Discusses types of faucets for tank wagons.
- 3149.** RAILWAY AGE. Report of the committee on tank cars. Vol. 74, June 23, 1923, pp. 1625-1626.
- 3150.** STEIN, O. C. Handling asphalt freight traffic in liquid form. Good Roads, vol. 65, Nov. 7, 1923, pp. 156-157. Heating system is required to liquefy asphalt for loading and unloading tank cars.
- See also* Nos. 3296, 3407, 3409, 5897, 5898.

CONSTRUCTION AND MAINTENANCE (412.1)

- 3151.** ATLANTIC CONNECTING ROD. World's largest tank truck. Vol. 16, March, 1923, p. 41. Brief description of special frame construction having a capacity of 2,700 gallons.
- 3152.** JUNE, ROBERT. Handling bulk quantities of fuel oils. Power Plant Eng., vol. 27, April 1, 1923, pp. 366-367. Describes methods and equipment used in discharging and gauging oil.
- 3153.** LEWIS, J. W. Unloading tank cars. Atlantic Conn. Rod, vol. 16, May, 1923, pp. 23-28. Gives methods for safely handling loaded tank cars, unloading, and returning them to their place of shipment. *See also* Oildom, vol. 14, Aug., 1923, p. 64. Petrol. World (Los Angeles), vol. 8, Dec., 1923, pp. 70, 72.
- 3154.** MINING AND OIL BULLETIN. Transportation of natural-gas gasoline. Vol. 8, Sept., 1922, pp. 525-526. "Tank-car tests show that present method of vapor pressure determination which allows use of 90° F. water during winter is preferable to proposed regulation requiring use of 100° F. water throughout year." Insulated cars are desirable, especially in summer; compressed-air method of unloading cars had disadvantages, but is better than methods which require outlet valves and removal of dome covers.
- 3155.** NATIONAL PETROLEUM NEWS. Bottom outlet valve indispensable Institute committee report says. Vol. 15, May 30, 1923, pp. 22-23. Recommendations of Bureau of Explosives for abolishment of bottom valve in tank cars opposed as dangerous.
- 3156.** ——— Institute favors change to bolted covers on tank cars. Vol. 15, May 30, 1923, p. 23. Recommendations regarding bolted covers on tank cars.
- 3157.** ——— Colonel Dunn asks support of gasoline men in increasing safety of tank cars. Vol. 15, May 2, 1923, pp. 113, 115, 117. Recommendations for tank-car openings. *See also* Oil and Gas Jour., vol. 21, April 26, 1923, pp. 14, 118-119.
- 3158.** ——— Device cuts repair bills. Vol. 14, Oct. 4, 1922, p. 20. Cork plug is inserted in outlet valve of cars where freezing is likely to occur, and cork takes expansion caused by freezing water in valve.
- 3159.** ——— Steam jacket aids unloading. Vol. 14, Oct. 4, 1922, p. 20. Describes steam jacket which fits over outlet valve and sprays steam over lower parts of car.
- 3160.** OIL AND GAS JOURNAL. Success is claimed for welded pipe line. Vol. 20, May 25, 1922, p. 116. Account of tests made on welded pipe lines.
- 3161.** OIL NEWS. Measuring water or sediment in tank cars. Vol. 11, Aug. 20, 1923, p. 30. Tells of determining presence of sediment in bottom of car by means of a long-handled cup; sediment can be separated by straining. Water is detected by sensitized paper, and may be drained off and measured.
- 3162.** ——— Overloading of truck tanks. Vol. 10, Aug. 20, 1922, p. 26. Construction of a tank truck which overruns estimated weight causes rapid depreciation and high maintenance charges; another cause of overloading is addition of racks, etc., which permit the carrying of a greater load than that for which truck was designed.
- 3163.** PETROLEUM AGE. Tank making is improving. Vol. 10, Sept. 15, 1922, pp. 76, 78. Describes improvements in equipment devices and designs of storage tanks.
- 3164.** PETROLEUM TIMES. The building of oil-tank wagons. Vol. 7, Feb. 25, 1922, pp. 257-258. Describes tank cars of British construction.

- 3165.** POWER. Unloading tank cars by compressed air. Vol. 57, June 12, 1923, p. 943. Describes compressed air method of unloading tank car when oil is not of high viscosity. *See also* Gas Age-Rec., vol. 51, June 23, 1923, p. 792.
- 3166.** RAILWAY AGE. Oil car for M., K. & T. supply train. Vol. 75, Oct. 27, 1923, p. 782. Description and illustration of car equipped to supply oil to store house, stations, and other places by the Missouri, Kansas & Texas Railway Co.
- 3167.** ——— Report of committee on tank cars. Vol. 72, June 16, 1922, pp. 1441-1443; discussion, pp. 1443-1445. Recommendations regarding safety valves, dome-closing arrangements, heater coils, and the bottom outlet. *See also* Railway Rev., vol. 70, June 24, 1922, pp. 975-976.
- 3168.** RAILWAY ENGINEER. Oil-tank wagons. Vol. 43, May, 1922, p. 187. Detailed plans and description of main features.
- 3169.** GENERAL AMERICAN TANK CAR CORPORATION. Tank-car anatomy chart. Harris Trust Bldg., Chicago. Gives correct names for tank-car parts.
See also Nos. 3090, 3484, 3525, 3526, 3528, 3530, 3539.

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- 3170.** CARLL, A. B. Cover for tank cars. United States patent 1,432,591, Oct. 17, 1922.
- 3171.** ENTERPRISE RAILWAY EQUIPMENT Co. Tank car. Canadian patent 221,648, Aug. 1, 1922.
- 3172.** GARRETT, M. A. Tank-car dome cover. United States patent 1,405,577, Feb. 7, 1922.
- 3173.** HAUPT, C. H. Tank-car outlet valve. United States patent 1,439,415, Dec. 19, 1922.
- 3174.** HUGH, P. G. Motor tank for heavy liquids. Canadian patent 233,807, Aug. 28, 1923.
- 3175.** SIMPSON, W. T. Loading apparatus for gasoline tank cars. United States patent 1,474,297, Nov. 13, 1923.
- 3176.** SMITH, A. E. Tank car. United States patent 1,432,497, Oct. 17, 1922.

RECORDS AND STATISTICS (412.2)

- 3177.** ENGINEERING. Air compressor and cargo oil pump. Vol. 115, June 22, 1923, pp. 772-773. Describes main features of several types of pumps.

FINANCIAL, COSTS (412.3)

- 3178.** HARMON, I. G. Meeting oil-field transportation problems. Oil Weekly, vol. 30, Aug., 1923, pp. 25-26, 68-70. Cooperation with traffic department will reduce trips of motor trucks and increase efficiency by minimizing half-load trips.
- 3179.** THE MID-CONTINENT YEARBOOK, 1923. Converts freight costs per hundredweight into barrels and gallons. Tulsa, Okla., 1923, p. 155. Conversion table.

WATER TRANSPORTATION (413)

- 3180.** HAND R. F. The transportation of petroleum overseas. The Lamp, vol. 5, June, 1922, pp. 5-8. Discusses development of oil-carrying ships and problems connected with Mexican oil shipping. Illustrations.
- 3181.** NAUTICAL GAZETTE. Apparatus for cleaning oil sludge from ships' tanks. Vol. 104, May 26, 1923, p. 602. General features of cleaning oil tanks and recovering waste oil for fuel.

3182. PETROLEUM TIMES SUPPLEMENT. The world's oil tankers. Vol. 10, Sept. 15, 1923. List of tankers over 1,000 gross tonnage, giving owners, date of construction, gross tonnage, and port of registry. Illustrated.
3183. STEAM. New oil dock at Manchester, England. Vol. 30, Oct., 1922, p. 99.
- See also Nos. 1323, 3288, 3320, 3451, 3524, 5897, 5898.

TANK STEAMERS (413.1)

3184. MOTORSHIP. Motorship owner's fuel-supply ship. Vol. 7, Sept., 1922, pp. 694-695. Plans of Swedish Diesel tanker *Oljaren*.
3185. ——— Standard Oil Co. orders Diesel electric-driven tanker. Vl. 7, Aug., 1922, pp. 601-603. Plans, dimensions, and particulars of vessel.
3186. ——— German-built tanker for Italy. Vol. 7, July, 1922, p. 542. Plans of a Diesel-driven tanker.
3187. NATIONAL PETROLEUM NEWS. Pipe line used to unload ships, claimed to be better than hose. Vol. 14, June 28, 1922, p. 83. Discusses advantages of pipe line used to unload ships.
3188. PEW, J. G. Modern tank steamships. Min. and Met., Dec., 1922, pp. 15-17. Construction and equipment of tank ships; provisions for gas expansion and pressure. See also Petrol. Times, vol. 9, Jan. 27, 1923, pp. 119-120.
3189. SHIPBUILDER (NEWCASTLE-ON-TYNE, ENGLAND). The oil-tank steamer *Daghestan*. Vol. 26, June, 1922, pp. 459-464. Gives main dimensions of oil tanker equipped with vertical cylindrical oil tanks.

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3191. DORMAN, W. H., AND Co., LTD., AND STEED, O. H. G. Loading and discharge pipe-line apparatus for oil tankers. British patent 195,428, Apr. 11, 1923.
3192. EBSEN, W. A. Oil-carrying ship or barge. United States patent 1,410,287, Mar. 21, 1922.
3193. STEED, O. H. G. Loading and discharge pipe-line system for oil tankers. United States patent 1,478,925, Dec. 25, 1923.
3194. ——— Loading and discharging pipe-line system for oil tankers. Canadian patent 234,819, Oct. 9, 1923.
3195. WHEELER, H. J. Methods and apparatus for pumping fuel residue from oil-burning vessels, and other purposes. British patent, 192,580, Feb. 14, 1923.

CONSTRUCTION AND MAINTENANCE (413.11)

3196. ENGINEERING. Air compressor and cargo oil pump. Vol. 115, June 22, 1923, pp. 772-773. Description.
3197. CREGER, HENRIK. Southern Pacific Oil tanker, *Tamiahua*. Marine Eng., vol. 27, May, 1922, pp. 308-312. Describes cargo oil-pumping system and main engine.
3198. MOTORSHIP. Steamship performances excelled by American motorship. Vol. 7, March, 1922, pp. 177-178. Plans and general description of motor tanker *Bayonne*; type of fuel oil.
3199. NATIONAL PETROLEUM NEWS. Germans convert former commercial submarines to oil-tanker service. Vol. 14, Dec. 27, 1922, p. 25. Keel and superstructure of vessel have been added to submarine hulls divided in half. See also Nautical Gaz., vol. 102, Feb. 4, 1922, p. 139.

- 3200.** NAUTICAL GAZETTE. Rand bunker oil-heating system. Vol. 104, May 26, 1923, p. 593. Describes system which eliminates heating coils involving use of fresh water and the attendant danger of leakage into fuel oil.
- 3201.** PACIFIC MARINE REVIEW. German motor tankers for American interests. Vol. 20, Dec., 1923, pp. 577-578. Plans and dimensions of a 12,000-ton tanker under construction. Describes steam plant and pump system.
- 3202.** ——— A Diesel-electric tanker. Vol. 19, Aug., 1922, pp. 457-459. Profile and hold plans of tanker, Standard Oil Co., California; details of pumping system.
- 3203.** ——— First American ore and oil vessel. Vol. 19, May, 1922, pp. 303-305. Describes oil tanks on vessel designed to carry a cargo of ore on return trip. *See also* Nautical Gaz., vol. 102, April 29, 1922, p. 521. Petrol. Age, vol. 9, May 1, 1922, p. 106.
- 3204.** SMITH, T. J. Notes on efficiency in operation of oil tankers. Marine Eng., vol. 28, Aug., 1923, pp. 477-479. Tankers should be designed with regard to special use, upkeep, and strict supervision of economy and efficiency in all phases of operation.
- 3205.** TRIPLETT, GRADY. Houston as outlet for Mid-Continent. Oil and Gas Jour., vol. 22, Sept. 6, 1923, p. 56. Describes facilities for loading tankers; proximity to Mid-Continent refineries gives advantage in lower railroad rates. *See also* No. 7242.

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- 3207.** WHEELER, H. J. Pumping apparatus. United States patent 1,405,173, Jan. 31, 1922.
- 3208.** ZULVER, C., AND ENDERT, D. C., JR. Apparatus for the removal of oil carried in the double-bottom tanks of ships. British patent 176,652, Mar. 22, 1922.

RECORDS AND STATISTICS (413.12)

- 3209.** ROHLFS, J. C. Oil-marine transportation. Bull. Am. Petrol. Inst., vol. 4, Dec. 31, 1923, pp. 147-150. Review of growth of oil-transportation methods on water. Describes features of early tankers, foreign and American. Discusses types of present-day tankers, their operation and construction. Gives methods of oil transportation on inland waters. *See also* Oil and Gas Jour., vol. 23, Dec. 20, 1923, p. 23.

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- 3211.** MOTORSHIP. Motor tanker for New York State barge-canal service. Vol. 8, Aug., 1923, pp. 547-548. Illustrations and dimensions of Standard Oil Co. barge.
- 3212.** WILLIAMS, A. W. River oil shipping revives. Petrol. Age, vol. 11, May 15, 1923, pp. 16-18. Combination steel barges, equipped to carry oil and other cargoes both ways, have helped to make river shipping from Kentucky successful.

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POLLUTION AND PREVENTION THEREOF (413.3)

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- 3215.** ENGINEER. The conduct separator for oily ballast water. Vol. 135, June 29, 1923, p. 688. Details of apparatus.
- 3216.** ——— Separating barge for oil ballast water. Vol. 135, Jan. 26, 1923, p. 91. Plan of barge into which ship discharges ballast water, which is then filtered and separated. Illustrations. *See also* Feb. 2, p. 109. *Petrol. World* (London), vol. 20, Feb., 1923, pp. 78-79.
- 3217.** ——— Petroleum spirit dock on the Manchester ship canal. Vol. 134, Sept. 29, 1922, pp. 324-326. "Floating reinforced concrete caisson as precautionary measure for closing oil dock." Detailed description and diagrams of half deck, cross section, and deck winch. *See also* Eng. and Contr., vol. 58, Nov. 29, 1922, pp. 511-512.
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- 3221.** ——— Oil dock for Manchester. Ship canal developments. Vol. 10, July 22, 1922, Eng. Sec., p. 181. Describes construction of oil dock designed to prevent escape of oil into navigable waters.
- 3222.** MARINE ENGINEERING. Bilge and ballast oil filter. Vol. 27, Dec., 1922, p. 768. Diagram and details of Todd filter tank for prevention of oil pollution of harbor water.
- 3223.** McLOUD, N. C. Reclaiming surface oil from Baltimore harbor. *Eng. News-Rec.*, vol. 90, Feb. 8, 1923, p. 268. Scow is equipped with pumping device which draws oil from surface of water and empties it into settling tank. Illustration of equipment.
- 3224.** PACIFIC MARINE REVIEW. Oil eliminated from bilge and ballast discharge of vessels. Vol. 20, March, 1923, p. 36. Diagram of filter tank for discharge of ballast oil and water.
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- 3228.** BRADY, F. W. Supporting structure for fuel-oil tank. Power Plant Eng., vol. 26, March 15, 1922, pp. 333-334. Details of construction and formulas for estimating stress on parts.
- 3229.** LONDON TIMES TRADE SUPPLEMENT. Gas-holder-design novelties in continental practice. Vol. 9, Feb. 18, 1922, Eng. Sec., p. 53. Discusses distinctive features of various types of gas holders. Describes improvements on original principles of construction and equipment.
- 3230.** McCLURE, W. C. Spherical tank built for oil storage. Iron Age (New York), vol. 112, Nov. 22, 1923, pp. 1388-1389. "Designed to withstand leakage and prevent evaporation under heavy internal pressure; rigid construction."
- 3231.** NATIONAL FIRE PROTECTION ASSOCIATION QUARTERLY. Life of buried steel fuel-oil tanks. Vol. 15, April, 1922, pp. 352-354. Gives lists of tanks and particulars regarding conditions and protection, soil, age in years, and depth of top below ground.
- 3232.** WILLSON, C. O. Business of storing crude petroleum. Oil and Gas Jour., vol. 21, April 5, 1923, pp. 14, 119. Details and specifications of oil-tank construction.
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TANKS (421)

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- 3236.** NATIONAL PETROLEUM NEWS. Jobber has preference for upright oil-storage tanks. Vol. 14, Dec. 20, 1922, p. 79. Believes upright tanks have the least evaporation.
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- 3238.** OILDOM. Building foundations for storage tanks. Vol. 13, Dec., 1922, p. 64. Considers proper foundation highly important. Recommends foundations for various types of storage tanks.
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- 3247.** McCAHON, T. S. Tank for combustible liquids. United States patent 1,413,043, Apr. 18, 1922.
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STEEL AND IRON (421.1)

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- 3252.** ENGINEERING NEWS-RECORD. Life of buried steel oil tanks. Vol. 88, May 25, 1922, p. 873. Report of investigation by Factory Mutual Laboratories in National Fire Protective Association Quarterly. Deals with treatment of storage tanks in different kinds of soil. Best steel tanks should be coated with red lead and asphalt and buried in clean sand free from contact with tide water and ground water.
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- 3254.** JURIS, L. D. World's largest steel tanks for oil storage. *Min. and Oil Bull.*, vol. 9, Oct., 1923, pp. 856-857. Details of construction. Illustrations.
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- 3256.** MINING AND OIL BULLETIN. How oil storage is built. Vol. 9, Oct., 1923, pp. 850-854, 907, 917, 919-920. Technical construction of reservoirs and steel tanks. Illustrations.
- 3257.** NATIONAL PETROLEUM NEWS. Electric welding used in constructing and repairing large storage tanks. Vol. 15, July 25, 1923, p. 85. Observes that welding eliminates working of rivets and evaporation losses. Illustrations.
- 3258.** ——— All-steel tanks, properly vented, carry oil contents safely through fire. Vol. 15, June 20, 1923, p. 119. Reports that gas-tight all-steel tanks and contents remained intact when surrounded by burning oil.

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- 3261.** ——— Unique method used in testing storage tanks. Vol. 27, Dec. 2, 1922, p. 32. Tank roofs are tested by air pressure of one-half ounce from within; if they are not gas-tight and air-tight, soapy water applied to all seams discloses the fact.
- 3262.** ——— Welding successfully repairs tank bottom. Vol. 26, Aug. 26, 1922, p. 88. Reports that seams and rivets were welded, and worn and pitted spots replaced with welding metal; this method was found more economical than other methods of repairing tank bottoms.
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- 3266.** SCHOLL, WARREN. How to make the larger oil tanks. Sheet Metal Worker, vol. 14, April 27, 1923, pp. 241-243, 278. Gives details of construction, testing methods, and table of capacities.
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- 3269.** ATLANTIC SEAL. Storage of surplus California oil. Vol. 1, Oct., 1923 pp. 4-6. Details of construction of some concrete reservoirs in southern California.
- 3270.** CANADIAN ENGINEER. Construction of concrete fuel-oil tanks. Vol. 45, July 10, 1923, pp. 131-133. Recommendations submitted at the annual meeting of the American Concrete Institute. Gives main features of tank design and specifications for construction material.
- 3271.** ——— Action of oils upon concrete. Vol. 42, Jan. 3, 1922, p. 115. Concrete is unaffected by most mineral oils, but is likely to be injured by acids of vegetable and of some mineral oils, so that an impervious layer should line inside of concrete tank. A lining of margalite (an artificial resin produced by condensation of formaldehyde with phenol) has been found proof against acids of animal, vegetable, and mineral oils, but alcohol and oils having much phenol content affect margalite coating. *See also* Concrete, vol. 21, Aug., 1922, pp. 62-63. Canadian Eng., vol. 45, Aug. 28, 1923, p. 270.

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- 3273.** ——— German concrete oil storage. Vol. 20, April, 1922, p. 179. Brief description of a storage system whereby the higher hydrostatic pressure of water in outer tank prevents seepage of oil.
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- 3276.** GIANOLI, GIUSEPPE. Concrete tanks for mineral oil storage. *Industria* (Milan), vol. 36, Feb. 28, 1922, p. 64. Describes tanks.
- 3277.** NATIONAL PETROLEUM NEWS. New California oil reservoir holds 1,045,000 barrels. Vol. 14, Sept. 20, 1923, p. 73. Construction details of Standard Oil Co. tank at El Segundo. Photographs.
- 3278.** OIL ENGINEERING AND FINANCE. Concrete tanks for oil storage. Vol. 2, 1922, p. 368. Discusses special surface treatment required for some oils. Gives list of companies. Tells of types of tanks, their capacity, and gravity of oil stored.
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RESERVOIRS (422)

See Nos. 3256, 4476.

EARTHEN (422.1)

See No. 737.

CONCRETE-LINED (422.2)

- 3281.** CALIFORNIA OIL WORLD. Huge reservoirs and refinery of Pan American at Watson. Vol. 15, July 26, 1923, p. 1. View of concrete reservoir of 1,500,000 barrels capacity.
- 3282.** ——— Huge reservoir holds one day's yield of crude. Vol. 15, June 28, 1923, p. 5. Reports that concrete storage for light oils hitherto considered impracticable has been found satisfactory. Illustration. *See also* Bull. Union Oil Co. of Calif., vol. 2, May, 1923, p. 22.
- 3283.** ENGINEERING AND MINING JOURNAL-PRESS (Pacific Min. News). New oil-storage reservoirs. Vol. 1, Nov., 1922, p. 220. Describes Standard Oil Co. reservoir at El Segundo. Includes details of floor and roof construction, and gives methods of rendering the roof waterproof.
- 3284.** OIL WEEKLY. Will build largest oil reservoir in world. Vol. 28, Feb. 24, 1923, pp. 11-12. Describes underground concrete storage tank being constructed at Wilmington, Calif. *See also* Oil News, vol. 11, March 5, 1923, p. 37. Petrol. Times, vol. 9, March 24, 1923, pp. 433-435. Petrol. World (London), vol. 20, April, 1923, p. 142.

- 3285.** PETROLEUM WORLD (LOS ANGELES). A good investment—the 3,000,000-barrel oil reservoir. Vol. 8, Dec., 1923, pp. 52, 53. Detailed description of Standard Oil Co. reservoir at El Segundo, California.
- 3286.** STANDARD OIL BULLETIN. Our million-barrel concrete-lined reservoir. Vol. 10, May, 1922, pp. 2-3. Details of construction of tank at El Segundo. Photographs. *See also* Oil Trade Jour., vol. 13, Aug., 1922, p. 71. Oil News, vol. 10, June 5, 1922, p. 60. Oil Weekly, vol. 25, June 10, 1922, pp. 50-51.
- 3287.** WAGNER, PAUL. California crude purchases curtailed further; cracking set back. Nat. Petrol. News, vol. 15, May 2, 1923, pp. 87-88. Gives distinctive features of Trumbull refining system. Describes reservoir construction.

STORAGE OF BUNKER OILS (423)

- 3288.** ENGINEER. Petroleum-spirit dock on the Manchester ship canal. Vol. 134, Sept. 29, 1922, pp. 324-326. Detailed description and cross-section drawings of important features of dock designed for the safe handling of petroleum. *See also* Engineer, vol. 133, March 17, 1922, p. 309.
- 3289.** MARINE ENGINEERING. System for handling bunker oil from storage. Vol. 28, Jan., 1923, p. 49. Use of steam-heating coils in inner bottom of tanks is eliminated by forcing a jet of hot oil from boiler room into the cold oil. Diagram of system and of revolving discharge nozzle.
- 3290.** OIL WEEKLY. Takes sludge from bunker tanks by vacuum system. Vol. 29, June 23, 1923, p. 46. Oil compartments are drained into tanks on barge, where water and residue settle, leaving oil in usable form.
- See also* Nos. 1129, 1130, 6068, 6097.

TANK AND RESERVOIR EQUIPMENT (424)

- 3291.** GÉNIE CIVIL. La manipulation automatique des hydro-carbures. Par les procédés de la Societé Hardoll. T. 81, Sept. 16, 1922, pp. 257-261. Describes garage and service-station pumps and equipment, reservoirs, and gauges.
- 3292.** JAMES, G. B. Gattrell roofs for oil tanks found to protect against fires. Nat. Petrol. News, vol. 14, July 12, 1922, p. 29. Usual wooden or metal roofs allow escape of gases and increase fire hazard as well as evaporation losses. Gives details of construction of roof which is gas-tight and grounded to carry off static electricity. Diagrams.
- 3293.** JARVIS, J. R. Compressed vapors from storage tanks. Nat. Gas, vol. 4, Aug., 1923, pp. 30, 32, 34. Steam-heating coils in gasoline tank enable gases to be recovered at safe pressure and also ensure a gasoline of marketable quality. Illustration of system.
- 3294.** NATIONAL PETROLEUM NEWS. New connection for tank roofs claimed to minimize evaporation. Vol. 14, May 24, 1922, p. 75. Review of booklet by S. H. Brooks, Oil Conservation Co., Cleveland, Ohio. "A message to the oil industry." Describes tank-roof construction which permits joints of roof and slides to be calked; states that baffle wind gauge and thief hole covers should be self-closing. Contains designs for correct tank-roof construction.
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- 3301.** FARR, F. G. Controlling valve for hydraulic oil-storage and distribution systems. United States patent 1,470,233, Oct. 9, 1923.
- 3302.** GALLAGHER, C. R. Liquid-sealed tank deck. United States patent 1,478,359, Dec. 18, 1923.
- 3303.** GUYTON, FRANK. Automatic oil-tank switch. United States patent 1,447,843, Mar. 6, 1923.
- 3304.** JOLLY, J. A. Automatic water drain for oil tanks. United States patent 1,471,737, Oct. 23, 1923.
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- 3306.** ——— Automatic loaded valves particularly for vents of oil tanks and like containers. British patent 203,644, Sept. 19, 1923.
- 3307.** LELAND, H. R., AND SCHWEMLEIN, WILLIAM. Floating decks for oil tanks. United States patent 1,426,999, Aug. 22, 1922.
- 3308.** ——— Deck for oil tanks. United States patent 1,426,997-8, Aug. 22, 1922.
- 3309.** MACARTHUR, W. J. Device for draining water from oil tanks. United States patent 1,442,677, Jan. 16, 1923.
- 3310.** SLATER, F. B. Filler attachment for oil reservoirs. United States patent 1,413,878, Apr. 25, 1922.
- 3311.** WALTERS, ELMER. Oil-tank cleaner. United States patent 1,437,372, Nov. 28, 1922.
- 3312.** WHITTIER, N. P. Gasoline tank and feed-line lock. United States patent 1,461,507, July 10, 1923.

TEMPORARY AND SMALL CONTAINERS (425)

- 3313.** CLARKE, ROBERT, JR. Buying shipping drums. Oil News, vol. 10, Nov. 5, 1922, p. 35. "Uses of light and heavy drums, strength of bilged barrels; types of chime construction."
- 3314.** HALBERT, W. K. Domestic vacuum cleaner chief part of barrel-cleaning process. Nat. Petrol. News, vol. 15, Nov. 14, 1923, pp. 22-24. Describes method, apparatus, and solution used in cleaning oil barrels.
- 3315.** KEECH, R. E. Emptying oil barrels with compressed air. Power, vol. 55, Jan. 3, 1922, p. 34. Description and illustration of two methods of unloading contents of oil barrels.
- 3316.** NATIONAL PETROLEUM NEWS. Steamless barrel cleaner. Vol. 14, June 7, 1922, p. 41. Describes method and device used to clean barrels.

- 3317.** OIL, PAINT AND DRUG REPORTER. Cleaning petroleum barrels. Vol. 101, May 29, 1922, p. 44; June 5, p. 40; June 19, p. 42C. Method of cleaning barrels without use of steam; methods used by the Standard Oil Co., New Jersey, for cleaning steel barrels and drums.
- 3318.** OIL TRADE JOURNAL. Barreling plant important refinery adjunct. Vol. 13, Dec., 1922, pp. 100, 102, 104. Describes site, plant, equipment. Gives methods of handling and shipping products.
- 3319.** PETROLEUM REFINER. New rules on drums announced by the I. C. C. Vol. 11, July 27, 1922, p. 10. Eight rules relating to size of drum and staves, hoops, method of manufacture, and material. *See also* Oildom, vol. 13, Aug., 1922, p. 51.
- 3320.** PETROLEUM TIMES. The Petroleum Import and Export Corporation, Inc. Vol. 7, June 3, 1922, pp. 773-774. Describes facilities for barreling and case-packing petroleum products, equipment for transportation to refineries and ships, and facilities for loading on ships at New Orleans.
- 3321.** PETROLEUM WORLD (LOS ANGELES). How to eliminate waste in barreling. Vol. 8, Feb., 1923, p. 21. Describes barrel-filling system which automatically shuts off flow of oil when specified weight has been reached. Illustration. *See also* Petrol. Age, vol. 11, Feb. 15, 1923, p. 80. Oil News, vol. 11, Feb. 5, 1923, p. 32. Oil Age, vol. 19, Feb. 21, 1923, pp. 22-23. Min. and Oil Bull., vol. 9, March, 1923, p. 214. Oildom, vol. 14, March, 1923, pp. 49-50.

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- 3323.** HAYES, A. H. Apparatus for washing out the interior of receptacles, such as petrol or other oil cans. British patent 179,280, May 17, 1922.
- 3324.** STREDA, J., GILLESPIE, G. J., AND BENCE, E. H. Tanks for the storage and transport of petroleum and the like. British patent 207,900, Dec. 19, 1923.

EQUIPMENT (425.1)

- 3325.** AMERICAN MACHINIST. Storing and clarifying oil in shops. Vol. 57, July 27, 1922, pp. 125-127. Describes methods and systems used in 12 plants.
- 3326.** ——— Increasing production and reducing scrap with clean cutting oil. Vol. 56, May 25, 1922, p. 784. Description and plan of oil-storage system for reclaiming oil used in screw machine department of automobile shop.
- 3327.** HENN, E. C. Supplying oil to 2,000 automatic screw machines. Am. Machinist, vol. 56, Jan. 5, 1922, pp. 4-7. Describes system for storing, distributing, sterilizing, and reclaiming oil.

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- 3329.** BINGMAN, JOHN. Attachment for hydrocarbon containers. United States Patent 1,424,068, July 25, 1922.
- 3330.** BROWN, W. C. Filling means for gasoline tanks. United States patent 1,449,492, Mar. 27, 1923.
- 3331.** STEPHENSON, W. H. Gauge and filler spout for gasoline tanks. United States patent 1,477,728, Dec. 18, 1923.

- 3332.** THOMPSON, W. H. Filler cap for oil tanks. United States patent 1,464,301, Aug. 7, 1923.
- 3333.** TRAXEL, W. J. Safety device for gas drums. United States patent 1,464,226, Aug. 7, 1923.

STORAGE AND TANK FARMS (426)

- 3334.** BREWER, A. F. Lubricating-oil storage and handling methods. *Elec. Light and Power*, vol. 1, Sept., 1923, pp. 13-16, 76-77, 79. Describes construction of storehouse and equipment for handling containers. Tells of plant delivery and measurement of oil. Discusses types of shipping containers.
- 3335.** GOOLSBY, W. B. Mistakes in oil warehouses. *Oil News*, vol. 10, Nov. 5, 1922, pp. 37-48. Carefully prepared plans are needed to meet all requirements of business in size, construction, and equipment.
- 3336.** ——— Making the warehouse plans. *Oil News*, vol. 10, Oct. 20, 1922, pp. 23, 28. Required storage arrangements.
- 3337.** MINING AND OIL BULLETIN. Storing surplus California oil. Vol. 9. Sept., 1923, pp. 752-775. Oil-storing facilities in southern California. Illustrations.
- 3338.** NATIONAL PETROLEUM NEWS. Marland doubts value of gravity in the operation of bulk stations. Vol. 15, June 13, 1923, p. 35. Diagram and description of compact arrangement of storage station; mechanical equipment for the handling of products in barrels and cases, and of liquids in bulk. Power pumps are used and tanks are upright; tank cars are unloaded through dome.
- 3339.** STANEK, FRANZ. (Storage of fuel oil.) *Chem. App.*, vol. 10, May 20, 1923, pp. 31-32. Illustrations of storing methods.
- 3340.** TRUESDELL, PAUL. Fitting the bulk station to job-standardizing on types. *Nat. Petrol. News*, vol. 15, Nov. 28, 1923, pp. 35-38, 40-42. Gives plans, construction, and equipment of a bulk oil station. Considerations in selection of site, and policies of various companies in regard to location of bulk stations. Illustrations.
- 3341.** WALKER, J. C. Building the storage station. *Oil News*, vol. 10, July 20, 1922, pp. 21-22. Elevation of land for site of tanks is desirable; proximity to railroad tracks is economy in unloading. Mentions precautions to be taken in unloading. Discusses care of tanks.
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PATENT.

- 3342.** DOW, E. Y., AND McCLELLAND, N. E. Storage and delivery system particularly adapted for use in vessels using oil, as or for the creation of the motive power. British patent 173,826, Jan. 25, 1922.

LOSSES (427)

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- 3344.** BREWER, A. F. The storage and handling of lubricating oil. *Ind. Management*, vol. 64, July, 1922, pp. 27-30. Proper storage facilities are necessary to preserve best qualities of an oil. Describes storage methods and systems. Discusses lubricants of various types.

- 3345.** BROWN, REGINALD. Oilproof treatment of concrete storage tanks. *Petrol. Times*, vol. 8, Sept. 2, 1922, p. 342. Carefully prepared concrete, when tested for penetrability under pressure, showed no absorption of oil; method of preparing concrete is to decrease the porosity and neutralize the free lime by applying a special liquid, and then to apply an oilproof compound. *See also* *Nat. Petrol. News*, vol. 15, Jan. 3, 1923, p. 47.
- 3346.** BUCK, C. P. Control of evaporation. *Petrol. Age*, vol. 12, July 1, 1923, pp. 16-18; July 15, pp. 26, 28, 30, 72. To reduce vapor losses through relief valves to a minimum, tanks should be constructed to carry a point of pressure calculated to condense vapor back into crude oil. Results of laboratory tests conducted to test evaporation. *See also* *Bol. Petról.*, vol. 16, Aug., 1923, pp. 69-74.
- 3347.** COOPER, A. B. Tank. *Sci. Am.*, vol. 129, Nov., 1923, p. 346. Brief description of a bottomless storage tank submerged in water to prevent evaporation; the structure is portable and easily set up.
- 3348.** CROSS, ROY. Losses in the storage of crude. *Oil and Gas News*, vol. 13, Sept. 17, 1923, pp. 16, 18-19. Discusses losses from various types of storage. Reviews tests made with paints of different colors.
- 3349.** DEACON, W. T. How color reduces the evaporation of oil. *Oil News*, vol. 11, Sept. 5, 1923, pp. 13-14. Color and quality of paint are factors affecting evaporation rate. Discusses aluminum paint as an effective factor in reducing the temperature of storage tanks.
- 3350.** ———. To stop evaporation losses. *Petrol. Age*, vol. 11, March 1, 1923, pp. 21-22. States that paint is an important factor in reducing evaporation from tanks because of its ability to deflect heat. The paint selected should prevent corrosion or the formation of soluble sulphur compounds.
- 3351.** EDWARDS, J. D. Aluminum paint for outside work. *Chem. and Met. Eng.*, vol. 29, Nov. 19, 1923, p. 927. High reflectivity of aluminum paint is desirable as a means of minimizing evaporation losses in oil storage tanks. Contains formula for an aluminum paint.
- 3352.** GRIEVE, JOHN. Paint as a protection for steel structures. *Canadian Eng.*, vol. 43, Dec. 5, 1922, pp. 601-603. Discusses need for checking and preventing corrosion, deterioration of material caused by electrochemical action, and action of paint films in preventing corrosion.
- 3353.** INTERNATIONAL PETROLEUM REPORTER. New German tank prevents loss by pore seepage. Vol. 1, April 12, 1922, p. 50. Brief description of tank constructed of concrete containing moisture absorbing salts, such as calcium chloride, which keep surface of concrete moist; this tank is enclosed in another tank filled with water to level of oil in first tank, so that pressure of water prevents escape of oil.
- 3354.** KIRKPATRICK, R. Z. Protecting gasoline storage tanks from evaporation. *Jour. Am. Soc. Naval Eng.*, vol. 34, Nov. 1922, pp. 592-596. Tells of method of equipping tanks on Panama Canal with hoods and "petticoats" painted white which reduced evaporation appreciably. Data on tests of trials made with variations in equipment. *See also* *Nat. Petrol. News*, vol. 15, Jan. 31, 1923, p. 41.
- 3355.** ———. Protection of tank saves gasoline from evaporation. *Eng. News-Rec.*, vol. 88, April 27, 1922, p. 684. Photograph of tank with eaves.
- 3356.** LORD, C. W. Story of the gas-tight tank. *Min. and Oil Bull.*, vol. 8, Nov., 1922, pp. 653-654, 669. Data on tests with three tanks showing evaporation losses when being filled and when standing full.

- 3357.** MORLEY, H. T. Evaporation losses in field storage tanks. *Midwest Rev.*, vol. 4, March, 1923, pp. 4-5, 13; April, pp. 2-3, 19. Methods of decreasing evaporation. Data on evaporation losses obtained by investigations in the Rocky Mountain fields.
- 3358.** MOTOR AGE. How gasoline shrinks from tank wagon to garage pump. Vol. 43, May 31, 1923, p. 39. Sealer says variation is about 2 gallons in 100 for 20° change in temperature.
- 3359.** OIL AND GAS JOURNAL. Natural-gas gasoline evaporation one of largest preventable losses. Vol. 23, Dec. 13, 1923, p. 60. Figures showing waste of gasoline from escaping gas.
- 3360.** ——— Test shows large loss caused by evaporation. Vol. 21, Dec. 7, 1922, p. 97. Brief account of experiment conducted by Bureau of Mines at Bartlesville, Okla.; loss and preventive measures. *See also* Oil News, vol. 10, Dec. 5, 1922, p. 41. *Nat. Petrol. News*, vol. 14, Dec. 6, 1922, p. 29.
- 3361.** ——— 72,000,000 gallons of gasoline vanish yearly from 775 tanks. Vol. 21, Oct. 12, 1922, p. 14. Report of findings of tests conducted by Bureau of Mines and Johns-Manville, Inc., showing conditions under which evaporation occurs.
- 3362.** OIL WEEKLY. Experimenting with corrugated asbestos board as coverage for crude tanks. Vol. 26, Sept. 9, 1922, p. 13. Reports that tests with tanks protected by asbestos on a steel frame show vapors several degrees lower than those in unprotected tanks; tanks thus insulated are also protected from lightning.
- 3363.** ORMSBY, J. P. Science gives paint tips. *Petrol. Age*, vol. 9, April 1, 1922, pp. 62, 64. Discusses importance of selecting suitable paints for protection of metal surfaces.
- 3364.** PETROLEUM AGE. How storage losses mount. Vol. 11, April 15, 1923, pp. 22-24. Summary of losses by evaporation. Comparison of losses in open-top tanks with those in vapor-tight tanks. Vapor-tight tanks decrease losses and fire hazards.
- 3365.** PETROLEUM WORLD (LOS ANGELES). How color of paint on storage tanks affects evaporation. Vol. 8, Aug., 1923, pp. 48, 50. Data showing effect of various colors upon temperature of benzine in small tanks.
- 3366.** ——— Color a factor in oil evaporation. Vol. 8, July, 1923, pp. 65-66. Climate, as well as size, shape, and material of containers, is a factor affecting evaporation.
- 3367.** ——— Insulated roofs for storage tanks as a means of combating evaporation losses. Vol. 8, July, 1923, pp. 21, 79-80. Types of roofs; losses increased by winds and by "breathing" of tanks; insulating methods and material.
- 3368.** ROBINSON, C. L. New tank deck solves problem. *Petrol. Ref.*, vol. 10, Jan. 26, 1922, p. 26. Describes deck, giving its advantages. *See also* *Petrol. World* (Los Angeles), vol. 7, Feb., 1922, pp. 32, 40.
- 3369.** SCHMIDT, LUDWIG. A floating roof for oil tanks. *Repts. of Investigations*, Serial 2547, Bureau of Mines, Nov., 1923, 9 pp. Mimeographed. Describes invention, in reality a tub of slightly less circumference than a tank, equipped with rubber buffers, which maintain a fairly tight seal between roof and tank. Data on evaporation tests. Maintains that fire hazards as well as evaporation losses are reduced. *See also* *Petrol. World* (Los Angeles), vol. 8, Dec., 1923, pp. 60, 62, 64, 84-85. *Oil and Gas Jour.*, vol. 23, Dec. 6, 1923, pp. 84, 92.
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as diminish volume. Data on experiments with water sprays, water-seal roof, and insulation systems of cooling. Conclusions regarding cooling systems. Review in *Oildom*, vol. 14, Nov., 1923, p. 48. *Nat. Petrol. News*, vol. 15, Oct. 17, 1923, pp. 51-52, 54, 56-57. *Oil and Gas Jour.*, vol. 22, Oct. 18, 1923, pp. 96, 98. *Petrol. World (London)*, vol. 20, Nov., 1923, pp. 445-446, 448-452.

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- 3372.** THOMPSON, C. M. Natural-gas leakage. *Gas Age-Rec.*, vol. 51, Feb. 24, 1923, pp. 239-240. Methods of locating and measuring leaks in natural-gas mains.
- 3373.** WIGGINS, J. H. Methods of decreasing evaporation losses of petroleum. *Tech. Paper 319, Bureau of Mines 1923*, 57 pp. Calls attention to necessity of preventing pipe-line losses as well as evaporation losses on lease. Discusses devices and methods of reducing evaporation, and recovery of gasoline from crude on lease.
- 3374.** ——— Evaporation of petroleum in the Mid-Continent field. *Bull. 200, Bureau of Mines, 1922*, 115 pp. General discussion of evaporation problems; causes of evaporation losses; estimation of losses and gauging apparatus; evaporation losses and various types of storage; data on evaporation of petroleum products; results of weathering test made on compression of natural gasoline; costs of evaporation-prevention equipment. *See also Nat. Petrol. News*, vol. 14, Nov. 22, 1922, pp. 30, 32; Nov. 29, p. 29; Dec. 20, p. 31; vol. 15, Jan. 3, 1923, p. 31.
- 3375.** WILLIAMS, G. B. Stopping fuel-oil waste. *Oil News*, vol. 10, Aug. 5, 1922, pp. 36-37. Discusses economical factors in purchase, storage, and use of fuel oil.
- See also Nos. 279, 2910, 3230, 3255, 3257, 3293, 3295, 3297, 3321, 3434, 3450, 3538, 6205, 7628.*

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- 3377.** HOWARD, F. A., AND JENNINGS, J. M. Prevention of evaporation. United States patent 1,415,352, May 9, 1922.
- 3378.** HOWARD, F. A., KENT, G. H. L., AND JENNINGS, J. M. Foam for preventing evaporation of stored liquids. United States patent 1,443,538, Jan. 30, 1923.
- 3379.** HOWARD, F. A., ROBINSON, C. I., AND JENNINGS, J. M. Evaporation of stored liquids. United States patent 1,415,351, May 9, 1922.
- 3380.** JENNINGS, J. M. Foam covering for preventing the evaporation of stored liquids. United States patent 1,423,720-1, July 25, 1922.
- 3381.** ——— Stable foam for preventing the evaporation of stored liquids. United States patent 1,423,719, July 25, 1922.
- 3382.** SEIBER, F. M., AND GREGG, E. T. Transporting oil and apparatus useful therefor. United States patent 1,439,451, Dec. 19, 1922.
- 3383.** STANDARD OIL CO. Prevention of evaporation from stored liquids. Canadian patent 235,482, Nov. 6, 1923.
- 3384.** WADE, H. Prevention of evaporation of stored liquids. British patent 200,855, Aug. 1, 1923.

RECORDS, STATISTICS, MAPS (428)

- 3385.** BAHR, F. W. Control of warehouse stocks. Oil News, vol. 11, Feb. 20, 1923, pp. 29-30. Invoiced gallonage should be charged rather than gallonage received, as loss may occur in transportation. Contains plan for checking tank wagons.
- 3386.** BECKER, L. D. Inventory a nightmare. Oil Age, vol. 10, May 5, 1922, p. 23. Describes accurate methods of measuring oil stocks.
- 3387.** NATIONAL PETROLEUM NEWS. Simplified bookkeeping as worked out by eastern jobbing concern. Vol. 15, May 30, 1923, pp. 21-22. Outline of features of accounting system adapted to oil-distributing business.
- 3388.** OIL AGE. Temperature should be allowed for in retail gasoline sales. Vol. 19, June 6, 1923, p. 23. Fact that gasoline is purchased under normal temperature conditions and sold from underground tank where temperature is lower causes loss to dealer, as volume of gasoline expands in warm atmosphere and contracts at cool temperature. See also Oil News, vol. 11, June 5, 1923, p. 48. Oildom, vol. 14, July, 1923, p. 60.
- 3389.** TRIPLETT, GRADY. Oil company has scheme for daily inventory. Oil Weekly, vol. 30, Sept. 22, 1923, p. 21. System consists of equipment maps in colors with inventory sheets attached, and permits the condition of lease to be seen at a glance.
- See also Nos. 3356, 3357, 3359, 3360, 3539, 3542, 7631, 7858, 7863.

MEASUREMENT OF VOLUMES AND WEIGHTS, GAUGING,
AND METERING (430)

- 3390.** BAYER, F. M. (Improvements in measuring apparatus for gases, vapors, liquids, and granular substances.) Chem. App., vol. 9, 1922, pp. 22-24, 52-54, 78-81, 110-111, 133-135, 144-146, 156-158, 221-223, 231-233. Review of German patents, with 40 cuts. See also vol. 8, 1921, pp. 59-61, 67-69, 88-90, 94-96, 161-163, 170-173, 179-181.
- 3391.** BURNHAM, C. H. M. A linear chart for calculating pipe-line capacities. Nat. Gas Ind., vol. 16, May, 1922, bet. pp. 166-167. Contains chart and formulas.
- 3392.** CONTI, JAMES. Dispositif donnant une grande précision à la mesure à distance du poids du contenu d'un réservoir. Chim. et ind., Special Number, May, 1923, pp. 290-294. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct. 1922.) Describes measuring device, or level, and its operation for measuring the contents of a tank. Illustrations.
- 3393.** DELBRIDGE, T. G. Method of correcting volume of oil for temperature variations. Nat. Petrol. News, vol. 14, June 28, 1922, pp. 41-42. Formulas and tables employed for obtaining a volume at 60° F. from gauge gallons at other temperatures.
- 3394.** DODGE, B. F. Flow of fluids. Chem. and Met. Eng., vol. 29, Nov. 5, 1923, pp. 844-846. Methods of calculating the six important variables involved in the flow of gas or liquid.
- 3395.** HALBERT, W. K. Tank car outages can be figured closely without higher mathematics. Nat. Petrol. News, vol. 15, Feb. 28, 1923, pp. 53-54, 56. Methods and tables for computing leakage and outage, and for making temperature correction.
- 3396.** JUDD, HORACE, AND PHELEY, D. B. Effect of pulsations on flow of gases. Mech. Eng., vol. 45, April, 1923, pp. 223-229, 270. Study of pulsation of gases for the purpose of discovering a practical means of preventing it and remedying its effects on meters. Tells of experiments carried out with

- Venturi meter, orifice, flange nozzle meter, and pilot meter. Concludes that throttling combined with volume enlargement of line is most effective for the mechanical prevention of pulsations. *See also* Natural Gas, vol. 4, Aug., 1923, pp. 4-5, 23-26, 42, 44, 60-61.
- 3397.** LACEY, STEPHEN. Flow of gas in pipes. *Gas Jour.*, vol. 163, July 4, 1923, pp. 119-132; discussion, pp. 132-133. Contains formulas for calculation of flow of gas through small pipes at low velocity and for flow of gas at high velocity; determination of value of coefficient of friction.
- 3398.** LICHTY, L. C. Measurement, compression, and transmission of natural gas. New York, 1924. 523 pp. Tables and formulas for application with various types of meters, tubes, and pipe lines. Discusses physical properties and the compressibility of natural gas.
- 3399.** M'DAVID, J. W. A rapid and accurate method for the calibration of storage tanks. *Jour. Soc. Chem. Ind.*, vol. 41, Sept. 15, 1922, pp. 295T-296T. Describes apparatus for measuring volume of a tank, based upon the principle "that water, flowing through a tube or orifice under a constant head gives a constant rate of flow."
- 3400.** McNAIR, G. H. To figure expansion of oils. *Petrol. Age*, col. 10, Sept. 1, 1922, pp. 80, 82. Formulas for measurement of expansion or shrinkage caused by temperature.
- 3401.** MECHANICAL ENGINEERING. Measurement of pulsating flow by nozzles. Vol. 44, March, 1922, pp. 199-200. When nozzles are used to measure pulsating flow the results are inaccurate "unless flow curve is known as function of time." Nozzle or similar device can be used accurately on a large tank if a small throttling flange is located at the jointure of the tank and delivery pipe.
- 3402.** MINING AND OIL BULLETIN. Vehicle-tank regulations. Vol. 9, July, 1923, pp. 589, 591, 593, 628. Tentative specifications and tolerances regarding inspection of weighing and measuring methods and devices.
- 3403.** ———. New scale records pounds and gallons at a glance. Vol. 8, April, 1922, p. 218. Illustration of a chart with scales, by which it is possible to determine the contents of a barrel of oil in pounds and gallons.
- 3404.** MORRICE, CHARLES. The gauging department in the oil fields. *The Record (Pacific, Associated and Amalgamated Oil Companies)*, vol. 3, June, 1922, pp. 7-8. Procedure in gauging contents of a tank car or reservoir; equipment.
- 3405.** NATIONAL PETROLEUM NEWS. Converts freight costs per hundredweight into barrels and gallons. Vol. 15, Nov. 7, 1923, p. 91. Conversion table for the translating of costs per hundred weight into costs per gallon and barrel.
- 3406.** ———. Gauging table for 10,100-gallon car tank. Vol. 14, Aug. 30, 1922, p. 45. "Contents in gallons at one-quarter inch variation in liquid level of partly filled tank."
- 3407.** ———. Are your tanks accurate? Vol. 14, May 24, 1922, p. 43. Tells of using spirit level to determine whether or not tank trucks are standing square; position often makes an appreciable difference in gallonage.
- 3408.** OIL AND GAS JOURNAL. Fuel-oil measurement. Vol. 22, June 14, 1923, p. 116. Measurement of oils by weight rather than volume is recommended, as volume varies with gravity and temperature but weight is not influenced by temperature changes.
- 3409.** ———. Tank car outage gauge is invented. Vol. 20, Feb. 24, 1922, pp. 72, 80-81. Description, with diagram, of the "H. & C. tank car outage gauge," invented by W. D. Callahan and J. C. Hoskins, for automatically locking and registering the number of inches of outage when the dome

- cover of the car is removed, so that when car is returned in that position to shipper, the outage claim of the purchaser may be checked accurately by the refiner or manufacturer.
- 3410.** OIL AND GAS NEWS. Corrections of gauged volume of oil to 60° F. Vol. 13, Dec. 3, 1923, pp. 16-17. Directions for using table for correction of gauged volumes of oil at any temperature from 30 to 300° F. to the corresponding volume at 60° F.
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- 3412.** PETROLEUM AGE. Measurement. Vol. 9, Jan. 15, 1922, p. 55; June 15, p. 39. Deals with capacity and outage of steel tanks.
- 3413.** PETROLEUM REFINER. New accuracy in barrel filling. Vol. 12, Feb. 8, 1923, p. 3. Describes scale which measures liquid content of a barrel and automatically shuts off flow when required weight has been reached.
- 3414.** PIERCE, H. R., JONES, W. R., SCHELHARDT, M. A., AND PETERSON, H. J. Thin plate orifice measurement of gas. Oil and Gas Jour., vol. 22, Nov. 15, 1923, pp. 82, 86, 90. Discusses conditions which are responsible for variation in actual flow of gas through an orifice and calculated flow. Gives procedure in investigations of factors. Hydraulic formula with corrections is deemed simple and satisfactory instead of the thermo-dynamic formula.
- 3415.** RATHBUN, J. B. To gauge a cylindrical tank. Petrol. Age, vol. 9, June 1, 1922, pp. 84, 86, 88. Formula for ascertaining volume of oil in a partly filled cylindrical tank.
- 3416.** RINEHART, B. C. Accurately gauging tanks. Oil News, vol. 11, Jan. 20, 1923, pp. 21-22. Factors which account for inaccurate results, and methods for correct measurement.
- 3417.** SMITH, E. S., JR. The oil Venturi meter. Trans. Am. Soc. Mech. Eng. Vol. 45, 1923, pp. 67-75. Discusses use of Venturi meter for measurement of oil and viscous liquids. Method of determining quantity of flow. Formula for calibration. See also Mech. Eng., vol. 45, May, 1923, pp. 297-298. Oil Field Eng., vol. 25, May, 1923, pp. 98-100. Chem. and Met. Eng., vol. 29, July 2, 1923, pp. 20-22.
- 3418.** SMITH, R. W. Testing of liquid-measuring devices. Bureau of Standards Miscellaneous Publication 48, 1922, pp. 64-72. Discusses field tests of mechanically operated liquid-measuring devices used in vending or measuring gasoline or oils, pointing out the more important steps in their examination.
- 3419.** SPITZGLASS, J. M. Orifice coefficients—data and results of tests. Mech. Eng., vol. 45, June, 1923, pp. 342-348. "Tests included effect of varying factors, such as orifice ratio, size of pipe, and the distance of the up and down stream connections upon the pressure differences across orifice plate."
- 3420.** TAYLOR, JOHNSTONE. Venturi tubes and orifices for bulk gas measurement. Am. Gas Jour., vol. 117, Aug. 12, 1922, pp. 139-141, 144. Venturi system overcomes limitations of drum-type gas meters. Explains principles of operation and gives diagrams of parts.
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- 3422.** WALLER, T. P. Measurement of fuel and oil. Gas Age-Rec., vol. 50, Aug. 5, 1922, pp. 171-174. Contains outline of method for keeping record of oil stock in plant.
- 3423.** WILSON, R. E., McADAMS, W. H., AND SELTZER, M. The flow of fluids through commercial pipe lines. Jour. Ind. and Eng. Chem., vol. 14, Feb., 1922, pp. 105-119. Describes experimental work undertaken "to fill in the gaps in the existing data on the flow of fluids in pipes of commercial size and

roughness, especially for very viscous liquids and in the critical region between viscous and turbulent flow; and to determine, with reasonable accuracy, correction factors for the pressure drop around bends." Tells of development of a single method of calculation for all types of flow.

- 3424.** YINGLING, V. N. To find contents of partially filled horizontal cylindrical tanks. *Natural Gas*, vol. 4, May 1923, p. 56. Diagram and formula for finding contents of tank having flat, convex, or bumped ends.

See also Nos. 14, 2860, 2862, 3083, 3099, 3152, 3550.

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- 3426.** ANDERSON, H. A. Liquid-fuel meter. United States patent 1,412,263, Apr. 11, 1922.
- 3427.** EATON, C. D. Oil gauge. United States patent 1,413,836, Apr. 25, 1922.
- 3428.** LOSSING, RICHARD. Gasoline meter. United States patent 1,414,964, May 2, 1922.

FIRE HAZARDS AND PREVENTION (440)

- 3429.** AGATON, A. H. Welding gasoline tank causes fatality. *California Safety News*, vol. 7, June, 1923, pp. 13-14. Only method by which gasoline tanks can be welded with any safety is to fill tank with water so high that volume of explosive gases will be at a minimum.
- 3430.** ATLANTIC CONNECTING ROD. Salvaging for safety. Vol. 16, May, 1923, p. 37. Describes scow equipped with an engine and pump and surface intake for oily water; oil and water are allowed to separate, and water is drained off.
- 3431.** BABBITT, F. W. Design of oil-tank fire walls. *Eng. News-Rec.*, vol. 90, June 28, 1923, pp. 1132-1133. Formulas for construction of a fire wall having one nad one-half times the cubic capacity of oil tanks.
- 3432.** BEAN, F. A. Practice fire prevention is best way to protect one's business. *Nat. Petrol. News*, vol. 14, Mar. 29, 1922, pp. 49-50. Discusses fire-prevention methods that may be incorporated in a wholesale plant.
- 3433.** BLACK, J. C. How fire foam originated. *Min. and Oil Bull.*, vol. 9, Nov., 1923, p. 997. Brief account of early experiments with licorice extract, glue, and other substances.
- 3434.** BOLETÍN DEL PETRÓLEO. Patente Francesa para la construccion de tanques de almacenamiento para petróleo. Vol. 15, Feb., 1923, pp. 116-119. Illustrations and description of patent for submerging storage tanks in water to protect from evaporation and fire.
- 3435.** BRAME, J. S. S. Fire hazards and fire extinction. *Jour. Inst. Petrol. Tech.*, vol. 9, April, 1923, pp. 113-127. Deals with origin of petroleum fires, precautionary measures, and extinguishing methods. *See also* *Petrol. World* (London), vol. 20, May, 1923, pp. 202-206.
- 3436.** BRAUN, J. C. Static. *Atlantic Conn. Rod*, vol. 17, Aug., 1923, pp. 20-21. Account of tank trucks which were electrically charged by escaping steam. Precaution of grounding trucks should be taken before removing manhole cover plugs or before loading or unloading.
- 3437.** BREWER, A. F. Practical use of oil fuels. *Combustion*, vol. 8, April, 1923, pp. 231-235. Deals with installation of adequate fire-prevention equipment, precautionary measures, and location and construction of storage tanks.

- 3438.** BUREAU OF EXPLOSIVES. Report of the chief inspector, March, 1922. B. E. Report No. 15, 85 pp. Reviews the work of the bureau for the year ended December 31, 1921. Appendixes include statistical tables covering explosions; fires and accidents involving explosives and other dangerous articles; reports from the chemical laboratory of the bureau; annual report of the tests and specifications department; a reprint of B. E. Special Bull. 3, Feb. 10, 1921, on the casing-head gasoline explosion at Memphis, Tennessee; reprint of B. C. L. 197, on unloading tank cars; and other data.
- 3439.** CARRUTHERS, A. C. Oil-tank fires and their prevention. *Safety Eng.*, vol. 46, Aug., 1923, pp. 51-63. How fires originate from lightning; directions and diagram for construction of a safe tank; illustrations of some large tank fires; protection of tanks; fire-extinguishing systems and methods.
- 3440.** CHEMICAL AGE. Governmental investigation of pollution of navigable waters. Vol. 31, Oct., 1923, p. 433. Discusses report of committee on pollution of navigable waters; oil tankers and oil-burning ships are considered greatest menace to cleanliness of territorial waters, as they may discharge outside the three-mile limit. Discusses danger to marine life, wild fowl, and to public health and safety.
- 3441.** CHEMICAL AGE (LONDON). Security in handling inflammable liquids. Vol. 5, Sept. 24, 1921, pp. 372-373. Describes Mauclère patent for storage and protection of gasoline.
- 3442.** CHEMICAL AND METALLURGICAL ENGINEERING. Oil tank protected from fire by cork insulation. Vol. 26, May 24, 1922, p. 990. Temperature of tank kept below ignition point by heat-retarding qualities of cork-board covering.
- 3443.** Dow, D. B. Hazards involved in the transportation of natural-gas gasoline. Pamphlet issued by Association of Natural Gasoline Manufacturers in cooperation with the Bureau of Mines, Tulsa, Okla., Jan., 1922, 26 pp. Study of volatile properties of natural gasoline. Contains recommendations for handling and shipping. States that most accurate method of determining volatility is by distillation loss. Pressures were found to be much higher in standard tank cars than in insulated cars; compressed air for unloading cars has disadvantages, but is safest method. Gives graphic and tabular data. *See also Oil Field Eng.*, vol. 24, June, 1922, p. 169.
- 3444.** ENGSTRAND, G. C. New system removes oil sludge and dangerous gases. *Marine Eng.*, vol. 28, Jan., 1923, p. 47. Sludge is drawn from ship's tanks by means of vacuum pump into hold of tender alongside and oil is recovered for burning. Illustrations.
- 3445.** GAS AGE-RECORD. Vol. 51, March 10, 1923, p. 314. Photograph showing operation of fire-extinguishing system on oil tank.
- 3446.** GEIGER, C. W. A new method for extinguishing oil fires. *Power Plant Eng.*, vol. 27, July 1, 1923, pp. 692-693. Report of test with curtain of water. Illustrations.
- 3447.** ———. Curtain of water puts out tank fire. *Popular Mech.*, vol. 39, June, 1923, pp. 884-885. Illustration of tests. Describes equipment and method.
- 3448.** HALBERT, W. K. Tulsa bulk storage plant is rated high for fire safety. *Nat. Petrol. News*, vol. 14, April 12, 1922, p. 43. Methods of grounding tanks and loading platforms as a protection against static electricity; provisions for fire fighting; pipe system.
- 3449.** HILL, BANCROFT. Methods of controlling and properly disposing of waste fuel oil in ports. *Nautical Gaz.*, vol. 103, Oct. 28, 1922, pp. 552-555. Excerpts from paper before Eleventh Annual Convention of American Port Authorities, Toronto. Contains methods for prevention of oil discharge into harbor at Baltimore. Tells of apparatus being constructed to remove oil from surface of harbor water.

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- 3452.** MARINE ENGINEERING. Rules for cleaning oil tanks. Vol. 27, March, 1922, pp. 165-166. Outline of recommendations for removal of explosive gases in oil tanks, made by marine fire hazards committee of the *Nat. Fire Protect. Assoc.*
- 3453.** MINING AND OIL BULLETIN. How oil companies guard against fires. Vol. 9, Dec., 1923, pp. 1075-1080, 1137, 1145. Discusses protection of wooden roofs of reservoirs; insulation of piping, valves, and fittings; guy-wire slide for derrick; and insulating material for tanks.
- 3454.** ——— Extinguishing oil-tank fires. Vol. 9, May, 1923, p. 405. Tank fires have been successfully extinguished by spreading an unbroken sheet of water over surface of tank. *See also* *Petrol. Age*, vol. 11, May 1, 1923, p. 28.
- 3455.** ——— Static electricity. Vol. 9, Jan., 1923, pp. 34, 57. Protective methods employed against static electricity hazard in handling oil equipment.
- 3456.** ——— Novel features of filling-station service. Vol. 8, July, 1922, pp. 403-404. Filling pipe is connected with special wiring which is grounded; tank wagon can not be filled until plug with which car is equipped is inserted in cap, unlocking it and at same time drawing off any static electricity with which tank is charged.
- 3457.** MOTOR AGE. Preventing and extinguishing gasoline fires. Vol. 44, Aug. 23, 1923, pp. 48-49. Discusses danger from gasoline and gasoline vapors in presence of flame or running engine of car; hazard of static electricity.
- 3458.** MÜLLER, BRUNO. Die Reibungselektricität in Rohrleitungen als Ursache von Benzineexplosionen. *Chem. Ztg.*, Jahrg. 47, Feb. 1, 1923, pp. 97-98. Points out that frictional electricity in pipe nozzles is a cause of benzine explosion.
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- 3461.** NATIONAL PETROLEUM NEWS. Demonstrate machine to stop pollution. Vol. 15, Nov. 28, 1923, p. 75. Report of demonstration of Viecken oil purifier.
- 3462.** ——— Brass eliminates sparks. Vol. 15, Aug. 22, 1923, p. 85. Tells of brass used to prevent explosions caused by steel striking steel near gas tanks and trucks. *See also* *Atlantic Conn. Rod*, vol. 17, July, 1923, pp. 41-42.

- 3463.** NATIONAL PETROLEUM NEWS. Oil companies win by compromise in spacing of tanks. Vol. 15, July 18, 1923, p. 95. Contains revised table of tank distances approved by National Fire Protection Association.
- 3464.** ——— Data on water pollution are given Secretary Hughes. Vol. 15, May 9, 1923, p. 40. Pollution of water comes from ballast water of steamers; salvage expense would be greater than value of oil recovered.
- 3465.** ——— Railroads, not oil industry, cause most gasoline accidents. Vol. 15, Mar. 28, 1923, pp. 21–22. Review of annual report of Bureau of Explosives of the American Railway Association. Precautions in the handling of tank cars.
- 3466.** ——— Results of fierce oil fire show efficiency of explosion hatches. Vol. 15, Jan. 10, 1923, pp. 35–37. Describes successful operation of Hull explosion hatches on tanks. Wooden roofed tanks are great fire hazard.
- 3467.** ——— Brick walls isolate each tank here. Vol. 14, Aug. 9, 1922, p. 37. Photographs and description of fire-protection measure in a storage plant.
- 3468.** ——— Warns of filling danger. Vol. 14, July 26, 1922, p. 49. Tank with which funnel is in contact must be grounded to avoid hazards of static electricity.
- 3469.** ——— An antistatic nozzle. Vol. 14, May 24, 1922, p. 41. Spring holds nozzle securely, making it impossible to strike a spark.
- 3470.** ——— Fire protection conferees favor curb pumps in certain districts. Vol. 14, Apr. 5, 1922, pp. 41–42. Tells of meeting of the committee on inflammable liquids of the National Fire Protection Association, in which curb pumps and the freeing of tanks of explosive vapors were discussed. Gives outline of good practice for freeing tanks of such vapors before entering them to make repairs.
- 3471.** NATIONAL SAFETY NEWS. Static electricity. Vol. 6, Dec., 1922, pp. 47–54. Reprint of Safer Practice Pamphlet 52, publ. by Nat. Safety Council, Chicago. Gives details concerning generation of static electricity. Discusses methods and devices for reduction of hazards of static electricity in various industries.
- 3472.** NAUTICAL GAZETTE. Relative fire risks of petrol and power alcohol. Vol. 103, Nov. 25, 1922, p. 693. Petrol gases form fire hazard, as they are heavy and not easily dispersed; alcohol mixes readily with water and thus when a fire is easily controlled by water. Points out other advantages of alcohol.
- 3473.** ——— Floating oil thrown upon the sea is almost indestructible. Vol. 103, July 22, 1922, p. 107. Danger and loss from oil accumulations on harbor and ocean water.
- 3474.** ——— Extinguishment of fires in fuel oil tanks. Vol. 102, April 8, 1922, p. 437. Besides using a foam system, the fire hazard may be minimized by replacing oil with water taken in at bottom of tank; in this way the tank is kept full and no gas is allowed to form.
- 3475.** NEUBERGER, D. M. A call to the chemist to purge industry of its contamination of our coast and inland waters. Chem. Age, vol. 31, Oct., 1923, pp. 431–432. Tells of losses occasioned by widespread pollution; legislation or invention must solve the problem.
- 3476.** OIL AND GAS JOURNAL. While getting "gas," hose nozzle should touch tank's mouth. Vol. 22, Sept. 6, 1923, p. 131. To prevent explosions from ignition of gasoline vapor by static sparks, hose nozzle should be in continuous contact with unpainted metal mouth of tank.
- 3477.** ——— Static electricity from flowing "gas" causes explosions. Vol. 22, July 12, 1923, p. 107. Flow of gasoline from pump to tank may cause electrical discharge; a chain touching pavement may aid in grounding current.

- 3478.** OIL AND GAS JOURNAL. Easy way to cause a gasoline blow-up. Vol. 21, March 15, 1923, pp. 110-111. Precautions necessary in the handling of gasoline.
- 3479.** ——— Proposed rules satisfy railroads. Vol. 21, Feb. 8, 1923, pp. 98-99. Rules for the loading, unloading, and storage of inflammable liquids.
- 3480.** ——— Safeguarding shipment of gasoline. Vol. 20, May 4, 1922, pp. 102, 104, 106. Contains revised method of determining vapor tension proposed by Bureau of Explosives. Proposed outage requirements.
- 3481.** OIL NEWS. Causes of deadly gasoline explosions. Vol. 11, Feb. 5, 1923, p. 54. Static electricity generated by friction in fur, wool, or silk causes explosions. *See also* Ind. and Eng. Chem., vol. 15, Feb., 1923, p. 140. Oildom, vol. 14, March, 1923, p. 60.
- 3482.** ——— How to avoid fires from static electricity. Vol. 10, June 20, 1922, p. 26. Outline of precautions for grounding trucks, faucets, and containers.
- 3483.** ——— Explosive transportation. Vol. 10, Feb. 20, 1922, pp. 40, 42, 46-47, 49. Gives statement of the American Petroleum Institute to the Interstate Commerce Commission in which it is held that the present regulations are efficacious and that modifications proposed by the commission are unnecessary.
- 3484.** OIL, PAINT AND DRUG REPORTER. Insulated tank car has many advantages. Vol. 102, July 24, 1922, p. 42C. Describes insulated type of car which protects contents from explosion and fire; internal temperature of car remains practically unchanged regardless of exterior temperature, and evaporation losses are eliminated.
- 3485.** OIL TRADE JOURNAL. Fighting and preventing oil fires with foam systems. Vol. 13, July, 1922, p. 66. A standard foam system is imperative; home-constructed equipment has proved inadequate.
- 3486.** OIL WEEKLY. A. P. I. discusses tank-fire prevention. Vol. 31, Dec. 22, 1923, p. 29. Lightning rod will protect vaporproof tank. Bird-cage type of tank is considered for petroleum storage tanks.
- 3487.** ——— Fuel oil floating on waters for a time is not a fire hazard. Vol. 27, Oct. 28, 1922, p. 12. After oil has been on water for a considerable time an emulsion is formed and its volatile qualities disappear.
- 3488.** OILDOM. Rules on static electricity. Vol. 14, Sept. 1923, p. 19. When gasoline tanks are being filled, care should be taken to have nozzle of hose in continuous contact with unpainted metal mouth of tank; trucks should be grounded.
- 3489.** ——— Oil Fires. Vol. 13, Dec., 1922, p. 49. Discusses advantages of "Phomene" foam-type fire extinguisher over the soda-acid extinguisher.
- 3490.** PACIFIC MARINE REVIEW. Fighting fire with foamite. Vol. 20, April, 1923, p. 42. Describes installation of foamite system for marine uses.
- 3491.** PETROLEUM AGE. Hazards and problems of oil. Vol. 10, Dec. 15, 1922, pp. 17-18, 76. Considers advantages of vapor-tight storage tanks and of including fire-fighting apparatus in plant equipment. Discusses recovery of light oil from acid sludge, rearrangement of apparatus to give greater distillation efficiency, and factors involved in heat saving.
- 3492.** ——— Static perils are studied. Vol. 10, Nov. 1, 1922, pp. 82, 92. Protective measures are discussed.
- 3493.** PETROLEUM REFINER. Safety tank eliminates the oil-fire hazard. Vol. 10, Feb. 2, 1922, p. 19. Tells advantages of a safety tank with floating roof. Brief description.
- 3494.** PETROLEUM WORLD (LONDON). On the alleged dangers of static. Vol. 20, Feb., 1923, p. 83. Considers danger of ignition from static sparks negligible.

- 3495.** PETROLEUM WORLD (LOS ANGELES). How science is reducing the oil man's fire bill. Vol. 8, Dec., 1923, pp. 76, 78, 80. Methods of fighting oil and gas well fires and tank fires; precautionary measures.
- 3496.** ——— How to avoid fire losses at service stations. Vol. 8, Aug., 1923, p. 58. Safe practices which reduce fire hazard.
- 3497.** ——— Reducing the fire hazard from static electricity. Vol. 7, Nov., 1922, p. 36. Tells of device designed to ground tank. Illustrations.
- 3498.** ——— Preventing tank-car fires caused by electricity. Vol. 7, April, 1922, p. 42. Rules recommended by American Railroad Engineers' Association, annual meeting, March 14-16, 1922.
- 3499.** POWER. Installing oil tanks. Vol. 58, Nov. 13, 1923, p. 768. Directions for insulating and constructing fuel-oil storage tanks in buildings.
- 3500.** THE RECORD (Pacific, Associated and Amalgamated Oil Companies). Gasoline in the garage. Vol. 4, April, 1923, pp. 8-9. Precautions to be taken in handling gasoline.
- 3501.** SAFETY ENGINEERING. The danger of gasoline in vapor form. Vol. 46, Dec., 1923, pp. 265-267. Tells of accidents resulting from ignition of gasoline vapor.
- 3502.** SCIENTIFIC AMERICAN. Putting out oil-tank fires with water. Vol. 129, Aug., 1923, p. 103.
- 3503.** SCOTT, R. J. The care of fire-prevention apparatus. Min. and Oil Bull., vol. 9, Dec., 1923, pp. 1081, 1159. Pumps and power system of foam plant should be apart from the rest of the plant to be safe from fire; inspection of foam-delivery system should be frequent; tests of solution are necessary to detect deterioration; emergency power should be provided for; dykes and fire walls must be kept in condition.
- 3504.** STANDARD OIL BULLETIN. Fire chiefs visit Richmond refinery. Vol. 10, Oct., 1922, pp. 8-9. Tells of a demonstration of effectiveness of fire foam for extinguishing oil fires, and use of metal gauge on tanks as a fire-preventive measure.
- 3505.** TAYLOR, E. D. Floating-roof tank prevents fire, checks evaporation; eliminates roof-plate corrosion. California Oil World, vol. 15, Aug. 16, 1923, p. 7. Description and merits of tank which has been successfully tested. Illustration and diagram. *See also* Oil Age, vol. 20, Aug., 1923, pp. 41-42. Oil and Gas Jour., vol. 22, Aug. 30, 1923, p. 82.
- 3506.** TRIPLETT, GRADY. The human element of fire prevention. Oil Weekly, vol. 31, Nov. 3, 1923, pp. 19, 21, 23. Discusses use of water in oil-fire fighting and considers other methods. Points out that in preventing fires intelligent cooperation among workers is essential.
- 3507.** ——— Tanks are targets for lightning bolts. Oil Weekly, vol. 31, Oct. 27, 1923, pp. 23-25, 60. Recommends all-steel vapor-tight storage as best protection.
- 3508.** WALLIS, G. E. Preventing accident leaks in U. G. I. gas plants. Nat. Safety News, vol. 8, Nov., 1923, pp. 15-16. Deals with protection of gas-oil storage.
- 3509.** WEDGER, W. L. Watch out for static electricity in gasoline. Fire and Water Eng., vol. 72, Aug. 23, 1922, pp. 355-356, 359, 373. Friction with nonconductor causes spark, and resulting combustion is followed by fire and explosion.
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- See also* Nos. 229, 355, 780, 1369, 1775, 3007, 3077, 3215, 3216, 3217, 3218, 3220, 3222, 3223, 3224, 3225, 3237, 3244, 3258, 3288, 3292, 3362, 3368, 3369, 3548, 3549, 4441, 4442, 5689, 5876, 5880, 5883, 6105, 7419, 7601, 7665, 7706, 7707.

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3513. HOLMES, O. J. Apparatus for automatically extinguishing fires in oil tanks and other structures. United States patent 1,455,789, May 22, 1923.
3514. HUFF, W. S. Fireproof tank. United States patent 1,463,268, July 31, 1923.
3515. KENT, G. H. L. Foam for fire prevention. United States patent 1,441,728 Jan. 9, 1923.
3516. MAUCLÈRE, P. A. P. Safety system for storing inflammable liquids. United States patent 1,446,263, Feb. 20, 1923.
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3518. PATTERSON, D. W. Fire-extinguishing system. United States patent 1,403,621, Jan. 17, 1922.
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3520. WYATT, K. A. Lightning protection apparatus for oil tanks. United States patent 1,463,523, July 31, 1923.

SAFETY (441)

3521. EDWARDS, W. D. Breathing apparatus for the petroleum industry. *Min. and Oil Bull.*, vol. 8, April, 1922, pp. 213-214. Describes two general classes of breathing apparatus and the three types of gas masks.
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3524. McBRIDE, L. M. Uses of All-Purpose canister gas mask at sea. *Nat. Safety News*, vol. 8, Nov., 1923, pp. 27-28. Abstract of address before Marine Section of the National Safety Council, Twelfth Annual Safety Congress. Description and illustrations of All-Purpose gas mask. States that hose mask or oxygen breathing apparatus is safest equipment for long periods of exposure to petroleum or benzine vapors. Mentions precautions to be taken with gas masks.
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3526. ——— Ingenious gauge-hole cover. Vol. 14, June 7, 1922, p. 41. Hole large enough for measuring stick obviates removal of manhole covers and ensuing consequences of carelessness or theft.
3527. ——— Gives value of gas masks in oil vapors. Vol. 14, May 24, 1922, p. 48. Discusses various types of breathing apparatus and their suitability for use in oil tanks.
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3529. OIL AND GAS JOURNAL. Explosives Bureau makes revision. Vol. 20, May 25, 1922, pp. 90, 91. New rules proposed for location of loading racks and protection of cars and workmen; installation of piping and storage facilities.

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- 3531.** PETROLEUM AGE. Accidents in transit. Vol. 9, June 15, 1922, p. 41. Summary of accidents occurring while transporting petroleum products.
- 3532.** TEWKSBURY, F. A. Accident prevention. *Nat. Gas Industry*, vol. 16, Jan., 1922, pp. 9-12. Discusses accidents to gas-meter readers.
- 3533.** WICHUM, V. Percentage of air in gas line shown. *Oil and Gas Jour.*, vol. 22, Oct. 25, 1923, p. 72. When natural gas is mixed with air the danger of explosion is great, the yield of natural gasoline is decreased, and excessive wear on equipment results.
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LOCAL DISTRIBUTION (450)

- 3534.** ANDERSON, R. A. M. Where every inch counts. *Oil and Gas News*, vol. 13, May 21, 1923, pp. 20-21. Ground plan of a service station.
- 3535.** CHATFIELD, J. C. Jobbers develop special equipment for distillate delivery. *Nat. Petrol. News*, vol. 15, Nov. 21, 1923, pp. 35-37. Describes tanks and equipment used in delivery of furnace oil for domestic use; delivery policies.
- 3536.** GAYTON, J. A. How to pick out a profitable location for a gasoline service station. *Petrol. World* (Los Angeles), vol. 8, March, 1923, pp. 21, 80. Points out that traffic, side of street, driveway, and visibility are essential considerations.
- 3537.** GÉNIE CIVIL. La manipulation automatique des hydrocarbures par les procédés de la Société Hardoll. T. 81, Sept. 16, 1922, pp. 257-261. Discusses distribution of gasoline for automobiles.
- 3538.** GOOLSBY, W. B. The location, design, construction, and operation of distributing warehouses. *Oildom*, vol. 13, May, 1922, pp. 17-20. Discusses importance of central location for warehouse to reduce expense of long delivery hauls to customers, as well as from refinery. Recommends storage equipment and protection against leakage and cold.
- 3539.** HYATT, L. V. Distribution and accounting for gasoline. *Railway Age*, vol. 72, June 20, 1922, pp. 1600-1602. Equipment and methods of handling gasoline developed by the Missouri Pacific Railroad Co. Includes a sketch of side and end elevation of gasoline tank car. *See also* *Railway Rev.*, vol. 70, June 24, 1922, pp. 1008-1010.
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- 3541.** OIL NEWS. Fuel oil delivered like gas. Vol. 11, Jan. 20, 1923, p. 31. Describes underground system of oil pipes used in Wichita Falls, Tex., whereby large consumers are supplied with fuel oil. *See also* *Nat. Petrol. News*, vol. 14, Dec. 6, 1922, p. 94. *Oil News*, vol. 10, Dec. 20, 1922, p. 44.
- 3542.** ROSS, D. S. Accounting systems to fill jobbers' need and what they can show. *Nat. Petrol. News*, vol. 15, Sept. 12, 1923, pp. 27, 29. Address delivered before Four-State Jobbers meeting, St. Joseph, Mo., Sept., 1923. Directions for interpreting and comparing information contained on balance sheet.
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- 3544.** TAYLOR, JOHNSTONE. High-pressure gas distribution. *Am. Gas. Jour.*, vol. 117, Oct. 14, 1922, pp. 335-337. An account of British practice. Discussion and description of the three compressing systems commonly used in England; the turbo or fan system, the rotary and exhaustor system, and the reciprocating compressor. Diagrams of the principal features of the compressor systems.
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PATENT.

- 3545.** BYWATER, D. Apparatus for delivering measured quantities of liquids, particularly the more volatile oils. British patent 174,841, Feb. 15, 1922.

SAMPLING (460)

PATENT.

- 3546.** JOHNSON, C. E. Vacuum sampler for tanks of refined oil and gasoline. United States patent 1,416,354, May 16, 1922.

LEGISLATION AND REGULATION (470)

- 3547.** NATIONAL PETROLEUM NEWS. Invite criticisms on proposed code of tolerances for tanks. Vol. 15, Oct. 10, 1923, pp. 51-52. Specifications and standards proposed at Annual Conference of Weights and Measures Officials of United States, Washington, D. C., May, 1923.
- 3548.** PETROLEUM AGE. Service stations. Vol. 12, July 1, 1923, p. 49. Fire regulations adopted by the National Board of Fire Underwriters, applying to the storage of "Hazardous Liquids."
- 3549.** ———. Fuel oil. Vol. 10, Oct. 15, 1922, pp. 37, 39; Nov. 1, p. 37; vol. 12, Sept. 1, 1923, p. 57. Deals with tanks and oil-storage regulations.
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RATE MAKING (480)

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MISCELLANEOUS (490)

- 3552.** JAMES, H. J. Cooperation in marketing industry. *Oil and Gas Jour.*, vol. 21, March 15, 1923, pp. 102-105. Discusses English policy in regard to oil production and method of marketing oil.
- 3553.** ZEITSCHRIFT DES VEREINES DEUTSCHER INGENIEURE. Gallone und Barrel im Mineralölhandel. Bd. 67, March 31, 1923, p. 309. Volume and weight of the English and American gallon and barrel.
- See also* Nos. 49, 3315, 3335, 3336, 3405, 7829.

PATENT.

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PROPERTIES AND THEIR DETERMINATION (500)

See Nos. 7770, 7780.

PHYSICAL PROPERTIES (510)

See Nos. 1459, 1465, 1507, 4121, 5409, 5410, 5416.

MOLECULAR WEIGHT (511)

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OPTICAL PROPERTIES (512)

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3564. DELBRIDGE, T. G., ET AL. Color of petroleum products. *Proc. Am. Soc. Test. Mat.*, vol. 22, 1922, pp. 425-429. Report of subcommittee on test for refined oil; Saybolt chromometer used.

3565. LUBRICATION. Determination of color in petroleum oils. Vol. 8, June, 1922, pp. 61-67. Discusses color as an indication of successful refining and types of colorimeters. Contains tables.

- 3566.** NATIONAL PETROLEUM NEWS. A box, a light—that's all. Vol. 14, July 5, 1922, p. 46. Describes simple device for quick test of bright stocks.
- 3567.** PARSONS, L. W., AND WILSON, R. E. A new method of color measurement for oils. Jour. Ind. and Eng. Chem., vol. 14, Apr., 1922, pp. 269–278. Published as Contribution No. 43 from the Research Laboratory of Applied Chemistry, Massachusetts Institute of Technology. Discusses the need for and development of a new and consistent method for rapid and accurate measurement of the true color of virtually all petroleum oils; disadvantages of Lovibond method; basic principles of color measurement; details of new method. *See also* Nat. Petrol. News, vol. 14, May 31, 1922, p. 35.
- 3568.** RAKUSIN, M. A. Ueber das optische Verhalten und einige andere Eigenschaften des ägyptischen Erdöls. Petrol. Ztschr., Jahrg. 19, May 1, 1923, pp. 412–413. Optical behavior and other properties of Egyptian petroleums.
- See also* Nos. 3675, 3823, 3829, 3894, 3898, 3904, 3905, 3906, 3928, 3938, 4022, 4108, 4197, 4222, 5248.

REFRACTIVITY (512.1)

- 3569.** ECKART, HANNS. Refraktometrische Untersuchungen von flüssigen Kraftbrennstoffen. Brennstoff-Chem., Bd. 4, Jan. 15, 1923, pp. 24, 25. Method and apparatus used for measurement of refractivity of liquid fuels; tabulated data; refractive indices of different samples of petrols, benzols, ethyl alcohol, tetraline, and other compounds used as motor fuels as determined by the Zeiss-Pulfrich refractometer used with sodium flame. *See also* Jour. Soc. Chem. Ind., vol. 42, Feb. 16, 1923, p. 134A.
- 3570.** PRITZKER, J., AND JUNGHUNZ, R. Beiträge zur Untersuchung von Benzin and Benzol. Chem. Ztg., Jahrg. 47, April 12, 1923, pp. 313–314. Facts concerning benzols; refractometric determination of benzol and benzene; various other methods; data.
- 3571.** UTZ, —. (Refractometric examination of petroleum and petroleum products.) Petrol. Ztschr., Jahrg. 17, 1921, pp. 1293–1299. "A comprehensive review of past work on the refractive indices of petroleum products." *See also* Jour. Soc. Chem. Ind., vol. 41, Jan. 16, 1922, p. 2A.

POLARIZATION (212.2)

See No. 712.

PHOTOCHEMICAL (512.3)

- 3572.** TYCININ, B. G. (The photochemical properties of Kalusjskja petroleum (Maikop).) Neft. Slants. Khoz., vol. 4, No. 1, 1923, p. 73; Jour. Inst. Petrol. Tech., vol. 9, Aug., 1923, p. 207A. "On extracting solid asphalt from this crude by Holde's method, the solution in petroleum ether, free from asphalt, continued to deposit lake-like films on standing exposed to the light. The deposition of asphalt ceased in the dark. Presence of large surface solids (fine Ni wire or glass wool) increased the amount of deposit. The phenomenon is explained by the fact that the preformed asphalt is contained in the petroleum as a colloidal solution and can be coagulated by the action of light, heat, or solvents. The formation of the natural asphalt is explained in this way. It is suggested that Holde's method be modified as follows: (1) the precipitation of asphalt to be always made in the dark, (2) solids such as glass wool to be introduced to secure quick and complete precipitation." *See also* No. 4860.

**DENSITY (SPECIFIC GRAVITY) AND COEFFICIENT OF EXPANSION
(513)**

- 3573.** ANDERSON, R. P. Gravity correction calculator adds to speed and convenience. *Oil and Gas Jour.*, vol. 21, April 26, 1923, p. 113. Celluloid disc contains temperature scale, A. P. I. gravity scale, and also specific gravity scale. Rapid calculation is possible by this device as well as finding lower range of temperature and higher range of gravity. Illustration. *See also* *Natural Gas*, vol. 4, June 1923, p. 25. *Bol. Petról.*, vol. 15, April, 1923, p. 278.
- 3574.** COOPER, H. C. Standardization in the natural-gas industry. *Proc. Nat. Gas Assoc. Am.*, vol. 14, 1922, pp. 65, 70; discussion, pp. 70-74. Discusses need of standardization of the unit of volume, heat value, method of determination of specific gravity, and other calculations.
- 3575.** KROCH, EMERYK. (Note on the determination of the specific gravity of petroleum products.) *Mat. grasses*, t. 14, 1922, pp. 6257-6258. Points out error in formula of Engle-Höfger and others. *Chem. Abs.*, vol. 17, Jan. 10, 1923, p. 204.
- 3576.** MANNING, V. H. Meets demand for standard tables. *Oil and Gas Jour.*, vol. 21, April 19, 1923, p. 84. Hydrometer scale approved by U. S. Bureau of Standards is to be known as Baumé scale to distinguish it from that of petroleum refiners, which differs slightly and is to be known as A.P. I. scale. *See also* *Min. and Oil Bull.*, vol. 9, May, 1923, pp. 391-394. *Oil Age*, vol. 19, June 6, 1923, pp. 22-23. *Petrol. Times*, vol. 9, June 9, 1923, pp. 859-860.
- 3577.** OSBORNE, W. F. Lubrication-specific gravity. *Power*, vol. 55, Jan. 24, 1922, p. 138. Method of determining specific gravity; formulas.
- 3578.** PASK, C. E. Temperature effect. *Oil News*, vol. 10, Feb. 20, 1922, pp. 29-30. Describes experiments showing effect of temperature changes on gasoline, and gives chart illustrating the fluctuation of the surface of the liquid due to varying temperatures of two grades or gravities of gasoline in visible pump containers.
- 3579.** PETROLEUM AGE. Measurement. Vol. 11, Mar. 1, 1923, pp. 37, 39. Expansion of petroleum oils.
- 3580.** POWER PLANT ENGINEERING. Classification of fuel oils. Vol. 27, Sept. 1, 1923, p. 895. Contains formulas for changing degrees Baumé to specific gravity, or specific gravity to degrees Baumé.
- 3581.** SCHAPHORST, W. F. Simple way to figure density. *Natural Gas*, vol. 4, Sept., 1923, pp. 34, 36. Method and formula used in determining density of oil without hydrometer.
- 3582.** SUMAN, J. R. How to determine gravity correctly. *Oil Weekly*, vol. 28, Jan. 20, 1923, pp. 64-65, 68, 70. Conditions and method for correct use of hydrometer, and means of maintaining high gravity by preventing evaporation. Tables for correcting gravities.
- 3583.** U. S. BUREAU OF STANDARDS. Hydrometer scale for petroleum oils. Annual Report of Director, 1922, Miscellaneous publication No. 50, 1922, pp. 21-22. Distinction has been established between United States standard scale, or Baumé scale, and that used by petroleum industry, which is to be known as American Petroleum Institute scale.
See also Nos. 38, 2895, 3635, 3637, 3659, 3704, 3803, 3827, 3828, 3836, 3850, 3857, 3942, 4025, 4108, 4127, 4144, 4204, 4209, 4224, 4603, 5660, 6137, 7762.

PATENT.

- 3584.** RUSSELL, C. Apparatus for determining the specific gravity of liquids. British patent 187,484, Nov. 1, 1922.

THERMAL PROPERTIES (514)

See Nos. 3851, 5548, 6005.

PATENT.

- 3585.** JOHNSON, J. W. Device for indicating the thermal value of gas. United States patent 1,442,574, Jan. 16, 1923.

SPECIFIC HEAT AND LATENT HEATS (514.1)

- 3586.** BRUHAT, G., AND DELAYGUE, A. Determination de point d'inversion supérieur de la chaleur spécifique de la vapeur saluée de benzine. *Compt. rend.*, t. 174, April 3, 1922, pp. 937, 939. Describes experiments and gives results. Two limits, 252 and 267° C., were found between which the temperature is definitely included; temperature of inversion is taken to be 280° C.

See also Nos. 3704, 3752, 7245.

BOILING POINTS AND VAPOR PRESSURES—EVAPORATION, VOLATILITY, FRACTIONAL DISTILLATION (514.2)

- 3587.** CHATFIELD, J. C. Distillation curve becoming generally used as motor-fuel index. *Nat. Petrol. News*, vol. 15, June 6, 1923, pp. 34–36. Curves which may be used as standards for distillation tests to determine volatility of various types of motor fuels.
- 3588.** COOKE, M. B. Temperature-pressure curves of petroleum products. *Repts. of Investigations, Serial 2368, Bureau of Mines*, June, 1922, 2 pp. Mimeographed. Data showing "pressure that may be developed when gasoline or other oil is subjected to elevated pressures." Petroleum products of low-boiling range generate, at a certain temperature, a higher pressure than water vapor; those of a higher boiling range generate less pressure than water vapor. Discusses application of results to reaction of pressure in still when gasoline or other contents are subjected to elevated temperatures. See also *Oil Field Eng.*, vol. 24, Sept., 1922, p. 256.
- 3589.** COX, E. R. Pressure-temperature chart for hydrocarbon vapors. *Ind. and Eng. Chem.*, vol. 15, June, 1923, pp. 592–593. Directions for construction of chart which is a means of "deriving closely approximate values from a single boiling point where no other data are available."
- 3590.** ECKART, HANNS. (Contributions to the solution of the vaporization of liquid fuels.) *Auto-Technik, Jahrg. 11*, pp. 14–5, 6–15; *Chem. Zentralb., Jahrg. 93, Bd. 4*, 1922, p. 648. Surface tension and viscosity play an important part in the vaporizing of a liquid fuel; data of investigations of these properties in various fuels.
- 3591.** GAVIN, M. J. Analytical distillation of typical shale oils. *Petrol. World (London)*, vol. 19, May, 1922, pp. 181–187.
- 3592.** GORDON, P. F. The separation of the components of petroleum. Parts 1, 2, 3, 4. *Jour. Soc. Chem. Ind.*, vol. 42, Oct. 19, 1923, pp. 405–T, 414–T. Contains chart showing steps in process of refining a sample of Burma petroleum, and separating wax. Gives results of fractional distillation, factors controlling surface tension, and conclusions.
- 3593.** GRUSE, W. A. Dew point and volatility of gasoline. *Oil and Gas Jour.*, vol. 22, Nov. 22, 1923, p. 86. Paper before Petroleum Division, *Am. Chem. Soc., Milwaukee, Wis.* Dew point is best indication of the volatility of a gasoline. Describes apparatus and method of finding the volatility index of a gasoline; this index corresponds closely to the dew points, and may be

- taken as a fair indication of type of gasoline. Contains curves giving dew points of several typical gasolines. *See also* Chem. and Met. Eng., vol. 29, Nov. 26, 1923, pp. 970-971. Ind. and Eng. Chem., vol. 15, Aug., 1923, pp. 796-799. Petrol. Age, vol. 12, Nov. 15, 1923, pp. 20-21. Nat. Petrol. News, vol. 15, Nov. 28, 1923, pp. 55-56. Oil, Paint and Drug Rep., vol. 103, April 9, 1923, p. 63.
- 3594.** NATIONAL PETROLEUM NEWS. How to run accurate distillation test on motor-fuel gasolines. Vol. 15, Feb. 21, 1923, pp. 37, 39-40. Describes apparatus and method of making the standard A. S. T. M. test.
- 3595.** OIL AGE. Determination of volatility of mineral oil. Vol. 19, May 16, 1923, p. 24. Abstract of paper by C. J. Rodman before Petroleum Division, American Chemical Society. Volatility of oil is governed by surface exposed, interchange of atmosphere above oil, and temperature. Discusses method devised to obviate difficulty presented by nonuniformity in surface area. *See also* Oil, Paint and Drug Rep., vol. 103, April 9, 1923, p. 20.
- 3596.** ORMANDY, W. R., AND CRAVEN, E. C. Equilibrium boiling point and latent heat of vaporization of motor fuels. Jour. Inst. Petrol. Tech., vol. 9, Oct., 1923, pp. 368-379. The latent heat of evaporation controls the cooling of the cylinder, and the drop in temperature of the induction pipe upon which the volumetric efficiency of the engine depends. Reviews results of experiments to determine latent heat of a mixture.
- 3597.** ———. Le point d'inflammation des combustibles liquides légers. Chim. et ind., Special Number, May, 1923, pp. 226-230. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Description and illustration of apparatus used to determine the flash point of a liquid. Contains table showing flash and boiling points of a number of hydrocarbons and alcohols.
- 3598.** RHODES, F. H., AND McCONNELL, E. B. The vapor pressures of gasolines and light petroleum naphthas. Ind. and Eng. Chem., vol. 15, Dec., 1923, pp. 1273-1275. Gives method for determination of vapor pressures of gasoline and naphtha. Compares vapor pressures of several types of gasoline and naphtha. States that no relation exists between the vapor pressure of gasoline and its average temperature of distillation and its density.
- 3599.** TIZARD, H. T., AND MARSHALL, —. A method for the determination of the vapour pressure of hydrocarbon fuels, and the estimation of dissolved air. Jour. Inst. Petrol. Tech., vol. 8, April, 1922, pp. 217-223. Apparatus and formulas.
- 3600.** WILSON, R. E., AND WYLDE, E. P. The vapor pressure of volatile solvents; solutions of benzene, hexane, and cyclohexane in various types of lubricating oils, with molecular weight data. Ind. and Eng. Chem., vol. 15, Aug., 1923, pp. 801-809. "Data on experiments made to determine vapor pressures of various types of volatile solvents dissolved in nonvolatile oils. Data is applicable to (1) the recovery of solvents from gases by scrubbing with absorbent oils; (2) crankcase dilution in internal-combustion engines; and (3) the removal of traces of solvent from solvent-extracted edible oils."
- 3601.** WILSON, R. E., AND BARNARD, D. P., 4th. Further data on the effective volatility of motor fuels. Jour. Soc. of Auto. Eng., vol. 12, March, 1923, pp. 287-292. Describes methods and apparatus used in tests conducted with 14 motor fuels. Contains curves for determining the dew point of nonaromatic hydrocarbon fuel and tabulated data showing the characteristics of typical motor fuels.
- See also* Nos. 3443, 3592, 3675, 3707, 3823, 3886, 3896, 3900, 3920, 3971, 3982, 4025, 4076, 4078, 4097, 4126, 4256, 4455, 4462, 7150, 7161, 7367.

**MELTING POINTS, CRYSTALLIZATION, COLD TESTS,
CONGEALING POINT (514.3)**

- 3602.** AMERICAN SOCIETY FOR TESTING MATERIALS. Standard method of test for melting point of paraffin wax. Am. Soc. Test. Mat. standards adopted in 1922, pp. 24-27. Apparatus, including thermometer; procedure.
- 3603.** AMERICAN SOCIETY FOR TESTING MATERIALS, PROCEEDINGS. Tentative method of test for cloud and pour points of petroleum products. Vol. 23, 1923, pt. 1, pp. 698-702.
- 3604.** ——— Tentative method of test for cloud and pour points of petroleum products. Vol. 22, 1922, pp. 781-785; revised, 1922. Includes a diagram of apparatus.
- 3605.** ——— Tentative method of test for melting point of petrolatum. Vol. 22, 1922, pp. 766-767. Melting point; procedure; apparatus.
- 3606.** BAXTER, F. R., ET AL. Petrolatum. Proc. Am. Soc. Test. Mat., vol. 22, 1922, pp. 419-421. Report of subcommittee on melting-point determination of petrolatum.
- 3607.** BRÜHLMANN, G. Der Einfluss tiefer Temperaturen auf die Mineralöle in Transformatoren und Ölschaltern und die Kalteprüfung der öle. Petrol. Ztschr., Jahrg. 19, Jan. 20, 1922, pp. 67-72. Apparatus and procedure in tests; data.
- 3608.** DELBRIDGE, T. G., ET AL. Cloud and pour test (petroleum products). Proc. Am. Soc. Test. Mat., vol. 22, 1922, pp. 442-444. Changes in the "tentative test" are recommended.
- 3609.** FRICKE, K. Solidification interval of paraffin. Oil News, vol. 11, May 5, 1923, p. 32. Résumé of article in Chem. Ztg., Jahrg. 45, Sept. 15, 1921, p. 891. Method of determining interval of solidification of wax at 60° C. and complete solidification for candle making; interval should be not more than 65 minutes.
- 3610.** GLASER, KARL. Vereinfachter Apparat zur Bestimmen der Kaltbestandigkeit von Mineralölen. Petrol. Ztschr., Jahrg. 18, Jan. 20, 1922, pp. 81-82. Apparatus and method for testing resistance to cold of mineral oils; diagram of apparatus. *See also* Chem. Abs., vol. 16, Sept. 20, 1922, p. 3199.
- 3611.** KARRICK, L. C., AND PARRY, V. F. A melting-point bridge for petrolatums, shale oils, and shale-oil distillates. Ind. and Eng. Chem., vol. 15, June, 1923, pp. 600-602. Apparatus has rod that will maintain a rectilinear temperature gradient between its ends and will include within its range the melting point of oil to be tested; diagram of apparatus.
- 3612.** MORRELL, J. C. AND EGLOFF, GUSTAV. Congealing temperatures of cracked residues. Ref. and Nat. Gas. Manufact., vol. 2, 1923, pp. 17-20, 33. Discusses physical properties and calorific values of various fuel and gas oils, topped crude oil, and the products obtained by the Dubbs process; tabulated data.
- 3613.** OSBORNE, W. F. The meaning of cloud and pour points in lubricating oil. Power, vol. 55, March 21, 1922, pp. 458-459. Method and apparatus.
- 3614.** PRUTZMAN, P. W. The chemical properties and general characteristics of California petroleum. Petrol. World (Los Angeles), vol. 8, Oct., 1923, pp. 32, 65-66, 70, 72. Paper before Association of Petroleum Geologists, Los Angeles, 1923. General classification of cold-test and waxy crudes; main distinction between two types is in proportion of commercial constituents; analyses of typical samples; refining methods.
- 3615.** WILLIAMS, G. B. Cold test or viscosity. Oil News, vol. 10, Apr. 5, 1922, pp. 44-45. Discusses importance of knowing viscosity of fuel oil.
See also Nos. 745, 3637, 3675, 3803, 3823, 3827, 3828, 3829, 3850, 3920, 4180, 4201, 4224, 4236.

LUBRICATING VALUE (515)

3616. ACHESON, E. G. Petroleum's likeness to milk. *Oil News*, vol. 11, July, 1923, pp. 33-34. Microscopic examination discloses characteristics of milk; chemical and filtration treatment of oils decreases lubricating properties.
3617. BULL, A. A. Oil consumption. *Jour. Soc. Auto. Eng.*, vol. 10, June, 1922, pp. 513-522; discussion, vol. 11, Dec., 1922, pp. 491-494, 519. Paper before semiannual meeting at Detroit. Deals with fundamental factors which affect oil consumption. Contains testing methods, diagrams, illustrations, and tabulated and graphical data.
3618. CLAYDEN, A. L. Effect of dilution upon viscosity and oiliness of lubricant. *Automotive Ind.*, vol. 47, Nov. 23, 1922, pp. 1023-1024. Oil used on bearings may be highly diluted, but an undiluted oil is best for piston lubrication, as it is subjected to high temperatures.
3619. DOUBLEDAY, IDA. Boundary lubrication and chemical constitution. The optically active carbinols of the formula $C_2H_5.CH(OH).C_nH_{2n-1}$. *Jour. Chem. Soc. London*, vol. 121, 1922, pt. 2, pp. 2875-2879. Briefly reviews apparatus and methods for measurement of lubricating power. Contains data on tests with ethyl and methylethyl carbonal as lubricants. Discussion.
3620. DUNHAM, W. M. Petroleum chemists attain success. *Oil and Gas Jour.*, vol. 21, May 3, 1923, p. 98. Survey of part played by chemistry in petroleum refining. Points out valuable lubricating properties of asphaltic oil.
3621. DUNSTAN, A. E., AND THOLE, F. B. Our broadening knowledge of lubrication. *Chem. and Met. Eng.*, vol. 28, Feb. 14, 1923, pp. 299-302. Paper before Petroleum Div., Am. Chem. Soc., Pittsburgh, Pa., Sept., 1922. Discusses principles of lubrication and properties of mineral lubricating oils; outlines for research. *See also* *Bessemer Monthly*, Sept., 1923, pp. 3-5, 10, 14-16.
3622. HARDY, W. B., AND DOUBLEDAY, IDA. Boundary lubrication—the latent period and mixtures of two lubricants. *Proc. Roy. Soc. London*, 104A, 1923, pp. 25-39. Latent period is space of time required for a lubricant to reach a steady value; factors controlling duration of latent period. *See also* *Chem. Abs.*, vol. 17, Nov. 10, 1923, p. 3602.
3623. ———. Boundary lubrication—the paraffin series. *Proc. Roy. Soc. London*, vol. 100, No. A707, March 1, 1922, pp. 550, 574. Results of investigations; lubricating properties of normal paraffins and related alcohols and acids. *See also* *Am. Jour. Sci.*, vol. 4, July, 1922, pp. 75-76.
3624. HELDT, P. M. Lubrication value of oils is affected by properties other than viscosity. *Automotive Ind.*, vol. 49, Oct. 25, 1923, pp. 842-844. Discusses "oiliness" and lubricating properties of glycerins and fatty acids, capillary and colloid theories.
3625. ———. Lubrication session. *Automotive Ind.*, vol. 46, Jan. 19, 1922, pp. 112-114. Review of papers by W. H. Herschel, on viscosity and friction; by Neil MacCougll on relation of fluid friction and transmission efficiency; by Robert Wilson and W. P. Barnard, 4th, on the mechanism of lubrication, Papers presented at Soc. Automotive Eng., Jan., 1922, New York.
3626. HERSCHEL, W. H. Viscosity and friction. *Jour. Soc. Automotive Eng.* vol. 10, Jan., 1922, pp. 31-41. Detailed study of various phases of lubrication and lubricants, their properties and tests. *See also* *Sci. Lub. and Liquid Fuel*, vol. 2, Jan., 1922, pp. 10-21. *Automotive Ind.*, vol. 46, Jan. 19, 1922, pp. 112-114.
3627. HERSEY, M. D. Problems of lubrication research. *Jour. Am. Soc. Naval Eng.*, vol. 35, Nov., 1923, pp. 648-673. Discusses main aspects of lubrication: (1) Carrying power of an oil film; (2) journal friction under varied conditions; (3) thermal equilibrium; (4) viscosity under pressure; (5) oiliness.

- 3628.** JOHNSTONE-TAYLOR, M. F. Testing bearing metals and lubricants. *Am. Machinist*, vol. 58, May 10, 1923, pp. 700-702. Describes apparatus for measurement of oil-film thickness and frictional resistance.
- 3629.** JUNE, ROBERT. Lubrication in power plants. *Gas Age-Rec.*, vol. 49, Mar. 4, 1922, pp. 263-264, 278. Discusses friction and lubrication of moving machinery in a boiler and power plant, characteristics of various lubricants, and tests of lubricants.
- 3630.** LEE, WILLIAM. Lubrication. *Trans. Soc. Eng. (London)*, 1923, pp. 175-193; discussion, pp. 193-196. Discusses important characteristics of present-day lubricants. Theories of lubrication of various investigators; general types of lubricants; refining and treatment of petroleum oils; data giving properties of various petroleum lubricants; specifications and tests.
- 3631.** MICHELS, A. Die Schmierung von Öllagern. *Ztschr. Ver. deut. Ing.*, Bd. 67, Dec. 8, 1923, pp. 1100-1103. Theory of lubrication (Reynolds).
- 3632.** NATIONAL PETROLEUM NEWS. Relative values of asphalt and paraffin lubricating oils tested. Vol. 15, Feb. 7, 1923, pp. 99, 101. Procedure and results of tests for comparative lubricating values of oils manufactured from various crudes; no appreciable difference.
- 3633.** NAUTICAL GAZETTE. Value of oil lubricants depends on their friction-reducing power. Vol. 103, Sept. 23, 1922, p. 394. Besides being a good lubricant, an oil should have properties suited to serve the particular conditions for which it is used.
- 3634.** OIL ENGINE POWER. Shall we revise our views on lubrication? Vol. 1, Sept., 1923, pp. 433-434. Theories and work of investigators relating to boundary lubrication.
- 3635.** OIL NEWS. Lubricating explained in plain language. Vol. 10, Sept. 5, 1922, p. 47. Definition of viscosity, flash and fire points, and gravity.
- 3636.** OSBORNE, W. F. A practical way to test lubricating oils for fractional losses. *Power*, vol. 55, June 27, 1922, pp. 1010-1011. Directions for testing temperature of bearing in order to determine suitability of oil; determinations of heat carried off by oil and cooling water is important in test.
- 3637.** OWEN, J. T. Lubrication and standardization of specifications. *Oil Trade Jour.*, vol. 13, May, 1922, pp. 70, 72. Discusses value of gravity, fire and flash, cold tests, and viscosity tests in manufacture of lubricants.
- 3638.** SEYER, W. F. Oiliness of lubricating properties of the various series of hydrocarbons. *Trans. Roy. Soc. Canada*, vol. 15, 1921, pp. 69-71. Data on lubricating properties of the saturated and unsaturated constituents of oil distilled from a California asphalt-base petroleum. *Jour. Soc. Chem. Ind.*, vol. 41, May 31, 1922, p. 360A.
- 3639.** STANTON, T. E. The nature of lubrication in engineering practice. *Jour. Inst. Petrol. Tech.*, vol. 9, Aug., 1923, pp. 260-273. Paper before Internat. Air Cong., London, June, 1923. Efficiency of lubricant depends upon its qualities of being absorbed; addition of as little as 1 per cent of organic acid of mineral-oil lubricants obtained a 17 per cent reduction in the coefficient of friction; acids, alcohol, and esters are more quickly absorbed by water than paraffin, and are better lubricants than the paraffin. *See also* *Power Plant Eng.*, vol. 27, Sept. 15, 1923, pp. 948-950. *Power*, vol. 58, Oct. 2, 1923, p. 551. *Engineer*, vol. 135, June 29, 1923, pp. 678-679.
- 3640.** ——— Some recent researches on lubrication. *Engineer*, vol. 134, Dec. 8, 1922, pp. 598-600. Account of tests; apparatus and conclusions.
- 3641.** STONEY, GERALD, BOSWELL, R. O., AND MASSEY, J. The thickness and resistance of oil films in high-speed bearings. *Engineering*, vol. 113, Mar. 3, 1922, pp. 249-250. Reports investigations of the influences of load variations, rubbing speed, and viscosity on oil-film thickness.

- 3642.** WILSON, R. E., AND BARNARD, D. P., 4TH. The measurement of the property of oiliness. *Jour. Soc. Automotive Eng.*, vol. 11, Aug., 1922, pp. 143-156; discussion, pp. 156-157. Oiliness of vegetable, animal, and mineral oils; methods used to determine oiliness, of which static-friction test is considered best; apparatus and data.
- 3643.** ——— The mechanism of lubrication. *Jour. Soc. Automotive Eng.*, vol. 11, July, 1922, pp. 49-60. Factors affecting coefficient of friction; bibliography; definition of terms. "Methods of measuring the property of oiliness." *See also Ind. and Eng. Chem.*, vol. 14, Aug., 1922, pp. 683-695. *See also Nos.* 3577, 3678, 3680, 3682, 3684, 3761, 3898, 3921, 3939, 3972, 3974, 3979, 4143, 4144, 4146, 4148, 4150, 4153, 4158, 4163, 4164, 4165, 4168, 4169, 4171, 4173, 4175, 4176, 4177, 4179, 4180, 4182, 4184, 4199, 5344, 5396, 5694, 5719, 7521, 7529, 7545, 7569, 7570, 7582, 7585.

OTHER PROPERTIES OF GASES AND LIQUIDS: VISCOSITY, SURFACE TENSION, CAPILLARITY, ETC. (518)

- 3644.** ADAMS, H. R. Alcohol fuel mixtures. *Jour. Chem. Met. Min. Soc. South Africa*, vol. 23, 1922, pp. 112-118. Discusses alcohol as a motor fuel; chief objection to alcohol alone as fuel is low vapor pressure. Contains tables and curves showing solubility of gasolines, kerosene, benzene.
- 3645.** AMERICAN SOCIETY FOR TESTING MATERIALS, PROCEEDINGS. Tentative methods of test for viscosity of petroleum products and lubricants. Vol. 23, 1923, pt. 1, pp. 672-676.
- 3646.** BIDDISON, P. MCD. Correction factors for variation of gas from Boyle's law. *Natural Gas*, vol. 4, June, 1923, pp. 30, 32, 34, 36, 38, 40, 42. Tables for correction of data obtained from gas analysis.
- 3647.** BOAN, R. Principles of viscometry. *Ind. Australian and Min. Stand.*, vol. 69, May 10, 1923, pp. 754-755. Lecture at Soc. Chem. Ind. of Victoria, Australia, April, 1923. *See also Notes on the Viscometer*, by W. Stone, p. 755. Describes various types of viscometers and their operation. Illustration and description of Stone viscometer. Contains formulas for absolute viscosity.
- 3648.** ——— Viscosity. *Chem. Eng. and Min. Rev.*, vol. 15, 1923, pp. 297-299. "Viscosities of lubricants should be expressed in abs. units if the coefficient of friction is to be calculated." Describes constant-pressure viscometer.
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- 3650.** BRIERLY, R. C. The viscosity factor in burning liquid fuel. *Combustion*, vol. 6, Jan., 1922, pp. 16-19. On the importance of knowing viscosity when heating heavy oils to obtain efficient atomization in burning.
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OTHER PROPERTIES OF SOLIDS: HARDNESS, DUCTILITY, TOUGHNESS, CONSISTENCY, PENETROMETRY, VISCOSITY (519)

- 3694.** BINGHAM, E. C., BRUCE, H. D., AND WOLBACH, MARTIN, JR. The plastometer as an instrument for process control. *Jour. Ind. and Eng. Chem.*, vol. 14, Nov., 1922, pp. 1014-1015. Chemical analysis is often not sufficient for testing character of colloidal or amorphous materials. Discusses the variable-pressure viscometer and plastometer for measuring friction and mobility of a substance.
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CHEMICAL PROPERTIES (520)

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THERMOCHEMICAL PROPERTIES (521)

- 3698.** OSBORNE, W. F. Lubrication-carbon residue. *Power*, vol. 55, Feb. 21, 1922, p. 306. Causes of carbon; test for carbon tendency in lubricating oils.
- 3699.** SOCIETY AUTOMOTIVE ENGINEERS, JOURNAL. Pressures in gaseous explosions. Vol. 12, March, 1923, p. 319. Defines time of explosion of a homogeneous inflammable gas. Pressure is greater and rate of cooling is slower when the interior of the vessel is reflecting instead of absorbent.
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FLASH AND BURNING POINTS, IGNITION POINT, AND
IGNITION MIXTURES (521.1)

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- 3702.** BOUSSU, R. G. Limite d'inflammabilité des vapeurs du système alcool-essence et d'un système triple à base d'alcool et d'essence. *Compt. rend.*, t. 175, July 3, 1922, pp. 30-32. Le Chatelier and Boudouard method is used in a study of the variation of the lower limit of inflammability of the binary system alcohol-petrol and of the ternary system petrol-alcohol-ether.
See also *Jour. Soc. Chem. Ind.*, vol. 41, Aug. 15, 1922, p. 578A.
- 3703.** CRAVEN, E. C., AND BANKS, B. G. Note on the effect of small quantities of volatile impurities on the flash point of kerosene. *Jour. Inst. Petrol. Tech.*, vol. 8, Oct., 1922, pp. 490-498. Results of experiments made with oil mixed with finely divided coal. Discusses probable cause of rise in flash point. *See also* *Jour. Soc. Chem. Ind.*, vol. 42, Jan. 5, 1923, p. 6A.
- 3704.** INSTITUTION OF ELECTRICAL ENGINEERS, JOURNAL. Report on researches on the chemical and physical properties of insulating oils. Vol. 61, June, 1923, pp. 661-674. Tests for tendency to sludge: flash point; viscosity at various temperatures; density; specific heat.
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- flash points in mixed gases; and flash points where vapor-air mixture is further heated. Materials used were heptane, toluene, and ethyl alcohol. *See also* Petrol. Times, vol. 9, Jan. 20, 1923, pp. 87-89. Chem. Abs., vol. 17, Aug. 20, 1923, p. 2777.
- 3707.** ORMANDY, W. R., AND CRAVEN, E. C. An investigation into the physicochemical significance of flashpoint temperatures. *Jour. Inst. Petrol. Tech.*, vol. 8, April, 1922, pp. 145-172; discussion, pp. 173-180. Data and results of experiments conducted, in part, to observe processes occurring in carburetor and explosion chambers of internal-combustion engines; relation between flash and boiling points of different hydrocarbons; defects of usual flash-point apparatus. Describes an improved type of apparatus. *See also* Chem. Trade Jour., vol. 70, Jan. 13, 1922, pp. 41-42. *Petrol. Times*, vol. 7, Jan. 14, pp. 65-67.
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- 3709-3710.**—PAYMAN, WILLIAM, AND WHEELER, R. V. Effect of pressure on the limits of inflammability of mixtures of the paraffin hydrocarbons with air. *Jour. Chem. Soc.*, vols. 123-124, March, 1923, pp. 426-434. Increased initial pressure tends to change range of inflammability of each hydrocarbon; temperature variations noted during change in propagation of flame due to convection currents. *See also* *Jour. Soc. Chem. Ind.*, vol. 42, May 25, 1923, p. 437A.
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- 3712.** WIBAUT, J. P. L'énergie de valence des hydrocarbures. *Chim. et ind.*, Special Number, May, 1923, pp. 178-185. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922). Review of investigations of Thomsen, Fajans, and others. Data on heat of combustion of olefines, cyclohexanes, naphthalene, and other hydrocarbon series. *See also* Nos. 3597, 3635, 3637, 3675, 3823, 3825, 3829, 3850, 3882, 4204, 4210, 4292, 4780, 5899, 7657, 7660, 7662.

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- 3713.** KLEE, F. H. M. Apparatus for determining the flash point of oils and the like. British patent 185,814, Sept. 27, 1922.

CALORIFIC POWER AND CALORIMETRY (521.2)

- 3714.** BESSEMER MONTHLY. Some reasons for growing use of fuel oil. Nov., 1923, pp. 1-5. Data regarding thermal value of fuel oil.
- 3715.** BJERREGAARD, A. P. Fuel oil characteristics and advantages as compared with coal. Before Internat. Petrol. Cong., Tulsa, Okla., Oct., 1923; *Nat. Petrol. News*, vol. 15, Oct. 17, 1923, pp. 32A-32B. Gives B. t. u. values of various gravities of Mid-Continent oils, and heat values per pound as compared with heat value of the same quantity of coal. *See also* *Bol. Petról.*, vol. 16, Nov., 1923, pp. 295-298.
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- 3718.** GAS JOURNAL. Eighth report of the research subcommittee of the gas investigation committee of the Institution of Gas Engineers. The Fair-weather recording gas calorimeter. Vol. 161, Feb. 21, 1923, pp. 462-465; Feb. 28, pp. 524-525; March 14, pp. 692-693; March 21, p. 766; vol. 162, April 4, pp. 30-31; April 11, pp. 106-107; April 18, p. 163; April 25, pp. 222-223; June 6, pp. 598-600; June 13, pp. 677-679; June 20, pp. 744-745; vol. 163, July 4, p. 102-103. Describes apparatus, its operation, errors, and improvements.
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- 3721.** HARWOOD, NELSON. The determination of the calorific value of liquid fuels. *Engineering*, vol. 116, Sept. 28, 1923, p. 396. Apparatus for a volume method of measuring calorific value of fuels; diagram of calorimeter.
- 3722.** MILTON, H. M., JR. Preliminary report of power-producing qualities of certain gasolines. *Agric. and Mech. College of Texas Bull.*, vol. 8, No. 8, Aug. 1, 1922, 39 pp. Results of tests with various grades of petroleum products and a four-cycle internal-combustion engine.
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- 3725.** PETROLEUM AGE. Combustion. Vol. 11, May 1, 1923, p. 37. Thermal calculations of gasoline, distillate, kerosene, and gas oil.
- 3726.** ——— Fuel oil. Vol. 9, Jan. 1, 1922, p. 55. Comparisons of fuel oil and coal.
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ILLUMINATING POWER, BURNING QUALITIES, AND PHOTOMETRY (521.5)

- 3728.** ROSEWARNE, P. V. Notes on the burning quality of kerosene oils for illuminating purposes. Canada Dept. Mines, Mines Branch, Summary report of investigations, 1921, pp. 226-232. Account of experiments with market kerosene for investigation of burning qualities. Of three samples tested, the one giving the most satisfactory results had the lowest iodine value, specific gravity, and sulphur content.
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THERMAL DECOMPOSITION OR CRACKING (521.4)

- 3729.** BROWN, R. L., POHLMAN, E. F., AND BERGER, H. G. Relation of operating practice to composition of light oil from carbureted water gas. Repts. of Investigation, Serial 2537, Bureau of Mines, Oct., 1923, 9 pp. Data and results of "study of the variation in the composition of the light oil from three typical gas oils when cracked in an atmosphere of blue gas under identical conditions." Apparatus and procedure. *See also* Gas Age-Rec., vol. 52, Nov. 24, 1923, pp. 645-648.
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- 3733.** POULEUR, H. The decomposition by heat of heavy petroleum products. Rev. univ. mines, vol. 17, 1923, pp. 215-232. A review.
- 3734.** REILLY, J., AND BLAIR, E. W. Thermal decomposition of petroleum residues at reduced pressure. Jour. Soc. Chem. Ind., vol. 41, Sept. 15, 1922, pp. 302T-303T. *See also* Chem. Abs., vol. 16, Dec. 10, 1922, p. 4333.
- 3735.** SMOLENSKI, K., TUROWICZ, S., AND DOBROWESKI, R. Cracking petroleum. Przemysl Chem., vol. 5, 1923, pp. 201-220, 237-254. Krosno petroleum yields aromatic hydrocarbons similar in amounts to Baku petroleum; quality of products depends largely upon temperature of distillation. *See also* Chem. Abs., vol. 16, Sept. 10, 1922, p. 2984. Jour. Soc. Chem. Ind., vol. 41, June 15, 1922, p. 402A.
- 3736.** WEAVER, E. R. Production of hydrogen by the thermal decomposition of oil. Chem. and Met. Eng., vol. 28, April 30, 1923, pp. 764-768; May 28, pp. 939-945; June 18, pp. 1072-1075. Process and apparatus used in experiment to determine practicability of making hydrogen of sufficiently high purity for airship use. Graphical presentation of data showing composition of gas produced at various temperatures. Diagrams of plant arrangement and apparatus.
See also Nos. 4245, 4794.

DETONATION AND COMBUSTION (521.5)

- 3737.** BERL, E., AND FISCHER, H. Zur partiellen Verbrennung von Methan. Ztschr. angew. Chem., Jahrg. 36, June 6, 1923, pp. 297-302. Graphical and tabulated data relating to partial combustion of methane.
- 3738.** BURRELL, G. A. Ethyl gas. Natural Gas, vol. 4, Dec., 1923, p. 9. Properties of ethyl gas, an antiknock compound for gasoline.
- 3739.** CHASE, HERBERT. Combustion research—an aid to better performance. Automotive Ind., vol. 46, June 8, 1922, pp. 1253-1256. Detonation is an important feature of combustion and affects engine efficiency. Results of work of various investigators.

- 3740.** DUNSTAN, A. E., AND THOLE, F. B. Aviation spirit—past, present, and future. *Jour. Inst. Petrol. Tech.*, vol. 9, Aug., 1923, pp. 249–259. Paper before International Air Congress, London, 1923. Review of high-speed internal-combustion engine fuels, their properties and shortcomings; detonation and its prevention; discussion of work of Ricardo and Midgley and Boyd.
- 3741.** MASON, WALTER. The speed of the uniform movement of flame in mixtures of the paraffins with air. *Jour. Chem. Soc.*, vol. 123–124, Feb., 1923, pp. 210–214. Describes photographic checking of data obtained by screen-wire method.
- 3742.** MIDGLEY, THOMAS, JR. Some fundamental relations among the elements and compounds as regards the suppression of gaseous detonation. *Ind. and Eng. Chem.*, vol. 15, April, 1923, pp. 421–423. A study of factors producing detonation and their control by means of antiknock compounds, as diethyl, selenide, or tetraethyl lead.
- 3743.** MIDGLEY, THOMAS, JR., AND BOYD, T. A. Chemical control of gaseous detonation with particular reference to the internal-combustion engine. *Jour. Ind. and Eng. Chem.*, vol. 14, Oct., 1922, pp. 894–898. See also *Petrol. World (London)*, vol. 20, Jan., 1923, pp. 18–20, 28–30. Discusses, detonation in connection with internal combustion and theories regarding it. Tables, which show the relative effects of antiknock compounds of iodine, nitrogen, tin, selenium, and tellurium compared with benzine and various other compounds. *Bull. Am. Petrol. Inst.*, vol. 3, Dec. 30, 1922, pp. 84–89.
- 3744.** ——— Detonation of motor fuels. *Oil Field Eng.*, vol. 24, Oct., 1922, pp. 269–271. Data on detonation characteristics of blends of alcohol and alcohol-benzol mixtures with hydrocarbons. See also *Oil News*, vol. 10, Sept. 20, 1922, pp. 37–38, 40.
- 3745.** ——— Detonation characteristics of blends of aromatic and paraffin hydrocarbons. *Jour. Ind. and Eng. Chem.*, vol. 14, July, 1922, pp. 589–593. Data on tests made with various amounts of toluene, xylene, and benzene upon the detonation of paraffin oils in badly carbonized or high-compression engines; apparatus.
- 3746.** MIDGLEY, THOMAS, JR., AND JANEWAY, ROBERT. Laws governing gaseous detonation. *Jour. Soc. Automotive Eng.*, vol. 12, April, 1923, pp. 367–373. Apparatus, procedure, and formulas employed in the mathematical analysis of conditions in an internal-combustion engine containing an explosive mixture of gases when ignition occurs. Charts and photographs.
- 3747.** PAYMAN, W., AND WHEELER, R. V. Combustion of complex gaseous mixtures. *Jour. Chem., Soc. London*, vol. 121, 1922, pp. 363–379. "The speed of propagation of flame in the limit mixtures of each of the paraffin hydrocarbons with air is the same under standard conditions, and in general if the limit mixture of one gas with air be mixed in any proportion with the limit mixture of the same type of another gas with air the speed of propagation of flame in the resulting complex mixture is unchanged."
- 3748.** PETROLEUM WORLD. Kerosene fuel experiments. Vol. 20, March, 1923, p. 126. Oxidized kerosene reduces knocking and has approximately the same power potentiality as ordinary kerosene.
- 3749.** POWER. Detonation in internal-combustion engines. Vol. 57, Jan. 2, 1923, p. 40. Extract from paper by Thomas Midgley and T. A. Boyd, before *Am. Petrol. Inst.*, St. Louis, Mo., Dec. 6, 1922. Theories regarding causes of detonation; control of detonation.
- 3750.** REDZICH, KONSTANTIN. (Combustion in oil motors.) *Wärme-und-Kälte-Technik*, Jahrg. 24, 1922, pp. 17–18. Relation of combustion process to engine operation; ignition points of several fuels, and thermal reactions of some hydrocarbons.
- See also Nos. 3751, 3986, 4004, 4007, 6252, 6280, 6300, 7212, 7213, 7218, 7219, 7220, 7223, 7233.

MISCELLANEOUS, INCLUDING PROPERTIES SUCH AS HEAT OF FORMATION, HEAT OF REACTION, HEAT OF FUSION (521.9)

- 3751.** CANADIAN MINING JOURNAL. Synthetic kerosene fuel. Vol. 44, Jan. 19, 1923, p. 63. Tells of oxidized kerosene produced by catalytic oxidation from low-grade petroleum; knocking tendency is less than in straight kerosene; power development is approximately the same as straight kerosene, although thermal value is one-eighth less. From report of Dr. James, Carnegie Institute.
- 3752.** PAYMAN, WILLIAM. Propagation of flame in complex gaseous mixtures. V. Interpretation of the law of speeds. Jour. Chem. Soc., vol. 123, March, 1923, pp. 412-420. The flame speed of a mixture of gases is equal to its specific heat; mass action influences calculations made on flame speed. *See also* Jour. Soc. Chem. Ind., vol. 42, May 25, 1923, pp. 436A-437A.
- 3753.** WILSON, R. E., AND BARNARD, D. P. Total sensible heats of engine fuels and their mixtures with air. Jour. Soc. Automotive Eng., vol. 10, Jan., 1922, pp. 65-68. Describes certain approximate methods used by the research laboratory of applied chemistry at the Massachusetts Institute of Technology in determining the total sensible heat content of Socony internal-combustion engine gasoline and kerosene and their mixtures with air at temperatures up to 500° C. *See also* Jour. Ind. and Eng. Chem., vol. 13, Oct., 1921, pp. 912-915. Automotive Ind., vol. 46, Jan. 19, 1922, pp. 112-114.

ELEMENTARY ANALYSES (523)

- 3754.** LEWIS, W. K., AND ROBINSON, C. S. The simple distillation of hydrocarbon mixtures. Jour. Ind. and Eng. Chem., vol. 14, June, 1922, pp. 481-484. Discusses possibility of determining the components of a mixture when the Engler curve is known. Suggests modifications in Engler distillations.
- See also* Nos. 203, 1404, 1467, 1654, 1683, 1922, 3667, 3804, 4121, 4161, 4197, 4205, 4214, 4252, 4603.

CARBON AND HYDROGEN (523.1)

- 3755.** TAYLOR, H. S. Industrial hydrogen. Am. Chem. Soc., Monograph No. 4. New York, 1922. Contains 203 pp. chapter which deals with hydrocarbons as a source of hydrogen.
- See also* Nos. 3827, 3866.

SULPHUR (523.2)

- 3756.** EGLOFF, GUSTAV, AND MORRELL, J. C. Distribution of sulphur in petroleum products. Chem. and Met. Eng., vol. 28, April 9, 1923, pp. 633-635. Tabulated data of investigations to determine the distribution of sulphur in the primary products of cracking. Methods of determining presence of sulphur, which is found to increase with density of liquid and solid products, but is higher in the gas than in any of the products. *See also* Petrol. Times, vol. 9, May 5, 1923, p. 630.
- 3757.** RAKUSIN, M. A. Ueber die Wahrscheinlichkeit der Gegenwirkung zwischen Schemfel und den festen Paraffinen in den erdölfuhrenden Regionen. Petrol. Ztschr., Jahrg. 18, May 20, 1922, pp. 581-582. On account of low temperature in regions, reaction between sulphur and paraffin is unlikely.
- 3758.** SOCIETY AUTOMOTIVE ENGINEERS, JOURNAL. Sulphur in benzol. Vol. 11, Oct., 1922, p. 358. Tests for the determination of sulphur and thiophene in benzol and the removal thereof. *See also* Oil News, vol. 11, Jan. 5, 1923, p. 32.

- 3759.** WATERS, C. E. Sulphur compounds and oxidation of petroleum oils. *Jour. Ind. and Eng. Chem.*, vol. 14, Aug., 1922, pp. 725-727. Oxidation usually is accomplished more speedily with mineral lubricating oils of high sulphur content. "The residues left behind on cracking and partly distilling-off oils, as in the Conradson carbon residue test, tend to retain sulphur in the oil." Discusses these facts and their relation to formation of sludge in transformer and turbine oils and of carbon in internal-combustion engines. *See also* Nos. 3831, 3832, 3874, 3911, 3915, 3935, 3941, 4025, 4204, 5250, 5268, 5269, 5270, 5273, 6006.

See No. 743.

NITROGEN (523.3)

HALOGENS (523.4)

- 3760.** JOHANSEN, E. M. Iodine and bromine values of petroleum products. *Jour. Ind. and Eng. Chem.*, vol. 14, April, 1922, pp. 288-292. Contains bibliography.

ANALYTICAL NUMBERS (IODINE, BROMINE, SAPONIFICATION, ACETYL, SULPHURIC ACID, ABSORPTION, ETC.) (524)

- 3761.** DEAN, E. W., HILL, H. H., SMITH, N. A. C., AND JACOBS, W. A. The analytical distillation of petroleum and its products. *Bull. 207, Bureau of Mines*, 1922, 82 pp. Procedure and apparatus for distillation of crude oil at atmospheric pressure and in a vacuum; distillation and testing of lubricating oil; apparatus. Tables; illustrations.
- 3762.** HLADKY, JAN. (The use of Hanus's method for the determination of the iodine figure of mineral oils.) *Chem. Listy*, vol. 16, 1922, pp. 207-211. Discusses Hanus method and comparison of results with those of Hübl and Wijs. *See also* *Chem. Abs.*, vol. 17, April 20, 1923, p. 1545.
- 3763.** JOHANSEN, E. M. Iodine and bromine values of petroleum products. *Jour. of Ind. and Eng. Chem.*, vol. 14, April, 1922, pp. 288-292. The low results that are obtained with the Hanus, Hübl, or Wijs solutions for iodine values represent the halogen added to the double bond as well as that which substitutes in the hydrocarbons and are not an indication of the comparative unsaturation of petroleum products. Bibliography.
- 3764.** KAWAI, SEI. Iodine values of petroleum oils. *Jour. Chem. Ind. (Japan)*, 1922, vol. 25, pp. 406-419; *Jour. Soc. Chem. Ind.*, vol. 41, July 31, 1922, p. 535A. Effects of concentration, temperature, and time of absorption are noted. *See also* *Chem. Abs.*, vol. 17, Jan. 10, 1923, p. 204.
- 3765.** VAUBEL, WILHELM. Der jetzige Stand der Bestimmung der Bromzahl der Öle und Fette. *Ztschr. angew. Chem.*, Jahrg. 35, Dec. 1, 1922, p. 679. Discusses method for determination of bromine number of oils and fats.
- 3766.** WATERMAN, H. I., AND PERQUIN, J. N. J. (Estimation of the degree of "unsaturation" of mineral oils in the process of Bergius.) *Rec. trav. chim.*, vol. 40, 1921, pp. 677-680. Results of an experiment with a high-melting fraction of a crude mineral oil to which the Hanus (I No.) was applied before and after treatment by the Bergius method at 400°. *See also* *Chem. Abs.*, vol. 16, March 20, 1922, p. 1009.
- See also* Nos. 3805, 3806, 3929, 3937, 4170, 4234, 4248.

HYDROCARBONS AND HYDROCARBON DERIVATIVES (525)

- 3767.** BERL, E., AND FISCHER, H. Zur partiellen Verbrennung von Methan. *Ztschr. angew. Chem.*, Jahrg. 36, June 6, 1923, pp. 297-302. Discusses possibility of oxidizing methane to produce methyl alcohol, formaldehyde, formic acid, carbon monoxide, and carbon dioxide by means of oxygen, ozone, sulphur trioxide, and sulphur dioxide. Results of investigations. *See also* *Jour. Soc. Chem. Ind.*, vol. 42, Aug. 3, 1923, p. 698A.
- See also* Nos. 1916, 4108, 4109, 4122, 4254.

OXYGEN COMPOUNDS (525.1)

3768. BLAIR, E. W., AND WHEELER, T. S. The action of ozone on hydrocarbons with special reference to the production of formaldehyde. *Jour. Soc. Chem. Ind.*, vol. 42, pt. 2, Aug. 17, 1923, pp. 343T-346T; pt. 1, Aug. 24, pp. 347T-350T. "The action of ozone on ethylene."
3769. ELWORTHY, R. T. The partial oxidation of methane in natural gas. *Trans. Roy. Soc. Canada*, vol. 16, sect. 3, 1922, pp. 93-104. Oxidation by silent electrical discharge in mixture of gas and oxygen gave a viscous liquid containing resins, aldehydes, MeOH, HCHO, and HCOOH. *See also Chem. Abs.*, vol. 17, June 10, 1923, p. 2042.
3770. FISCHER, F., AND SCHNEIDER, W. Ozonization of paraffin wax and montan wax. *Ges. Abhandl. Kennt. Kohl.*, vol. 5, 1920, pp. 117-178. Procedure, results, and conclusions. *See also Chem. Abs.*, vol. 17, July 20, 1923, pp. 2497-2498.
3771. KOETSCHAU, RUDOLF. Über Erdölazonide. *Ztschr. angew. Chem.*, Jahrg. 35, Sept. 19, 1922, pp. 509-513. *Jour. Soc. Chem. Ind.*, vol. 41, Nov. 15, 1922, p. 848A. Data on experiments to determine the action of ozone on American petroleum oils; results of ozonising a Russian petroleum are discussed. Petroleum ozonides serve same purpose as coumarone resins. Removal of petroleum fractions. *See also Chem. Abs.*, vol. 17, Jan. 20, 1923, pp. 337-338.
3772. SIEBENECK, H. Bietrage zur Kenntnis des Paraffin Oxydation. *Petrol. Ztschr.*, Jahrg. 18, Oct. 1, 1922, pp. 1193-1196. *Jour. Soc. Chem. Ind.*, vol. 41, Nov. 30, 1922, p. 888A. Describes methods and products.
3773. ——— Der Einfluss der Elemente der Sauerstoffgruppe an Paraffine. *Petrol. Ztschr.*, Jahrg. 18, March 10, 1922, pp. 280-286. Effects of the oxygen group upon paraffins. Paraffin heated to 135° is treated by bubbling air and oxygen through it; results are noted. *See also Chem. Abs.*, vol. 16, Sept. 20, 1922, p. 3200.
3774. VON PIOTROWSKI, W., AND JAKUBOWICZ, W. Beitrag zur Kenntnis der Oxydation der Petrolkohlenwasserstoffe. *Petrol. Ztschr.*, Jahrg. 19, Jan. 1, 1923, pp. 5-9. Discusses methods of separating aromatic hydrocarbons from aliphatic compounds; results from Hess test differ from those obtained by nitration test; the catalyzer influences the amount of aromatic hydrocarbons produced; apparatus and procedure; treatment and production.
3775. WHEELER, T. S., AND BLAIR, E. W. The oxidation of hydrocarbons with special reference to the production of formaldehyde. Part V. The slow oxidation of the higher liquid, saturated hydrocarbons. *Jour. Soc. Chem. Ind.*, vol. 42, Dec. 21, 1923, pp. 491T-497T. Reviews results of previous experiments; methods; summary and conclusions.
3776. ——— The action of ozone on hydrocarbons with special reference to the production of formaldehyde. Vol. 41, pt. 1, Oct. 16, 1922, pp. 331T-332T. *See also Nos.* 3931, 7660.

CHOLESTERIN (525.11)

3777. TROPSCH, HANS. Über die Zusammensetzung des Montanwachses. *Chem. Ztg.*, Jahrg. 46, July 4, 1922, p. 595. Résumé of paper presented at Verein deutscher Chemiker, Hamburg, June, 1922. The acid compounds of crude montan wax from central-German brown coal, which have heretofore been considered as producing only free and esterified montan acids, have been found to contain also acids of the formula $C_9H_{18}O_2$ and others of similar nature.

PETROLEUM ACIDS AND ACID CONTENT (525.12)

- 3778.** INSTITUTE PETROLEUM TECHNOLOGISTS, JOURNAL. Sulphoacids obtainable from petroleum hydrocarbons. Vol. 9, April, 1923, pp. 104A-105A. Abstract of paper by G. S. Petroff given before First All-Russian Petroleum Congress, Jan., 1923. Treatment by which "contact acids" are derived from petroleum distillates; their uses.
- 3779.** TANAKA, Y., AND NAGAI, S. Naphthenic acids derived from Japanese petroleum. Jour. Am. Chem. Soc., vol. 45, March, 1923, pp. 754-756. Methyl esters obtained by esterification of crude naphthenic acids were redistilled and treated until the pure naphthenic acids were colorless and odorless. *See also* Jour. Soc. Chem. Ind., vol. 42, May 11, 1923, pp. 391A-392A.
- 3780.** TROPSCH, HANS. Über die Zusammensetzung des Montanwachses. Chem. Ztg., Jahrg. 46, July 4, 1922, p. 595. Résumé of paper presented at Vereins deutscher Chemiker, Hamburg, June, 1922. The acid compounds of crude montan wax from central-German brown coal, which have heretofore been considered as producing only free and esterified montan acids, have been found to contain also acids of the formula $C_9H_{18}O_2$ and others of similar nature.
- See also* Nos. 3914, 4025, 4204, 5170, 5274.

HALOGEN COMPOUNDS (525.2)

- 3781.** BRENNSTOFF-CHEMIE. Über die Chlorierung des Methans. Bd. 4, June 15, 1923, p. 181. Data and description of method of chlorinating methane.
- See also* No. 3815.

REDUCED HYDROCARBONS, HYDROGENATION, AND CATALYSIS (525.3)

- 3782.** GRAHAM, J. I., AND SHATWELL, H. G. Artificial production of coal and the hydrogenation of coal and oil. Fuel, vol. 2, 1923, pp. 54-57. Method and apparatus of hydrogenating oil. *See also* Chem. Abs., vol. 17, June 10, 1923, p. 2039.
- 3783.** ODA, K. Hydrogenation of acetylene for the preparation of fuel oils. Jour. Chem. Ind. Japan, vol. 24, 1921, pp. 1161-1166. A mixture of equal amounts of C_2H_2 and H_2 was passed over a catalyzer of Ni with Hg at 25 to 35°; 51.7 per cent of the theoretical yield of oil was obtained; a light oil and a heavy oil were obtained from the gas of the mixture. *See also* Chem. Abs., vol. 16, July 20, 1922, p. 2399.
- 3784.** SHATWELL, H. G. Hydrogenation of mineral oils. Univ. Birmingham Min. Soc. Tech. Mag., June, 1923, pp. 48-57. Apparatus used and results obtained by hydrogenation of an Anglo-Persian gas oil by Bergius method. *See also* Jour. Soc. Chem. Ind., vol. 42, Aug. 17, 1923, p. 757A. Fuel, vol. 2, 1923, pp. 229-232.
- 3785.** WOOG, PAUL. Observation directe de l'hydratation des hydrocarbures. Compt. rend., t. 177, July 16, 1923, pp. 207-208. Saturated oils have turbid appearance when exposed to water vapor at ordinary temperature; unsaturated oils remain transparent; this action is compared with phenomena occurring when oil is spread on water.
- 3786.** ZELINSKII, N. (Behavior of naphthenes toward catalytic dehydrogenation. The nature of petroleum.) Ber. Deut. chem. Gesell., Jahrg. 56B, 1923, pp. 1718-1723. "Octanaphthene, iso-octanaphthene and nonanaphthene undergo very slight dehydrogenation in the presence of platinum

- or palladium black at 300 to 310° C. It therefore appears that the natural naphthenes of petroleum consist mainly of cyclic compounds other than hexahydro-aromatic hydrocarbons." *See also* Chem. Abs., vol. 17, Nov. 20, 1923, p. 3783.
- 3787.** ZELINSKII, N. (Decahydronaphthalene and its behavior during the catalytic dehydrogenation process.) *Ber. Deut. chem. Gesell., Jahrg.*, 56B, 1923, pp. 1723-1724. "Naphthalene was completely dehydrogenated by passing tetrahydronaphthalene and H over platinized asbestos at 150 to 160°. The same reactions take place at 120 with pd. black. The product b. 189-90° (corrected)." *See also* Chem. Abs., vol. 17, Nov. 20, 1923, pp. 3783-3784.
- 3788.** ——— (Catalytic decomposition of petroleum oils under the influence of aluminum chloride.) *Techn.-Wirtschaftl. Nachr.*, 1922, pp. 193-197; *Chem. Zentralb., Johig*, 94, Bd. 4, 1923, p. 476. Attempt was made to prepare artificial petrol from heavy petroleum oils by heating in presence of charcoal; results. *See also* *Jour. Soc. Chem. Ind.*, vol. 42, Oct. 26, 1923, p. 1010A. *See also* Nos. 3782, 3817, 3818, 4068, 6038.

NITROGEN DERIVATIVES (525.4)

- 3789.** PYHÄLÄ, EWALD. Einige neue stickstoffhaltige Kohlenwasserstoffe aus dem Bakuer Erdöl. *Chem. Ztg.*, Jahrg. 46, Oct. 21, 1922, p. 953. Acid sludge from kerosene agitators diluted with water was distilled and treated with sodium hydroxide and sulphuric acid. Describes results. Concludes that compounds were amines caused by sulphuric acid and superheated steam. "The original constituents were probably formed by anhydrous reaction between the carboxylic acids and NH₃." *See also* Chem. Abs., vol. 17, Feb., 1923, pp. 1132-1133. *Jour. Soc. Chem. Ind.*, vol. 42, Jan. 5, 1923, p. 5A.
- 3790.** ——— Ein Beitrag zur Genesis des Erdöls. *Petrol. Ztschr.*, Jahrg. 18, Sept. 1, 1922, pp. 1069-1073. Nitrogen is contained in the greater part of the petroleum found throughout the world, and the bases of such oils are called pyridine and chinoline derivatives; the colors derived in laboratory distillation of petroleum have been identified as the result of color reaction produced by petroleum bases and mineral acids derived from distillation.

See also No. 7722.

SULPHUR (525.5)

See No. 7622.

MISCELLANEOUS COMPOUNDS (525.9)

- 3791.** DAMIENS, A. Sur l'absorption de l'éthylène par l'acid sulfurique production d'alcool éthylique, de sulfate diéthylique et hydrocarbures liquides. *Compt. rend.*, t. 175, Oct. 9, 1922, pp. 585-588. Absorption of ethylene by sulphuric acid in presence of cuprous sulphate produced diethyl sulphate, ethylsulphuric acid, and a mixture of saturated hydrocarbons similar to petrol, according to conditions. *See* *Jour. Soc. Chem. Ind.*, vol. 41, Dec. 15, 1922, p. 957A.
- 3792.** WOOG, PAUL. Sur l'hydratation des hydrocarbures. *Compt. rend.*, t. 177, July 2, 1923, pp. 60-62. Observations and procedure in studying conditions under which hydration of hydrocarbons is effected. Both saturated and unsaturated hydrocarbon oils take up water readily when passed as drops down a helical copper wire in atmosphere at 20° C. saturated with moisture. When tested in a dry glass flask the saturated oil gave off more water than the unsaturated oil, because the moisture was attached more firmly to the molecules of the unsaturated oil than to those of the saturated oil.

WATER AND SOLID IMPURITIES, SAND, B. S., ETC. (526)

- 3793.** AMERICAN SOCIETY FOR TESTING MATERIALS. Tentative method of test for water in petroleum products and other bituminous materials. Vol. 23, p. 1, 1923, pp. 694-697.
- 3794.** AUBERT, M., AND DIXMIER, G. Stabilités des mélanges alcool-essence en présence de l'eau. Compt. rend., t. 176, May 7, 1923, pp. 1307-1310. When water is added gradually to an alcohol-petrol mixture, a limit is finally reached, causing a separation into two layers; the proportions of water required varies with the composition of the original mixture. Data on experiments with mixtures and varying proportions of water is given in diagrams; temperature was also studied. *See also* Jour. Soc. Chem. Ind., vol. 42, July 6, 1923, p. 592A.
- 3795.** BAUER, A. D. Methods for determining sediment in fuel oils. Repts. of Investigations, Serial 2408, Bureau of Mines, Oct. 1922, 4 pp. Mimeographed. Centrifugal test is not suitable for heavy oils; methods of making the following tests: benzol extraction, A. S. T. M., Dean and Lerch methods. Data. Concludes that benzene extraction method can be used satisfactorily for all grades of fuel oils. *See also* Oil Age, vol. 19, Jan. 17, 1923, p. 16. Oil News, vol. 11, March 5, 1923, p. 32. Refiner, vol. 1, No. 3, p. 12, 1922. Chem. Abs., vol. 17, Jan. 20, 1923, p. 337.
- 3796.** DODD, H. V. Determination of water in petroleum emulsions. Monthly chapter, Eighth annual report, State oil and gas supervisor, California State Mining Bureau, vol. 8, Nov., 1922, pp. 5-7. A centrifuge method has been worked out that is satisfactory for all practical purposes. *See also* Salt Lake Min. Rev., vol. 24, March 30, 1923, pp. 12-13. Eng. and Min. Jour.-Press (Pacific Min. News), vol. 2, Aug., 1923, pp. 226-227.
- 3797.** DOUGHERTY, G. T. Determination of salt in petroleum. Jour. Ind. and Eng. Chem., vol. 14, Jan., 1922, p. 80. Describes method used for determining salt in fuel oil used in metallurgical furnaces.
- 3798.** LORIETTE, P. Hygroscopicité de l'alcool absolu fabrication de celui-ci et son emploi pour la préparation des mélanges combustibles liquides. Chim. et ind., Special Number, May, 1923, pp. 718-721. Result of treating a gasoline-alcohol mixture with a dehydrating agent. *See also* Chem. Abs., vol. 17, Oct. 10, 1923, p. 3241.
- 3799.** LOSANA, LUIGI. (Estimation of water in mineral oils.) Giorn. chim. ind. applicata, vol. 4, 1922, pp. 570, 573. Oil is treated with calcium or sodium amalgam, and moisture is estimated by measuring pressure required to keep total gas content of apparatus constant. Describes apparatus and procedure. *See also* Jour. Soc. Chem. Ind., vol. 42, March 2, 1923, pp. 172A-173A.
- 3800.** MARINOT, A. (Determination of water in liquid fuels.) Ann. chim. analyt., vol. 4, 1922, pp. 7-8. Errors of estimating water in solid or liquid fuels may occur because of absorption of oxygen, or with coal by distillation of organic matter; these errors may be avoided by making test in a current of dry hydrogen. The apparatus consists of two 100 c. c. flasks, connected, and heated in a constant-level water bath. *See also* Jour. Soc. Chem. Ind., vol. 41, March 15, 1922, pp. 165A-166A.
- 3801.** NATIONAL PETROLEUM NEWS. Tentative method of test for water in petroleum products. Vol. 15, Oct. 17, 1923, pp. 101-102. Apparatus and procedure specified by American Society for Testing Materials for determining water in a bituminous material by distillation with a volatile solvent.
- 3802.** SHRADER, J. E. Determination of water in transformer oil. Elec. World, vol. 79, Jan. 28, 1922, pp. 174, 175. Describes new improved method of ascertaining water content of oil. Diagram of apparatus. *See also* Nos. 3792, 3828, 3851, 4202, 4204, 4216.

ASH CONTENT (527)

See Nos. 1653, 1689, 3830.

DETECTION OF MIXTURES AND ADULTERANTS (528)

- 3803.** BJERREGAARD, A. P. Effect of paraffin wax on the properties of mineral oils. *Jour. Ind. and Eng. Chem.*, vol. 14, Mar., 1922, pp. 215-217. Study of effect of paraffin wax on viscosity, freezing point, and specific gravity of various oils and mixtures of oils.
- 3804.** CHEMICAL TRADE JOURNAL AND CHEMICAL ENGINEER. Aromatic hydrocarbons in motor spirit. Vol. 71, Oct. 13, 1922, pp. 448-449. Estimation of benzene, toluene, and xylene. Specific gravity and critical solution temperature are used for estimation of total aromatics or of individual aromatics; details of tests.
- 3805.** GAULT, H. Caractérisation des carbures acycliques saturés dans les fractions de pétrole. *Chim. et ind.*, Special Number, May, 1923, pp. 186-187. Chlorination in presence of metallic Fe is proposed, and identification upon distillation.
- 3806.** ———. Identification of aliphatic hydrocarbons in fractions of petroleum. *Oil Eng. and Fin.*, vol. 2, 1922, p. 476. "Bromination of C chains in the presence of Fe gives polybromated substances varying according to the conditions of the expt. but equal to the number of atoms of C. The ease with which H can be substituted in a C chain depends upon phys. factors, chiefly temperature."
- 3807.** HACKL, O. Zum Nachweis von steinkohlen Teerpech im Naturasphalt. *Chem. Ztg.*, Jahrg., 46, Dec. 24, 1922, p. 1156. Natural asphalt treated with CS₂ and alcohol without showing trace of coal-tar pitch disclosed its presence in Durand Claye test (extraction of asphalt with benzine, followed by shaking benzine solution with alcohol).
- 3808.** KRIEGER, A. Benzolbestimmung im Gas mit aktiven Kohle. *Chem. Ztg.*, Jahrg. 47, April 26, 1923, pp. 357-358. Use of charcoal is not entirely reliable, as it loses absorbent qualities; test should be checked by the petroleum absorption method.
- 3809.** OIL, PAINT AND DRUG REPORTER. Benzol detection in gasoline. Vol. 102, Sept. 18, 1922, p. 45. 2 c. c. of a mixture of equal volumes of aniline and 95 per cent alcohol to 5 c. c. of gasoline sample will cause layer of aniline to separate if sample is free from benzol; a small percentage of benzol will keep aniline in solution.
- 3810.** ORMANDY, W. R., AND CRAVEN, E. C. A method for expressing the value of mixing agents between hydrocarbons and 95 per cent volume alcohol. *Jour. Inst. Petrol. Tech.*, vol. 9, April, 1923, pp. 129-132. A suitable mixing agent between aqueous alcohol and petrol is needed; presents formula for recording the relative values of mixing agents under investigation. *See also Chem. Abs.*, vol. 17, Aug. 20, 1923, pp. 2778-2779.
- 3811.** SCHWARZ, P., AND GLADLOCH, M. Über den Nachweis von Benzol in Benzin. *Chem. Ztg.*, Jahrg. 46, May 4, 1922, p. 401. Four methods of determining presence of benzol in benzine. *See also Chem. Abs.* vol. 16, July 20, 1922, p. 2403. *Jour. Soc. Chem. Ind.*, vol. 41, July 15, 1922, p. 493A.
- 3812.** WATERMAN, H. I., AND PERQUIN, J. N. J. (Determination of aromatic hydrocarbons in fractions of mineral oils.) *Rec. trav. chim.*, t. 41, 1922, pp. 192-198. "The 'aniline point' method described by Tizard and Marshall (J., 1921, 20T), which consists in noting the temperature at which a mixture of equal volumes of aniline and hydrocarbon separates before and after

treatment of the latter with 98 per cent sulphuric acid, is considerably affected by the nature of the fraction dealt with." Results of trials gave results which were inaccurate when checked with amount of added aromatic hydrocarbons. *Jour. Soc. Chem. Ind.*, vol. 41, Apr. 20, 1922, pp. 282A. *See also* Nos. 3703, 3774, 3833, 3842, 3864, 3876, 3880, 3897, 3926, 3929, 3944, 4170, 5717.

MISCELLANEOUS AND SPECIFIC TESTS (529)

- 3813.** CASIMIR, E. Ueber die Teerzahlbestimmungen in Mineralölen. *Petrol. Ztschr.*, Jahrg. 19, Aug. 1, 1923, pp. 763-765. Compares results of three methods for determining tar content of mineral oils: Holde, Marcusson-Schwarz petroleum-ether extraction, and Kramer C_6H_6 extraction methods; the first two methods were the most accurate. *See also* *Jour. Soc. Chem. Ind.*, vol. 42, Sept. 14, 1923, p. 878A.
- 3814.** ELECTRICAL WORLD. Dielectric strength of oil not uniform. Vol. 80, July 8, 1922, p. 77. Report on tests.
- 3815.** GAULT, H. Caractérisation des carbures acycliques saturés dans les fractions de pétrole. *Chim. et ind.*, Special Number, May, 1923, pp. 186-187. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Finds fractional distillation of petroleum is inapplicable in some cases. Deals with identification of paraffin hydrocarbons by chlorination with or without the aid of a catalyst.
- 3816.** OIL TRADE JOURNAL. Acetone as a solvent for bitumens. Vol. 13, Sept., 1922, p. 123. Investigations at Mellon Institute, Pittsburgh, show solvent properties of acetone decrease as hardness of bitumen or asphalt increases.
- 3817.** RIDEAL, E. K., AND THOMAS W. Absorption and catalysis in fuller's earth. *Jour. Chem. Soc.*, London, vol. 121, 1922, pp. 2119-2123. Discusses specific surface, absorption, and catalytic activities of Florida, Surrey, and Somerset varieties of fuller's earth.
- 3818.** SCHRAUTH, W., AND VON KEUSSLER, O. (The dracorubin test of hydrogenated compounds.) *Auto-Technik*, Jahrg. 10, 1921, No. 17, pp. 3-4. Tests reveal that saturated hydrocarbons show benzene (petroleum spirit) characteristics and hydrogenated phenols the alcohol characteristics, but that unsaturated hydrocarbons show unchanged benzene characteristics; use as motor fuel confirms these results. *See also* *Chem. Abs.*, vol. 16, Sept. 10, 1922, p. 2984.
- See also* Nos. 4219, 4252.

PHYSIOLOGICAL EFFECTS (530)

- 3819.** DE LIEUW, A. L. Infection from cutting oil. *Am. Machinist*, vol. 57, Dec. 14, 1922, pp. 915-916. Report on laboratory tests with cutting oils; use of soda solution recommended.
- See also* Nos. 505, 7315, 7682.

ANALYTICAL AND TESTING METHODS; DETERMINATION OF PHYSICAL AND CHEMICAL PROPERTIES; APPARATUS; AND PROCEDURE (540)

- 3820.** ABBOTT, M. L. Gas composition by calculation. *Gas Age-Rec.*, vol. 51, Feb. 3, 1923, pp. 141-143. Method and formula.
- 3821.** AIR SERVICE INFORMATION CIRCULAR. Determination of water in gasoline as received. Vol. 4, Mar. 15, 1922, 2 pp. Results of investigation to determine whether or not enough water can be absorbed by gasoline to cause corrosion.

- 3822.** AMERICAN SOCIETY FOR TESTING MATERIALS, PROCEEDINGS. Report of Committee D-9 on electrical insulating materials. Vol. 23, pt. 1, 1923, pp. 431-460. Includes methods and apparatus for determining sludging properties of transformer oils.
- 3823.** ——— Report of Committee D-2 on petroleum products and lubricants. Vol. 23, pt. 1, 1923, pp. 343-393. Contains report of subcommittees on petrolatum, grease, color, distillation, oxidation at high temperatures, emulsification; flash, organic acidity, sampling and gauging, cloud and pour tests, illuminating oils; nomenclature.
- 3824.** ——— Tentative method of test for distillation of gasoline, naphtha, kerosene, and similar petroleum products; apparatus and procedure. Vol. 23, pt. 1, 1923, pp. 665-671.
- 3825.** ——— Tentative method of test for flash and fire points by means of open cup. Vol. 23, pt. 1, 1923, pp. 690-693; Nat. Petrol. News, vol. 15, Oct. 10, 1923, p. 41. States revisions; in one inch immersion thermometer is specified.
- 3826.** ——— Tentative method of test for steam emulsion of lubricating oils. Vol. 23, pt. 1, 1923, pp. 685-689.
- 3827.** ——— Tentative methods of testing gas oils. Vol. 23, pt. 1, 1923, pp. 703-708. Gravity, distillation, sulphur, carbon residue, pour point, viscosity, water.
- 3828.** ——— Report of Committee D-2 on petroleum products and lubricants. Vol. 23, pt. 1, 1923, pp. 343-348. Recommendations for tentative standards for testing gas oils, petroleum products, and other bituminous materials; methods and apparatus for determining water, color, gravity, viscosity, pour point, and residue.
- 3829.** ——— Report of Committee D-2 on petroleum products and lubricants. Vol. 22, 1922, pt. 1, pp. 418-451. The following tentative specifications were recommended for adoption as standard: (1) Tentative method of test for melting point of paraffin wax (D87-21T), (2) tentative method of test for flash point by means of Pensky-Martens closed tester (D93-21T) (with amendments). Report of subcommittees on petrolatums, on paraffin wax, on viscosity, on grease, on color, on emulsification, on flash, cloud and pour test, and on gasoline.
- 3830.** ——— Tentative method of analysis of grease. Vol. 22, 1922, pp. 768-776. Solvents; determination of ash; quantitative and qualitative examination of ash. Determination of fillers of various materials.
- 3831.** ——— Tentative method of test for detection of free sulphur and corrosive sulphur compounds in gasoline. Vol. 22, 1922, p. 780.
- 3832.** ——— Tentative method of test for sulphur in petroleum oils heavier than illuminating oil. Vol. 22, 1922, pp. 777-779.
- 3833.** ANDREWS, E. Lubricants and how to test them. Power, vol. 58, Sept. 11, 1923, pp. 430-431. Means of determining acids and other impurities in lubricating oils; tests and characteristics of a good cylinder oil.
- 3834.** ARNOLD, H. Über die Bestimmung der ungesättigten und aromatischen Anteile des Urteers. Ztschr. angew. Chem., Jahrg. 36, Oct. 28, 1923, pp. 545-546. Use of formolite reaction of Nastjukoff to test benzines and tar oils; with $\text{Hg}(\text{OA}^e)_2$, Me_2SO_4 and formolite reaction, composition of the oils was ascertained fairly accurately.
- 3835.** ATLANTIC CONNECTING ROD. The visconverter. Vol. 17, July, 1923, pp. 42-43. An instrument for transposing the viscosity readings from one of the various viscosimeters to the value of another viscosimeter.
- 3836.** ——— Single standard hydrometer for petroleum industry. Vol. 14, May, 1922, pp. 5-7. Contains table showing difference between Baumé gravity and A. P. I. gravity for different specific gravities.

- 3837.** BINGHAM, E. C., AND MURRAY, H. A., JR. A new combined viscometer. Preprint of paper presented at annual meeting, American Society for Testing Materials, June, 1923. "A new principle in viscometry is proposed, where the shearing stress is varied by allowing the material to enter a capillary under constant pressure head." Advantages; procedure and calculation of results. *See also* Am. Soc. Test. Mat., Tech. Papers, vol. 23, pt. 2, 1923, pp. 655, 662.
- 3838-3839.** BLAIR, E. W., AND WHEELER, T. S. An improved form of gas-analysis apparatus. *Jour. Soc. Chem. Ind.*, vol. 41, June 15, 1922, pp. 187T-188T. Gives description, illustration, and details of operation of apparatus, an important feature of which is use of compressed air and mercury to alter mercury levels.
- 3840.** CANNING, T. A. Gas calorimetry. *Gas World*, vol. 78, April 21, 1923, pp. 343-345. Types of calorimeters; use of calorimeter for testing.
- 3841.** CANTELO, R. C. The absorption of gasoline from natural gas. *Canadian Chem. and Met.*, vol. 6, Aug., 1922, pp. 177-179; Sept., pp. 196-200. Determination of gasoline content of gas; natural-gas production in Canada; theory and development of absorption process; data on experiments; amount of absorbent required. Bibliography.
- 3842.** CHEMICAL AND METALLURGICAL ENGINEERING. Acetone as a solvent for bitumens, asphalts, animal and vegetable oils. Vol. 27, Sept. 27, 1922, p. 651. Report on investigations to determine the solvent properties of acetone; characteristics of acetone.
- 3843.** CHEMICAL TRADE JOURNAL AND CHEMICAL ENGINEER. The viscosity test for fluids. Vol. 71, Aug. 11, 1922, p. 162. Abstract of paper by C. W. Gosling, presented at Pharmaceutical Conference, Nottingham, England, and printed in the *Pharmaceutical Journal and Pharmacist*, July 29, 1922. Describes four types of viscometers and their operation. Discusses advantages of Michell viscometer and its improvement over other designs.
- 3844.** CHEMIKER ZEITUNG. Apparat zur Bestimmung der Verdampfbarkeit, Blasenbildung und Adhäsion von Asphalten an Metall nach J. W. H. Utyenbogaart, jr. *Jahrg.* 46, June 22, 1922, pp. 565-566. "The apparatus consists essentially of a naphthalene bath by which the asphalt is heated in a porcelain crucible to determine the volatility and in a steel crucible to determine the adhesion and tendency to blister." Illustration. *Chem. Abs.*, vol. 16, Sept. 10, 1922, p. 2797.
- 3845.** CHEMIKER ZEITUNG. Neuer Apparat zur Untersuchung von Paraffinen, Wachsen, Harzen, Pechen, Asphalten. *Jahrg.* 46, April 29, 1922, p. 386. Describes Nashan's malakograph used to determine rate of softening of waxes and similar substances; method of operation. *See also* *Jour. Soc. Chem. Ind.*, vol. 41, June 15, 1922, p. 443A. *Chem. Abs.*, vol. 16, Aug. 20, 1922, p. 2624.
- 3846.** CLEMMER, H. F., AND HELMLE, H. C. Testing road oils. *Eng. and Contract.*, vol. 60, Sept. 5, 1923, pp. 497-498. Paper presented at annual meeting, American Society for Testing Materials, June 28, 1923. Method of evaporating road oil used by Illinois Division of Highways; air-bath apparatus.
- 3847.** COOKE, M. B. An experimental still for the detailed study of crude petroleum. *The Mid-Continent Yearbook*, 1923. Tulsa, Okla., 1923, pp. 97, 105, 107, 109, 111. Detailed description and drawings of still used by Bureau of Mines from which higher yields of gasoline were obtained than from laboratory Hempel still. Operation; data of distillation.

- 3848.** CREIGHTON, H. J. M. Convenient form of burette for exact gas analysis. Proc. Trans. Nova Scotian Inst. Sci., vol. 15, 1919-1920, pp. 115-117. Diagram of apparatus and description of important features. *See also* Chem. Abs., vol. 17, Nov. 10, 1923, p. 3431.
- 3849.** CROSS, ROY. A handbook of petroleum asphalt and natural gas. Methods of analysis, specifications, properties, refining, processes, statistics, tables, and bibliography. Kansas City Testing Laboratory Bull. 16, 1922, 622 pp.
- 3850.** DELBRIDGE, T. G. Improvements in apparatus for testing petroleum products. Proc. Am. Soc. Test. Mat., vol. 21, 1921, pp. 1100-1110. Describes apparatus for taking Baumé gravities, gravity temperature corrector, a special gas burner, distillation apparatus for naphtha, assembly of Saybolt Universal viscosimeters, paraffin-wax melting-point recorder, Cleveland open-cup flash tester, for use with small samples of oil and the Altreco viscosimeter.
- 3851.** DUNSTAN, A. E. Standardization of the testing of petroleum and its products. Jour. Inst. Petrol. Tech., vol. 8, Dec., 1922, pp. 578, 617. Report and recommendations of committees relative to an international standard of testing and refining for petroleum and its products. Tests and methods of recording results should be standardized. Special mention of boiling points, melting points and viscosities. Specifications for determining water content of crude oil. *See also* Le courrier des pétroles, 4e Année, Jan. 13, 1923, pp. 5-9. Jour. Soc. Chem. Ind., vol. 42, Feb. 2, 1923, p. 85A; March 2, p. 172A. Oil Eng. and Fin., vol. 2, 1922, p. 439. Petrol. Times, vol. 8, Oct. 14, 1922, pp. 565-566. Chem. et ind., Special Number, May, 1923, pp. 212-225.
- 3852.** ELECTRICAL WORLD. Testing transformer oil in field. Vol. 81, March 17, 1923, p. 638. Method and specifications, how record is made.
- 3853.** EMMONS, W. J. Plant inspection of asphaltic paving mixtures. Eng. and Contract., vol. 59, May 2, 1923, pp. 999-1008. General duties and procedure; asphalt tests.
- 3854.** ENGINEER. A new form of viscometer. Vol. 134, Nov. 17, 1922, p. 532. Details of Michell cup and ball viscometer; principles of operation.
- 3855.** EVANS, E. A. Asphalt in lubricating oils. Jour. Inst. Petrol. Tech. vol. 9, Oct., 1923, pp. 384-388. Accurate method for determination of asphalt content in oil.
- 3856.** FISCHER, R. Nouveau viscosimètre pour la détermination de substances très visqueuses. Chim. et ind., t. 9, Jan., 1923, p. 89; Seife, Jahrg. 45, 1922, pp. 483-484. A tube containing sample is surrounded by a jacket in which water circulates at 62°; the time required for an A1 ball to fall the length of the sample tube is compared with the standard, glycerol.
- 3857.** FOULK, C. W. A new form of precision hydrometer. Jour. Optical Soc. Am., vol. 7, 1923, pp. 327-334. Describes apparatus which furnishes more accurate scale reading, prevents troublesome surface phenomena, and makes possible uniform temperature.
- 3858.** GAS JOURNAL. Boy's recording and integrating gas calorimeter. Vol. 158, June 21, 1922, pp. 680-681; vol. 159, July 5, pp. 25-26. Detailed description of instrument designed to "obtain a continuous record of the gross calorific power of gas in relation not to actual volume but to corrected volume, i. e., to volume that gas would occupy if it were measured at a specified temperature and pressure and saturated with water vapor." Diagrams of important parts of machine.

- 3859.** GAS WORLD. The Fairweather recording calorimeter. Vol. 78, June 30, 1923, pp. 586-589. Report by the gas-research subcommittee. Theory of instrument operation; diagram.
- 3860.** ——— Determining the calorific values of coal and gas. Vol. 78, May 12, 1923, pp. 413-415. Description and diagram of a new gas calorimeter.
- 3861.** ——— Professor Boys describes modifications in his calorimeter. Vol. 78, May 5, 1923, pp. 386-387. Developments and modifications in the Boys' calorimeter; results are identical with those obtained from spot test instrument.
- 3862.** GAVIN, M. J. Analytical distillations of typical shale oils. Repts. of Investigations, Serial 2332, Bureau of Mines, March, 1922, 12 pp. Mimeographed. Method of determining properties and economic values of shale oils; modifications of analytical distillation method for petroleum to meet requirements of shale oils.
- 3863.** GÉNIE CIVIL. Appareils de mesure de la viscosité de huiles; le viscosimètre Engler et l'ixomètre Barbey. T. 80, March 25, 1922, pp. 279-280. Directions for use of apparatus for measurement of viscosity; illustrations.
- 3864.** GILL, A. H. A short handbook of oil analysis. Rev. 10th ed., Philadelphia, 1922. 223 pp. Methods for applying physical and chemical tests of animal, vegetable, and mineral oils. Deals with their preparation, properties, analytical constituents, uses, and adulterants.
- 3865.** GRIFFIN, R. C. Technical methods of analysis. New York, 1921. 666 pp. Contains chapters which deal with analysis of fuels and oils.
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- 3867.** HANUS, O. Methods of determining the asphalt content of crude oils. Rept. Fuel Tech. Inst. Czech. Polytechnic High School, in Prague, for 1921. 1922, pp. 91-93. Data; precipitation of crude oil with mixture of ether and glacial acetic acid gave highest values of asphalt free from ceresin-like substance. See also Chem. Abs., vol. 17, June 10, 1923, p. 2047.
- 3868.** HASSEL, K. Erfahrungen mit der Suthauschen Ölprüfmaschine. Chem. Ztg., Jahrg. 46, Nov. 2, 1922, pp. 992-993. Tabulated data recording tests made with oil-testing apparatus.
- 3869.** HAYDEN, J. L. R., AND EDDY, W. N. Three thousand tests on the dielectric strength of oil. Jour. Am. Inst. Elec. Eng., vol. 41, July, 1922, pp. 495-499.
- 3870.** HERSCHEL, W. H. Bath temperatures of viscometers of the Saybolt type. Ind. and Eng. Chem., vol. 15, Sept., 1923, pp. 945-946. Standard temperatures are necessary if results of various laboratories are to agree; calculation of bath temperatures.
- 3871.** ——— The improved MacMichael viscosimeter. Jour. Optical Soc. Am., vol. 7, 1923, pp. 335-353. Describes apparatus. Considers advantages and disadvantages. See also Chem. Abs., vol. 17, June 20, 1923, p. 2065. Nat. Petrol. News. vol. 15, Aug. 15, 1923, p. 99.
- 3872.** ——— Fuel-oil viscosimeters. Chem. and Met. Eng., vol. 26, June 21, 1922, pp. 1175-1177. Use of Saybolt viscosimeter and tables for conversion. Instrument is adapted to measuring fuel oils of high viscosity.

- 3873.** HERSCHEL, W. H. The Redwood viscometer. Tech. Paper 210, Bureau of Standards, April 10, 1922, pp. 227-246. Pamphlet. Report on investigation of errors due to inaccuracy of Meissner formula for average head, and to cooling of oil; conclusions. Contains tables for conversion of Redwood time into Saybolt Universal time or Engler degrees.
- 3874.** HILLER, HEINRICH. Ein neuer Tiegel zur Schnell-Schwefelbestimmung. Jahrg. 36, Ztschr. angew. Chem., Jan. 13, 1923, pp. 25-26. Modification of Parr's crucible. Sulphur is converted into sodium sulphate and is precipitated as barium sulphate. *See also* Chem. Abs., vol. 17, March 20, 1923, p. 904.
- 3875.** HOLDE, D. Ueber einige Erfahrungen in der Mineralölprüfung. Petrol. Ztschr., Jahrg. 18, July 10, 1922, pp. 853-858. Data on investigations made with Frey's aniline test and description of Conradson emulsion test; changes in bulbs and connecting tubes of the Engler viscosimeter. Review and discussion of investigations and conclusions regarding materials, apparatus, and methods.
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- 3885.** KOWALKE, O. L. Brady B. t. u. indicator tests. *Gas Age-Rec.*, vol. 49, April 1, 1922, pp. 405-406. Types of calorimeters, theory of Brady B. t. u. indicator, cost of installation, and operation; data on comparative tests.
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- 3888.** LEVY, LEONARD. Professor Boys' lecture on gas calorimetry at the Royal Institution. *Gas World*, vol. 78, May 5, 1923, pp. 385-386. Describes device and its use.
- 3889.** LEWKOWITSCH, J. Chemical technology and analysis of oils, fats, and waxes. Vol. 1, 2, and 3. New York, 1913. 3 vol. A laboratory reference covering edible oils, paint oils, lubricating oils, processed oils, fatty acids, candle and soap making, and the utilization of waste oils and fats.
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- 3891.** LUNN, C. A. Testing and valuation of gas-oil report. *Gas Age-Rec.*, vol. 52, Oct. 20, 1923, pp. 491-492. Tentative standard proposed for apparatus and method by subcommittee on gas and oils of Committee D-2, submitted to American Society for Testing Materials.
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- 3894.** MANNEBACH, O. Neuer Vergleichsapparat für colorimetrische Bestimmungen. *Chem. Ztg.*, Jahrg. 46, Jan. 15, 1922, p. 20. "The comparison tubes stand obliquely in a beaker of H₂O which is placed in a wooden box, black inside, open at the top, and with a round hole slightly smaller than the bottom of the beaker cut in the bottom. Under the box is a reflector which throws a suitable light up through the beaker, enabling a comparison of the most delicate tints."
- 3895.** MATTHIS, A. R. (Transformer oils). *Rev. gen. elec.*, t. 13, April 7, 1923, pp. 582-583. Directions for dielectric tests; oxidation and polymerization of hydrocarbons and oils.

- 3896.** MATTHIS, A. R. (Determination of volatility of oils.) *Bull. fed. ind. chim. Belg.*, t. 1, 1922, pp. 397-405; *Jour. Soc. Chem. Ind.*, vol. 41, Sept. 30, 1922, pp. 699A-700A. "In addition to the quantity of oil used for the test and temperature and duration of heating, the area of exposed surface and the projection of the vessel above the surface of the oil should be taken into account, as these have a definite bearing on the rate of evaporation."
- 3897.** MEZGER, R. (Automatic apparatus for the estimation of water, especially in tar.) *Gas und Wasserfach*, Jahrg. 66, 1923, pp. 303-304. Sample for testing is heated with xylene to boiling point in flask; vapor passes through an insulated tube to a reflux condenser; from thence the condensed liquid flows into a graduated burette where water settles and xylene is returned to flask through side tube at top; distillation is continued until water in burette ceases to rise. *See also Chem. Abs.* vol. 17, Nov. 10, 1923, p. 3431.
- 3898.** MOORE, H. Standardization of methods for testing lubricating oils and allied substances. *Oil Eng. and Finance*, vol. 2, 1922, pp. 395-396. Discusses need of standardizing Pensky-Martens flash-point test and color and viscosity tests. Correction of thermometer for flash point tests.
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POWER AND EFFICIENCY TESTS (550)

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VOLATILE FRACTIONS, INCLUDING MOTOR OILS, GASOLINES, NAPHTHAS, BENZINES (573)

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4133. OSTWALD, W. Die neuere Entwicklung der Motorkraftstoffe. Ztschr. angew. Chem., Jahrg. 35, June 9, 1923, pp. 278-279. Recent developments in motor fuels.
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LUBRICATING, TRANSFORMER, MEDICINAL, AND SWITCH OILS
(575)

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- 4153.** EVANS, E. A. Some physical properties of lubricants. *Jour. Inst. Petrol. Tech.*, vol. 9, Oct., 1923, pp. 380-384. Abstract of paper before International Air Congress, London, 1923. Discusses viscosity, its characteristics, and its rôle in lubrication.
- 4154.** ——— Lubricating and allied oils. London, 1921. 128 pp.
- 4155.** FRIESE, R. M. (Dielectric (breakdown) value of insulating oils.) *Wiss. Veroffentl. Siemens-Konzern*, 1921, Jahrg. 1, pp. 41-45; *Chem. Zentralb.*, Jahrg. 4, 1921, 92, p. 1349. "Insulating oil, prepared by the purification and fractional distillation of petroleum oil, has when perfectly dry a maximum dielectric (breakdown) value of 230 kilovolts per cm., but this is considerably reduced by absorption of moisture from the surrounding air; e. g., in free contact with air of about 50-50 per cent relative humidity, the value is reduced to about 50 kilovolts per cm." *See also Jour. Soc. Chem. Ind.*, vol. 41, Feb. 28, 1922, p. 147A.

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4178. ——— Oil acidity. Vol. 10, June 20, 1922, p. 46. Carbonization of oil is often of greater consequence than acidity; low-carbonization oil should be used with high temperature and pressure engines.
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PARAFFIN, OZOKERITE, CERESIN, VASELINE, MONTAN WAX, ETC. (577)

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ASPHALT, TARS, ETC. (578)

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SHALES, MISCELLANEOUS SOLID BITUMENS, LAMPBLACK, AND COKE (579)

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MISCELLANEOUS (590)

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DISTILLATION OF LIQUIDS (612)

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GASIFYING AND PRODUCTION OF LAMPBLACK AND COKE (613.4)

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4811. ——— Utilization of aluminum chloride residues. Canadian patent 222,318, Aug. 15, 1922.
4812. ——— Production of aluminum chloride. Canadian patent 222,317, Aug. 15, 1922.
4813. ——— Production of aluminum chloride. Canadian patent 222,315, Aug. 15, 1922.
4814. ——— Utilization of aluminum chloride residues. Canadian patent 222,308, Aug. 15, 1922.
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DISTILLATION OF SOLIDS (614)

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of coke, the heat in the coke, which is absorbed by the last portions of the gas distilled from the fuel, is recovered in this manner. Then the temperature of this residual gas is raised until it is high enough to reheat the combustible, and the distillation is accomplished by gas derived from the combustion of a part of the residual gases. This process is applicable to plants which wish to obtain, by dry distillation of coal, products similar to those of petroleum distillation." *See also* Am. Gas Jour., vol. 119, Aug. 18, 1923, pp. 129-131.

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- 4827.** TRENT, W. E. Improved apparatus for distillation of oil-producing materials. British patent 174,336, Mar. 22, 1923.

OIL SHALES (614.1)

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- 4830.** ——— Oil shale—a résumé for 1921. Colorado Sch. of Mines Circular of Information, 1922. 8 pp. Review of important events in all producing localities. Concludes with bibliography of recent articles. *See also* Petrol. Ref., vol. 10, Jan. 26, 1922, p. 31; Feb. 9, pp. 25-26; vol. 11, Feb. 16, 1922, pp. 22-26. R. R. Red Book, vol. 39, Jan., 1922 pp. 7-14.
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- 4832.** BERTHELOT, C. Les fours modernes pour la distillation des schistes bitumineux. Chim. et ind., Special Number, May, 1923, pp. 439-442. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Chemical properties of French bituminous schists and oil content. Main features of design and operation of Scottish retort, Fischer rotary furnace, and Salneri horizontal furnace.

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- 4878.** ——— Retorting experiments on Norfolk shale. Vol. 9, May 19, 1923, pp. 729-730; June 2, 1923, p. 790; June 9, p. 840. Experiments carried out with different types of shale retorts; best results obtained with Scottish retort. Describes various types of retorts and their merits and disadvantages.
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- 4880.** ——— The retorting of oil shales. Vol. 8, Aug. 12, 1922, p. 233. Explains main feature of new low-temperature carbonization method of treating shale; gases circulate over and through the retort, from which they pass through a mechanical extractor where heavy oil is precipitated; gas is again forced into retort, after being reheated in a furnace, is saturated with oil, compressed to obtain oil, and again reheated and passed through retort; a saving is possible in that the condenser is small and used only periodically.
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4893. ——— New shale retort attracts experts. Vol. 24, Apr. 15, 1922, p. 15. Briefly describes shale retort in operation at De Beque, Colo., which distills oil from shale and also fractions oil into gasoline and similar products.
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SULPHURIC AND SULPHUROUS ACID REFINING (616.12)

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PARAFFIN, VASELINE, CERESIN, AND MONTAN WAX (623)

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ASPHALT (624)

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ON LOCOMOTIVES (721.1)

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ON SHIPS (721.2)

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6285. ——— Determining compression pressures for solid injection oil engines. *Power*, vol. 57, Feb. 6, 1923, pp. 214-215. Observes desirability of keeping near low-compression limit rather than high-compression limit. Gives principles governing compression limits.
6286. ——— Development of the solid-injection oil engine. *Power*, vol. 57, Jan. 16, 1923, pp. 92-94. Summary of improvements in design of combustion chamber from hot tube and hot bulb to solid-injection type; diagrams of types of combustion chamber. Discussion of characteristics of mechanical atomization; comparison with merits of air spray.

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6290. TOWL, F. M. Types of oil engines and advantages of the various designs. *Nat. Petrol. News*, vol. 15, Oct. 31, 1923, pp. 45-46. Paper before Ohio Oil and Gas Men's Convention, Columbus, 1923. Important features of different types of oil engines; fuel characteristics; use as factor in cost of operation. Discusses hot-bulb and Diesel-type engines and use to which four-cycle and two-cycle types of engines are best adapted. *See also Ohio Gas and Oil Men's Jour.*, vol. 5, Nov., 1923, pp. 8-10.
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6292. WATKINSON, A. S. More on the two-cycle versus four-cycle controversy. *Motorship*, vol. 8, Feb., 1923, pp. 110, 113. Compares the relative merits and important features of several types of engines.
See also Nos. 38, 2917, 3600, 3965, 3991, 5981, 5998, 6018, 6027, 6028, 6044, 6071, 6072, 6087, 6335, 7151, 7152, 7246, 7276, 7307, 7335, 7763, 7766, 7777.

GAS ENGINES (725.1)

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6294. BESSEMER MONTHLY. Cause of carbon in gas engines. No. 203, Nov., 1922, pp. 4, 6. Explains that decomposition of oil film because of slow speed of engine or because of slow ignition is responsible for accumulation of carbon on cylinders.
6295. BOULEAT, MAURICE. Les automobiles à gaz pauvre. *La nature*, June 3, 1922, pp. 344-346. Describes gas engine designed to use wood for production of gas, thus eliminating the usual requirement of water.
6296. BRONN, J. (Methane in steel cylinders as a commercial product and as a starting gas for motors.) *Auto-Technik*, Jahrg. 11, No. 17, pp. 6-8; *Chem. Zentr.*, Jahrg. 4, 1922, p. 855. Considers CH₄ in steel cylinders an ideal gas for automobiles from standpoint of dependability, supply, and price, as well as because it may be used at 150 atmospheric pressure without danger of ignition.
6297. DEWEY, M. J. Use of natural gas by oil company. *Gas Age-Rec.*, vol. 50, July 29, 1922, pp. 146-147, 150. Discusses use in operation of gas engines and steam boilers; data on installation costs and economies; equipment.

- 6298.** ENGINEERING. The "Wren" light aeroplane. Vol. 116, Oct. 26, 1923, pp. 526-527. Describes especially designed features of engine and arrangement of petrol tanks, which insures low operating costs.
- 6299.** HARDECKER, J. F. Aeronautical fuel, lubricating, and cooling systems. Aerial Age, vol. 16, Feb., 1923, pp. 60-62, 90. Advantages and disadvantages of various materials used in construction of a fuel system; desirable features of design.
- 6300.** NICHOLSON, A. I. Various oil engine trials and experiments. Motorship, vol. 8, Dec., 1923, pp. 866-871. Results of trials made on a Scott-Still combustion oil and steam engine; the following phases were investigated: (1) Leakage of oil at pump plunger; (2) mechanical friction and engine efficiency; (3) fuel injection—(a) atomization, (b) penetration of air charge by fuel jets, (c) distribution of fuel in air charge, (d) the relative importance of these factors; (4) detonation; (5) scavenging, as affected by piston shape.
- 6301.** OSBORNE, W. F. Cause of carbon in gas engines. Power, vol. 56, Nov. 14, 1922, pp. 761-762. Discusses viscosity of oil as an important factor in reduction of carbon deposits; filtered oils also reduce carbon deposits.
- 6302.** WEISS, E. Le gazogène "cazes" pour camion automobile. La nature, March 11, 1922, pp. 145-147. Describes uses and main features of motor which burns charcoal or similar gas.
- See also* No. 6258.

PATENTS.

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- 6304.** WRENTMORE, E. L. Motor using oil, gasoline, or gas as a fuel. United States patent 1,454,499, May 8, 1923.

GASOLINE ENGINES (725.2)

- 6305.** ENGINEER. The Zeppelin passenger airship *L. Z. 126*. Vol. 136, Dec. 7, 1923, pp. 604-605. Describes engine and fuel-storage system.
- 6306.** KERSEY, A. T. J. Petrol engines. Proc. Inst. Mech. Eng., April, 1923, p. 493. Discusses the following problems of engine design: (1) Elimination of noise; (2) elimination of vibration; (3) breakdowns; (4) accessibility for examination; (5) flexibility; (6) economy in fuel consumption; (7) reduction in weight and space occupied per horsepower; (8) low cost of production.
- 6307.** LOCKWOOD, E. H. New interpretation of exhaust-gas analysis. Jour. Soc. Automotive Eng., vol. 12, March, 1923, pp. 299-301. Explains use of Orsat apparatus in analysis of gas from internal-combustion engines. Formulas for the interpretation of results.
- 6308.** LUBRICATION. Care of the motor car in winter. Vol. 9, Jan., 1923, pp. 1-12. Observes that priming and choking should be resorted to as little as possible. Water in gasoline is likely to freeze in the fuel line. Tells of other precautions which will minimize trouble; formulas for nonfreezing mixtures.
- 6309.** MACCOULL, NEIL. Relation between fluid friction and transmission efficiency. Jour. Soc. Automotive Eng., vol. 10, March, 1922, pp. 193-199. Describes experiments to determine the mechanical losses in an automobile, including all friction losses between the working gases in the engine and the driving wheels of the vehicle, and discusses possibilities for increasing the fuel economy of a motor vehicle. *See also* Lubrication, vol. 8, Jan., 1922 pp. 1-8.

- 6310.** MARTINOT-LAGARDE, —. Les moteurs d'aviation, évolution, tendances actuelles. Bull. Soc. d'encour., t. 134, March, 1922, pp. 187-222. Development of aeroplane engines of military and commercial types, including carburetor improvements. Illustrations.
- 6311.** MELLANBY, A. L. Clyde marine oil engines. Engineering, vol. 116, July 20, 1923, pp. 95-98; July 27, pp. 128-130. Changes in plan of ship to adapt it to oil burning and to install an oil power system; various designs and their chief features; consideration of lubrication problems; factors affecting power.
- 6312.** POWER ENGINEER (LONDON). Petrol and paraffin engines. Vol. 18, June, 1923, pp. 209-212; Aug., pp. 285-287. Theory of design and operation. Discusses possibility of two-stroke "Paragen" cycles.
- See also* Nos. 6258, 6480, 7288.

DIESEL ENGINES (725.3)

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- 6314.** AUTOMOTIVE INDUSTRIES. New Diesel engine may be practical for automotive use. Vol. 48, June 21, 1923, pp. 1336-1337. Discusses automotive engines equipped with fuel-injection valves and "lightning" ignition. Design makes it possible to use any of lower grades of hydrocarbon oils.
- 6315.** BERTHELOT, C. Le congrès et l'exposition des combustibles liquides. Rev. métal., 20e année, March, 1923, pp. 175-182. Description and comparison of Diesel and semi-Diesel motors on exhibition; use of heavy oils, alcohol, and vegetable oils as fuels. Illustrations.
- 6316.** BURRUS, R. C. An efficient oil-engine light plant. Power, vol. 58, Dec. 25, 1923, pp. 1016-1020. Diesel engine installation; data on operation.
- 6317.** CHAPMAN, L. B. The Still engine. Marine Eng., vol. 27, April, 1922, pp. 265-266. Still engine is a combination Diesel and steam engine designed to produce an increase in thermal efficiency over the Diesel engine. Enumerates advantages. Contains cross section of Still engine. Illustrations.
- 6318.** CHEMICAL TRADE JOURNAL AND CHEMICAL ENGINEER. Diesel engine developments in Germany. Vol. 72, Feb. 2, 1922, p. 134. Remarks that trend is toward air injection for high-powered engines only; others will have solid injection.
- 6319.** DUFOUR, PAUL. Conditions d'emploi des moteurs Diesel, comparative-ment aux différents systèmes de production de force motrice. Chim. et ind., Special Number, May, 1923, pp. 301-307. (Trans. Internat. Expos. of Combust. Liquids, Paris, Oct., 1922.) Data on laboratory tests, practical tests, and the industrial performance of Diesel engines.
- 6320.** ELECTRICAL WORLD. Diesel engines offer means of improving economy in power production. Vol. 80, Aug. 12, 1922, p. 313. Claims of fuel economy alone do not justify adoption of Diesel engines, but in small steam plants or water-power plants they are desirable because standby charges are at a minimum and the Diesel engine can carry the economic load with a steam reserve for the peak load.
- 6321.** ENGINEER. Recent Schneider-Diesel oil engines. Vol. 136, Aug. 10, 1923, pp. 157-158. Main features of a slow oil engine designed in France.
- 6322.** ——— Tests of a Cammellaird-Fullagar marine Diesel engine. Vol. 134, Aug. 11, 1922, pp. 140-142. Characteristics of oil used in test.

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6326. GRIFFIN, J. G. Use of cooling water for Diesel engines. Petrol. World (London), vol. 20, May, 1923, pp. 211-215. Deals with cooling-water systems; quantity of water required; scale problems and remedy.
6327. HOWE, S. M. Increasing the output of a semi-Diesel engine. Power, vol. 57, Feb. 27, 1923, p. 319. Observes that to secure the maximum efficiency, an oil engine should be altered in accordance with the altitude in which it is to operate.
6328. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. The flexibility of the Diesel engine. Vol. 67, Mar. 9, 1922, pp. 469-470. Direct-driven Diesel locomotive.
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6330. JUNIEN, MAURICE. L'emploi des huiles de goudron dans les moteurs "Diesel." Chim. et ind., Special Number, May, 1923, pp. 609-624. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Specifications for Diesel oils of hydrocarbon and vegetable origin. Study of combustion in Diesel engines. Principles of operation of Diesel engines. Physical and chemical properties of petroleum and coal-tar oils from the principal countries of the world.
6331. LEVERGER, C. Moteurs thermiques; les moteurs à combustion interne; moteurs marins à deux temps Diesel-Sulzer. Génie civil, t. 81, Aug. 19, 1922, pp. 169-174. Discusses two-cycle Diesel-Sulzer marine engines. Diagrams.
6332. LIENESCH, C. F. Brief sketch of the development of the internal-combustion engines. Oil Weekly, vol. 25, May 13, 1922, pp. 11-13. Deals with early applications of principles of combustion and explosion to power production; follows gradual growth through modern engines to Diesel engine.
6333. LISLE, T. O. Variations in modern Diesel-engine design. Jour. Soc. Automotive Eng., vol. 11, July, 1922, pp. 93-105; discussion, pp. 105-106. Describes main features of chief types of American and European Diesel engines; fuel consumption by Diesel engines. Illustrations.
6334. LONDON TIMES ENGINEERING SUPPLEMENT. Fullgar engines for land purposes. Vol. 13, July 14, 1923, p. 425. Describes engine operating on Diesel principles; oil is atomized by means of a three-stage air compressor driven from the end of a crank-shaft.
6335. LONDON TIMES TRADE AND ENGINEERING SUPPLEMENT. Working cost of heavy-oil engines. Vol. 12, March 17, 1923, p. 19. Brief report of a committee of the Diesel Engine Users' Association, giving average fuel-oil cost of six representative installations.
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- 6337.** LUNDGREN, EDWIN. The two-stroke-cycle Diesel's superiority for large powers. *Power*, vol. 56, Dec. 26, 1922, pp. 1015-1016. Merits of two-stroke-cycle engine in respect to weight, space, and amount of mechanism, compared with those of four-stroke-cycle engine.
- 6338.** MARINE ENGINEERING. Oil engines designed for large liners. Vol. 28, June, 1923, pp. 363-364. Distinctive features in construction of marine Diesel engines.
- 6339.** ——— The new M. A. N. Diesel engine. Vol. 27, Aug., 1922, pp. 509-510. Describes engine designed to operate on boiler fuel oil or tar oil.
- 6340.** MECHANICAL ENGINEERING. Internal-combustion engineering. Vol. 44, Jan., 1922, pp. 53-54. "An American solid-injection Diesel engine, distinctive feature of which is two-part combustion chamber which reduces explosive pressures and creates condition of air turbulence in main combustion chamber during combustion period." "Ignition of fuel is from heat compression."
- 6341.** MENDELSON, C. The economical operation of Diesel engines. *Elec. World*, vol. 82, Nov. 10, 1923, pp. 970-971. Average fuel consumption; type of fuel.
- 6342.** MORRISON, L. H. Oil engines reduce power-plant costs. *Power*, vol. 58, Sept. 18, 1923, pp. 455-456. Observes that greater efficiency and reduction of operating costs is gained by use of Diesel engine; gives kilowatt-hour output of coal and oil.
- 6343.** ——— Efficiency of the Diesel oil engine. *Power*, vol. 55, Feb. 28, 1922, pp. 340-341. Explains greater thermal efficiency at part loads of Diesel engine in contrast to other engines.
- 6344.** MOTORSHIP. Diesels discussed by Verein Deutscher Ingenieure. Vol. 8, Aug., 1923, pp. 551-576. Herr Alt discusses fuels and their combustion in the Diesel engine. Latest practical knowledge has determined that atomized fuel ignites directly without prior vaporization and combustion should take place without vaporization.
- 6345.** ——— Diesels discussed by Verein Deutscher Ingenieure. Vol. 8, Aug., 1923, pp. 551-576. Review by Dr. Newmann on tests made with fuel injection with and without aid of air blast; difficulties of airless injection; data showing combustion rates of different fuels.
- 6346.** ——— Diesels discussed by Verein Deutscher Ingenieure. Vol. 8, Aug., 1923, pp. 551-576. Paper by Dr. Riehm on increasing the power of four-cycle engines through increase in piston pressure by induction of larger quantity of fuel into regular air charge of working cylinder; heat stresses of four-cycle engine are lower than in a two-cycle engine of similar dimensions.
- 6347.** ——— New high-powered Augsburg Diesel engine. Vol. 7, Oct., 1922, pp. 752-756. Specifications for tar oil and for bunker oil used in tests.
- 6348.** NÄGEL, H. Die Dieselmachine der Gegenwart. *Ztschr. Ver. deut. Ing.*, Bd. 67, July 14, 1923, pp. 677-685; July 21, pp. 711-713; July 28, pp. 725-735; Aug. 11, pp. 778-782; Aug. 18, pp. 808-812. Injection and atomization of fuels without compression; diagrams of injection device. Traces development of Diesel engine with respect to improvements in design made to ensure greater economy; two-cycle process adopted instead of four-cycle process; design modified to increase combustion of heavy fuels; solid or mechanical injection substituted for compressed air. *See also Power*, vol. 58, Sept. 18, 1923, p. 476. *Petrol. World* (London), vol. 20, Oct., 1923, pp. 422-424. *Motorship*, vol. 8, Aug., 1923, pp. 551-576.
- 6349.** NAUTICAL GAZETTE. Burmeister and Wain engines in lead. Vol. 104, Feb. 17, 1923, p. 227. Explains that as combustion is the governing factor in regard to fuel used, the air injection may be as satisfactory as solid injection in Diesel engines, providing the combustion chamber is constructed of brickwork which becomes incandescent and permits combustion to occur at a high temperature.

- 6350.** NAUTICAL GAZETTE. Diesel engines surpass gasoline prime movers in efficiency. Vol. 103, Nov. 4, 1922, p. 599. Compares economies, power, and work possibilities of the Diesel engine with the gasoline engine; principles of operation of each.
- 6351.** ——— Diesel engines constructed on bolder scale are proving themselves at sea. Vol. 103, Oct. 14, 1922, p. 488. Tendency is toward increasing cylinder sizes; greater power development possible; use of heavier fuel oils possible.
- 6352.** ——— Increase in normal performance of Diesel engines is very risky. Vol. 103, July 15, 1922, p. 72. Points out that practice of raising the degree of heat by an increase in fuel supply is unsafe.
- 6353.** NEWELL, A. B. Mexican fuel oil with Diesel engines. *Motorship*, vol. 8, May, 1923, p. 350. Factors in the satisfactory burning of low-grade fuel; small tank of light high-grade fuel, as gas oil or Diesel oil for starting and finishing; extraction of ash from asphaltic oil. Fuel valves and atomizers should have careful attention. Discusses other problems and their solution.
- 6354.** ——— Salt water in suspension. *Motorship*, vol. 8, March, 1923, p. 185. Points out that difficulties with Diesel engine may be caused by salt water entering fuel tank from leaking rivets, poor tank covers, or leaking fuel line.
- 6355.** NORMAN, C. A. The future development of heavy-oil engines. *Pacific Mar. Rev.*, vol. 20, Feb., 1923, pp. 101-102. Paper before Am. Petrol. Inst., St. Louis, Dec., 1922. Trend in Diesel-engine design in United States and abroad is simplicity by means of solid injection by pump pressure instead of injection by compression; firing of engines by heat of compression is another feature of development; development has been away from semi-Diesel engines toward compound Diesel engine built on injection principle to operate on heavy fuels. Discusses success of transfer valve in automotive industries.
- 6356.** Now, T. C. Operation of semi-Diesel engines. *Power*, vol. 58, Aug. 7, 1923, p. 211. Lubrication and oil in crankcase must be watched to obtain efficient service.
- 6357.** OIL ENGINE POWER. Types of modern power-plant oil engines. Vol. 1, July, 1923, pp. 341-344, 349-350. Distinctive features of the Worthington two-cycle Diesel engine. Illustrations.
- 6358.** ——— Modification of the Diesel principle for low power. Vol. 1, March, 1923, p. 127. Discusses new Gernandt oil engine which compresses small quantities of exhaust products of combustion thereby atomizing and injecting the fuel into a compressed charge of pure air. Fuel vaporization is aided by heat of exhaust and compression raises the temperature to ignition point. Illustration.
- 6359.** PACIFIC MARINE REVIEW. A new Pacific coast Diesel. Vol. 19, Oct., 1922, pp. 579-580. Distinctive features of oil-burning system.
- 6360.** PETROLEUM WORLD (LONDON). Diesel Engine Users' Association. Vol. 20, Dec., 1923, pp. 511-512. Review of paper by Geoffrey Porter. Improvements in Diesel engine design; types of engines for land use; facts to observe when selection of engine is made.
- 6361.** POWER. Diesel engines reduce operating costs. Vol. 58, Oct. 30, 1923, pp. 689-690. Comparative costs of operating a power plant with coal and with oil.
- 6362.** ——— Cost of oil-engined central stations. Vol. 58, Oct. 2, 1923, pp. 537-538. Itemized unit of costs for construction and operation of semi-Diesel engines; data from five organizations.

- 6363.** POWER. The Diesel engine and how it operates. Vol. 56, Oct. 31, 1922, pp. 688-690. Account of "cycle of events occurring in the cylinder of the Diesel engine." Diagrams illustrating operating movements and arrangement of parts.
- 6364.** PURDAY, H. F. P. Marine Diesel engines. Petrol. World (London), vol. 19, July, 1922, pp. 294-300. Abstract of paper before Diesel Engine Users' Assoc. Chief features of types of Diesel engines.
- 6365.** REAVELL, WILLIAM. The use of compressed air in Diesel-engined ships. Petrol. World (London), vol. 19, March, 1922, pp. 115-116, 118, 120. Abstract of paper before the Northeast Coast Institution of Engineers and Shipbuilders.
- 6366.** REDZICH, KONSTANTIN. (The compressorless Diesel engine.) *Wärme und Kälte Technik*, Jahrg. 24, 1922, pp. 103-105; *Chem. Abs.*, vol. 16, Oct. 10, 1922, p. 3380. Mentions eight devices which may be used for injection of fuel into cylinder without use of separate compressor.
- 6367.** RICARDO, H. R. The internal-combustion engine. Vol. 1, Slow-speed engines; vol. 2, High-speed engines. New York, 1923, 2 vols. Includes discussions of Diesel and similar engines, and vaporizing oil engine; value of Diesel engines; advantages and disadvantages; development of high-speed engines in recent years.
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- 6369.** ROSBLOOM, JULIUS, AND SAWLEY, O. R. The 20th century guide for Diesel operators. Seattle, Wash., 1922. 637 pp. Deals with all phases of operation of marine and land Diesel engines. Discussion includes technical terms, formulas, construction principles, comparative advantages of high and low compression pump, batteries, auxiliaries, and machinery.
- 6370.** ROTTER, MAX. Diesel engines and fuels. Petrol. World (London), vol. 20, Feb., 1923, pp. 76-78. Points out need of a suitable Diesel-engine fuel; characteristics which are most desirable.
- 6371.** SCHMIDT, KURT. Der deutzerliegende Kompressorlose Diesel-Motor. *Ztschr. Ver. deut. Ing.*, Bd. 66, Dec. 23, 1922. pp. 1225-1229. Developments in design of combustion chambers, sprayers, and various types of fuels. Diagrams.
- 6372.** SCHUBERT, ADRIEN. Les moteurs semi-Diesel; état actuel de leur construction et leur utilisation. *Bull. Soc. d'encour.*, t. 134, May, 1922, pp. 418-505. Types of motors, theories of operation; suitable fuels, especially vegetable oils. Describes motors designed in various European countries. Bibliography.
- 6373.** SOTHERN, J. W. M. Notes and sketches on marine Diesel oil engines. New York, 1922. 400 pp. Describes various Diesel engines, their installation and operation.
- 6374.** STIGEN, JOHN. Sea-going Diesel-engined motorships. *Pacific Mar. Rev.*, vol. 20, May, 1923, pp. 234-236. Advantages of Diesel engines for marine power are immediate availability of full power and possibility of quick reversal in emergency; reduction of bunker space and decrease in crew; against this, increased lubricating costs, insurance, and depreciation must be charged.
- 6375.** VOSBURY, W. D. Diesel engines to furnish power for water works. *Eng. News-Rec.*, vol. 88, May 11, 1923, pp. 793-794. Plan of plant, showing arrangement of motorized pumps and oil engine driven generators.

- 6376.** WINDELER, G. E. Care and maintenance of Diesel engines. *Petrol. World*, vol. 19, Nov., 1922, pp. 469-472; Dec. 1922, pp. 519-524. Abstract of paper read before Diesel Engine Users' Assoc., Oct., 1922; discussion, vol. 20, March, 1923, pp. 122-126. With care and replacement of parts, efficiency can be maintained indefinitely. Discusses scale formation and the success of hydrochloric acid in its removal; protection of air vessels in case of fire; efficiency of different mixtures of lubricating oils; electrical measurement of compressor cooling coils; provisions for cleaning and storing lubricating oils; care of fuel-injection valve. *See also* *Nautical Gaz.*, vol. 103, Dec. 2, 1922, p. 713. *Oil Eng. Power*, vol. 1, Jan., 1923, pp. 28, 33-34; Feb., pp. 76, 80.
- See also* Nos. 2381, 4034, 4089, 4092, 4833, 6021, 6042, 6066, 6071, 6077, 6080, 6090, 6091, 6116, 6141, 6258, 6440, 6480, 7191, 7196, 7197, 7241, 7248, 7250, 7373, 7554, 7607, 7647, 7653, 7814.

PATENT.

- 6377.** HENTSCHEKE, PAUL. Diesel engine. United States patent 1,464,906, Aug. 14, 1923.

MISCELLANEOUS HEAVY-OIL ENGINES (725.4)

- 6378.** ABELL, R. Single-valve internal-combustion engine design and operation. *Jour. Soc. Automotive Eng.*, vol. 13, Oct., 1923, pp. 301-309. Factors which control satisfactory engine operation. Describes single-valve engine which eliminates possibilities of carbon deposits, detonation, and is capable of greater efficiency and power by reason of increased compression-pressure.
- 6379.** ATLANTIC CONNECTING ROD. Oil-burning autos. Vol. 16, Jan., 1923, p. 20. Automobile used in Paris has a semi-Diesel engine which burns "gas oil" instead of gasoline.
- 6380.** CANADIAN MINING JOURNAL. The oil engine for mine use. Vol. 44, Aug. 10, 1923, pp. 599-600. Considers characteristics which an engine should have. Fuel should not have over 0.9 specific gravity, and 18,000 B. t. u. per pound.
- 6381.** CHEMICAL AND METALLURGICAL ENGINEERING. Horizontal oil engine. Vol. 28, May 7, 1923, p. 818. Construction of combustion chamber prevents fuel fog from condensing upon metallic surface.
- 6382.** DELANGHE, G. Le moteur à huiles lourdes Peugeot-Tartrais. *Génie civil*, t. 82, June 9, 1923, pp. 547-552. Main features and design of the Peugeot-Tartrais motor which operates on heavy oils.
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CARBURETORS, VAPORIZERS, AND SPRAYERS (725.5)

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SUBSTITUTES FOR BITUMINOUS FUELS IN INTERNAL-COMBUSTION ENGINES (727)

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ALCOHOL (727.1)

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7288. GARDNER, H. A. Alcohol as a motor-fuel constituent. *Ind. and Eng. Chem.*, vol. 15, May, 1923, pp. 483-485. Paper before American Chemical Society, Gas and Fuel Section. Discusses disadvantages of various motor fuels for aircraft use, characteristics desirable in an aircraft fuel, and an alcohol-gasoline blend as fulfilling requirements. Discussion in *Oil News*, vol. 11, May 5, 1923, pp. 47, 52.
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7290. GRANDMOUGIN, EUGÈNE. La préparation industrielle de l'alcool. *Génie civil*, t. 83, Sept. 1, 1923, pp. 198-201; Sept. 8, pp. 224-228; Sept. 15, pp. 246-248. Industrial preparation of alcohol by fermentation of vegetable products; description of plant.
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7295. INDUSTRIAL AUSTRALIAN AND MINING STANDARD. Power alcohol from calcium carbide. Vol. 69, May 24, 1923, pp. 834-835; May 31, pp. 896-897. Discusses possibilities of utilizing the hydroelectric power of the Severn for production of synthetic alcohol. Process.
7296. ——— Industrial alcohol from molasses. Vol. 69, April 26, 1923, p. 690. Thermal value of alcohol-gasoline motor fuel; use for domestic fuel.
7297. ——— The prickly-pear menace in Queensland. Vol. 69, Feb. 1, 1923, pp. 171-172. States that use of prickly-pear fruit for alcohol would utilize worthless raw material and supply motor fuel; tests have found alcohol produced from this source as satisfactory as best gasoline.
7298. ——— Power alcohol. Vol. 68, Dec. 14, 1922, p. 1035.
7299. ——— A new motor fuel. Vol. 68, Oct. 26, 1922, p. 755. Tells of fuel produced by mixing crude whisky with an extract from vegetable of Indian origin.
7300. ——— Alcohol as motor fuel. Vol. 68, July 6, 1922, p. 2.
7301. ——— Use of alcohol fuel. Vol. 67, Feb. 23, 1922, p. 391. Effect on car, and hints for adjustment.
7302. INSTITUTION OF PETROLEUM TECHNOLOGISTS, JOURNAL. Fuel for motor transport. Vol. 8, April, 1922, p. 14. Review of Second Mem. Fuel Research Board, Great Britain, Dept. Scientific and Industrial Research. Investigation and experimentation show that production of alcohol from sugar and molasses in British Empire is not possible on a large scale; production of alcohol from calcium carbide is impracticable except under best conditions.
7303. LANDER, C. H. Some aspects of the fuel problem. *Jour. Soc. Chem. Ind.*, vol. 42, Nov. 2, 1923, pp. 1052-1056. Considers production of alcohol for power purposes to replace coal, but production in the British Isles is not feasible, as extensive acreage is required for vegetation.
7304. LEGRAND, C. Le carburant national. *Étude sur sa constitution possible*. *Chim. et ind.*, t. 10, Sept., 1923, pp. 411-428. Results of investigations of several fuel mixtures; considers fuel properties and stability of various individual motor fuels. Outlines desirable characteristics. Data on tests with various mixtures of benzene.
7305. LONDON TIMES TRADE SUPPLEMENT. Power from prickly pears. Vol. 11, Dec. 9, 1922, p. 293. Alcohol distilled from prickly pear was found by tests in automobiles to be equal, and in some respects superior, to gasoline; large supply of raw material makes production of fuel from this source profitable.
7306. MARILLER, C. Le carburant national et l'industrie de la distillation. *Chim. et ind.*, t. 7, June, 1922, pp. 1071-1077; discussion, pp. 1077-1078. Urges utilization of domestic resources to fullest possible extent in order to attain independence of foreign motor fuels. Proposes motor fuel consisting of alcohol and motor spirit suitably stabilized. Discusses three methods of obtaining a dehydrated alcohol. *See also Chem. Abs.*, vol. 16, Oct. 10, 1923, pp. 3379-3380.
7307. ——— (A national liquid fuel.) *Technique moderne*, t. 14, 1922, pp. 497-499. Brief discussion of alcohol as a motor fuel, alone and combined with gasoline.
7308. ——— (The "national" motor fuel; its actual status and industrial preparation.) *Bull. assoc. chim. suc. dist.*, t. 39, 1921, pp. 215-231. World's production of petroleum and its consumption in France; proposed fuel composition to be of combustibles produced in France in their relative proportions combined with imported gasoline; methods of dehydration of alcohol. *See also Chem. Abs.*, vol. 16, July 20, 1922, p. 2399.

- 7309.** MARILLER, C., AND VAN RUYMBEKE, —. Sur un procédé pour la production de l'alcool absolu industriel et son application à la préparation du carburant national. *Compt. rend.*, t. 175, Oct. 9, 1922, pp. 588-590. Deals with production of fuel alcohol. Only absolute alcohol mixes satisfactorily with petrole and motor spirit, but the cost of its production makes its use impossible; limestone used as "carbure de calkien" is expensive; use of liquid dehydrants, especially glycerine, gives satisfactory results. *See also* *Chem. Abs.* vol. 17, Jan. 20, 1923, p. 332.
- 7310.** MASFARAUD, M. (The "national" motor fuel; motor alcohol.) *Bull. Assoc. chim. suc. dist.*, t. 39, 1921, pp. 65-93. Advantages and disadvantages of some motor fuels containing alcohol; production and use in France.
- 7311.** MECHANICAL ENGINEERING. Motor-car engineering. Vol. 45, March, 1923, p. 188. Review of article in *Auto Car*, vol. 49, Dec. 29, 1922, pp. 1310-1311. One of chief difficulties of employing alcohol as motor fuel is overcome by using gasoline for starting the car and then operating it on alcohol.
- 7312.** MEUNIER, G. L'alcool ethylique de cellulose. *Bull. soc. d'encourag.*, t. 134, Aug.-Sept.-Oct., 1922, pp. 766-777. Cellulose sources of alcohol; treatment of alcohol; distilling system.
- 7313.** MEZZADROLI, GIUSEPPE. (Alcohol as fuel and its production in Italy.) *Giorn. chim. ind. applicata*, vol. 5, 1923, pp. 125-128. Economic discussion of alcohol as fuel; alcohol yield from various products.
- 7314.** MIDGLEY, THOMAS, JR., AND BOYD, T. A. The application of chemistry to the conservation of motor fuels. *Jour. Ind. and Eng. Chem.*, vol. 14, Sept., 1922, pp. 849-851. Discusses probable decline in gasoline resources. Considers shale oil, oils from coal, and alcohol as replacing gasoline for motor fuel. Increase in efficiency of consumption by improvement of engines considered best way of eliminating detonation.
- 7315.** MONIER-WILLIAMS, G. W. Power alcohol; its production and utilization. London, 1922. 323 pp. Alcohol as a source of future fuel supply when gasoline is exhausted; Chemistry of manufacture; sources; physical and chemical properties; experiments with alcohol and alcohol mixtures for motor fuel; blending with other mixtures, especially benzol. *See also* *Am. Jour. Sci.*, vol. 4, July, 1922, pp. 76-77.
- 7316.** NATHAN, FREDERIC. Les combustibles pour moteurs, en particulier l'alcool. *Chim. et ind.*, Special Number, May, 1923, pp. 627-634. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Vegetable sources of alcohol; production of synthetic alcohol from hydrocarbons.
- 7317.** NATIONAL PETROLEUM NEWS. Czechoslovakia to use benzol-alcohol fuel. Vol. 15, Aug. 8, 1923, p. 95. Fuel consisting of 60 per cent benzol and 40 per cent alcohol is recommended by the Ministry of National Defense. *See also* *Oil and Gas Jour.*, vol. 22, Aug. 2, 1923, p. 132.
- 7318.** ———. Alcohol-benzol fuel used with limited success by Paris omnibuses. Vol. 14, Aug. 23, 1922, p. 28. From article by W. F. Bradley, *Automobile Industries*, July 13, 1922. Discusses disadvantages; greater volume of new motor fuel is required; difficulties are found in starting in cold weather; parts deteriorate.
- 7319.** OHIO GAS AND OIL MEN'S JOURNAL. New fuel mixture for tractors in France. Vol. 4, July, 1922, p. 16. Gasoline-alcohol mixture would dispose of surplus alcohol of sugar beet distillation and would assure France of independence from imported mineral oils. Formula: Gasoline, 900; alcohol, 95°, 100; cyclohexanol, 17.5; phenol, 37.5.

7320. OIL AND GAS JOURNAL. French experiments in alcohol mixture. Vol. 22, Sept. 6, 1923, p. 133. Review of article by M. Peredier, Soc. ing. civils. Brief résumé of results of tests; alcohol-benzol mixtures are suitable motor fuels; results with low-grade kerosene or gasoline and alcohol amounting to 40 to 45 per cent were slightly less satisfactory than mixtures in equal parts.
7321. ——— Alcohol as motor fuel. Vol. 22, June 14, 1923, p. 52. Recent tests with alcohol show that operation cost is less than with gasoline; the same has been found in the case of experiments with "natalite."
7322. ——— Dynakol new fuel in Czechoslovakia. Vol. 22, June 7, 1923, p. 133. New fuel is composed of alcohol, benzol, naphthalin, and ether; successful use with automobiles has been reported.
7323. OIL NEWS. Another successful gasoline substitute. Vol. 11, July 20, 1923, p. 18. New aviation gasoline manufactured from denatured anhydrous alcohol and gasoline.
7324. OIL, PAINT AND DRUG REPORTER. German motor fuel in England. Vol. 104, Nov. 12, 1923, p. 44D. Patented fuel is known as "benzolit" and is composed of 50 per cent benzol, 20 per cent gas oil, and 30 per cent alcohol. See also Bureau of Foreign and Domestic Commerce, Commerce Reports, Nov. 12, 1923, p. 433.
7325. OILDOM. Alcohol motor fuel. Vol. 14, June, 1923, p. 54. So far experiments with alcohol as motor fuel show its superiority to gasoline in respect to thermodynamic efficiency.
7326. ——— African railways using "natalite." Vol. 14, Feb., 1923, p. 62. Sugar-cane product is said to be 90 per cent efficient as compared with gasoline; cost is little more than half as much as that of gasoline. See also Oil News, vol. 11, Feb. 5, 1923, p. 43. Oil Age, vol. 19, Feb. 7, 1923, p. 20.
7327. ORMANDY, W. R., AND CRAVEN, E. C. Carburants à base d'alcool. Chim. et ind., Special Number, May, 1923, pp. 635-637. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Low calorific power of alcohol; characteristics of alcohol mixtures; miscibility of alcohol with ether and hydrocarbons; effect of Et_2O and of higher alcohols as stabilizers.
7328. OSTWALD, W. Die neue Entwicklung der Motorkraftstoffe. Ztschr. angew. Chem., Jahrg. 35, June 9, 1922, pp. 278-280. "A brief review of work on the utilization of motor fuels." Discusses fuel "RKS," composed of 50 parts benzene, 25 parts tetralin, and 25 parts of 95 per cent EtOH .
7329. PETROLEUM TIMES. South Africa's motor fuel. Vol. 9, June 30, 1923, p. 968. Prickly pear, which grows in abundance, produces 13 gallons per ton of alcohol satisfactory for motor fuel.
7330. ——— Protest against the carburant national. Vol. 9, April 7, 1923, pp. 501-502. Objections to new law hold that it gives an inferior combustible, lower calorific, and bad thermic results; that "alcohol-absolute" is little understood as to manufacture and use and is unstable in mixings; and that it rusts parts it touches, and frequent changes in motor designs would be necessary to meet changes in fuel.
7331. POMARET, —, ET NICOLARDOT, P. Distillerie agricole coopérative de la Vallée du Sausseron à Nesles-La-Vallée (Seine-et-Oise). Chim. et ind., Special Number, May, 1923, pp. 69-70. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Methods and apparatus used in distillation of alcohol from sugar beets.
7332. PURGOTTI, A., AND PURGOTTI, L. (The use of alcohol in explosion motors. "Eterol.") Ann. scuola agr. Portici (2), vol. 16, 1920, pp. 1-23. Etherized alcohol is specially treated so as to replace gasoline in motor; composition is constant and results are definite after carburetor is readjusted; results of experiments.

- 7333.** SCARRATT, A. W. The carburetion of alcohol. Sugar (New York), vol. 25, Dec., 1923, pp. 662-663. Factors affecting the successful use of alcohol as combustion-engine fuel.
- 7334.** SCHWERS, F. L'emploi rationnel de divers combustibles liquides dans les moteurs à combustion interne. Chim. et ind., Special Number, May, 1923, pp. 682-701. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Extract from "Travaux et mémoires du comité scientifique du carburant national." Review of investigations and results in regard to efficiency of various liquid fuels in internal-combustion engines, with particular reference to the merits of alcohol. Data.
- 7335.** SOCIETY AUTOMOTIVE ENGINEERS, JOURNAL. Alcohol for motor fuel. Vol. 10, May, 1922, pp. 364-365. Points out that successful adaptation of internal-combustion engines to alcohol involves research and solution of problems relating to metering of charge, distribution to and in the cylinder, combustion characteristics within the cylinder, performance of engine as regards power, flexibility, and economy, and incidental or secondary effects of the fuel on the engine and accessories. Bibliography.
- 7336.** SOCIETY OF CHEMICAL INDUSTRY, JOURNAL. Alcohol as motor fuel. Vol. 41, Sept. 15, 1922, p. 371R. Reviews discussion by E. Barthe, regarding commercial production of absolute alcohol which does not separate when mixed with petrol for motor fuel purposes.
- 7337.** ——— Interim report of the engineering committee of the Empire Motor Fuels Committee. Vol. 41, May 31, 1922, pp. 223R-224R. Reviews report of tests made on alcohol by Ricardo. Results showed that alcohol could be used in all existing types of volatile fuel engine and in especially designed high compression engines; in all instances the thermal efficiency is greater than with hydrocarbon fuels. Cylinder is more easily kept cool than with hydrocarbon, and there is no corrosion. Heat supplied to the carburetor reduced the power-output somewhat, but the thermal efficiency was slightly increased.
- 7338.** STEVENSON, P. J. New motor fuel reported from South Africa. Bureau of Foreign and Domestic Commerce, Commerce Reports, Oct. 30, 1922, p. 277. Tells of new fuel made from juice of the prickly pear combined with chemicals; it is odorless, noncorrosive, and has greater power and flexibility than gasoline.
- 7339.** SYCKS, D. C. Use of alcohol in the Fiat tractor. Bureau of Foreign and Domestic Commerce, Commerce Reports, July 3, 1922, p. 40. Reports that excellent results were obtained in Italy in experiments with a tractor fuel consisting of equal parts of benzol and alcohol.
- 7340.** WATSON, O. W. J. La question du combustible et les transports en commun dans la ville de Londres. Chim. et ind., Special Number, May, 1923, pp. 675-679; discussion, pp. 680-681. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Fuel power of various mixtures of alcohol and benzol compared with gasoline. Discusses results obtained from tests in London.
- 7341.** WOOD, C. W. Power alcohol as a fuel for Egypt. Cairo Sci. Jour., vol. 10, 1921, pp. 9-24. General discussion. Lack of raw material prevents growth of alcohol industry. Chem. Abs., vol. 16, Sept. 10, 1922, p. 2978.
- See also Nos. 1132, 1133, 1134, 1259, 1260, 1267, 1268, 1272, 1284, 1341, 1684, 1790, 3644, 3663, 3717, 3744, 3951, 3962, 3964, 3968, 3977, 3993, 3997, 3998, 4008, 4066, 4071, 4085, 4292, 4307, 4833, 5204, 5978, 6419, 7157, 7198, 7205, 7206, 7207, 7208, 7209, 7215, 7221, 7844.

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7343. ——— Alcohol fuels. British patent 178,498, May 3, 1922.
7344. BOUSQUET, G. H. G. Carburant d'alcool ethylique destiné à remplacer d'essence de pétrole dans la fonctionnement de tous les moteurs qui utilisent ou utiliseront ce combustible. French patent 559,607, June 20, 1923.
7345. CHEMICAL FUEL CO. OF AMERICA, INC. Process for preparing motor fuels containing alcohol. British patent 159,880, May 31, 1922.
7346. DUNSTAN, A. E., AND THOLE, F. B. Utilization of alcohol in the production of liquid fuel. British patent 205,367, Oct. 24, 1923.
7347. ELEKTRIZITÄTSWERK IONZA. (Process for stabilizing commercial paraldehyde, for use as motor fuel.) German patent 369,635, May 13, 1921. Conv. July 15, 1920.
7348. HAWES, J. Alcohol fuel. British patent 184,607, Aug. 30, 1922.
7349. LEFEVRE, E. Constitution d'un nouveau carburant à base d'alcool et de ses dérivés. Addition 25,598 to French patent 563,176, Oct. 9, 1923.
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7351. LORIETTE, P. Process for the production of liquid-fuel mixtures containing alcohol. British patent 188,336, Dec. 5, 1923.
7352. PENHALE, J. Alcohol fuel. British patent 178,373, Apr. 26, 1922.
7353. SOCIÉTÉ RICARD ALLINET ET CIE. Procédé de déshydratation de l'alcool pour carburant. French patent 558,287, May 23, 1923.
7354. U. S. INDUSTRIAL ALCOHOL Co. Process of producing liquid fuel. Canadian patent 221,090, July 18, 1922.
7355. WHITAKER, M. C. Fuel adapted for use in internal-combustion engines. United States patent 1,423,058, July 18, 1922.

BENZOL (727.2)

7356. BERTHELOT, CHARLES. Le pétrole en Auvergne. Jour. du pétrole, 22 Année, May, 1922, p. 7. Possibilities of obtaining a liquid fuel supply by low-temperature carbonization of lignites; oil yield from lignites of several localities.
7357. ERHARD, J. Les benzols au point de vue du carburant national. Chim. et ind., Special Number, May, 1923, pp. 579-582. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Properties of benzol and its merits as a motor fuel; methods of production; treatment.
7358. GAS AGE-RECORD. Naphthalin as a motor fuel. Vol. 51, April 14, 1923, p. 462. Discusses hydrated naphthalin as a motor fuel; production and properties.
7359. GAS WORLD. Preparation and uses of tar and its simple derivatives. Vol. 77, July 22, 1922, pp. 66-71. Reprint of Bureau of Mines Technical Paper 268, by W. W. Odell. Explains that pure benzol is not used as a motor fuel; recommends fuel mixture containing benzol.
7360. HINCKLEY, W. O. The comparative merits of benzol and gasoline as engine fuels. Jour. Soc. Automotive Eng., vol. 11, Oct., 1922, pp. 359-360; discussion, pp. 360-362. Specification for motor-fuel benzol; comparison of properties of benzol and gasoline; data on tests made with benzol and gasoline as fuel.
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- 7362.** LAWTON, J. J. Benzene as a motor fuel. *Jour. Ind. and Eng. Chem.*, vol. 14, July, 1922, p. 635. Observes that calorific value of benzene is 13 per cent higher than that of petrol or gasoline; more mileage is obtained from motor benzene per gallon than from straight gasoline, because it is possible to use a leaner mixture.
- 7363.** LORMAND, C. Le hydrures de naphthaline et leurs emplois. *Chim. et ind.*, Special Number, May, 1923, pp. 602-606; discussion, pp. 606-608. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Production of tetraline from naphthaline; use as fuel; formulas for motor fuels.
- 7364.** MALLET, P. Production générale du benzol. *Chim. et ind.*, Special Number, May, 1923, pp. 529-530. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Merits of benzol as a motor fuel; production data of various countries.
- 7365.** PEIFFERT, P. Le traitement des goudrons et des benzols source de combustibles liquides. *Chim. et ind.*, Special Number, May, 1923, pp. 542-558. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Methods of treatment of crude materials; combustible liquids produced, their properties, and use for motor fuels.
- 7366.** PETROLEUM TIMES. Benzene as motor fuel. Vol. 10, Aug. 11, 1923, p. 206. Compares benzene with standards for ideal motor fuel; greater mileage is obtained than with petrole, as carbon content is higher than in the corresponding paraffin compounds, thus allowing more air in combustion; mixed with petroleum oils it raises their efficiency.
- 7367.** STACK, W. F. Benzol blend better motor fuel than straight gasoline; scientific blending is necessary. *Nat. Petrol. News*, vol. 14, Sept. 6, 1922, pp. 22-24. Low initial of benzol insures air necessary for complete combustion; added to this is casing-head gasoline and a fuel of higher heat unit, making, when supplied in proper proportions, an ideal fuel. Considers advantages and characteristics of a benzol-blend fuel.
- See also* Nos. 1268, 3969, 4137, 4140, 4292, 6275, 7244, 7268, 7324, 7340.

TAR AND TAR OILS (727.4)

- 7368.** COMMENTZ, CARL. Tar-oil fuel for Diesel engines. *Motorship*, vol. 7, Jan., 1922, p. 31. Operation tests with tar oil; characteristics.
- 7369.** DACY, G. H. Plastic fuel can be made of low-grade coal and oil and can be coked even if noncoking coal is used. *Coal Age*, vol. 21, 1922, pp. 953-956. Cheap crude petroleum products may be used to produce a good coke even with anthracite. Describes a commercial plant. *Chem. Abs.*, vol. 16, Aug. 20, 1922, p. 2768.
- 7370.** EBERT, A. (Naphthalene as a motor fuel.) *Schweiz Chem. Ztg.*, 1922, pp. 248-249. Explains that solid $C_{10}H_8$ must be melted before starting and connections cleared before stopping. Only dilute solutions in liquid fuels are practical for motor use. $C_{10}H_8$ burns without residue and its heating power is equal to liquid fuels. *See also* *Chem. Abs.*, vol. 16, Aug. 10, 1922, p. 2588.
- 7371.** HÄUSSER, F., BESTEHORN, R., AND ELLERBUSCH, H. (Experiments on vehicle motors.) *Ber. Ges. Kohlentechnik.*, Jahrg. 1, 1920, pp. 152-160; *Chem. Zentralb.*, vol. 4, 1922, p. 721. Crude-tar fractions as fuel for vehicle operation. Concludes after tests that crude-tar benzine it not practicable for present motors, as valve becomes clogged and exhaust is smoky.
- 7372.** INDUSTRIAL AUSTRALIAN AND MINING STANDARD. The brown-coal asset. Vol. 67, Apr. 13, 1922, p. 686.

- 7373.** JUNIEN, M. The burning of tar oils in Diesel engines. *Oil Eng. and Fin.*, vol. 2, 1922, p. 487; *Chim et ind.*, Special Number, May, 1923, pp. 609-624. Compares analyses of tar with mineral and vegetable oils; qualities most desirable in tar oils; methods of obtaining those qualities.
- 7374.** OIL NEWS. Advantages of colloidal fuel. Vol. 10, July 5, 1922, p. 48. Describes methods of preparation and handling of colloidal fuel.
- 7375.** ROMAN, L. Nouveau carburant pour moteurs à explosion, provenant de la distillation des goudrons. *Chim. et ind.*, Special Number, May, 1923, pp. 583-586; discussion, p. 586. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Preparation and tests with cosmoline, a naphthalene compound; equipment. Conclusions.
- 7376.** SHEPHERD, H. F. Using tar oil in solid-injection engines. *Power*, vol. 56, Dec. 12, 1922, p. 939. Tests with Crosley oil engine; specifications for petroleum residuum from California and Mexican crude oils; design of spray nozzles.
- See also* Nos. 4214, 4819, 5111.

PATENT.

- 7377.** MASCHINENFABR. AUGSBURG-NÜRNBERG A.-G. (Production of liquid fuel from oils containing creosote.) German patent 351,817, Dec. 5, 1920.

OTHER SUBSTITUTES (727.9)

- 7378.** BATES, L. W. Colloidal fuel for railroad use. *Petrol. Ref.*, vol. 11, May 25, 1922, p. 22; June 1, pp. 26-27. Characteristics of colloidal fuel methods of manufacture; merits as a fuel.
- 7379.** CANADIAN CHEMISTRY AND METALLURGY. A new motor fuel. Vol. 7, April, 1923, p. 106. Tells of a successful and economical petrol substitute manufactured from crude whiskey and an extract from a vegetable of Indian origin.
- 7380.** ——— Motor fuel from prickly pear. Vol. 7, March, 1923, p. 73. Tells of industry for the production of industrial alcohol and fuels for lighting, heating, and motor uses which has been organized in South Africa.
- 7381.** CHARLES, —. Les huiles vegetales et leurs applications au chauffage industriel, à la force motrice et à la traction. *Chim. et ind.*, Special Number, May, 1923, pp. 769-774. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Physical properties of several vegetable oils and hydrocarbon oils, and requirements for successful combustion of vegetable oils; use with various types of internal-combustion engines.
- 7382.** LE COURRIER DES PÉTROLES. L'huile d'eucalyptus employée comme carburant. 4e Année, May 26, 1923, pp. 2-3. Reports that high calorific value of eucalyptus oil presented difficulty in starting, but mileage was greater than with usual motor fuel. *See also* Oil News, vol. 11, June 20, 1923, p. 38.
- 7383.** GOFFIN, —. (Tests of an internal-combustion motor using palm-oil fuel.) *Bull. mat. grasses inst. colonial Marseilles*, No. 1, 1921, pp. 19-24; *Experiment Station Rec.*, vol. 45, 1921, p. 690. Report of tests with a two-stroke cycle gas engine modified for palm oil; motor ran as well on palm oil as on gasoline. *See also* Chem. Abs., vol. 16, Sept. 20, 1922, p. 3192.
- 7384.** HÄUSSER, F., BESTEHORN, R., AND ELLERBUSCH, H. (Use of benzine from gas produced by low-temperature carbonization as motor fuel.) *Ber. Gesell. Kohlentechnik.*, Jahrg. 4, 1923, pp. 205-209; *Chem. Zentralb.*, 94, Bd. 4, 1923, p. 220. Tells of producing a good motor fuel equal to motor benzol; having no tendency to preignition. High hydrogen content and

- a more uniform distillation range than motor benzol and benzol mixtures have are characteristics of a good motor fuel. In combustion tests there was no choice between the fuels; Reichkraftstoff required the least lubrication and benzol spirit the most.
- 7385.** IMPERIAL INSTITUTE, BULLETIN. Utilization of palm oil as motor fuel in the Gold Coast. Vol. 20, 1922, pp. 499-501. Reports that palm oil proved to be a satisfactory engine fuel in trial conducted with mineral and palm oils; Tangye semi-Diesel, four-cycle engine used. *See also* Chem. Abs., vol. 17, May 20, 1923, pp. 1878-1879.
- 7386.** ——— Palm oil as a motor fuel. Vol. 19, 1921, p. 515. Trials were made with a semi-Diesel engine which was but slightly modified. Data. *See also* Chem. Abs., vol. 16, Aug. 20, 1923, p. 2769.
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- 7388.** ——— Suction gas as a fuel for motor vehicles. Vol. 68, Sept. 7, 1922, p. 429. Result of tests. Contains drawing of chassis and steam generator of Thornycroft suction gas lorry.
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PAVEMENT AND ROAD BUILDING AND MAINTENANCE (731)

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- See also* Nos. 411, 592, 909, 923, 925, 3220, 3846, 3853, 4026, 4028, 4033, 4035, 4036, 4038, 4074, 4077, 4230, 4233, 4238, 4241, 5792, 5793, 5797.

ROOFING (732)

- 7495.** FINLEY, DOZIER. Petroleum asphalts in the roofing and waterproofing industries. Chem. and Met. Eng., vol. 27, Oct. 18, 1922, pp. 798-803. Account of utilization of petroleum products and their increasing importance for industrial purposes. Tells of early use of tar for roofs, improvement in asphalt roofing materials, asphalt in waterproof paints and coatings, and the composition and uses of various bituminous roofings. *See also* Oildom, vol. 14, June, 1923, pp. 45-47; Oct., pp. 54-56.
- 7496.** U. S. BUREAU OF STANDARDS. United States Government specifications for asphalt-saturated rag felt for roofing and waterproofing. Standard Specifications No. 86, adopted Dec. 29, 1923. Circular 161, March 1, 1924, 5 pp. Pamphlet. Specifications; inspection; laboratory tests.
- See also* No. 7673.

PATENTS.

- 7497.** BECKMAN, B. C., AND HERZOG, A. O. Apparatus for the manufacture of tapered asphalt shingles. United States patent 1,412,828, Apr. 18, 1922.
- 7498.** FERRARI, C. G. Preservative waterproof and mold-proof compound for wrapped food products and method of producing the same. United States patent 1,407,400, Feb. 21, 1922.

WATERPROOFING AND PRESERVING (733)

- 7499.** AMERICAN SOCIETY FOR TESTING MATERIALS. Tentative specifications for asphalt for use in damp proofing and waterproofing above ground level. Vol. 22, 1922, pp. 865-866.
- 7500.** ——— Tentative specifications for asphalt for use in damp proofing and waterproofing below ground level. Vol. 22, 1922, 863-864.
- 7501.** ——— Tentative specifications for primer for use with asphalt for damp proofing and waterproofing below and above ground level. Vol. 22, 1922, pp. 857-868.
- 7502.** COOPER, S. D. Tie-treating practices of the A. T. & S. F. Ry. RAILWAY REV., vol. 73, Sept. 22, 1923, pp. 415-418. Includes an account of petroleum treatment.

- 7503.** ENGINEERING AND CONTRACTING. Waterproofing processes for preservation of masonry walls. Vol. 60, Nov. 28, 1923, pp. 1153-1154. Use of paraffin wax for damp proofing.
- 7504.** ——— Asphalt lining for drainage ditches. Vol. 60, Nov. 14, 1923, p. 1002. Method used in Borneo, East Indies, for control of mosquitoes. Describes lining. Asphalt is applied to bottom and sides of drain and sand is sprinkled thereon; this coating is then ignited with aid of oil and a permanent coating is formed upon cooling.
- 7505.** ENGINEERING NEWS-RECORD. Paraffin and poisons for wood preservation. From article by Paul Bartsh, National Lumber Bulletin, vol. 89, Sept. 21, 1922, p. 491. Paraffin combined with iodine of arsenic, iodine of copper or other poison, and injected into wood renders it proof against destructive organisms for indefinite period; paraffin penetrates wood more readily than other preservatives commonly used.
- 7506.** RAILWAY REVIEW. Oiling prevents corrosion of rail and fixtures. Vol. 73, Sept. 15, 1923, pp. 377-378. Type of oil used to prevent deterioration; car and equipment used in application. Illustrations.
- 7507.** SEILER, J. F. Wrapping concrete bridge abutments in an asphalt blanket. Munic. and County Eng., vol. 64, April, 1923, pp. 135-136. Asphalt coatings were applied at foundations of abutments to prevent disintegration of concrete by alkali.
- 7508.** STANDARD OIL BULLETIN. Asphalt—the binder. Vol. 11, Dec. 1, 1923, pp. 5, 6. Ancient use of asphalt for mortar and waterproofing; early use in California for floors.
- 7509.** ——— Lining for irrigation canals. Vol. 11, Oct., 1923, pp. 6-7. Experiments have proved the value of asphalt-concrete lining in irrigation canals.
- 7510.** ——— Asphalt—the binder. Vol. 11, Dec. 1, 1923, pp. 5-6. Ancient use of asphalt for mortar and waterproofing purposes; early uses in California for floors.
- 7511.** WHITE, A. H. Integral waterproofings for concrete. Ind. and Eng. Chem., vol. 15, Feb., 1923, pp. 150-153. Graphs show water absorption by mortars without waterproofing applications; results of tests with waterproof agents, such as hydrated lime, clay, petroleum residues, and insoluble soaps. See also Nos. 3271, 3278, 3283, 3345, 3667, 5777, 5845, 7721.

PAINTS AND PAINT VEHICLES (INCLUDING DETECTION OF PETROLEUM SUBSTITUTES IN PAINT VEHICLES) (734)

- 7512.** GARDNER, H. A., AND BIELOUSS, E. Drying oils from petroleum and other products, obtained by chlorination and dechlorination. Jour. Ind. and Eng. Chem., vol. 14, July, 1922, pp. 619-621. Experiments made in developing a commercial process to produce a drying oil from petroleum shows that the petroleum product is equal to raw linseed as a drying oil; other desirable characteristics; dark color precludes its use in paints, except with dark colors.
- 7513.** GAS WORLD. Oils and paints for gas works. Vol. 78, Feb. 17, 1923, pp. 139-140. Paper read by H. Chaloner before the Manchester and District Junior Gas Assoc., Feb. 17, 1923. Discusses suitability of oil, metallic oxide, and bituminous paints for protection against certain forms of corrosion.
- 7514.** THAYER, H. H. Protective coatings for shipbuilding purposes—bituminous compositions. Marine Eng., vol. 28, June, 1923, pp. 369-371. Contains Shipping Board specifications for asphalt coatings; methods of application required by Navy Department.

- 7515.** THAYER, H. H. Cement and concrete for shipbuilding purposes. II. *Marine Eng.*, vol. 27, June, 1922, pp. 391-393. Specifications for bituminous hull paints.
- 7516.** U. S. BUREAU OF STANDARDS. United States Government specification for asphalt varnish. Standard specification No. 19, revised Jan. 2, 1923. *Circ. No. 104*, Jan. 30, 1923, 7 pp. Specifications for composition and general characteristics, and testing methods.
- 7517.** ——— United States Government specification for volatile mineral spirits for thinning paints. Standard Specification No. 16. *Circ. No. 98*, 1923, 10 pp. Method of testing, standards, and basis of purchase of petroleum distillates known as mineral spirits.
- See also* Nos. 3363, 3365, 5795, 5857, 5874.

LUBRICATION (740)

- 7518.** BAILEY, W. H. The present status of lubrication engineering. *Petrol. World* (Los Angeles), vol. 8, Aug., 1923, pp. 42, 67, 74, 76, 80. Points out that lack of scientific knowledge concerning the production and application of mineral-oil lubricants results in waste of valuable materials. Purpose of the American Society of Lubrication Engineers.
- 7519.** BREWER, A. F. What the lubrication engine has done for power plant maintenance. *Ind. Management*, vol. 66, Nov., 1923, pp. 281-289. Classes of lubricants for power-plant use; power-plant equipment requiring lubrication; describes a lubricating and filling system.
- 7520.** ——— Lubrication problems and their correction. *Ind. Management*, vol. 66, Sept., 1923, pp. 134-139. Types of lubricating oils and their use for special purposes; importance of correct lubrication justifies study of individual needs and problems.
- 7521.** ——— Selecting and handling lubricants for the boiler room. *Combustion*, vol. 8, May, 1923, pp. 304-306. States that properties of lubricating oils should vary in accordance with purpose for which they are used. Gives composition of oils for steam cylinders, pumps, and chain gear. Recommends that care be taken in storage to prevent contamination and waste; use.
- 7522.** ——— The technical supervision of plant lubrication. *Ind. Management*, vol. 64, Sept., 1922, pp. 141-144; Oct., pp. 221-223. Importance of supervised lubrication under direction of lubrication engineer; recommends storage methods; discusses organization and operation of a supervised lubrication system.
- 7523.** ——— The lubrication of steam turbines. *Ind. Management*, vol. 63, April, 1922, pp. 206-207. Discusses main features of chief types of lubricating systems; working conditions which must be considered in selection of an oil of right viscosity.
- 7524.** DUCKHAM, ALEXANDER, AND BOWREY, S. E. Ball-bearing lubrication. *Engineering*, vol. 116, Nov. 16, 1923, pp. 612-613. Characteristics desirable in the several types of lubricants suitable for use on ball-bearing parts.
- 7525.** DUFFING, —. Über Schmieröle, Lagerreibung, and Reibungsversuche. *Ztschr. angew. Chem.*, Jahrg. 35, Oct. 20, 1922, pp. 605-607. Discusses lubricants and investigations regarding surface friction.
- 7526.** ENGINEERING. Tubular oil cooler. Vol. 114, July 21, 1922, p. 89. Description and diagram of cooling system for lubricating oil.
- 7527.** HENNESSY, J. J. Present lubrication methods faulty. *Railway Age*, vol. 72, Feb. 25, 1922, pp. 487-489. Oil is better for journal lubrication than grease; notes shortcomings of both grease and oil lubricants.

7528. HOFF, F. A. Steam turbines and their lubrication. *Oil News*, vol. 11, Sept. 5, 1923, p. 15. In an Ingersoll-Rand type of turbine the oil grooves in Babbitt box must extend entirely around or bearing pressure will exceed forced feed pressure; ring oils must be true to insure proper lubrication. Mentions types of oil which are unsuited to turbine lubrication.
7529. HYDE, J. H. *Lubrication and lubricants*. London, 1922. 114 pp. Scientific principles governing reduction of friction by solid or liquid lubricants; friction by solid or liquid lubricants; friction of different materials; chemical and physical tests of lubricants; theory and practice of lubrication and of physical and chemical properties; testing methods.
7530. LUBRICATION. Lubrication in the printing industry. Vol. 9, Dec., 1923, pp. 133-144. Parts requiring lubrication; types of oil required.
7531. ——— Steam power-plant prime movers and their lubrication. Vol. 9, Nov., 1923, pp. 121-128. Method of lubricating reciprocating steam engines; parts that require lubrication; suitable lubricants.
7532. ——— Steam-turbine lubrication. Vol. 9, Nov., 1923, pp. 129-132. Factors affecting character of turbine lubricants are: (1) Rotational speed; (2) size of bearings; (3) clearance space. Turbine oil should cool bearings and withstand evaporation to greatest possible extent; precautions should be taken to prevent decomposition and sludging of oil.
7533. ——— Why automobile oils must be periodically renewed. Vol. 9, Sept., 1923, pp. 97-104. Attributes deterioration to dilution of crank-case oil; solid impurities, carbon, and sludge also impair the lubricating value. Gives precautions against dilution.
7534. ——— Modern glass-making machinery and its lubrication. Vol. 8, Dec., 1922, pp. 133-144. Excessive heat and dust conditions existing in glass industry make necessary the utmost care in selection and application of lubricants.
7535. ——— Lubrication in the baking industry. Vol. 8, Nov., 1922, pp. 121-131. Careful selection of lubricant is highly important, as there is a possibility of contaminating the dough.
7536. ——— Lubrication of electric railway gears and pinions. Vol. 8, Nov., 1922, pp. 131-132. Requirements of gear lubricant; special factors.
7537. ——— Lubrication of firearms. Vol. 8, Oct., 1922, pp. 119-120. Properties of lubricant; application of lubricant and cleaning of gun.
7538. ——— Lubrication of flour-milling machinery. Vol. 8, Oct., 1922, pp. 109-119. States that type of oil for general use is straight-run unblended heavy engine oil of 400 to 500 sec. Saybolt universal viscosity at 100° F.
7539. ——— Lubrication of economizers. Vol. 8, Sept., 1922, pp. 106-108. Care of economizer equipment; application and types of lubricating oils. *See also* *Power Plant Eng.*, vol. 26, Dec. 15, 1922, pp. 1214-1215.
7540. ——— The lubrication of laundry machinery. Vol. 8, Sept., 1922, pp. 97-106. Moisture and heat to which various types of laundry machinery are subjected make type of lubricant an important factor.
7541. ——— Elevator lubrication. Vol. 8, Aug., 1922, pp. 85-94. Discusses type of lubricant and its application; lubrication of worm gear presents a research problem.
7542. ——— Some motor "lubrication failures" due to hidden causes. Vol. 8, June, 1922, pp. 69-72. Points out that effects of neglect and misuse of motor can not be counteracted by lubrication.
7543. ——— The superheated locomotive—its lubrication. Vol. 8, May, 1922, pp. 49-60. Principles of successful operation of superheated steam, and the importance of correct lubrication.

7544. LUBRICATION. Shoe machinery. Vol. 8, April, 1922, pp. 37-44. Properties of oils for light machinery and heavy machinery.
7545. ——— Lubrication of the uniflow engine. Vol. 8, Feb., 1922, pp. 13-21. Principles of operation of engine and selection of lubricating oils; illustrations of engine parts.
7546. LUDWICK, W. A. Lubrication and lubricants. Steam, vol. 29, June, 1922, pp. 157-164. Selection of lubricants; discusses characteristics of straight-run, blended, mineral, and animal oils; greases.
7547. MARINE ENGINEERING. An economizer that required no outlay. Vol. 28, June, 1923, pp. 356-359. Principles and suggestions regarding good lubricating practice.
7548. ——— Application of lubricants. Vol. 27, March, 1922, pp. 201-202. Distinctive features of types of lubricating systems; parts of machinery which require lubrication; method of application.
7549. MILLER, P. F. Maintenance of oil in use. Oil News, vol. 10, Aug. 20, 1922, pp. 29-30. Methods of oil purification; merits of centrifugal reclamation and continuous purification; effects of sludge accumulation.
7550. MOORE, HAROLD. Graissage des moteurs à combustion interne à huiles lourdes. Chim. et ind., Special Number, May, 1923, pp. 325-329. (Trans. Internat. Expos. Combust. Liquids, Paris, Oct., 1922.) Three classes of heavy oil engines; discusses types of lubricants required by them. See also Oil Eng. and Fin., vol. 2, 1922, p. 525.
7551. NAUTICAL GAZETTE. Correct lubrication is important factor in engine efficiency. Vol. 103, Sept. 16, 1922, p. 360. General characteristics required of cylinder oil; oiling methods and factors of correct lubrication.
7552. NUGEY, A. L. Rudiments of lubrication. Oil News, vol. 11, June 20, 1923, p. 44. Observes that brass in combination with other metals gives least frictional resistance. Discusses storage of lubricating oil. Definition of testing methods.
7553. OIL NEWS. Lubrication of railway cars. Vol. 10, July 20, 1922, p. 39. Rules for maintenance of lubricant in journal box; well-fitted dust guard essential.
7554. OSBORNE, W. F. The lubrication of Diesel engines. Power, vol. 56, Dec. 12, 1922, p. 944. Parts requiring lubrication; methods; types of oil.
7555. ——— Lubrication in internal-combustion engines. Bessemer Monthly, No. 203, Nov., 1922, pp. 2, 4. Points out necessity of selecting lubricant to withstand high temperatures occurring on exhaust stroke of piston.
7556. ——— Methods of lubricating the cylinders of internal-combustion engines. Power, vol. 56, Nov. 28, 1922, pp. 832-833. Points out that gasoline which is lower in viscosity than water is serious menace to viscosity of crank-case oil.
7557. ——— Why lubrication of gas engines is difficult. Power, vol. 56, Nov. 21, 1922, pp. 807-808. States that viscosity of lubricating oil is reduced by dilution with fuel oil. This may be offset by increasing temperature of circulating water.
7558. ——— Selecting ammonia compressor oils. Power, vol. 56, Oct. 10, 1922, pp. 566-567. Discusses operating conditions and properties required of lubricating oils.
7559. ——— Notes on air-compressor lubrication. Power, vol. 56, Sept. 26, 1922, p. 490. Pressures required for naphthene and paraffine oils of several viscosities.
7560. ——— Effect of superheated steam on cylinder lubrication. Power, vol. 56, Sept. 5, 1922, pp. 352-353. Observes that medium-viscosity compounded cylinder oil is best for wet steam; after lubrication complete atomization and evaporation should be provided to prevent carbonizing.

7561. OIL NEWS. Keeping an oil film on the cylinder walls. *Power*, vol. 56, Aug. 22, 1922, pp. 288-289. Oil film prevents corrosion of cylinder. Discusses physical properties desirable in a cylinder oil.
7562. ——— Atomizing cylinder lubricating oil. *Power*, vol. 56, Aug. 8, 1922, pp. 202-203. Finely atomized oil produces best lubricating results, as it adheres to surface and also remains in suspension better than large globules. Discusses atomizing devices and their operation with mechanical lubricators.
7563. ——— Lubricating reduction gears. *Power*, July 25, 1922, pp. 126-127. Selection of type of oil for turbine gear bearings.
7564. ——— Behavior of lubricating oil in steam turbines. *Power*, vol. 56, July 18, 1922, pp. 94-95. Defects in design or operation of lubricating system and their effect upon oil; suggested remedies.
7565. ——— The problem of lubricating steam-engine bearings. *Power*, vol. 56, July 11, 1922, pp. 53-54. Discusses lubricating systems and devices to prevent deterioration of oil. Illustration of method for preventing entrance of water to engine frame.
7566. ——— Finding a suitable lubricating oil for a circulating system. *Power*, vol. 56, July 4, 1922, pp. 15-16. Recommends frequent analysis of oil in system to determine its condition as compared with fresh oil.
7567. ——— Effect of high temperatures on lubricating oil in circulating systems. *Power*, vol. 55, May 16, 1922, pp. 781-782. Heat causes loss of oil by evaporation and increase in viscosity; objections to low temperature in lubricating system.
7568. ——— Advantages of the ring-oiling bearing. *Power*, vol. 55, May 2, 1922, pp. 697-698. Directions for selection of best grade of oil for purpose; maintenance of lubricating efficiency by replacing deteriorated oil.
7569. ——— Lubricating without an oil film. *Power*, vol. 55, April 25, 1922, p. 660. Explanation of theory of filmless lubrication.
7570. ——— A few notes on film lubrication. *Power*, vol. 55, Apr. 18, 1922, pp. 613-614. Effect of load, surface, and viscosity on lubrication efficiency.
7571. ——— Compounding of lubricating oils. *Power*, vol. 55, Apr. 4, 1922, pp. 535-536. Discusses types of compounded oils and their special uses for marine and power-plant purposes.
7572. ——— The cause of emulsions in lubricating oils. *Power*, vol. 55, March 28, 1922, pp. 502-503. Notes that viscosity is important factor in the control of emulsification; satisfactory tests for emulsifying qualities have not been developed.
7573. PARISH, W. F. The crank-case oil dilution problem and its solution. *Jour. Soc. Automotive Eng.*, vol. 11, July, 1922, pp. 35-45; discussion, pp. 45-47. Cause and effects of crank-case oil dilution and its effects upon viscosity; to meet this problem a water and fuel extraction system, which includes a filter for carbon and sand, may be combined with lubricating system. Data on tests, showing effects of dilution and results of installation of oil refiner.
7574. ——— When is oil "good"? Preprint of paper to be presented before the March meeting of Chicago members of the American Society of Lubricating Engineers, March 3, 1922, 5 pp. Mimeographed. Discusses good and poor motor fuels and the dilution problem; suggests treating the mixed lubricating oil and fuel by a process of regeneration while the engine is operating. *See also* *Internat. Petrol. Rep.*, vol. 1, Mar. 22, 1922, pp. 13-14. *Oil News*, vol. 10, Apr. 5, 1922, pp. 33-34.

7575. PARISH, W. F. The lubricating-oil business and the work of the lubrication engineer. *Chem. Age.*, vol. 30, Feb., 1922, pp. 61-63. Importance of lubricants in industry. Development of machinery has required improved lubricants of various types, consisting almost entirely of mineral oils. Gives facts regarding the use of lubricating oils and their general characteristics.
7576. PÉROT, RENÉ. Le graissage des compresseurs d'air. *Génie civil*, t. 81, Dec. 16, 1922, pp. 569-570. Study of lubrication; properties desirable in the lubricating oils used on air compressors.
7577. PETROLEUM AGE. Lubrication. Vol. 11, Apr. 1, 1923, pp. 37, 39. Economics of lubrication.
7578. PLANIOL, ANDRÉ. Influence de la vitesse et de la température sur les pertes par frottements dans les moteurs à explosions. *Compt. rend.*, t. 176, April 16, 1923, pp. 1044-1047. Shows that theories attributing change in lubricating oil to variation of losses are not consistent with results of tests.
7579. PORTEUS, T. C. Lubrication of paper mills. *Oil News*, vol. 10, June 20, 1922, pp. 35-36. Paper before meeting of paper-mill superintendents, Brunswick, Maine. Points out that grease forms a film on parts and gives better service than a liquid lubricant; describes tests and results.
7580. POWER PLANT ENGINEERING. Lubrication of the uniflow engine. Vol. 26, May 1, 1922, pp. 477-479. Problems of lubrication; characteristics required of lubricating oil.
7581. QUINN, E. A. Problems in steam-plant operation. *Jour. Elec. and West. Ind.*, vol. 50, May 15, 1923, pp. 370-377. Data on turbine oils of various kinds, giving properties and details regarding service obtained; recommendations and conclusions.
7582. RAKUSIN, M. A. Vergleichende Untersuchung von Mineral- und Pflanzenölen in Anwendung für Schmierzwecke. *Petroleum Ztschr.*, Jahrg. 19, May 10, 1923, pp. 454-456. Data on comparative tests with mineral and vegetable oils to determine a suitable substitute for the more expensive vegetable-oil lubricants.
7583. RATHBUN, J. B. A dozen causes of dilution. *Petrol. Age*, vol. 10, July 1, 1922, pp. 76, 78. Enumeration of causes of thin crank-case oil.
7584. ROSNER, —, AND NAVRAT, VIKTOR. Ergebnisse der Versuche über die Haltbarkeit vom Emulsionen, welche Mineralöle bei wechselndem Rüböl-zusatz mit Seewasser bilden. *Petrol. Ztschr.*, Jahrg. 19, June 20, 1923, pp. 611-612. Data on investigation to determine stability emulsions of mineral and rape oil with sea water. Results show that this emulsion is satisfactory for use in marine engines.
7585. STANTON, T. E. Some recent researches on lubrication. *Jour. Am. Soc. Naval Eng.*, vol. 35, Feb., 1923, pp. 175-184. Review of Reynolds and Towers theories of lubrication; results of experiments carried out on principles of perfect lubrication.
7586. THOMAS, J. Recent developments in lubrication with special reference to graphite. *Trans. Min. and Geol. Inst., India*, vol. 17, pt. 2, Nov., 1922, pp. 93-109.
7587. WÄRME UND KÄLTE TECHNIK. (Lubricants and their substitutes.) Vol. 24, March 1, 1922, pp. 53-56. Account of oil substitutes for lubricants in Germany.
7588. WHITE, R. B. Engine bearing lubrication. *Oil News*, vol. 10, Sept. 5, 1922, p. 35. Viscosity of oil should vary according to horsepower. Discusses lubricating systems.

See also Nos. 3411, 3617, 3618, 3622, 3625, 3626, 3629, 3630, 3631, 3633, 3639, 3641, 3643, 3653, 3921, 4023, 4039, 4041, 4042, 4043, 4044, 4045, 4046, 4047, 4048, 4049, 4050, 4051, 4052, 4053, 4054, 4055, 4056, 4057, 4058, 4059, 4060, 4061, 4062, 4063, 4064, 4089, 4095, 4148, 4150, 4158, 4163, 4165, 4168, 4169, 4174, 4177, 4182, 4186, 4192, 4200, 4316, 4317, 4357, 5711, 5719, 6227, 6336, 6356, 7197, 7225, 7429, 7614, 7670.

PATENT.

7589. ASPDEN, T., AND TOLLEY, W. J. Lubricating liquid to be added to motor spirit. British patent 202,830, Aug. 30, 1923.

PURIFICATION AND RECLAMATION (741)

- 7590.** AUTOMOTIVE INDUSTRIES. Reconditioning crank-case lubricating oil by a new method. Vol. 46, April 27, 1922, pp. 910-911. Description and diagram of a refining system which separates water and fuel from lubricant and which also filters sediment.
- 7591.** BREWER, A. F. Reclaiming power-plant lubricants. Elec. Light and Power (Chicago), vol. 1, Oct., 1923, pp. 13-16, 64-65. Methods of reclaiming and purifying lubricants.
- 7592.** ———. Getting better service from lubricating oils. Ind. Management, vol. 65, Jan., 1923, pp. 13-18. Equipment for and methods of purifying and reclaiming lubricating oils in order to prolong their service and obtain a maximum grade of efficiency while in use; illustrations and diagram of filtering and centrifugal apparatus.
- 7593.** BURKE, F. S. Effect of bearing metals on the color of oil. Atlantic Conn. Rod, vol. 15, Sept., 1922, pp. 12-13. Oil in contact with lead loses its color; recommends that filtration be provided to remove matter causing discoloration.
- 7594.** CLAYDEN, A. L. Dilution of crank-case oil is serious factor, even in summer. Automotive Ind., vol. 49, Aug. 30, 1923, pp. 415-417. Recommendations for prevention of dilution and exclusion of impurities. Discusses possible screening methods. Crank case should have a control convenient for opening draincock, so that oil may be changed at regular intervals.
- 7595.** CROSS, ROY. Lubricants for gasoline engines. Oil and Gas News, vol. 13, Aug. 6, 1923, pp. 16-17. Selection of lubricants should be based on use; desirable properties of a lubricant; factors affecting efficiency; effect of impurities and what they show.
- 7596.** DICKIE, D. W. A new lubrication development. Pacific Mar. Rev., vol. 20, Sept., 1923, pp. 451-452. Improvement in product is result of refining waste lubricating oils. Gives observations and results of oil recovery tests.
- 7597.** DRYSDALE, G. A. A simple method of reclaiming lubricating oils. Power, vol. 56, Nov. 23, 1922, p. 850. Illustration of lubricating oil reclaimed; data on sample tests.
- 7598.** DUMAS, PAUL. Problems of crank-case oil dilution. Motor Age, vol. 41, June 29, 1922, pp. 23-25. Discusses cause, effects, prevention of dilution, and devices on car for recovering diluted oil. Illustrations.
- 7599.** ELECTRIC RAILWAY JOURNAL (NEW YORK). Oil and waste reclaimed with profit in Milwaukee. Vol. 60, Nov. 18, 1922, pp. 805-808. Apparatus and method used to reclaim oil and waste in motor, axle, and journal housings.
- 7600.** ELEKTROTECHNISCHES ANZEIGER (BERLIN). (Apparatus for recovery of lubricating-oil residues.) Jahrg. 40, Jan. 18, 1923, pp. 74-76; Jan. 20, pp. 80, 82. Describes automatic apparatus for separation of water from oil and purifying oil.

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7602. HAPGOOD, C. H., AND BOYD, F. R. C. Maintaining the efficiency of turbine lubricating oil. Gen. Elec. Rev., vol. 25, Sept., 1922, pp. 548-554. Chief types of oil-purifying equipment; principles of operation of the centrifugal oil purifier and their application to purification of lubricating oils.
7603. HENN, E. C. Supplying oil to 2,000 automatic screw machines. Am. Machinist, vol. 56, Jan. 5, 1922, pp. 4-7. Describes system for storing, distributing, sterilizing, and reclaiming oil.
7604. HERSCHEL, W. H., AND ANDERSON, A. H. Reclamation of used petroleum lubricating oils. Technol. Paper 223, Bureau of Standards, Oct. 21, 1922, pp. 93-108. Pamphlet. Method of purifying lubricating oil; results of tests in reclaiming airplane motor oil. States that reclaimed oil passes usual requirements for lubricating oils. Conclusions.
7605. HOFF, F. A. Reclaiming crank-case oil. Oil News, vol. 11, July 20, 1923, pp. 17-18. Reclaiming methods.
7606. LANGSTON, R. E. Oil conservation and better lubrication. Am. Machinist, vol. 56, Jan. 5, 1922, pp. 27-28. Importance of selecting lubricants in accordance with use for which they are intended; obtaining greatest efficiency from lubricating oils; filtration of used oil to prevent loss.
7607. LEE, C. K. Using a lubricating-oil reclaimer on semi-Diesel engines. Power, vol. 57, Feb. 6, 1923, p. 207. A method of removing carbon from oil.
7608. MOTOR AGE. Reclaiming old cylinder oil. Vol. 43, May 31, 1923, p. 42. Process and equipment required.
7609. MOTORSHIP. Practical utilization of the DeLaval purifier. Vol. 8, Apr., 1923, p. 275. Explains that electrically drawn oil purifier is used to eliminate impurities in oil discharged from crank case and passing to lubricating oil tank.
7610. OSBORNE, W. F. Necessity of heating and cooling lubricating oil. Power, vol. 55, May 30, 1922, pp. 858-859. Heater for breaking an emulsion is recommended as part of circulatory lubricating system; advises that cooler be installed to reduce oil to required temperature. Points out that temperature requirements vary with characteristics of oil.
7611. PACIFIC MARINE REVIEW. The purification of used lubricating oils. Vol. 20, Aug., 1923, pp. 398-399. Centrifugal purification of Diesel engine oils; experiments with Sharples supercentrifuge.
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COSTS (770)**

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INSECTICIDES AND DISINFECTANTS (792)

See No. 7505.

ORE FLOTATION (793)

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PURIFICATION AND RECLAMATION (798.1)

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