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**INDUSTRIAL RESEARCH LABORATORIES**  
**OF THE**  
**UNITED STATES**  
**Including Consulting Research Laboratories**

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**EIGHTH EDITION**

**1946**



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1946

**BULLETIN**  
**OF THE**  
**NATIONAL RESEARCH COUNCIL**  
**NUMBER 113 JULY 1946**

**INDUSTRIAL RESEARCH LABORATORIES**  
**OF THE**  
**UNITED STATES**  
**Including Consulting Research Laboratories**

**EIGHTH EDITION**  
**1946**

**COMPILED BY CALLIE HULL**  
**WITH THE ASSISTANCE OF MARY TIMMS AND LOIS WILSON**

**PUBLISHED BY THE NATIONAL RESEARCH COUNCIL**  
**NATIONAL ACADEMY OF SCIENCES**  
**WASHINGTON, D. C.**

**The Lord Baltimore Press**  
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## PREFACE

With the publication of Bulletin Number 113, the National Research Council issues the Eighth Edition of the directory, **INDUSTRIAL RESEARCH LABORATORIES OF THE UNITED STATES**.

The first edition appeared in 1920 and contained a listing of 297 companies which maintained industrial research laboratories. With each new edition since that time, effort has been made to reach laboratories not heretofore included as well as new laboratories more recently established. The technical press has cooperated by carrying notices of the forthcoming edition and in urging the consideration of the Council's offer to send a questionnaire to any company requesting one.

A clipping of the previous entry was sent for revision to each of the 2,264 laboratories included in the 1940 edition. Requests were sent three times to companies from which no reply had been received, after which the entry was dropped from the new edition as no unrevised material is included.

It should be noted that the *number* of companies in each edition is not necessarily a fair measure of the growth or decline of industrial research over any period of time unless several factors, for example the absorption of one laboratory by another through merger or other means, are considered.

The present situation in regard to the reconversion of laboratories to a peace-time basis both in activities and in staff was taken into consideration but the need for information which was more current than that of the 1940 edition was the deciding factor in compiling the Eighth Edition at this time. The data included in the Eighth Edition of the directory were received during the period August 1945 through January 1946.

It is of interest to note the distribution by profession of the personnel employed in industrial research laboratories listed in this publication. The following table summarizes the data taken from the returned questionnaires. An estimated 5,000 may be added to the total since several large companies did not report the number of persons on their laboratory staffs.

### DISTRIBUTION OF RESEARCH PERSONNEL BY PROFESSION

Chemists .....	21,095	Physicists .....	2,660
Biologists .....	1,659	Metallurgists .....	2,364
Engineers .....	20,637	Psychologists .....	22
Doctors of Medicine.....	236	Geologists .....	81
In other scientific professions (unclassified).....			5,567
<b>TOTAL SCIENTIFIC PERSONNEL.....</b>			<b>54,321</b>
Technical personnel NOT included above.....			34,563
Combined number of administrative, clerical, maintenance, and similar personnel .....			44,631
<b>TOTAL NUMBER OF LABORATORY PERSONNEL.....</b>			<b>133,515</b>

An appendix has been included for the first time in this edition, listing colleges and universities which offer research service to industry. A letter, including a brief form asking for the name of the institution and the person to whom correspondence should be addressed, was sent to 800 universities and colleges. The list of 292 institutions given in the appendix contains the names of those which returned the form with the information as given. No further inquiry was made than this.

In compiling this series of directories, the term *research* has been interpreted in accordance with the definition expressed in the first edition:

Industrial research is the endeavor to learn how to apply scientific facts to the service of mankind. Many laboratories are engaged in both industrial research and industrial development. These two classes of investigation commonly merge so that no sharp boundary can be traced between them. Indeed, the term *research* is frequently applied to work which is nothing else than development of industrial processes, methods, equipment, production or by-products.

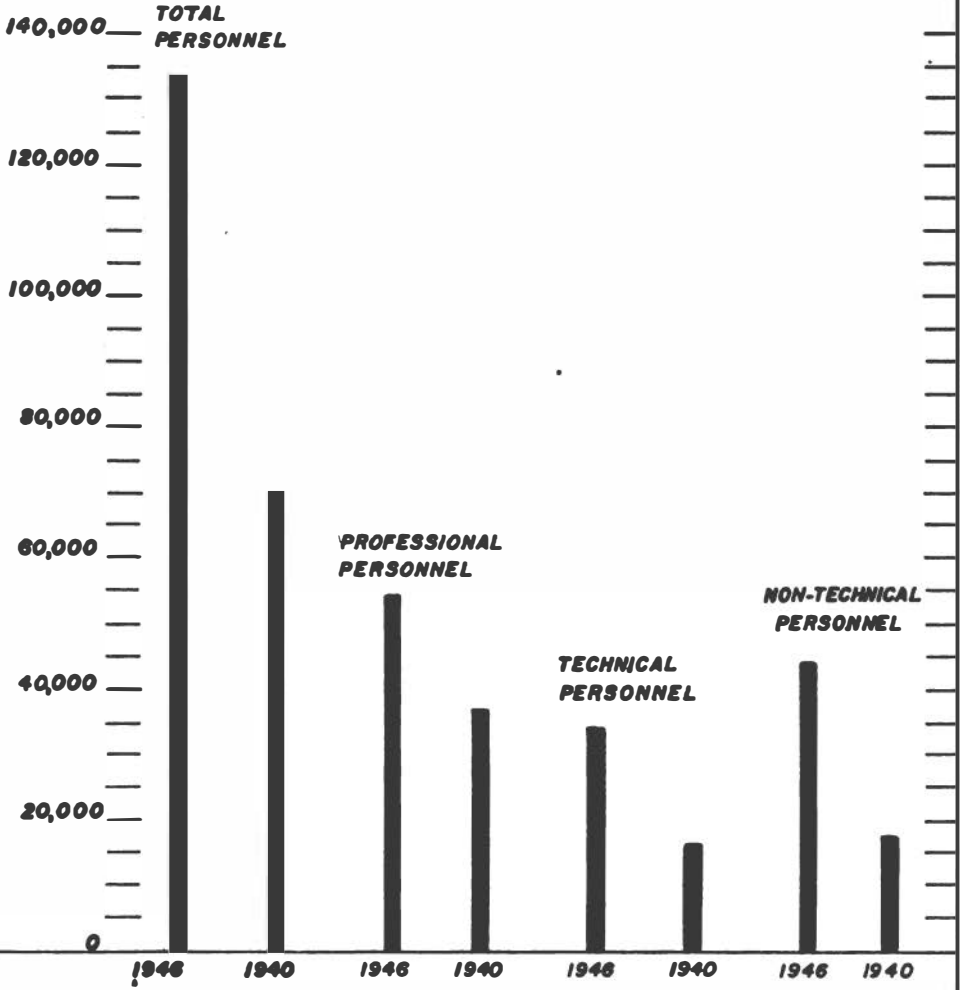
Laboratories connected with federal, state, or municipal governments have not been included except in a few cases where it seemed that the work was so closely associated with industry that information would be of direct interest to companies undertaking research. With this in mind, the National Bureau of Standards has been included again, and, for the first time, the Regional Research Laboratories of the U. S. Department of Agriculture. University and college laboratories are not included except in the appendix.

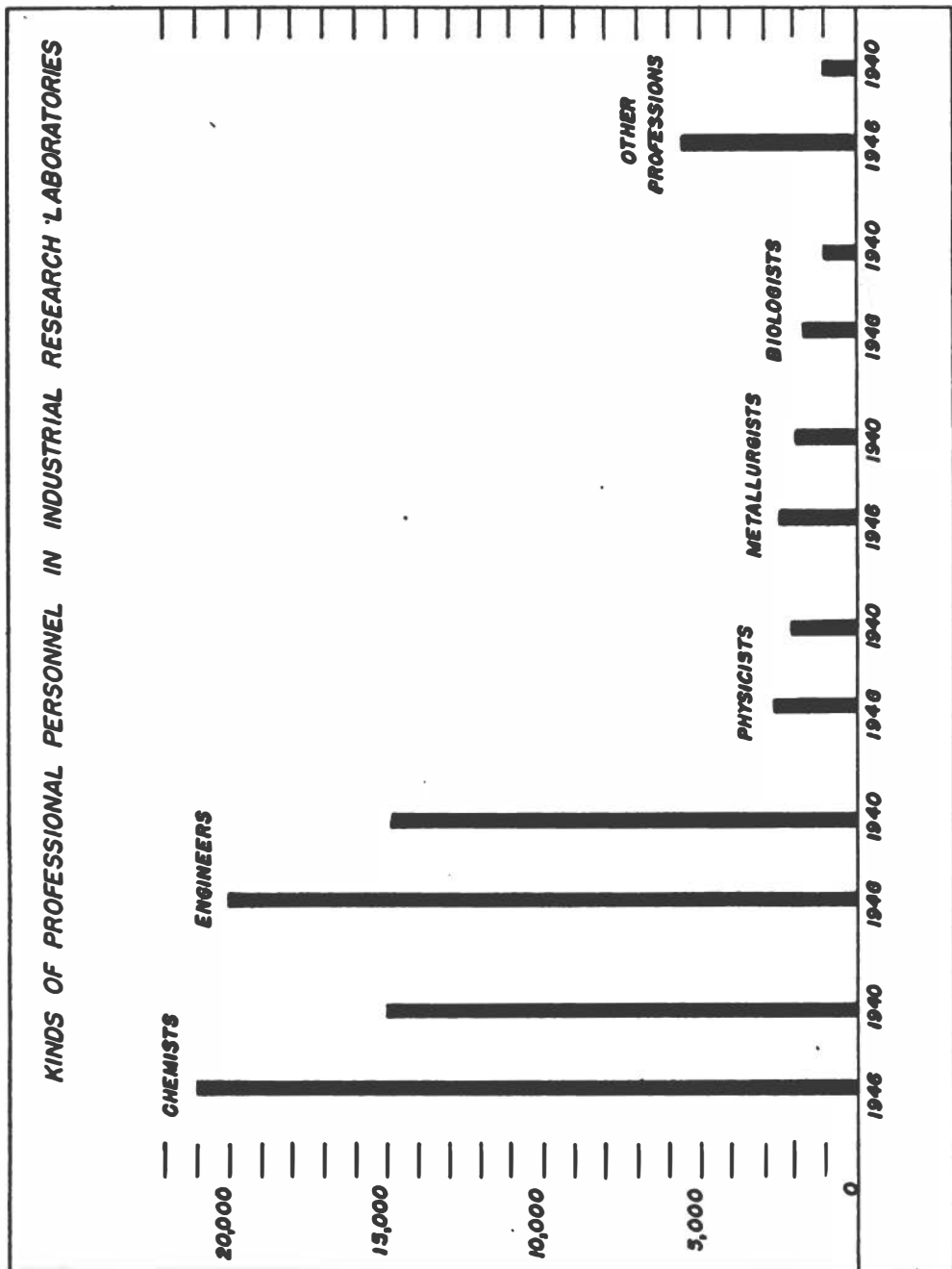
The directory carries three indexes: A Geographical Distribution of Laboratories; a Personnel Index (containing more than 7000 names); and a Subject Index of Research Activities.

Mr. Raymond Stevens consented to act as Adviser in the compilation of this edition of the directory. He has been called upon for advice and for practical suggestions many times, and on each occasion has been most helpful in making difficult decisions and in suggesting ways and means for making the directory more useful.

CALLIE HULL, Librarian  
National Research Council

**GROWTH IN PERSONNEL OF INDUSTRIAL RESEARCH LABORATORIES**





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## LIST OF LABORATORIES

- 1. Abanite Laboratories, Traverse City, Mich.**  
*President:* M. J. Hayes.  
*Research staff:* M. J. Hayes, Director. 2 chemists, 1 engineer; additional personnel 3.  
*Research activities:* Plastics; adhesives; electroplating; miscellaneous. (Research initiated 1944.)  
*Library:* 100 volumes.
- 2. Abbé Inc., Paul O., Little Falls, N. J.**  
*President:* Paul O. Abbé.  
*Research staff:* Paul O. Abbé, Director. 1 chemist, 2 engineers.  
*Research activities:* The investigation of the grinding, pulverizing, and mixing of materials, both dry and wet; the development of processes for manufacturers. (Research initiated 1919.)
- 3. Abbott Laboratories, 14th St. and Sheridan Road, North Chicago, Ill.**  
*Research staff:* E. H. Volwiler, Director; E. B. Carter and Carl Nielsen, Associate Directors; J. F. Biehn, Medical Director. 23 chemists, 14 biochemists, 18 biologists, 20 bacteriologists, 25 in other scientific professions; additional personnel 35.  
*Research activities:* Pharmaceuticals, including synthetic medicinal chemicals, alkaloids, etc.; vitamins and other food accessories; endocrines; animal pathology and bacteriology; allergens; pharmacology and pharmacognosy. (Research initiated 1907.)
- 4. Aberfoyle Manufacturing Company, 3rd St. and Morton Ave., Chester, Pa.**  
*President:* William T. Galey, Jr.  
*Laboratories:* Chester, Pa.; Guelph, Ont.  
*Research staff:* Lawrence A. Stead, General Manager. 4 chemists, 1 engineer; technical personnel 3; additional personnel 2.  
*Research activities:* Mercerized cotton yarns: improvement of the quality and the development of new uses. (Research initiated 1916.)  
*Cooperative research:* One fellowship is supported and one grant for research is made.
- Aberjona Division of General Seafoods Corporation. See General Foods Corporation.**
- Abrasive Company. See Simonds Saw and Steel Company.**
- AC Spark Plug Division, General Motors Corporation. See General Motors Corporation.**
- 5. Accurate Engineering Laboratories, 1444 West Lake St., Chicago 7, Ill.**  
*President:* Harold A. Burnson.  
*Research staff:* H. A. Burnson, Director. 2 chemists; additional personnel 1.  
*Research activities:* Electroplating phenomena, including the effect of addition agents. (Research initiated 1941.)
- 6. Ace Glass, Inc., Vineland, N. J.**  
*President:* P. E. Kramme.  
*Research staff:* C. M. DeWoody, Director. 3 engineers; additional personnel 1.  
*Research activities:* The investigation of production methods and machine design; design of scientific equipment; standards for glass. (Research initiated 1940.)
- 7. Acheson Colloids Corporation, 1635 Washington Ave., Port Huron, Mich.**  
*President:* Howard A. Acheson.  
*Laboratory:* 1019 Broad St., Newark 2, N. J.  
*Research staff:* Raymond Szymanowitz, Technical Director. 5 chemists, 1 engineer; technical personnel 5; additional personnel 4.  
*Research activities:* Physical and chemical research on colloids, surface chemistry, wetting, etc. (Research initiated 1912.)  
*Library:* 700 volumes.
- 8. Acme Backing Corporation, Meadow and Bogart Sts., Brooklyn 6, N. Y.**  
*President:* Ralph M. Freyberg.  
*Research staff:* Ralph M. Freyberg, Director; T. F. Tobin, Chief Chemist; 4 chemists, 2 engineers; technical personnel 4; additional personnel 6.  
*Research activities:* Industrial applications of high polymers; synthetic adhesives for fabric, paper, and metal foil; unsupported films. (Research initiated 1937.)  
*Library:* 200 volumes.
- 9. Acme Breweries, 762 Fulton St., San Francisco, Calif.**  
*President:* Karl F. Schuster.  
*Laboratories:* Main Laboratory: San Francisco, Calif. Control laboratory: Acme Brewing Company, 2080 East 49th St., Los Angeles, Calif.  
*Research staff:* Robert A. Clarke, Director; Jack Shaver, Chief Chemist; Robert D. Boynton, Superintendent. 2 chemists, 2 engineers; additional personnel 4.



*Research activities:* Problems connected with brewing, malt syrup, and the manufacture of yeast; research on spray-dried malt extract. (Research initiated 1917.)

**10. Acme Steel Company, Riverdale Station, Chicago, Ill.**

*President:* R. H. Norton.

*Research staff:* R. F. Main. 3 chemists, 3 metallurgists, 1 engineer; additional personnel 10.

*Research activities:* Problems connected with hot and cold rolling; electroplating; galvanizing; heat-treating. (Research initiated 1919.)

**11. Acme White Lead and Color Works, 8250 St. Aubin Ave., Detroit 11, Mich. (Affiliated with Sherwin-Williams Company.)**

*Vice President and General Manager:* Gordon H. Robertson.

*Research staff:* Glenn H. Hicks, Executive Officer in charge of research; C. T. Ellis, Factory Manager. 8 chemists; technical personnel 21; additional personnel 4.

*Research activities:* Formulations, physical tests, exposures, and commercial evaluations of paints and varnishes. (Research initiated 1910.)

**12. Acme Wire Company, P. O. Drawer M., Hamden Branch, New Haven, Conn.**

*President:* Thomas G. Nee

*Research staff:* Kenneth M. MacKay, Director. 2 chemists, 4 engineers.

*Research activities:* Insulating materials; varnishes; resins; etc.

**13. Acoustical Corporation of America, 91 Central Park West, New York 23, N. Y.**

*President:* M. C. Rosenblatt.

*Laboratory:* Philadelphia, Pa.

*Research staff:* M. C. Rosenblatt, Mechanical Engineer. 1 engineer; additional personnel 3.

*Research activities:* General audio-acoustics, audio-acoustics of buildings, and audio-acoustical devices; mechanical engineering: processes, engineering economics, and production management. (Research initiated 1915.)

*Library:* Extensive reference collection.

*Cooperative research:* One fellowship is supported.

**14. Addressograph-Multigraph Corporation, 1200 Babbitt St., Cleveland 17, Ohio.**

*President:* J. E. Rogers.

*Research staff:* C. L. Comegys, Manager, Research and Service Division; C. H. Van Dusen, Director. 3 chemists, 8 engineers, 1 metallurgist; additional personnel 16.

*Research activities:* The designing of office machines; graphic arts, especially lithography; type metals. (Research initiated 1926.)

**15. Advance Paint Company, 545 West Abbott St., Indianapolis 7, Ind.**

*President:* Robert E. Kelly.

*Research staff:* O. L. Kinder, Director. 3 chemists; technical personnel 5.

*Research activities:* Protective coatings.

*Library:* A library is maintained.

**16. Advance Solvents and Chemical Corporation, 245 Fifth Ave., New York 16, N. Y.**

*President:* A. L. Mullaly.

*Laboratories:* Research Laboratory, New York City; Synthetic Rubber and Protective Coatings Research, 315 Coles St., Jersey City 2, N. J.

*Research staff:* A. L. Mullaly, Executive Officer in charge of research; G. P. Mack, Research Director; C. A. Klebsattel, Chief Chemist; S. H. Longman, Chief Engineer; A. B. Mullaly, Development Manager. 8 chemists, 1 metallurgist, 2 engineers; technical personnel 3.

*Research activities:* Chemical, physical, and industrial research on synthetic and natural substances to be employed as driers for protective coatings; study and synthesis of wetting agents and detergents; chemical, physical, and mechanical investigation of softeners, accelerators, and antioxidants for synthetic and natural rubber; research and development work in compounding ingredients for rubber, paint, textiles, and related fields. (Research initiated 1931.)

*Library:* 350 volumes.

**17. Aeolian-Skinner Organ Company, Inc., 215 Sydney St., Dorchester, Mass.**

*President:* G. Donald Harrison.

*Research staff:* G. Donald Harrison, Technical Director.

*Research activities:* The acoustical development of tones produced from organ pipes; the development of new and improved mechanical and electrical devices to be used in the construction of pipe organs and automatic player mechanisms.

**Aeroproducts Division, General Motors Corporation. See General Motors Corporation.**

**18. Aetna Life and Affiliated Companies, 151 Farmington Ave., Hartford 15, Conn.**

*President:* Morgan B. Brainard.

*Research staff:* Walter Sayer Paine, Manager, Engineering and Research Division; Fred W. Sehl, Chemical Engineer. 2 chemists, 2 physicists, 3 engineers; 150 field engineers provide certain data and utilize the results obtained by the research laboratory; additional personnel 3.

*Research activities:* Research is carried out for the company's assured and underwriters, covering industrial disease exposure, explosive

hazards, electrical hazard tests, chemical analyses (of such products as mothproofing materials, solvents, etc.), mechanical tests, electrical tests, and other types of research and engineering activity in connection with the insurance business. (Research initiated 1918.)

*Library:* 1,500 volumes; 35,000 pamphlets and brochures.

*Cooperative research:* Grants have been made for special researches from time to time.

**19. Agricultural Laboratory, P. O. Box 522, Anaheim, Calif.**

*President:* Sam Walker.

*Research staff:* William S. Stewart, Director. 1 plant physiologist; technical personnel 5; additional personnel 4.

*Research activities:* Soil testing and orange grove maintenance; plant growth substances; foliar analyses. (Research initiated 1938.)

**20. Air Reduction Company, Inc., 60 East 42nd St., New York 17, N. Y.**

*Chairman:* C. E. Adams.

*President:* C. S. Munson.

*Laboratories:* Chemical and Liquefaction Research, Stamford, Conn. (operated jointly with U. S. Industrial Chemicals, Inc.); Apparatus Research, Jersey City, N. J.

*Research staff:* F. J. Metzger, Vice President in charge of liquefaction research; L. W. Bass, Director of chemical research; F. B. Adams, Jr., Director of apparatus research and production; F. R. Balcar, chemical research; J. J. Crowe, technical liaison; W. Dennis, liquefaction research; W. G. Fogg, technical service; G. S. Mikhailopov, apparatus research; C. C. Van Nuys, Chief Physicist. 20 chemists, 5 physicists, 6 metallurgists, 43 engineers, 18 laboratory technicians; additional personnel 109.

*Research activities:* Production and uses of oxygen, nitrogen, and rare gases; calcium carbide and acetylene; gas and electric cutting and welding apparatus and processes; carbon dioxide; chemicals. (Research initiated 1917.)

*Library:* 4,500 volumes.

*See also* Ohio Chemical and Manufacturing Company.

**21. Air-Refresher Manufacturing Company, 1463 Boston Road, Bronx 60, N. Y.**

*President:* E. Honigman.

*Research staff:* 1 engineer; additional personnel 3.

*Research activities:* The study of atmospheric conditions as they exist in homes and offices, and the development of suitable and inexpensive air conditioning units; the development of other mechanical devices using air to keep homes and offices clean. (Research initiated 1945.)

**22. Aircraft Engine and Accessory Development Company, Huntingdon Valley, Pa.**

*President:* Robert W. A. Brewer.

*Research staff:* Robert W. A. Brewer, Director. 1 consulting engineer, 2 assistant engineers, 1 production consultant.

*Research activities:* Aircraft power plants and installations, and their accessories; two-cycle engines, and advanced types of engines. (Research initiated 1928.)

**23. Aircraft Radio Corporation, Boonton, N. J.**

*President:* Lewis M. Hull.

*Research staff:* F. H. Drake, Executive Vice President and Director; K. C. Black, Director of new projects. 1 chemist, 4 physicists, 10 engineers.

*Research activities:* Wave propagation; properties of materials used in radio apparatus; circuit development. (Research initiated 1927.)

**24. Aircraft Screw Products Company, Inc., 47-23 Thirty-fifth St., Long Island City 1, N. Y.**

*President:* Benjamin Sack.

*Research staff:* Otto Haas, Director. 2 engineers, 2 development engineers; additional personnel 2.

*Research activities:* To standardize the company's product and to improve its quality; to develop new materials and better manufacturing methods; and to find new applications for the Aero-Thread Screw Thread System and Heli-Coil Thread Inserts. (Research initiated 1945.)

*Library:* 250 volumes.

*Cooperative research:* One grant for research is made.

**25. Airedale Worsted Mills, Inc., 828 Park Ave., Woonsocket, R. I.**

*President:* Joseph H. Axelrod.

*Laboratory:* 1 Main St., Woonsocket, R. I.

*Research staff:* Emory A. Richards, Chief Chemist. 1 chemist; technical personnel 3; additional personnel 1.

*Research activities:* Textile problems. (Research initiated 1945.)

**26. Airesearch Manufacturing Company, 9851 Sepulveda Blvd., Los Angeles 45, Calif. (A division of the Garrett Corporation.)**

*President:* J. C. Garrett.

*Research staff:* James V. Crawford, Director. 2 chemists, 2 metallurgists, 6 engineers; technical personnel 6, additional personnel 34.

*Research activities:* Heat transfer equipment; electrical motors and other electrical equipment; chemical and metallurgical studies; aircraft cabin pressure equipment; aircraft air

conditioning equipment. (Research initiated 1941.)

*Library:* 400 volumes; 1,000 technical reports.

**27. Airplane and Marine Instruments, Inc., Clearfield, Pa.**

*President:* Theodore W. Stemmler.

*Research staff:* G. Emerson Pray, Chief Engineer. 1 chemist, 2 physicists, 11 engineers; technical personnel 10; additional personnel 5.

*Research activities:* Radio and electronic circuits; electroplating. (Research initiated 1928.)

*Library:* 200 volumes.

**Airtemp Construction Corporation.** See Chrysler Corporation.

**28. Al-Chem Laboratory, 702 East Locust St., Bloomington, Ill.**

*President:* Justin J. Alikonis.

*Research staff:* Justin J. Alikonis, Director. 2 chemists, 1 engineer; technical personnel 3; additional personnel 1.

*Research activities:* Research on the chemistry and technology of food and food products; water and sanitation; insecticides and fumigants; chemical specialties; new chemicals and new commercial uses for chemicals derived from farm by-products. (Research initiated 1936.)

*Library:* A library is maintained.

**29. Alabama By-Products Corporation, Webb Crawford Bldg., Birmingham, Ala.**

*President:* J. W. Porter.

*Laboratory:* Tarrant, Ala.

*Research staff:* W. M. Mobley, Director. 4 chemists, 3 engineers, 5 in other scientific professions.

*Research activities:* The preparation, cleaning, and blending of different coals used in making metallurgical coke.

**30. Albany Felt Company, 1373 Broadway, Albany 1, N. Y.**

*President:* Charles P. Drumm.

*Research staff:* C. C. Gordon, Director. 3 chemists; additional personnel 2.

*Research activities:* The improvement of wool yarns and fabric quality by physical, chemical, or processing methods. The study of customer processes and fabric requirements in order to build better fabrics for specific needs. (Research initiated 1917.)

*Cooperative research:* One fellowship is supported.

**31. Alco Valve Company, 865 Kingsland, St. Louis 5, Mo.**

*President:* Russell Maguire.

*Research staff:* John E. Dube, Vice President

and Director of engineering. 6 engineers; technical personnel 22; additional personnel 4.

*Research activities:* The automatic control of refrigeration and air conditioning; study of the design and operation of evaporators; the study of refrigerant flow; industrial flow control problems. (Research initiated 1930.)

*Cooperative research:* One grant for research is made.

**32. Aldens Chicago Mail Order Company, 511 South Paulina St., Chicago 12, Ill.**

*President:* R. W. Jackson.

*Research staff:* C. T. Herzfeld, Manager of Quality Standards Division; B. W. Iovan, Manager of Laboratory. 3 chemists; technical personnel 3; additional personnel 2.

*Research activities:* The improvement and development of merchandise. (Research initiated 1928.)

*Library:* 100 volumes.

**Alemite Die Casting and Manufacturing Company.** See Electric Auto-Lite Company.

**33. Alexander, Jerome, 50 East 41st St., New York 17, N. Y.**

*Research staff:* Jerome Alexander, Consulting Chemist and Chemical Engineer.

*Research activities:* The application of chemistry and physics to problems in manufacturing, medicine, biology, etc.; the application of engineering to technological processes; physical and colloid chemistry; patent and legal testimony and advice. (Research initiated 1922.)

**34. Allegheny Ludlum Steel Corporation, Brackenridge, Pa.**

*President:* H. G. Batcheller.

*Laboratories:* Brackenridge, Pa.; Dunkirk and Watervliet, N. Y.

*Research staff:* Charles A. Scharschu, Director; R. A. Lincoln, L. C. Hicks, G. M. Butler, G. Mohling, G. C. Kiefer, Associate Directors. 15 chemists, 12 metallurgists, 1 engineer; additional personnel 20.

*Research activities:* Magnetic steels; corrosion-resistant steels; tool and die steels; special alloy steels; high temperature steels; stainless steels; methods of chemical analysis of steels and ferroalloys. (Research initiated 1929.)

*Library:* 1,500 volumes.

**35. Allen-Bradley Company, 136 West Greenfield Ave., Milwaukee 4, Wis.**

*President:* H. L. Bradley.

*Research staff:* L. H. Matthias, Director. 2 chemists, 1 physicist, 1 metallurgist, 11 engineers, 1 ceramist; additional personnel 5.

*Research activities:* Electrical arcs; electrical

contacts; particle type resistors. (Research initiated 1928.)

*Library:* 1,628 volumes.

36. Allen Metal Works, L. D., 6932 South Clyde Ave., Chicago 49, Ill.

*Proprietor and General Manager:* Bonnell H. Allen.

*Research activities:* Babbitt metals and bearing engineering. (Research initiated 1900.)

37. Alles, Gordon A., 770 South Arroyo Parkway, Pasadena 5, Calif.

*Research staff:* Gordon A. Alles, Director. 4 chemists, 2 biologists; additional personnel 1.

*Research activities:* Natural and synthetic drug chemicals; the relations between chemical constitution and physiological action leading to the development of medicinal chemicals. (Research initiated 1940.)

*Library:* 2,000 volumes.

38. Allied Chemical and Dye Corporation, 61 Broadway, New York 6, N. Y.

*Cooperative research:* More than 20 fellowships are supported by the company.

#### DEVELOPMENT DEPARTMENT

*Laboratory:* Central Research Laboratory, Morristown, N. J.

*Research staff:* D. C. Bardwell, Director.

*Research activities:* Fundamental and exploratory research in various fields of chemistry.

#### BARRETT DIVISION

##### ALLIED CHEMICAL AND DYE CORPORATION

40 Rector St., New York 6, N. Y.

*Laboratories:* Research laboratories, Edgewater, N. J., and Frankford, Philadelphia, Pa. Works laboratories at each of the company tar plants and felt mills. Research and development work at the plants is coordinated with the research laboratories.

*Research staff:* S. P. Miller, Technical Director.

*Research activities:* The improvement of roofing, coal tar products, and rock wool insulation, and the development of new products, test methods, and control.

#### GENERAL CHEMICAL COMPANY

40 Rector St., New York 6, N. Y.

*Laboratories:* Laurel Hill, Long Island, N. Y. (main research laboratory); Marcus Hook, Pa.; El Segundo, Calif. Engineering Service Laboratories: Edgewater, N. J.; El Segundo, Calif.; Wenatchee, Wash. Methods Laboratory: Edgewater, N. J. In addition there are 24 works laboratories at various locations.

*Research staff:* John J. Donleavy, Director.

*Research activities:* The development of new chemicals for the following industries: Textiles, including rayon, cotton, wool, and silk; pulp and paper; water and sewage treatment; soap and detergents; steel pickling, cleaning, and surface preparation; electroplating and chemical finishes of ferrous and nonferrous metals; oil refining, catalytic and noncatalytic; oil well drilling; glass production, etching, and surfacing; photography. The improvement of processes and products and their industrial application; products include heavy chemicals, insecticides and fungicides, and fine and reagent chemicals. (Research initiated 1899.)

#### NATIONAL ANILINE DIVISION

##### ALLIED CHEMICAL AND DYE CORPORATION

40 Rector St., New York 6, N. Y.

*Laboratories:* Research Laboratory, and Dye Application Research Laboratory, Buffalo, N. Y.; New Products Division, 40 Rector St., New York 6, N. Y.

*Research staff:* Walter M. Ralph, New York, Director; Wesley Minnis, Buffalo, Assistant Director; Jean G. Kern, Buffalo, Manager, Dye Application Research; Lawrence H. Flett, New York, Director, New Products Division.

*Research activities:* *Research Laboratory, Buffalo:* Organic chemicals; dyes; pharmaceuticals; organic intermediates for dyes and pharmaceuticals; organic chemicals for coating compositions, resins, plastics, and rubbers; synthetic organic detergents and textile chemicals. *Dye Application Research Laboratory:* Application of dyestuffs to various fibers. *New Products Division Laboratory:* Organic chemicals; surface active agents; antiseptics; insecticides; rubber chemicals.

#### SEMET-SOLVAY COMPANY

40 Rector St., New York 6, N. Y.

*Laboratories:* Syracuse, N. Y.; Ashland, Ky. *Research staff:* W. Tiddy, New York, N. Y., Director.

*Research activities:* The study of coal carbonization, by-product recoveries from coal distillation gases, gas manufacturing and waste recovery processes; the development of improved processes for manufacturing ammonia products, light oil, sulfur recovery, cyanogen compounds, tar derivatives, and special industrial and domestic gases.

#### SOLVAY PROCESS COMPANY

##### ALKALI DIVISION LABORATORY

Syracuse, N. Y.

*Research staff:* P. A. Keene, Director.

*Research activities:* The study of pure and applied chemical and physical factors involved

in the manufacture of alkalis and related products; the development of new products and new uses for existing products; technical sales research for the improvement of product application in industry.

**NITROGEN DIVISION LABORATORY**  
Syracuse, N. Y. and Hopewell, Va.

*Research staff:* E. D. Crittenden, Director, Hopewell.

*Research activities:* The study of ammonia synthesis and other inorganic and organic pressure catalytic reactions; the development of improved catalysts and methods for gas production and purification; new applications for existing products, e.g., ammonia, sodium nitrate, nitrogen solutions; and the development of new products.

**39. Allied Kid Company, 11th and Poplar Sts., Wilmington 99, Del.**

*President:* Ben Simon.

*Laboratory:* Richard Cann McMullen Experimental Station, 12th and Wilson Sts., Wilmington 99, Del.

*Research staff:* L. Seligsberger and A. Morrison, Directors; L. Erera, Supervisor of pilot plant; H. Spinell, Chief of process engineering. 3 chemists, 1 engineer; technical personnel 6; additional personnel 3.

*Research activities:* Tanning and associated processes; the formulation of synthetic materials for leather substitutes; the utilization of tanning wastes, etc. (Research initiated 1932.)

*Library:* 500 volumes.

*Cooperative research:* Several grants for research are made.

**40. Allied Laboratories, Inc., Pitman-Moore Division, 1200 Madison Ave., Indianapolis 6, Ind.**

*President:* E. A. Cahill.

*Laboratories:* Indianapolis and Zionsville, Ind.

*Research staff:* John W. Lee, Coordinator of chemical and pharmaceutical research; W. W. Gochenour, Director of biological research. 4 chemists, 2 physicians, 5 bacteriologists, 1 pharmacologist, 4 veterinarians; technical personnel 2; additional personnel 2.

*Research activities:* Research on new biological and medicinal products, and the improvement of existing products. (Research initiated 1899.)

*Library:* 657 volumes.

*Scientific periodicals:* Pit-Mor-Ian. Vol. I, 1935. Allied Veterinarian. Vol. I, 1929.

*Cooperative research:* Two grants for research are made.

**41. Allied Mills, 3400 Board of Trade Bldg., Chicago, Ill.**

*President:* H. J. Buist.

*Laboratory:* Peoria, Ill.

*Research staff:* J. E. Hunter, Director. 7 chemists, 1 biologist, 1 pathologist; technical personnel 9; additional personnel 4.

*Research activities:* Nutritional requirements of farm livestock, poultry, and fur-bearing animals; the relation of soybean processing to its nutritive value; preservation of the nutritive value of feed ingredients and of manufactured feeds. (Research initiated 1937.)

*Library:* 300 volumes.

**42. Allied Products, Inc., 30 Rockefeller Plaza, New York 20, N. Y.**

*President:* J. A. Ewald.

*Laboratories:* 12 East 46th St., New York 16, N. Y.; Division and Fair Sts., Suffern, N. Y.

*Research staff:* New York: Paul Fisher, Director. 1 chemist; technical personnel 1. Suffern: J. M. Williams, Chief Chemist. 8 chemists, 2 engineers; technical personnel 1; additional personnel 1.

*Research activities:* Cosmetic and allied research. (Research initiated 1926.)

*Library:* 500 volumes.

**Allied Research.** See Ozo-Ray Process Corporation.

**43. Allis Chalmers Manufacturing Company, Milwaukee 1, Wis.**

*President:* Walter Geist.

*Laboratories:* Research and Development Laboratories, West Allis, Wis.; Manufacturing, Development, and Control Laboratories at the following manufacturing divisions: West Allis, Wis.; Springfield, Ill.; Boston, Mass.; Pittsburgh, Pa.; Cincinnati, Ohio; La Porte, Ind.

*Research staff:* E. H. Brown, Vice President, in charge of engineering research and development; J. M. White, Vice President, in charge of manufacturing development and control; W. A. Roberts, Vice President, in charge of tractor development; J. T. Jarman, General Superintendent of laboratories; Forrest Nagler, Chief Mechanical Engineer, and S. H. Mortensen, Chief Electrical Engineer, general manufacturing division; C. E. Frudden, Executive Engineer, and M. L. Frey, Assistant to General Works Manager, tractor division; F. T. Agthe, process development; J. Wilson, Physicist; Walter Richter, Engineer, electrical laboratory; J. M. Cage, Engineer, electronics; J. T. Retalliatia, turbine research; C. E. Imhoff, Engineer, water conditioning; F. Bond, Engineer, ore processing. 12 chemists, 1 physicist, 24 metallurgists, 38 engineers, 3 in other

scientific professions; technical personnel 202; additional personnel 36.

*Research activities:* Mechanical and electrical improvement of the company's products; studies in high temperature applications of metals; corrosion fatigue and corrosion; X-ray and X-ray diffraction; and precision and centrifugal casting. The application of inductive currents; applications and fundamental research in electronics; electrical insulation. Investigation of transformer materials at the West Allis Works where there is a pilot plant laboratory with facilities for processing 100 tons of ore by various modern methods. (Research initiated 1925.)

*Library:* 775 volumes.

*Cooperative research:* One fellowship is supported.

*Scientific periodicals:* Allis Chalmers Electrical Review. Vol. I, 1936.

#### 44. Allison Company, Bridgeport 8, Conn.

*Research staff:* H. V. Allison, Director. 1 chemist; technical personnel 4; additional personnel 2.

*Research activities:* Organic bonded abrasive wheels. (Research initiated 1939.)

*Library:* 300 volumes.

Allison Division, General Motors Corporation.  
See General Motors Corporation.

#### 45. Aloe Company, A. S., 1831 Olive St., St. Louis 3, Mo.

*President:* Edward Jefferson.

*Research staff:* H. L. Ettman, Vice President in charge of research. 2 chemists, 1 biologist; technical personnel 6.

*Research activities:* The investigation of techniques and the development of instruments for research and routine laboratory procedure, especially for the biological sciences, i. e., biochemistry, pathology, bacteriology, public health, and related fields; research on special chemical reagents. (Research initiated 1937.)

*Library:* 200 volumes.

#### 46. Alrose Chemical Company, 180 Mill St., Cranston, R. I.

*President:* Mark Weisberg.

*Research staff:* H. W. Zussman, Director. 8 chemists, 1 metallurgist; technical personnel 3; additional personnel 3.

*Research activities:* Organic chemistry; electroplating; detergents; wetting agents of the anionic, cationic, and quaternary ammonium type; textile auxiliaries, such as mothproofing, mildewproofing, waterproofing, flameproofing, etc. (Research initiated 1932.)

*Library:* 400 volumes.

*Cooperative research:* Three fellowship are supported and three grants for research are made.

#### 47. Althouse Chemical Company, 500-540 Pear St., Reading, Pa.

*Owner:* C. Scott Althouse.

*Research staff:* C. Scott Althouse, Director. 10 chemists; additional personnel 2.

*Research activities:* Dyes and coal tar intermediates. (Research initiated 1915.)

#### 48. Aluminum Company of America, Pittsburgh 19, Pa.

*President:* Roy A. Hunt.

*Laboratories:* Aluminum Research Laboratories, New Kensington, Pa.; Chemical Development Division (at works of Aluminum Ore Company), East St. Louis, Ill.; Cleveland Research Division (at works of Aluminum Company of America), Cleveland, Ohio.

*Research staff:* Francis C. Frary, Director; H. E. Bakken, Associate Director; Junius D. Edwards, E. H. Dix, Jr., R. L. Templin, Assistant Directors. 65 chemists, 2 physicists, 37 metallurgists, 23 engineers, 6 patent attorneys; technical personnel 175; additional personnel 113.

*Research activities:* Metallurgy of the light metals; production and utilization of alumina and the hydrated aluminas; cryolite and other fluorides; production, fabrication, and utilization of aluminum and aluminum alloys; magnesium and magnesium alloys. (Research initiated 1919.)

*Library:* 6,000 volumes.

*Scientific periodicals:* Aluminum Research Laboratories, Technical Papers. Irregular.

*Cooperative research:* Three fellowships are supported and one grant for research is made.

#### AMERICAN MAGNESIUM CORPORATION

2210 Harvard Ave., Cleveland 5, Ohio

*President:* I. W. Wilson.

*Research activities:* Research work on magnesium and magnesium alloys is carried out by the Aluminum Research Laboratories.

#### 49. Aluminum Industries, Inc., Werk Road, Cincinnati 11, Ohio.

*President:* H. J. Hater.

*Laboratories:* Werk Road, Cincinnati 11, Ohio; Pinetree and Tremont Sts., Cincinnati, Ohio.

*Research staff:* J. J. Brennan, Director; Walter J. Klayer, Chief Engineer. 4 chemists, 2 metallurgists, 2 engineers, 3 radiographers, 3 spectrographers; technical personnel 5; additional personnel 5.

*Research activities:* The investigation of the metallurgy of aluminum, aluminum alloys, and other nonferrous alloys: chemical analysis, melting, refining, fabricating, machining, heat-treating, mechanical testing, radiography, microphotography, metallography, corrosion testing, etc.; investigation of steels and cast iron: forg-

ing, heat-treating, fabricating, testing, metallography, etc. Testing of paints, oils, and varnishes. (Research initiated 1926.)

*Library:* 200 volumes.

**50. Amalgamated Leather Companies, Inc.,**  
Front and Adams Sts., Wilmington, Del.

*President:* John B. Blatz.

*Research staff:* Peter A. Blatz, Director; H. P. Hocker. 2 chemists.

*Research activities:* The manufacture of glazed kid.

**51. Ameco Chemicals, Inc.,** 75 Rockwood St.,  
Rochester 10, N. Y.

*President:* S. J. Cohen.

*Research staff:* S. J. Cohen, Director. 8 chemists; additional personnel 4.

*Research activities:* The investigation of new processes and improvement of the present processes of production of special synthetic organic and inorganic chemicals, and the development of their uses. (Research initiated 1920.)

*Library:* A library is maintained.

**52. Amelia Earhart Luggage,** 408 Market St.,  
Newark 5, N. J.

*Research staff:* Sam Orenstein, Director. 1 chemist, 1 engineer, 1 wood technologist; additional personnel 6.

*Research activities:* Chemical, textile, wood, and leather research; adhesives. (Research initiated 1938.)

**53. American Agricultural Chemical Company,**  
50 Church St., New York 7, N. Y.

*President:* L. H. Carter.

*Laboratories:* Carteret, N. J.; Detroit, Mich.; Pierce, Fla.

*Research staff:* S. W. DuPuy, Manager of production and process development; R. C. Charlton, Director of chemical control. 34 chemists; additional personnel 6.

*Research activities:* Investigations on phosphorus, phosphoric acid, phosphates, phosphatic fertilizers, gelatin, bone black, and insecticides. (Research initiated 1928.)

*Library:* A library is maintained at each laboratory.

**54. American Air Filter Company, Inc.,** 215  
Central Ave., Louisville 8, Ky.

*President:* William M. Reed.

*Research staff:* James W. May, Director; Arthur Nutting, Chief Engineer; S. Sylvan, Research Consultant. 1 chemist, 1 physicist, 4 engineers; technical personnel 2; additional personnel 5.

*Research activities:* Viscous liquids for use in unit and automatic air filters; air flow measurement methods; methods for the study of air currents; the study of various shapes and their resistance to air flow; filter design; airborne solids, odors, corrosion, dust and smoke elimination by mechanical, dynamic, and electrical precipitation; methods for the determination of dust concentration in the air; the development of methods for the study of building ventilation; protective coatings for metals; problems in process dust removal in manufacturing industries. (Research initiated 1922.)

*Cooperative research:* Six grants for research are made.

**55. American Aniline Products, Inc.,** Lock  
Haven, Pa.

*President:* B. R. Armour.

*Laboratories:* Lock Haven, Pa.; New York, N. Y.

*Research staff:* Talfryn James, Vice President; A. T. Kilsdonk, Director. 14 chemists; additional personnel 9.

*Research activities:* Dyes: the manufacture of intermediates; new colors; physical characteristics, e.g., dispersion, application, particle size, solubility, etc. (Research initiated 1920.)

**56. American Anode, Inc.,** 60 Cherry St., Akron  
8, Ohio. (Subsidiary of B. F. Goodrich  
Company.)

*President:* B. F. Stauffer.

*Research staff:* Edward G. Partridge, Director. 8 chemists; technical personnel 2; additional personnel 11.

*Research activities:* Natural and synthetic rubber latices; dispersions and emulsions. (Research initiated 1926.)

*Library:* 130 volumes.

**American Artists' Color Works, Inc. See Art  
Crayon Company, Inc.**

**57. American Bemberg Corporation,** 261 Fifth  
Ave., New York, N. Y.

*President:* S. R. Fuller, Jr.

*Laboratory:* Elizabethton, Tenn.

*Research staff:* G. A. Hardt, Director. 3 chemists, 1 engineer; 2 in other scientific professions; technical personnel 2.

*Research activities:* The improvement of present processes and the development of new processes and machinery for cuprammonium synthetic yarn. (Research initiated 1926.)

**58. American Bitumuls Company,** 200 Bush St.,  
San Francisco 4, Calif. (Subsidiary of Stand-  
ard Oil Company of California.)

*President:* P. L. Fahrney. *Chairman of Board:* R. G. Smith.

**Laboratories:** 40 Arkansas St., San Francisco, Calif.; 4525 San Leandro St., Oakland, Calif.

**Research staff:** C. L. McKesson, Vice President and Director of engineering and research; P. E. McCoy, Research Engineer; W. D. Buckley, Chief Chemist. 8 chemists, 7 engineers; technical personnel 14; additional personnel 7.

**Research activities:** The production and development of emulsified asphalt and asphalt dispersions, paints, etc., and their uses in paving and industrial work. (Research initiated 1927.)

**59. American Bosch Corporation, Springfield 7, Mass.**

**President:** Donald P. Hess.

**Research staff:** Martin J. Berlyn, Vice President in charge of research; L. P. Kongsted, Electrical Laboratories; P. G. Burman, Diesel Research; S. E. Miller, Gasoline Injection Research; H. E. Boyer, Metallurgical Laboratory. 2 chemists, 1 physicist, 3 metallurgists, 16 engineers; technical personnel 26; additional personnel 12.

**Research activities:** Automotive and aviation ignition, magnetos, coils, starting vibrators, generators, voltage regulators, distributors, condensers, windshield wipers, Diesel fuel injection, and gasoline injection. (Research initiated 1919.)

**Library:** 200 volumes.

**60. American Box Board Company, 470 Market St., S. W., Grand Rapids 2, Mich.**

**President:** M. B. Hall.

**Research staff:** R. P. Aument, Director. 1 chemist; technical personnel 7; additional personnel 7.

**Research activities:** Tests on incoming shipments of wood pulp for moisture and paper-making characteristics; water analysis under unusual conditions of use; lime analysis; analysis of coal received, for moisture, ash, volatile matter, fixed carbon, sulfur, and B. T. U.; analysis of box board samples for content and physical characteristics; the development of products for new colors; the study of waterproof, fungiproof, and bloodproof materials; studies looking toward lightening the weight of materials used in relation to resulting strength; use and performance tests for desired qualities in all types of packaging. (Research initiated 1920.)

**Cooperative research:** Two grants for research are made.

**61. American Brake Shoe Company, 230 Park Ave., New York, N. Y.**

**METALLURGICAL LABORATORY**  
Mahwah, N. J.

**Research staff:** R. H. Schaefer, Chief Metallurgist and Director; H. S. Avery, Research

Metallurgist; J. L. Goheen, Metallurgical Engineer. 2 chemists, 17 metallurgists; technical personnel 46; additional personnel 15.

**Research activities:** Iron, steel, and nonferrous castings. (Research initiated 1933.)

**Library:** 275 volumes.

**Cooperative research:** Four grants for research are made.

**MECHANICAL LABORATORY**  
Westport, Conn.

**Research staff:** Lindsay H. Browne, Chief Engineer and Director. 1 engineer, 2 design engineers; technical personnel 1.

**Research activities:** Hydraulic pumps and rotary seals. (Research initiated 1941.)

**NATIONAL BEARING DIVISION**

4930 Manchester Ave., St. Louis 10, Mo.

**Research staff:** I. E. Cox, Chief Engineer and Director; B. J. Esarey, District Engineer and Metallurgist; L. L. Vrooman, Engineer of tests. 3 chemists, 2 metallurgists, 3 engineers; technical personnel 4; additional personnel 3.

**Research activities:** Bearing metal alloys; railroad bearings; Diesel engine main and connecting rod bearing development; nonferrous metallurgical and bearing development problems. (Research initiated 1936.)

**BRAKE SHOE AND CASTINGS DIVISION**  
Mahwah, N. J.

**Research staff:** R. B. Pogue, Chief Engineer and Director; R. L. Wilson, Assistant Chief Engineer; W. B. Sutherland, Assistant to Chief Engineer. 3 engineers; technical personnel 18.

**Research activities:** Materials for railroad and aircraft use. (Research initiated 1901.)

**Library:** 200 volumes.

**AMERICAN BRAKEBLOK DIVISION**  
4600 Merritt Ave., Detroit, Mich.

**Research staff:** Ray E. Spokes, Director. J. B. Littlefield, Assistant Technical Director. 9 chemists, 8 engineers.

**Research activities:** Friction materials for automotive, industrial, and aircraft uses; industrial plastics; industrial rubber products; laminated plastics.

**Library:** A library is maintained.

**American Brakeblok Division, American Brake Shoe Company.** See American Brake Shoe Company.

**62. American Brass Company, Waterbury 88, Conn.** (Subsidiary of Anaconda Copper Mining Company.)

**President:** Arthur W. Quigley. *Chairman of the Board:* C. S. Judd.



*Research staff:* John R. Freeman, Jr., Technical Manager. 40 chemists, metallurgists, and engineers; technical personnel 50.

*Research activities:* Copper and copper alloys; fundamental constants of copper alloy systems; physical properties, and corrosion studies; general mill problems; quality control. (Research initiated 1879.)

63. American Bridge Company, Frick Building, Pittsburgh 19, Pa. (Subsidiary of United States Steel Corporation.)

*President:* Leon A. Paddock.

*Laboratory:* Ambridge, Pa.

*Research staff:* C. G. Baumgartner, Chief Mechanical Engineer. 1 chemist, 2 engineers.

*Research activities:* Engineering research and testing in bridge and structural engineering. (Research initiated 1904.)

64. American Can Company, 230 Park Ave., New York 17, N. Y.

*President:* D. W. Figgis.

*Laboratories:* Central Research Laboratory, Maywood, Ill.; Division Laboratories, Hamilton, Ont.; New York, N. Y.; San Francisco, Calif. Research Representatives: Baltimore, Md.; Portland, Maine; Rochester, N. Y.; Tampa, Fla.; New Orleans, La.; Seattle, Wash.; Los Angeles, Calif.

*Research staff:* J. A. Stewart, Vice President in charge of research and development; B. S. Clark, Director; R. W. Pilcher, Associate Director; F. C. Baselt, Division Manager, New York, N. Y.; H. P. Stevens, Division Manager, Hamilton, Ont.; C. E. Lachele, Division Manager, San Francisco, Calif. 67 chemists, 1 physicist, 3 metallurgists, 24 engineers, 7 bacteriologists, 1 mathematician, 1 food technologist, 1 fishery technologist, 1 horticulturist; nonprofessional personnel 85; administrative personnel 71.

*Research activities:* The functions of the department are three: research, technical sales service, and manufacturing control. Research includes the physical metallurgy of sheet steel; the development of organic coatings for sheet steel and tin plate; the relation of metal surface condition to adhesion of organic coatings; can sealing compounds; soldering fluxes; subaqueous corrosion of tin plate; ferrous and nonferrous metals; moistureproof and oilproof paper containers; mechanical construction of the metal container in relation to its strength and hermetic properties; the bacteriology and sterilization of canned foods and beverages; vitamins in canned foods; the retention of natural flavor, color, and dietary values in canned foods; methods of food analysis; and objective methods for grading raw foods before canning. (Research initiated 1906.)

*Library:* 3,500 volumes.

*Scientific periodicals:* Library Abstracts. Monthly. Vol. I, 1935. Research Bulletin. Monthly. Vol. I, 1945.

*Cooperative research:* Several fellowships are supported.

65. American Cast Iron Pipe Company, P. O. Box 2603, Birmingham 2, Ala.

*President:* W. D. Moore.

*Research staff:* James T. MacKenzie, Director. 3 chemists, 2 physicists, 4 metallurgists, 3 engineers; technical personnel 16; additional personnel 18.

*Research activities:* Centrifugal casting of cast iron pipe, carbon, and stainless steels; metallurgy of cast iron and of cast steel; photography and photomicrography; spectrographic analysis; physical testing of cast iron pipe and fittings; corrosion; tar and asphalt coatings and cement coatings and linings; hydraulics; sands and clays for foundry use. (Research initiated 1914.)

*Library:* 2,000 volumes.

66. American Cellulose Company, P. O. Box 506, Indianapolis, Ind.

*President:* L. R. Sereinsky.

*Laboratory:* 1030 South White River Parkway, Indianapolis, Ind.

*Research staff:* L. R. Sereinsky, Director. 1 chemist, 1 physicist, 1 engineer; technical personnel 20.

*Research activities:* Plastics, pyroxylin, cellulose acetate, and cellulose; protective coatings. (Research initiated 1919.)

67. American Central Manufacturing Corporation, Connersville, Ind.

*President:* Saunders P. Jones.

*Research staff:* L. H. Davidson, Director of product development; J. C. Conrady, Assistant to the Director. 5 engineers; technical personnel 4; additional personnel 16.

*Research activities:* Sheet metal stamping and fabrication; self sterilizing restroom equipment; automatic dishwashers, etc. (Research initiated 1938.)

*Library:* 150 volumes.

68. American Chemical Paint Company, Ambler, Pa.

*President:* Leon Cherksey.

*Research staff:* Alfred Douty, Director; Gerald C. Romig; J. Leaper; Franklin D. Jones. 10 chemists, 10 engineers, 4 in other scientific professions.

*Research activities:* Rustproofing processes; corrosion and heat-resisting paints; the pickling of steel products; inhibitors of acid corrosion; the cleaning and preparation of metal surfaces for paints, etc.; wool scouring; the purification

of wool grease; plant growth substances. (Research initiated 1916.)

*Cooperative research:* Two fellowships are supported.

**69. American Chicle Company, 30-30 Thomson Ave., Long Island City, N. Y.**

*President:* Thomas H. Blodgett.

*Research staff:* Robert Heggie, Director; B. N. Lougovoy, Chief Chemist. 6 chemists; technical personnel 2; additional personnel 3.

*Research activities:* The improvement of products made from chicle, and the development of new products. (Research initiated 1916.)

*Library:* 500 volumes.

*Cooperative research:* Five grants for research are made.

**70. American Colloid Company, 363 West Superior St., Chicago 10, Ill.**

*President:* Paul Bechtner.

*Research staff:* 2 chemists, 1 engineer; additional personnel 2.

*Research activities:* Improvement in the selection and processing of bentonites, and the improvement and development of their industrial uses. (Research initiated 1931.)

*Library:* 453 volumes.

*Scientific periodicals:* Data sheets on bentonite technology and industrial uses, issued monthly.

*Cooperative research:* Occasional grants for research are made.

**71. American Color Research Laboratory, Ridgewood, N. J.**

*Research staff:* A. Maerz, Director. 1 physicist. The staff varies according to the need.

*Research activities:* Color measurement, specification, and standardization; color vision; color photography; problems in connection with dyes and pigments; identification of older and ancient substances; historical research; problems of color in industry and sales psychology; photo-elastic analysis; lenses and optical systems; consultant service. (Research initiated 1925.)

*Library:* 500 volumes.

**American Cyanamid and Chemical Corporation.**  
*See American Cyanamid Company.*

**72. American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y.**

*President:* W. B. Bell. *Vice President in charge of research:* M. C. Whitaker.

*Laboratory:* Stamford, Conn.

*Research staff:* R. C. Swain, Director of research; L. C. Jones, Administrative Director. The following are Division Directors: J. T. Thurston, chemical research; R. B. Barnes, physics; R. O. Roblin, chemotherapy; W. H. Harding, technical service and development;

S. J. Swainson, ore dressing; C. B. Clark, patent and abstract; A. S. Fromholz, chemical engineering; L. J. Christmann, basic nitrogen. 240 chemists, 58 physicists, 27 biologists, 16 metallurgists, 65 engineers, 2 physicians, 1 librarian; additional personnel 431.

*Research activities:* Fundamental and applied research in all major branches of chemistry with particular emphasis on organic nitrogen chemistry; research in physics and instrumentation; process and product development in the field of the company's interest: drugs, pharmaceuticals, plastics, surface coatings, surface active agents, organic intermediates, insecticides, germicides, rubber chemicals, mining chemicals, petroleum additives, paper chemicals, textile assistants, catalysts, etc. (Research initiated 1936.)

*Library:* 10,000 volumes.

*Cooperative research:* Thirty fellowships are supported.

#### CALCO CHEMICAL DIVISION

Bound Brook, N. J.

*President:* W. B. Bell.

*Research staff:* M. L. Crossley, Director; H. Z. Lecher, Associate Director; R. H. Kienle and E. H. Northey, Assistant Directors; E. H. Bart, Manager of process development; K. H. Klipstein, Manager of new product development. 183 chemists, 3 physicists, 1 metallurgist, 6 engineers, 34 textile chemists; technical personnel 144; additional personnel 53.

*Research activities:* Dyes; intermediates; sulfonamide drugs and pharmaceuticals; coal tar hydrocarbons; synthetic resin finishes; organic and inorganic pigments; rubber chemicals. (Research initiated 1915.)

*Library:* 5,500 volumes.

*Cooperative research:* Three fellowships are supported.

#### PINEY RIVER WORKS, CALCO CHEMICAL DIVISION

Piney River, Va.

*Research staff:* W. J. Cauwenberg, Director of development. 21 chemists, 10 engineers; technical personnel 13; additional personnel 36.

*Research activities:* Titanium dioxide pigments and titanium compounds. (Research initiated 1936.)

*Library:* 200 volumes.

#### LEDERLE LABORATORIES, INC.

30 Rockefeller Plaza, New York 20, N. Y.

*President:* W. B. Bell.

*Laboratory:* Pearl River, N. Y.

*Research staff:* W. G. Malcolm, Executive Vice President; B. W. Carey, Director of laboratories; Y. Subbarow, Director of research; H. R. Cox, Director of virus research. 50 chemists, 44 biologists and bacteriologists, 2 physi-

cians, 100 assistant laboratory workers and animal attendants; additional personnel 17.

*Research activities:* Bacteriology, general immunology, allergens, antigens (toxoids, toxins, and bacterial vaccines); sera; antitoxins, diagnostic reagents, and chemotherapy; chemistry and pharmacy; bacterial nutrition, human and animal nutrition (vitamins); biochemistry: liver therapy, pharmaceutical and drug therapy; virus and rickettsial diseases of both human and animal origins. (Research initiated 1930.)

*Library:* 8,000 volumes.

*Scientific periodicals:* Bulletin. 3 times a year. Vol. I, 1933.

*Cooperative research:* Sixty-seven fellowships and scholarships are supported.

DAVIS AND GECK, INC.

57 Willoughby St., Brooklyn 1, N. Y.

*President:* W. B. Bell.

*Research staff:* Ralph O. Clock, Director. 2 chemists, 1 engineer, 1 physician, 3 bacteriologists; technical personnel 7; additional personnel 5.

*Research activities:* Processing of raw catgut; methods of dehydration and sterilization of surgical sutures; factors influencing physical and chemical properties of surgical sutures, including tubing fluids, proteolytic enzymes, antiseptics, disinfectants, and hydrogen-ion concentration; tissue reaction to surgical sutures; absorption of surgical sutures by living tissues; bacteriologic technic for determining sterility of surgical sutures; development of new materials for surgical sutures. (Research initiated 1909.)

*Library:* 152 volumes.

AMERICAN CYANAMID AND CHEMICAL CORPORATION

Latrobe and New Castle, Pa.

*President:* H. L. Derby.

*Laboratory:* New Castle, Pa.

*Research staff:* R. G. Gutelius, Director; L. V. Clark, Assistant Director. 8 chemists; additional personnel 4.

*Research activities:* Production research on processes and materials for high explosives and blasting supplies; research on new explosive substances and their physical action. (Research initiated 1928.)

*Library:* 600 volumes.

73. American Die and Tool Company, Inc., 2nd and Buttonwood Sts., Reading, Pa.

*President:* J. H. Sternbergh.

*Laboratory:* 3rd and Greenwich Sts., Reading, Pa.

*Research staff:* Albert W. Ried, Research and Development Engineer. 1 metallurgist.

*Research activities:* New die and tool products. (Research initiated 1944.)

74. American Distilling Company, Inc., 247 Park Ave., New York, N. Y.

*President:* Russel R. Brown.

*Laboratories:* Pekin, Ill.; Sausalito, Calif.

*Research staff:* Hanns G. Maister, Director. 7 chemists; additional personnel 9.

*Research activities:* Alcoholic fermentation, the aging of whiskey, and the utilization of by-products. (Research initiated 1928.)

75. American District Steam Company, Bryant St., North Tonawanda, N. Y.

*President:* T. M. Evans.

*Research staff:* Fred H. Kindl, Research Engineer. Engineers employed for specific work as required.

*Research activities:* The development of improved slip type and packless expansion devices; insulation and conduit for underground steam lines; steam and condensation metering equipment, storage and instantaneous water heaters, and other devices used in the installation and operation of steam heating systems, and steam and other piping installations.

76. American Dry Milk Institute, Inc., 221 North LaSalle St., Chicago 1, Ill.

*Director:* Roud McCann.

*Research staff:* B. W. Fairbanks, in charge of scientific development; C. M. O'Malley, Chief Chemist. 4 chemists, 2 chemical engineers, 1 bacteriologist, 1 nutritionist; technical personnel 5; additional personnel 3.

*Research activities:* The investigation of non-fat dry milk solids, dry whole milk, dry butter-milk solids, and dry whey solids; quality control; standardization, chemical and physical properties, and vitamin assays. Nutritional investigation and use adaptation for the dry products of milk. (Research initiated 1929.)

*Library:* 150 volumes.

*Cooperative research:* Three fellowships are supported and three grants for research are made.

77. American Dyewood Company, 22 East 40th St., New York, N. Y.

*President:* Paul R. Mackinney.

*Laboratory:* Belleville, N. J.

*Research staff:* Raymond L. Drew, Director. 8 chemists, 1 physicist, 1 engineer.

*Research activities:* Dyewood products; aniline colors and related products.

78. American Electric Fusion Corporation, 2600 Diversey Ave., Chicago 47, Ill.

*President:* Edmund J. Henke.

*Research staff:* Edmund J. Henke, Director;

Thomas J. Henke, Assistant. 1 physicist, 1 engineer.

*Research activities:* Electric welding of the resistance type; the electronics of electric welding; high frequency heating and welding; tube manufacture. (Research initiated 1928.)

*Library:* 300 volumes.

79. American Electro Metal Corporation, 320 Yonkers Ave., Yonkers 2, N. Y.

*President:* P. Schwarzkopf.

*Research staff:* P. Schwarzkopf, Director. 2 chemists, 2 physicists, 2 metallurgists, 2 engineers; technical personnel 6; additional personnel 2.

*Research activities:* Powder metallurgy. (Research initiated 1939.)

*Library:* 150 volumes.

*Cooperative research:* One grant for research is made.

American Enameled Magnet Wire Company.  
*See* Electric Auto-Lite Company.

80. American Encaustic Tiling Company, Inc., Lansdale, Pa.

*President:* Malcolm A. Schweiker.

*Research staff:* Leslie Townsend, Director. 1 chemist; additional personnel 2.

*Research activities:* Color chemistry as applied to the tile industry; clay and ceramics. (Research initiated 1878.)

*Library:* 200 volumes.

81. American Enka Corporation, Enka, N. C.

*Vice President:* A. J. L. Moritz.

*Research staff:* J. J. Polak, Director; J. J. Schilthuis, Chief Chemist; G. I. Thurmond, Chemical Research; A. L. Jackson, Technical Research. 6 chemists, 1 engineer, 1 microscopist; technical personnel 20; additional personnel 6.

*Research activities:* The development of rayon manufacturing processes, and the processing of rayon. (Research initiated 1932.)

*Library:* 900 volumes.

82. American Felt Company, Glenville, Conn.

*President:* John T. Lawless.

*Research staff:* Wm. H. Lehmborg, Director. 2 chemists, 2 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Application and development of felt and improvement of processing methods. (Research initiated 1944.)

*Library:* 500 volumes.

83. American Foundry Equipment Company, Mishawaka, Ind.

*President:* Otto A. Pfaff.

*Research staff:* John C. Straub, Research Engineer. 2 engineers; additional personnel 5.

*Research activities:* Research and development work on shot blasting and shot peening for the purpose of increasing the fatigue life of machine parts, and the development of equipment for more effective performance of the operation. Study of the factors involved in the control of the blast. (Research initiated 1936.)

*Cooperative research:* Several grants for research are made.

84. American Gas Association Testing Laboratories, 1032 East 62nd St., Cleveland 14, Ohio.

*Laboratories:* Cleveland 14, Ohio; 1425 Grande Vista Ave., Los Angeles, Calif.

*Research staff:* R. M. Conner, Director; H. Luoma, Chief Research Engineer. 8 chemists, 2 physicists, 36 engineers, 1 geologist; additional personnel 71.

*Research activities:* Routine testing of various types of domestic and commercial gas-burning equipment and accessories. Investigational work in the development of the approval requirements of the American Gas Association, and fundamental studies which are assigned by the Executive Board of the Association. Research on industrial gas furnaces, and domestic gas-burning appliances. The laboratories are available, upon approval by the Laboratory Managing Committee, for commercial research relating to the gas industry. (Research initiated 1925.)

85. American Gum Importers Laboratories, Inc., 360 Furman St., Brooklyn 2, N. Y.

*President:* Charles F. Walden.

*Research staff:* Charles M. Ferri. 1 chemist.

*Research activities:* Basic research in the field of natural resins and applied research in paint, varnish, lacquer, and other fields. (Research initiated 1937.)

American Hammered Piston Ring Division, Koppers Company, Inc. *See* Koppers Company, Inc.

86. American Hard Rubber Company, 11 Mercer St., New York 13, N. Y.

*President:* F. D. Hendrickson.

*Laboratory:* Butler, N. J.

*Research staff:* P. Brown, Vice President in charge of research; H. Schelhammer, Director. 7 chemists; additional personnel 6.

*Research activities:* The study of rubber and rubber compounds, especially hard rubber; the development of new processes and applications for rubber products. (Research initiated 1918.)

*Library:* 100 volumes.

87. American Hardware Corporation, 10 Franklin Square, New Britain, Conn.

*President:* Charles B. Parsons.

*Research staff:* E. G. Anderson, Director.

4 chemists, 1 metallurgist; additional personnel 8.

*Research activities:* Electroplating; gray iron and nonferrous foundry practice; metal finishes; the control of raw materials. (Research initiated 1912.)

**88. American Home Products Corporation, 257 Cornelison Ave., Jersey City, N. J.**

INTERNATIONAL VITAMIN DIVISION  
1 Main St., Brooklyn 1, N. Y.

*President:* Walter Silbersack.

*Laboratories:* Brooklyn, N. Y.; 84-48 One Hundred and Twenty-ninth St., Richmond Hill, L. I., N. Y.

*Research staff:* Charles J. Kern, Chief Chemist. 7 chemists, 1 biologist, 1 engineer, 2 pharmacists; additional personnel 4.

*Research activities:* Vitamin research. (Research initiated 1930.)

*Library:* 1,000 volumes.

MARIETTA-HARMON CHEMICALS, INC. DIVISION,  
MARIETTA BRANCH  
Marietta, Ohio

*Chairman of the Board:* G. A. LaVallee.

*Vice President and Technical Director:* C. H. W. Whitaker.

*Research staff:* George L. Cunningham, Director. 3 chemists; technical personnel 3; additional personnel 2.

*Research activities:* Dyestuffs and organic chemicals. (Research initiated 1944.)

*Library:* A library is maintained.

**89. American Institute for Nutritional Research, Inc., 305 East 46th St., New York 17, N. Y.**

*President:* W. H. Evert.

*Research staff:* W. H. Evert, Director. 4 chemists, 1 physicist, 1 biologist, 1 engineer, 1 physician; technical personnel 5; additional personnel 9.

*Research activities:* Nutrition; amino acids. (Research initiated 1938.)

*Library:* 2,500 volumes.

**90. American Institute of Baking, 1135 Fullerton Ave., Chicago 14, Ill.**

*Director and Secretary:* Franklin C. Bing.

*Research staff:* William B. Bradley, Head of Laboratory. 3 chemists; technical personnel 2; additional personnel 2.

*Research activities:* The problems of baking and related subjects. (Research initiated 1922.)

*Library:* 5,000 volumes.

**91. American Institute of Laundering, Drawer 1187, Joliet, Ill.**

*General Manager:* George H. Johnson.

*Research staff:* George H. Isaacson, Director

of technical and laundry departments; Carlyle G. Morton, Manager, department of textiles and washroom methods. 2 chemists, 2 engineers; technical personnel 3; additional personnel 21.

*Research activities:* Studies of commercial laundry methods to investigate the scientific soundness of existing practice; the study of laundering qualities of fabrics; the study of particular problems arising within the industry. (Research initiated 1923.)

*Library:* 2,400 volumes.

**92. American Institute of Science, 1430 North Broad St., Philadelphia 21, Pa.**

*President:* Lawrence M. Rosenfeld.

*Laboratory:* Northeast corner 3rd and Huntingdon Sts., Philadelphia 33, Pa.

*Research staff:* Lawrence M. Rosenfeld, Director; J. Harold Felton, Co-director; Isador Cohen, Director of biological research. 6 chemists, 2 biologists and bacteriologists, 1 engineer, 1 botanist; additional personnel 5.

*Research activities:* The utilization of fuel, pulp, and agricultural by-products; investigations into unknown and little-known drugs and agricultural products; the development of new methods of standardization of drugs and other active agents by the Daphnia methods, using the new biologic test animal, *Daphnia magna*. The development of synthetic resins, elastomers, plasticisers, and synthetic fibers, as well as coating compounds; plastics. (Research initiated 1920.)

*Library:* 1,800 volumes.

**93. American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N. Y.**

*President:* Paul Coddington.

*Research staff:* T. R. Higgins, Director of engineering; F. H. Frankland, Consulting Engineer. Technical personnel 10.

*Research activities:* Problems related to stress distribution in structures and their connections, both riveted and welded; preparation and perfection of steel surfaces; protection of steel structures by fire resistive materials. (Research initiated 1921.)

*Cooperative research:* Two grants for research are made.

**94. American Instrument Company, Silver Spring, Md.**

*Partners:* W. H. Reynolds and L. Freeman.

*Research staff:* Gerald H. Lovins, Director; W. H. Reynolds, Chief Engineer. 2 chemists, 1 physicist, 1 metallurgist, 5 engineers; technical personnel 10.

*Research activities:* Gas and liquid flow apparatus; abridged spectrophotometers; fuel testing engine indicators; glass and quartz optical absorption cells; optical glass color filters; con-

stant temperature; constant humidity; extremely low temperature glass to metal seals; measurement of small time intervals; measure of transient phenomena. (Research initiated 1932.)

*Library:* 4,000 volumes.

**95. American Lanolin Corporation, 13 Railroad St., Lawrence, Mass.**

*President:* H. Bradford Lewis.

*Research staff:* John W. Russell, Director. 1 chemist; additional personnel 10.

*Research activities:* The production and utilization of lanolin (wool fat). (Research initiated 1920.)

**96. American Lava Corporation, Chattanooga 5, Tenn.**

*President:* P. J. Kruesi.

*Research staff:* Hans Thurnauer, Director. 2 chemists; technical personnel 7; additional personnel 1.

*Research activities:* Problems of ceramic insulation, with special reference to the electronic art; the development of materials of low dielectric loss or high dielectric constant; ceramic problems in connection with the chemical industry; research on the acid-resisting and wear-resisting materials used by the textile industry; the development of refractory materials with high dielectric strength at elevated temperatures. (Research initiated 1935.)

*Cooperative research:* One fellowship is maintained and one grant for research is made.

**97. American Locomotive Company, 30 Church St., New York 8, N. Y.**

*President:* D. W. Fraser.

*Laboratories:* Schenectady, N. Y.; Auburn, N. Y.; Latrobe, Pa.; Chicago Heights, Ill.

*Research staff:* J. E. Davenport, Vice President in charge of engineering research and development; E. J. Edwards, Chief Metallurgical Engineer; L. B. Jackson, Director of engineering, Diesel Division; L. F. Mulholland, Engineer of Tests; A. C. Mengel, Chief Chemist; J. Taylor, Chief Metallurgist; W. M. Nichols, Superintendent, Diesel Research and Experimental Laboratory; H. R. Sennstrom, Superintendent, Applied Mechanics and Electronics Research Laboratory; A. J. Diakoff, Consulting Engineer. *Schenectady:* 5 chemists, 9 assistant chemists, 1 physicist, 10 metallurgists, 10 engineers; technical personnel 5. *Auburn:* 3 chemists, 3 metallurgists. *Latrobe:* 6 chemists, 9 metallurgists. *Chicago Heights:* 6 chemists, 3 metallurgists. Additional personnel 36.

*Research activities:* Diesel Laboratory: Diesel engine research, fuel injection research, stress analysis and fatigue testing, air flow and liquid flow; general applied mechanics research.

*Material Laboratories:* The development of materials for Diesel and steam locomotives. (Research initiated 1890.)

*Library:* 3,200 volumes.

**98. American Machine and Foundry Company, 5502-24 Second Ave., Brooklyn 20, N. Y.**

*President:* H. H. Leonard.

*Laboratories:* Brooklyn, N. Y.; 1360 West Ave., Buffalo 13, N. Y.

*Research staff:* E. W. Menke, Director of engineering; C. W. Johnson, Brooklyn, Chief Engineer; H. G. Allen, Buffalo, Chief Engineer. 1 chemist, 1 metallurgist, 25 engineers; technical personnel 40; additional personnel 18.

*Research activities:* The development and improvement of automatic machinery.

*Library:* A library is maintained.

**American Magnesium Corporation. See Aluminum Company of America.**

**99. American Maize-Products Company, 100 East 42nd St., New York 17, N. Y.**

*President:* Theodore Sander, Jr.

*Laboratories:* Roby, Ind.; New York, N. Y.

*Research staff:* B. F. Buchanan, Supervisor of research. 9 chemists, 3 biologists, 2 engineers, 3 nutritionists, 16 control chemists; additional personnel 5.

*Research activities:* Carbohydrates, including starches, dextrans, sugars, and syrups; proteins; vegetable oils; animal feeds; new products; new processes; improvement of processes. (Research initiated 1932.)

*Library:* 500 volumes.

*Cooperative research:* Two fellowships are supported.

**100. American Meat Institute, 59 East Van Buren St., Chicago 5, Ill.**

*President:* Wesley Hardenbergh.

*Research staff:* H. R. Kraybill, Director. 8 chemists, 1 physician, 1 bacteriologist, 1 home economist; technical personnel 16; additional personnel 3.

*Research activities:* Fundamental studies in the curing of meat, the prevention of spoilage, etc.; the manufacture of lard, the chemistry of fats, and antioxidants for fats; the nutritive value of animal by-product protein feeds; the amino acid composition of meat. (Research initiated 1925.)

*Library:* 500 volumes.

*Cooperative research:* Two grants are made for research.

**101. American Meter Company, Inc., 60 East 42nd St., New York 17, N. Y.**

*President:* Norton McKean.

**D. McDONALD AND COMPANY WORKS**

991 Broadway, Albany, N. Y.

*Research staff:* A. F. Benson, Chief Engineer; W. V. Stockton, Jr., Director. 1 chemist, 2 engineers; additional personnel 2.

*Research activities:* The development and improvement of gas meters for low pressure measurement and of allied apparatus used by the gas industry. (Research initiated 1930.)

**METRIC METAL WORKS**

Erie 2, Pa.

*Research staff:* A. F. Benson, Chief Engineer; Hilding Beck, Director; George Brewer. 3 engineers; additional personnel 2.

*Research activities:* Testing and calibrating flow instruments, regulators, and controllers for the measurement of gases, steam, and oil and other liquids in varying volumes under low and high pressures. (Research initiated 1912.)

**102. American Molasses Company, 120 Wall St., New York 5, N. Y.**

*President:* Charles W. Taussig.

*Laboratory:* Applied Sugar Laboratories, Inc., 280 Richards St., Brooklyn 31, N. Y.

*Research staff:* Joseph T. Irazoqui, Director; A. A. Jackson, Chief Chemist. 4 chemists, 1 biochemist, 2 chemical engineers; technical personnel 3; additional personnel 6.

*Research activities:* Improvements in the manufacture of, and problems relating to: sugar in its refined state, molasses, invert syrups, and other types of syrups. (Research initiated 1930.)

*Library:* 2,000 volumes.

**103. American Mutual Liability Insurance Company, 142 Berkley St., Boston, Mass.**

*President:* C. E. Hodges, Jr.

*Research staff:* C. E. Pettibone, Director. 1 biologist and bacteriologist.

*Research activities:* Exploration into the causes of industrial diseases and their control. (Research initiated 1931.)

**104. American Net and Twine Division of the Linen Thread Company, Inc., 60 East 42nd St., New York, N. Y.**

*President:* F. K. Barbour.

*Laboratories:* Gloucester, Mass.; Paterson, N. J.

*Research staff:* Frank E. Firth, Manager, Netting Research Department. 1 chemist, 1 biologist.

*Research activities:* Fish net preservatives; netting; twine studies. (Research initiated 1920.)

**105. American Oak Leather Company, Kenner St. and Dalton Ave., Cincinnati, Ohio.**

*President:* W. H. Mooney.

*Research staff:* C. L. Ornes, Director. 2 chemists.

*Research activities:* The tanning and finishing of sole leather. (Research initiated 1927.)

**106. American Optical Company, Southbridge, Mass.**

*President:* George B. Wells.

*Laboratories:* Southbridge Mass.; Buffalo, N. Y.

*Research staff:* Edgar D. Tillyer, Director. 8 chemists, 3 physicists, 2 metallurgists, 10 engineers, 2 mathematicians, 1 ceramist; technical personnel 27; additional personnel 5.

*Research activities:* Metallurgical research in ferrous and nonferrous metals; spectral transmission and other optical and physical properties of glasses and optical materials; optical designing in general, especially the designing of scientifically correct ophthalmic lenses; glass strength investigations; ophthalmic diagnostic instrument designing and testing; the investigation of materials for surfacing glass; the study of methods of evaluating quality of glass surfaces; the development and the testing of respiratory protective devices; new types of glass; nonsilicate glasses; reflection modifying coatings; nonspherical lens surfaces. (Research initiated 1910.)

*Library:* 2,500 volumes.

**SCIENTIFIC INSTRUMENT DIVISION**

(Spencer Lens Company)

19 Doat St., Buffalo 11, N. Y.

*Research staff:* Alva H. Bennett, Director. 4 chemists, 12 physicists, 1 biologist, 1 metallurgist, 8 engineers, 3 mathematicians; technical personnel 24; additional personnel 4.

*Research activities:* The design of optical instruments and lens systems and the development of methods of optical design; the application of optical instruments to industrial and biological uses; polarimetry; refractometry; interferometry; spectroscopy; microscopy; biology; glass technology; colorimetry; photomicrography. (Research initiated 1916.)

*Library:* 1,000 volumes.

**BUREAU OF VISUAL SCIENCE**

Southbridge, Mass.

*Research staff:* Paul Boeder, Director. 1 psychologist, 2 mathematicians, 1 physiologist; technical personnel 3; additional personnel 3.

*Research activities:* The investigation of general and special problems of vision; ophthalmic diagnostic instrument design and clinical testing;

psychology of vision; educational psychology. (Research initiated 1934.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is maintained and three grants for research are made.

107. American Pharmaceutical Association, 2215 Constitution Ave., Washington 7, D. C.

*President:* George A. Moulton.

*Secretary:* Robert P. Fischelis.

*Research staff:* Justin L. Powers, Director; Melvin W. Green, Chemist in charge of laboratory; 5 pharmaceutical chemists; additional personnel 2.

*Research activities:* The development of official standards for drugs of the National Formulary and the U. S. Pharmacopoeia. (Research initiated 1936.)

*Library:* 5,000 volumes.

*Scientific periodicals:* Journal of the American Pharmaceutical Association, Vol. I, 1912. Bulletin of the National Formulary Committee, Vol. I, 1933. National Formulary, Seventh Edition. Pharmaceutical Recipe Book, Third Edition.

*Cooperative research:* Fellowships are supported and grants for research are made.

108. American Platinum Works, 231 N.J.R.R. Ave., Newark 5, N. J.

*President:* Charles Engelhard.

*Research staff:* Ross Bayes, Manager. 2 chemists, 3 metallurgists; technical personnel 5; additional personnel 2.

*Research activities:* The uses of platinum, gold, silver, and alloys of precious metals; silver brazing alloys. (Research initiated 1902.)

*Library:* A library is maintained.

*Cooperative research:* One fellowship is supported.

109. American Potash and Chemical Corporation, 122 East 42nd St., New York 17, N. Y.

*President:* F. C. Baker.

*Laboratory:* Trona, Calif.

*Research staff:* William A. Gale, Director; Henry B. Suhr, Assistant Director. 18 chemists, 12 engineers; additional personnel 5.

*Research activities:* The design and operation of evaporators, crystallizers, and other special equipment for the recovery of the constituents of Searles Lake brine in marketable form; the development of various by-products; a study of Searles Lake deposit, and phase rule studies of complex systems applicable to the foregoing; corrosion problems, etc. (Research initiated 1918.)

*Library:* 3,000 volumes.

American Printing Ink Company. See Sun Chemical Corporation.

110. American Products Company, 3265 Colerain Ave., Cincinnati 25, Ohio.

*President:* R. L. Flett.

*Research staff:* Robert Holz, Technical Director. 3 chemists, 1 physicist, 1 engineer, 2 dieticians; technical personnel 2; additional personnel 3.

*Research activities:* The development of new foodstuffs, insecticides, germicides, toilet preparations, and household and automobile accessories, such as soaps, cleaners, polishes, etc.; the development and improvement of methods of manufacture. (Research initiated 1920.)

*Library:* 400 volumes.

111. American Products Manufacturing Company, 8127-33 Oleander St., New Orleans 18, La.

*President:* Harold A. Levey.

*Research staff:* Harold A. Levey, Director. 3 chemists, 1 physicist, 1 metallurgist, 2 engineers; additional personnel 8.

*Research activities:* The development of plastic compositions made from cellulose derivatives and resins. (Research initiated 1919.)

112. American Radiator and Standard Sanitary Corporation, Bessemer Bldg., P. O. Box 1226, Pittsburgh, Pa.

*President:* H. M. Reed, Sr.

#### PLUMBING FIXTURE RESEARCH DIVISION

1541 South 7th St., Louisville, Ky.

*Research staff:* Erwin Sohn, Director. 1 chemist, 1 physicist, 1 metallurgist, 3 engineers.

*Research activities:* Cast iron for enameling purposes, enamels for cast iron, metallurgy of brass and white metals, vitreous china, backflow, and hydraulics. (Research initiated 1927.)

#### HEATING RESEARCH DIVISION

675 Bronx River Road, Yonkers, N. Y.

*Research staff:* B. Goerg, in charge of heating research; D. H. Meloche, in charge of chemical and metallurgical research. 1 chemist, 1 metallurgist, 5 engineers.

*Research activities:* The investigation and development of heating equipment. (Research initiated 1923.)

*Cooperative research:* One fellowship is supported.

See also C. F. Church Manufacturing Company, Detroit Lubricator Company, and Kewanee Boiler Corporation.



113. American Reinforced Paper Company, 55 Starkey Ave., Attleboro, Mass.

*President:* P. T. Jackson.

*Research staff:* F. F. Newkirk, Director. 2 chemists; technical personnel 3; additional personnel 3.

*Research activities:* Research on coatings, adhesives, and paper. (Research initiated 1931.)

114. American Resinous Chemicals Corporation, Peabody, Mass.

*President:* William Abramowitz.

*Research staff:* Ashworth N. Stull, Director of research; S. J. Baum, Director, Polymerization Laboratories; J. Y. L. Kao, Director, Latex Laboratories; M. A. Kimmel, Director, Adhesive Laboratory; Ray C. Martin, Director, Coating Division; H. A. Wells, Lacquer Laboratory; F. B. Speyer, Paper Converting Laboratory. 10 chemists, 1 mechanical engineer, 1 chemical engineer; technical personnel 5; additional personnel 5.

*Research activities:* Polymerization, emulsification, hot melts, synthesis of monomers, resin synthesis, adhesives, paper, leather, textiles, protective coatings, greasproofing, and waterproofing. (Research initiated 1940.)

*Library:* 500 volumes.

115. American Rolling Mill Company, Middletown, Ohio.

*President:* Charles R. Hook.

*Research staff:* Anson Hayes, Director; R. L. Kenyon, R. L. Davidson, T. F. Olt, G. H. Cole, Associate Directors. 1 chemist, 13 metallurgists, 29 engineers, 13 analysts, 4 research assistants, 7 laboratory assistants; technical personnel 13; additional personnel 19.

*Research activities:* The investigation of new metallurgical problems; the applications of iron and steel; the investigation of corrosion problems; research on new alloys, metallic and non-metallic coatings, and magnetic properties of iron and steel. (Research initiated 1903.)

*Library:* 2,075 volumes.

American Scientific Laboratories. See No. 2428 in *Addenda*.

116. American Screw Company, Providence 1, R. I.

*President:* Eugene E. Clark.

*Research staff:* 1 metallurgist, 3 engineers; technical personnel 2; additional personnel 1.

*Research activities:* The development of new products and methods; the testing and analysis of materials for screws; the technical control of manufacturing processes; sales engineering assistance. (Research initiated 1934.)

117. American Seal-Kap Corporation, 11-05 Forty-fourth Drive, Long Island City 1, N. Y. (Subsidiary of the American Seal Cap Corporation of Delaware.)

*President:* D. A. Mackin.

*Research staff:* C. W. Goodwin, Vice President and General Manager; H. G. Vore, Chief Chemist; Arnold Storrs, Dairy Technician. 1 chemist, 5 mechanical engineers, 1 laboratory assistant.

*Research activities:* Waxes and waterproofing compositions; paper and paper treatment; enzymes for the modification of foods, especially dairy products; the development and improvement of the design and manufacture of milk bottle caps and closures for liquid-tight containers; automatic closure applying equipment. (Research initiated 1929.)

118. American Seating Company, 901 Broadway, Grand Rapids 2, Mich.

*President:* H. M. Taliaferro.

*Research staff:* R. K. Merrill, Works Manager; H. S. Leader, Supervisor of research. 2 chemists, 2 engineers; technical personnel 3; additional personnel 13.

*Research activities:* The testing of products; the control of raw material; the testing and control of textiles; the manufacture and control of lacquers and of other raw materials such as glue stain, etc. (Research initiated 1925.)

*Library:* 200 volumes.

119. American Smelting and Refining Company, Perth Amboy (Barber), N. J.

*President:* Roger Straus.

*Research staff:* Albert J. Phillips, Manager; A. A. Smith, Jr., Physical Metallurgy; Y. E. Lebedeff, Chemical Metallurgy. 14 chemists, 11 metallurgists; additional personnel 31.

*Research activities:* The development of new processes and new products as applied to copper, lead, cadmium, zinc, silver, antimony, bismuth, etc. (Research initiated 1913.)

*Library:* 650 volumes; 1,050 bound periodicals.

120. American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York 10, N. Y.

*Laboratory:* 7218 Euclid Ave., Cleveland 3, Ohio.

*Research staff:* Cyril Tasker, Director; C. M. Humphreys, Senior Engineer. 6 engineers; technical personnel 2; additional personnel 5.

*Research activities:* The sciences of heating, ventilating, and air conditioning, and the equipment and apparatus utilized by the profession. (Research initiated 1919.)

*Library:* A library is maintained.

*Scientific periodicals:* Transactions of ASHVE. Vol. I, 1895.

*Cooperative Research:* Fourteen grants for research are made.

**121. American Solder and Flux Company, 2152 East Norris St., Philadelphia 25, Pa.**

*President:* Frank D. McBride.

*Research staff:* Harry C. Kofke, Director. 1 chemist.

*Research activities:* New formulae for soldering, brazing, and welding fluxes. (Research initiated 1931.)

**American Solder Flux Company. See Hoover Laboratories, C. M.**

**122. American Steam Automobile Company, West Newton, Mass.**

*President:* Thomas S. Derr.

*Research staff:* Thomas S. Derr, Director. 2 engineers.

*Research activities:* Steam cars, small boilers, engines, and small oil burners. (Research initiated 1927.)

**123. American Steel and Wire Company, Rockefeller Bldg., Cleveland 13, Ohio. (Subsidiary of United States Steel Corporation.)**

*President:* C. F. Hood.

*Laboratories:* Cleveland, Ohio; Worcester, Mass.

*Research staff:* Walter O. Everling, Director; Willis T. Cramer, Assistant Director. 8 chemists, 6 metallurgists, 2 engineers, 1 in another scientific profession; technical personnel 8; additional personnel 14.

*Research activities:* Metallurgy of iron and steel; metallography and heat treatment; cold drawing of wire, galvanizing and other metal coatings of wire and strip; spectrographic work; magnetic testing; X-ray analysis, etc.; the development of rubber compounds and coatings for cables; electronics.

*Library:* 350 volumes.

*Cooperative research:* Three scholarships are supported.

**124. American Steel Foundries, 410 North Michigan Ave., Chicago 11, Ill.**

*President:* Thomas Drever.

*Laboratory:* East Chicago, Ind.

*Research staff:* G. A. Lillieqvist, Director. 3 chemists, 4 metallurgists; technical personnel 5; additional personnel 8.

*Research activities:* Steel making practices; new compositions; metallurgical investigations; developing and testing of new sand mixes, new foundry techniques, and centrifugal castings; welding. (Research initiated 1926.)

*Library:* 1,000 volumes.

*Cooperative research:* Two grants for research are made.

**125. American Sterilizer Company, 12th and Plum Sts., Erie, Pa.**

*President:* George W. Bach.

*Research staff:* Weeden B. Underwood, Director; John J. Perkins, Associate Director; Raymond Jewell, Chief Engineer. 1 biologist; 2 engineers.

*Research activities:* The study of the functions and application of sterilizers. (Research initiated 1933.)

*Scientific periodicals:* The Surgical Supervisor, Vol. I, 1941; bimonthly.

**126. American Stove Company, 4931 Daggett Ave., St. Louis 10, Mo.**

*President:* Arthur Stockstrom.

*Research staff:* A. H. Brodbeck, Director. 4 chemists, 3 physicists, 1 metallurgist, 10 engineers; additional personnel 18.

*Research activities:* Developing and testing gas heating, cooking, and refrigeration appliances and accessories. Developing and testing solid fuel and oil cooking and heating appliances, and the materials used in their manufacture. Testing for safety, carbon monoxide formation (due to incomplete combustion), fire hazard, and general efficiency in performance. (Research initiated 1925.)

**127. American Sugar Refining Company, 120 Wall St., New York, N. Y.**

*President:* Joseph F. Abbott.

*Laboratories:* Brooklyn, N. Y.; Boston, Mass.; Baltimore, Md.; Chalmette (New Orleans), La.; and Philadelphia, Pa.

*Research staff:* Carl F. Huttlinger, Vice President in charge of research; Victor L. Johnson, Manager of refinery operations; Louis A. Wills, Technologist; Stroud Jordan, Manager of Service Division. 12 chemists; additional personnel 28.

*Research activities:* The technology of sugar refining, and the uses of cane sugar products.

**American Telephone and Telegraph Company. See Bell Telephone Laboratories, Inc.**

**128. American Thread Company, Inc., 260 West Broadway, New York 13, N. Y.**

*President:* P. S. Howe, Jr.

*Laboratory:* Willimantic, Conn.

*Research staff:* H. D. Corkum, Director. 4 chemists, 4 textile technologists; technical personnel 11; additional personnel 4.

*Research activities:* Fundamental research combined with the improvement of textile products from the standpoint both of quality and cost. (Research initiated 1943.)

*Library:* 513 volumes.

**129. American Tobacco Company, 111 Fifth Ave., New York 3, N. Y.**

*President:* George W. Hill.

*Laboratory:* 400 Petersburg Turnpike, Richmond 24, Va.

*Research staff:* H. R. Hanmer, Director; W. R. Harlan, Assistant. 29 chemists, 2 engineers, 1 bacteriologist, 1 librarian; technical personnel 11; additional personnel 17.

*Research activities:* The investigation of the chemical composition and physical nature of various types of tobacco, and the specific effect of manufacturing processes upon them; investigation of the chemical and physical nature of tobacco smoke; the correlation of composition of smoke with constituents of tobacco; investigation of the physiological significance of the constituents of the smoke of tobacco products; the development of methods for the scientific control of purchasing, processing, and blending tobaccos, and fabrication of tobacco products. (Research initiated 1911.)

*Library:* 1,670 volumes.

*Cooperative research:* One grant for research is made.

**American Tube and Stamping Division, Stanley Works. See Stanley Works.**

**130. American Viscose Corporation, Delaware Trust Bldg., Wilmington 99, Del.**

*President:* William C. Appleton.

*Laboratory:* Marcus Hook, Pa.

*Research staff:* C. S. Venable, Director; F. W. Koster, Assistant Director. 31 chemists, 4 engineers; technical personnel 50; additional personnel 23.

*Research activities:* Rayon and synthetic fibers; improvement of current products and development of new products and methods of production; fundamental studies in cellulose, plastics, and fibrous materials. (Research initiated 1922.)

*Library:* 4,000 volumes.

*Cooperative research:* Two fellowships are supported.

**131. American Water Softener Company, Lehigh Ave. and 4th St., Philadelphia, Pa.**

*President:* A. S. Garrett.

*Research staff:* George Bacon, Director.

*Research activities:* Water softening and filtering. (Research initiated 1903.)

**132. American Welding and Manufacturing Company, Warren, Ohio.**

*President:* W. J. Sampson, Jr.

*Research staff:* I. A. Oehler, Director. 2 metallurgists, 10 engineers; technical personnel 5; additional personnel 1.

*Research activities:* Welding and metallurgical research; railroad equipment. (Research initiated 1942.)

**American Wire Fabrics Corporation. See Wickwire Spencer Steel Company.**

**133. American Writing Paper Corporation, 9 Main St., Holyoke, Mass.**

*President:* Leon M. Yoerg.

*Research staff:* Helen U. Kiely, Director; Raymond Hemphill. 3 chemists, 7 engineers; additional personnel 6.

*Research activities:* New fibers; new paper-making processes and improvements in existing processes; mill experimental work to improve present processes and to effect economies in operation. (Research initiated 1898.)

**134. American Zinc Sales Company, P. O. Box 327, Columbus 1, Ohio.**

*Vice President:* A. C. Eide.

*Research staff:* John H. Calbeck, Director. 4 chemists; technical personnel 4; additional personnel 1.

*Research activities:* The development of pigments, particularly zinc pigments, and their use in the paint and rubber industries. (Research initiated 1923.)

*Library:* 500 volumes.

**135. Ames Company, W. V-B., 137 North Adams St., Fremont, Ohio.**

*President:* W. B. Holmes.

*Research staff:* W. B. Holmes and Cyril E. Cockrell, Chemists.

*Research activities:* The improvement of dental cements and filling materials, and the development of new products for similar purposes. (Research initiated 1910.)

**Amoskeag Fabrics, Inc. See Warwick Mills.**

**136. Ampco Metal, Inc., 1745 South 38th St., Milwaukee 4, Wis.**

*President:* C. J. Zaiser.

*Research staff:* W. W. Edens, Technical Director; J. F. Klement, Chief Metallurgist. 2 chemists, 3 metallurgists, 2 engineers; technical personnel 16; additional personnel 4.

*Research activities:* Metallurgical and chemical research. (Research initiated 1937.)

*Library:* 500 volumes.

*Cooperative research:* One educational grant is made.

**137. Ampco Twist Drill Company, Jackson, Mich.**

*President:* F. J. Sikorovsky.

*Research staff:* William J. Levy, Metallurgist. 2 chemists, 1 metallurgist, 1 engineer.

*Research activities:* High speed steel cutting tools. (Research initiated 1930.)

**Amplex Manufacturing Company.** See Chrysler Corporation.

**138. Amplifier Company of America, 398 Broadway, New York 13, N. Y.**

*Research staff:* 1 chemist, 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Electronic-audio equipment; measuring devices; test equipment; regulated power supplies; transformers. (Research initiated 1936.)

*Library:* 1,000 volumes.

**139. Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y.**

*President:* J. R. Hobbins. *Chairman of the Board:* C. F. Kelley.

*Laboratories:* Great Falls Reduction Works, Great Falls, Mont.; Anaconda Reduction Works, Anaconda, Mont.

*Research staff:* Great Falls Reduction Works: Guy T. Wever, Research Engineer; 6 chemists and metallurgists, 1 physicist. Anaconda Reduction Works: 9 chemists and metallurgists; additional personnel 10.

*Research activities:* Both laboratories are concerned with metallurgical problems, usually pyro- or hydrometallurgical, of nonferrous metals, mainly copper, lead, and zinc, but also including cadmium, indium, and gallium. (Research initiated 1900.)

**ANACONDA WIRE AND CABLE COMPANY**

25 Broadway, New York 4, N. Y.

*President:* H. Donn Kersey.

*Laboratories:* Hastings-on-Hudson, N. Y.; Marion, Ind.; Pawtucket, R. I.; Sycamore, Ill.; Muskegon, Mich.

*Research staff:* Chemists, physicists, metallurgists, and engineers.

*Research activities:* Investigation of the properties and development of the materials and processes used in the manufacture of electrical conductors, insulated cables, and their accessories; the development and testing of bare and insulated wires and cables for electrical purposes.

See also American Brass Company and International Smelting and Refining Company.

**Anaconda Wire and Cable Company.** See Anaconda Copper Mining Company.

**140. Anchor Post Fence Company (Fluid Heat Division), 6500 Eastern Ave., Baltimore 24, Md.**

*President:* W. F. Brannan.

*Research staff:* T. H. Smoot, Vice President

and Director. 5 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Combustion of gasoline, kerosene, and fuel oil; heat transfer equipment and automatic controls. (Research initiated 1930.)

*Cooperative research:* One grant for research is made.

**141. Anderegg, Frederick O., Raritan, N. J.**

*President:* Frederick O. Anderegg.

*Research staff:* Laboratory personnel 2.

*Research activities:* Consulting research on building materials, including: portland cement and its products; masonry cements, masonry units, and masonry erections; lime, mineral wool, and light-weight aggregates; plaster, light-weight molded blocks, glass units; the application and testing of paints; materials and members for pre-fabrication; corrosion of lead; ozone; resins. (Research initiated 1930.)

**142. Anderson, Norman P., Bloomfield, N. J.**

*President:* Norman P. Anderson.

*Research staff:* N. P. Anderson, Director. 1 chemist, 1 metallurgist, 1 engineer; additional personnel 1.

*Research activities:* Plant engineering; process development; dispersions and emulsions; corrosion control; heat-treatment and metallurgy; dewatering. (Research initiated 1939.)

*Library:* A library is maintained.

**143. Anderson Oil Company, F. E., Portland, Conn.**

*Partner:* F. E. Anderson.

*Research staff:* A. W. Ackerman, Chief Chemist. 2 chemists, 2 engineers; technical personnel 1; additional personnel 1.

*Research activities:* Rust preventives and protective coatings; industrial lubricating and metal working oils; metal cleaners. (Research initiated 1936.)

*Library:* 100 volumes.

**144. Anderson Physical Laboratory, 602 East Green St., Champaign, Ill.**

*Research staff:* Scott Anderson, Director, 1 chemist, 2 physicists, 1 metallurgist.

*Research activities:* Physical optics; oxidation of metals; fluorescence; properties of semiconductors. (Research initiated 1944.)

*Library:* 100 volumes.

**145. Anderson-Prichard Oil Corporation, 1000 Apco Tower, Oklahoma City 2, Okla.**

*President:* L. H. Prichard.

*Laboratories:* Chicago, Ill.; Cyril, Okla.; Akron, Ohio; New York, N. Y.; Colorado City, Tex.

*Research staff:* B. I. Scoggin, Manager, research department; D. D. Rubek, Director, Chicago; W. L. Steiner, Director, Cyril; C. A. Gault, Director, Akron. 12 chemists, 5 engineers; technical personnel 6; additional personnel 27.

*Research activities:* Process development in the refining of petroleum, particularly petroleum solvents; research and development in the application of various petroleum products; research in crude oil production. (Research initiated 1923.)

*Library:* 5,000 to 10,000 volumes.

146. **Andrews, A. B.**, State Assayer, Lewiston, Maine.

*Research staff:* A. B. Andrews, Director. Laboratory personnel 2.

*Research activities:* Cellulose; optical glass and lenses; textiles. (Research initiated 1915.)

147. **Androscoggin Mills; Bates Manufacturing Company; Edwards Manufacturing Company; Hill Manufacturing Company; York Manufacturing Company;** 9 Green St., Augusta, Maine.

*President:* Robert Braun.

*Laboratory:* Maine Mills Laboratory, Locust St., Lewiston, Maine.

*Research staff:* William Watson, Director. 3 chemists, 3 engineers; technical personnel 5; additional personnel 3.

*Research activities:* The improvement of processes in cotton manufacturing; the development of new end products; cotton and rayon; the use of plastics in conjunction with textiles; changing the characteristics of yarns and fibers. (Research initiated 1936.)

*Library:* 250 volumes.

148. **Anemostat Corporation of America**, 10 East 39th St., New York 16, N. Y.

*President:* August Rust-Oppenheim.

*Laboratories:* New York, N. Y.; 1031 New Britain Ave., Hartford (Elmwood), Conn.

*Research staff:* Franz K. Kurth, Vice President and Director of engineering; Leonard R. Phillips, Director of research. 5 physicists, 10 engineers; technical personnel 5; additional personnel 6.

*Research activities:* Heating, ventilating, and air conditioning equipment for trains, busses, aircraft, truck cabs, and automobiles; aircraft cabin heating; windshield deicing and defrosting; wing deicing; exhaust flame suppressing. (Research initiated 1940.)

*Cooperative research:* Three grants for research are made.

149. **Angier Products, Inc.**, 120 Potter St., Cambridge 42, Mass.

*President:* Donald Angier.

*Research staff:* Stanley O. Ames, Director. 9 chemists, 1 engineer; technical personnel 4; additional personnel 2.

*Research activities:* Adhesives and cements from synthetic and natural rubbers and resins; coatings and laminants for food and other packaging; saturants for pulp and fiber. (Research initiated 1931.)

150. **Anheuser-Busch, Inc.**, 721 Pestalozzi St., St. Louis 18, Mo.

*President:* Adolphus Busch III.

*Laboratories:* St. Louis, Mo.; Old Bridge, N. J.

*Research staff:* G. S. Bratton, Director. 24 chemists, 5 engineers (chemical), 4 biologists and bacteriologists, 1 legal-technical patent searcher, 2 geneticists, 1 nutritionist; additional personnel 30.

*Research activities:* Malting; brewing; the study of yeast (baking and pharmaceutical); corn products (syrup, starch, dextrines); animal feeds. (Research initiated 1892.)

*Library:* 3,525 volumes.

*Cooperative research:* Five grants for research are made.

151. **Ansbacher-Siegle Corporation**, 92 Chestnut Ave., Rosebank, Staten Island 5, N. Y.

*President:* B. R. Armour.

*Research staff:* Paul A. Thomasset, Director. 10 chemists, 2 engineers; technical personnel 15; additional personnel 4.

*Research activities:* The development and improvement of colored pigments and their application in printing ink, paint, lacquer, carbon papers, typewriter ribbons, cosmetics, rubber, artists' colors, plastics, etc. (Research initiated 1907.)

*Library:* 200 volumes.

**Anseo Division, General Aniline and Film Corporation.** See General Aniline and Film Corporation.

152. **Ansul Chemical Company**, Marinette, Wis.

*President:* H. V. Higley.

*Research staff:* Walter O. Walker, Director; Carl L. Wallfred, Pilot Plant Manager. 6 chemists, 2 chemical engineers; technical personnel 1; additional personnel 1.

*Research activities:* Methods of manufacture and uses of sulfur dioxide and methyl chloride; chloropicrin; refrigerants; fire extinguisher dry chemical. (Research initiated 1925.)

*Library:* 2,000 volumes.

*Scientific periodicals:* Ansul News Notes. Vol. I, 1937. Approximately four times a year.

153. Anthony Company, 47-33 Fifth St., Long Island City, N. Y.

*President:* A. W. Morse.

*Research staff:* 2 engineers.

*Research activities:* Oil burning and gas burning equipment, and industrial furnaces. (Research initiated 1907.)

154. Anthracite Industries, Inc., 101 Park Ave., New York 17, N. Y.

*President:* Frank W. Earnest, Jr.

*Laboratory:* Primos, Delaware County, Pa.

*Research staff:* R. C. Johnson, Vice President in charge of research. 3 chemists, 2 physicists, 20 engineers; technical personnel 10; additional personnel 15.

*Research activities:* The development of equipment for the utilization of anthracite; consultant and advisory work for manufacturers in connection with the testing and improvement of equipment. (Research initiated 1929.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported and grants are made for research.

155. Apache Powder Company, P. O. Box 218, Benson, Ariz.

*President:* P. G. Beckett.

*Laboratory:* Curtiss, Ariz.

*Research staff:* Louis W. Towle, Technical Service Supervisor. 3 chemists; technical personnel 1; additional personnel 1.

*Research activities:* The development of commercial explosives and problems pertaining to their manufacture and use; miscellaneous industrial problems. (Research initiated 1925.)

*Library:* 450 volumes.

156. Apex Chemical Company, Inc., 200 South 1st St., Elizabeth, N. J.

*President:* Seymour M. Hermann.

*Research staff:* Sidney M. Weinstein, Director. 8 chemists, 1 biologist, 2 engineers, 1 physician; technical personnel 2; additional personnel 3.

*Research activities:* Lactic acid; organic, textile, and leather chemicals. (Research initiated 1900.)

*Library:* 400 volumes.

157. Appleton Coated Paper Company, Appleton, Wis.

*President:* Charles S. Boyd.

*Research staff:* A. Lewenstein, Chief Chemist. 1 chemist, 1 engineer; additional personnel 5.

*Research activities:* Paper and paper coatings. (Research initiated 1923.)

158. Applied Research Laboratories, 4336 San Fernando Road, Glendale 4, Calif.

*Partners:* M. F. Hasler and R. W. Lindhurst.

*Research staff:* M. F. Hasler, Director. 1 chemist, 2 physicists, 4 engineers; technical personnel 2; additional personnel 3.

*Research activities:* The development of suitable methods and instruments for spectrochemical testing. (Research initiated 1934.)

*Library:* 200 volumes.

159. Applied Research Laboratories, Inc., Dayton, N. J.

*President:* Grace R. Durfee.

*Research staff:* Grace Durfee, Director. 2 chemists, 2 biologists, 1 physician, 1 bacteriologist; additional personnel 5.

*Research activities:* Commercial research in toxicology, pathology, endocrinology, bacteriology, pharmacology, and physiology. (Research initiated 1931.)

*Library:* 100 volumes.

160. Applied Research Service, 1244 North Central Park Ave., Chicago 51, Ill.

*Research staff:* Warren R. Price, Director. 1 chemical engineer; additional personnel 1.

*Research activities:* The improvement of products, reduction of costs, and development of specialty products in various fields, including printing inks, printing, adhesives, paper coating, bottle caps, matches, fiber and tufted rugs, vulcanized fiber. (Research initiated 1934.)

*Library:* 200 volumes.

Applied Sugar Laboratories, Inc. *See* American Molasses Company.

161. Archer Daniels Midland Company, 600 Roanoke Bldg., Minneapolis 2, Minn.

*President:* S. M. Archer.

*Laboratory:* 3100 38th Ave., South, Minneapolis, Minn.

*Research staff:* Biological research and development: J. W. Hayward, Director. 2 chemists, 10 biologists; technical personnel 6; additional personnel 5. Vegetable and animal oils research: S. O. Sorensen, Director. 12 chemists; technical personnel 5; additional personnel 5.

*Research activities:* Vegetable and animal oils, particularly drying oils. (Research initiated 1933.)

*Library:* 2,000 volumes.

*See also* Commander-Larabee Milling Company.

162. Arco Company, 7301 Bessemer Ave., Cleveland 4, Ohio.

*President:* H. E. Wise.

*Research staff:* Eugene W. Kanning, Direc-

tor; W. F. Zehe, Chief Chemist; A. G. Schanbel, W. R. Jenuleson, Assistant Chief Chemists. 18 chemists; technical personnel 7; additional personnel 4.

*Research activities:* Protective coatings, including paints, varnishes, lacquers, and insulating coatings; also adhesives and resins. (Research initiated 1910.)

ARCO COMPANY OF CALIFORNIA, LTD.  
745 East 59th St., Los Angeles, Calif.

*Research staff:* L. L. Sheaffer, Chief Chemist. 3 chemists.

*Research activities:* The development of paints, varnishes, lacquers, and other types of protective coatings, including caulks and adhesives. (Research initiated 1930.)

*Library:* 450 volumes.

163. Arerods Corporation, Sparrows Point 19, Md.

*President:* W. C. Keeley.

*Research staff:* J. H. Humberstone, Director, Research and Welding Engineering. 1 chemist, 1 physical chemist, 2 metallurgists, 3 engineers; technical personnel 2; additional personnel 8.

*Research activities:* Research and developmental activity in connection with metal arc welding electrodes. (Research initiated 1939.)

164. Argus, Inc., Ann Arbor, Mich.

*President:* R. D. Howse.

*Research staff:* C. H. Harris, Director of engineering and research; J. W. Beamesderfer, in charge of chemical research; H. W. French, Project Design Engineer; W. R. Patton and R. J. Wilson, Optical Engineers; C. W. Adams, Electronic Engineer; D. P. Feder, in charge of optical design. 1 chemist, 4 physicists, 8 engineers; technical personnel 17; additional personnel 148.

*Research activities:* Optical and electronic investigations. (Research initiated 1942.)

*Library:* 1,000 volumes.

165. Aridye Corporation, 1300 Plaza Road, Fair Lawn, N. J. (Subsidiary of Interchemical Corporation.)

*President:* Laurence G. Meads.

*Research staff:* Norman S. Cassel, Vice President and Director. 22 chemists, 2 engineers; technical personnel 36; additional personnel 7.

*Research activities:* The development of printing and dyeing compositions for textiles. (Research initiated 1937.)

*Library:* 150 volumes.

166. Arizona Testing Laboratories, P. O. Box 1888, Phoenix, Ariz.

*Owner:* Claude E. McLean.

*Research staff:* 2 chemists, 1 metallurgist, 1 engineer; additional personnel 2.

*Research activities:* Chemical problems in connection with industrial and engineering projects; hydrometallurgy; problems in connection with the production of iron salts and sulfuric acid. (Research initiated 1932.)

167. Arlinco Research Laboratory, Inc., 333 West 52nd St., New York 19, N. Y.

*President:* J. Jacques Martinat.

*Research staff:* J. Jacques Martinat, Director. 2 chemists, 1 biochemist; technical personnel 2; additional personnel 2.

*Research activities:* Basic and applied research on pharmaceuticals and in allied subjects. (Research initiated 1942.)

*Library:* 1,200 volumes.

168. Arlington Laboratories, Fairfax, Va.

*Research staff:* V. A. Conard, Director. 3 chemists; additional personnel 1.

*Research activities:* Microanalytical procedures. (Research initiated 1937.)

169. Armo Drainage Products Association, Middletown, Ohio.

*General Manager:* S. R. Ives.

*Research staff:* George E. Shafer, Director. 4 engineers; additional personnel 1.

*Research activities:* Improving and developing new uses for drainage products; developing new products. (Research initiated 1903.)

*Cooperative research:* One grant for research is made.

170. Armour and Company, U. S. Yards, Chicago 9, Ill.

*President:* George A. Eastwood.

*Laboratories:* 1425 West 42nd St., Chicago 9, Ill. Branch laboratories: Columbus, Ohio; Denver, Colo.; Fort Worth, Tex.; Hamilton, Ont.; Jersey City, N. J.; Kansas City, Kans.; Mason City, Iowa; East St. Louis, Ill.; Oklahoma City, Okla.; Pittsburgh, Pa.; Sioux City, Iowa; South Omaha, Nebr.; South St. Joseph, Mo.; South St. Paul, Minn.; Spokane, Wash.; West Fargo, N. Dak.; Des Moines, Iowa; Sedalia, Mo.; Minneapolis, Minn.; Louisville, Ky.; Woodward, Okla.

*Research staff:* V. Conquest, Director of research and development; A. W. Ralston, Assistant Director; J. D. Porsche, Assistant Director; M. L. Laing, Chief Control Chemist in charge of all branch laboratories. 110 chemists, 21 biologists and bacteriologists, 33 engineers, 1 physician, 1 psychologist, 1 pharmacologist, 2 ento-

mologists, 2 zoologists, 2 pharmacists, 3 professional bakers, 1 professional chef; technical personnel 49; additional personnel 23.

*Research activities:* Fats and fatty acids; meats and meat by-products; dairy products, poultry, and eggs; endocrines, hormones, enzymes; therapeutics from animal products; investigations on the improvement of products and processes, and research on operating and product problems. (Research initiated 1893.)

*Library:* 3,500 volumes; 12,000 bulletins.

*Cooperative research:* Five fellowships are supported.

**ARMOUR AND COMPANY AUXILIARIES**  
1355 West 31st St., Chicago 9, Ill.

(Division of Armour and Company, comprising the Armour Glue Works, Armour Soap Works, Armour Chemicals Division, Armour Sandpaper Works, Armour Ammonia Works, and Armour Curled Hair Works.)

*Vice President and General Manager:* D. M. Flick.

*Research staff:* E. W. Colt, Chief Chemist; M. L. Sheely, Technical Director. 22 chemists, 5 engineers; technical personnel 22; additional personnel 8.

*Research activities:* Research and development in fatty acids and derivatives, soap, glue, blood albumin, surface coated abrasives, and other packing house by-products. (Research initiated 1893.)

*Library:* 1,000 volumes.

*Cooperative research:* Two fellowships are supported.

**171. Armour Research Foundation, Illinois Institute of Technology, 33rd, Federal, and Dearborn Sts., Chicago 16, Ill.**

*Director:* J. E. Hobson.

*Research staff:* M. H. Heeren, Assistant Director; T. C. Poulter and F. W. Godwin, Associate Directors. 50 chemists, 40 physicists, 35 metallurgists, 71 engineers; technical personnel 51; additional personnel 73.

*Research activities:* The Armour Research Foundation was founded in September 1936, as an endowed non-profit organization for the exclusive purpose of rendering a research and experimental engineering service to industry in accordance with the Foundation's research project plan which carries full protective features in the sponsor's behalf.

Research is carried on in physics, chemistry and chemical engineering, metallurgy, mechanics of solids, fluid mechanics and heat transfer, electrical engineering, mechanical engineering, and engine research.

*Library:* 3,000 volumes.

*Cooperative research:* Three fellowships are supported.

*Scientific periodicals:* The Frontier. Quarterly. Vol. I, 1938.

**172. Armstrong Cork Company, Lancaster, Pa.**

*President:* H. W. Prentis, Jr.

*Laboratories:* Floor Plant and Closure Plant, Lancaster, Pa.; Beaver Falls, Pa.; Camden, N. J.; Dunkirk, Ind.; Fulton, N. Y.; Pensacola, Fla.; Pittsburgh, Pa.; Millville, N. J.; South Braintree, Mass.

*Research staff:* Edmund Claxton, Director; R. B. Rohrer, Assistant Director. 90 chemists, 17 physicists, 1 biologist, 1 metallurgist, 1 engineer, 1 architect, 6 ceramists, 2 technical librarians; technical personnel 65; additional personnel 22.

*Research activities:* Cork and cork products; insulating materials, including corkboard, fiberboard and high-temperature insulation products; linoleum, rubber tile, and other hard-surface floor coverings; acoustical products; asphalt products; adhesives and cements; felt paper products; bottle closures; glass containers and closures; miscellaneous shoe and textile products; industrial rubber compositions. (Research initiated 1928.)

*Library:* 5,500 volumes.

*Cooperative research:* Two fellowships are supported and nineteen grants for research are made.

**173. Armstrong Paint and Varnish Works, 1340 South Kilbourn Ave., Chicago 23, Ill.**

*President:* Mitchell Goldsmith.

*Research staff:* E. V. LeMaire, Technical Director; D. T. Woods, Chemist. 9 chemists; technical personnel 10.

*Research activities:* Castor oil dehydration with dicarboxylic and monocarboxylic acids with azotropic distillation; synthetic oils from esters of polyentaerythritol, sorbitol, and allyl alcohol; segregated copolymer and catalyst conjugated oil; also tall oil and its fatty acids. (Research initiated 1909.)

*Cooperative research:* Two scholarships are available.

**174. Arner Company, Inc., 303 Michigan Ave., Buffalo 3, N. Y.**

*President:* Fred C. Arner.

*Research staff:* Roy H. Clark, Chief Chemist; Niels C. Klendshoj, Medical and Technical Director. 3 chemists, 1 physician; technical personnel 1; additional personnel 1.

*Research activities:* Pharmaceutical chemistry. (Research initiated 1920.)

*Cooperative research:* Two fellowships are supported.



- 175. Arnold, Hoffman and Company, Inc.,** 55 Canal St., Providence 1, R. I.  
*President:* Edwin H. Arnold.  
*Laboratory:* Providence, R. I.; Dighton, Mass.  
*Research staff:* Earle D. McLeod, Director. 25 chemists, 2 engineers; additional personnel 2.  
*Research activities:* Textile, leather, and paper chemistry. (Research initiated 1937.)
- 176. Aronson Research Laboratories,** 791 Tremont St., Boston, Mass.  
*Research staff:* Mark Aronson, Director.  
*Research activities:* The development of apparatus and instruments; improvement in machinery pertaining to the food industry; research in chain-store operations; development of processing controls; manufacturing processes; scientific and mathematical instruments and devices; machinery for the meat industry, and for the ice cream industry; shoe manufacturing research; research and development of welding and cutting machinery; investigations; general consulting practice. (Research initiated 1916.)
- 177. Arrow Laboratories, Inc.,** 152-156 West 25th St., New York 1, N. Y.  
*President:* Walter von Feldau.  
*Research staff:* Eric Eichwald, Chief Chemist. 2 chemists, 1 physicist, 1 engineer; technical personnel 2; additional personnel 8.  
*Research activities:* Cosmetic products; insecticides. (Research initiated 1940.)
- 178. Art Crayon Company, Inc., and American Artists' Color Works, Inc.,** 5601 First Ave., Brooklyn 20, N. Y.  
*President:* Mack Lester.  
*Research staff:* Dana H. Johnson, Technical Director and Chief Chemist. 3 chemists.  
*Research activities:* Product improvement of artists' tempera, oil paints, pastel crayons, water colors, wax crayons, blackboard crayons, modeling clay, block printing inks, and drawing inks; formula control on manufacture and testing raw materials for above items; new products research; research for government agencies. (Research initiated 1930.)
- 179. Art Metal Construction Company,** Jamestown, N. Y.  
*President:* A. J. E. Larson.  
*Research staff:* J. R. Jones, Research Engineer. 1 chemist, 2 engineers, 2 mechanics.  
*Research activities:* The design and improvement of metal office furniture (desks and filing cabinets); bank, courthouse, and library equipment; shelving; household equipment; hospital equipment, chairs, etc. (Research initiated 1920.)
- 180. Artloom Corporation,** Howard St., and Allegheny Ave., Philadelphia 33, Pa.  
*President:* A. S. Mitchell.  
*Research staff:* C. A. Hess, Director. 2 chemists, 1 engineer.  
*Research activities:* The testing of raw materials for carpets; new processes, and the development of new methods. (Research initiated 1905.)
- 181. Askania Regulator Company,** 1603 South Michigan Ave., Chicago 16, Ill.  
*President:* H. Velten.  
*Laboratories:* Hydraulic Laboratory, 1603 South Michigan Ave.; Electronic Laboratory, 1420 South Michigan Ave.  
*Research staff:* H. Ziebolz, Vice President in charge of engineering; D. Gundersen; P. Glass. 6 engineers; technical personnel 2; additional personnel 2.  
*Research activities:* Control of processes; hydraulic and electronic servomechanisms; thermodynamics. (Research initiated 1933.)  
*Library:* 200 volumes.  
*Cooperative research:* Two fellowships are supported.
- 182. Asphalt Institute,** 801 Second Ave., New York 17, N. Y.  
*President:* Herbert Spencer.  
*Research staff:* Prevost Hubbard, Chemical Engineer. 1 chemist, 3 engineers; technical personnel 2; additional personnel 1.  
*Research activities:* Design of asphalt paving for highways and airports; the use of asphalt for revetments, jetties, soil erosion prevention, and water control; the development of asphalt products for miscellaneous uses. (Research initiated 1925.)  
*Library:* 200 volumes.
- 183. Associated Analytical Laboratories,** 265 Lexington Ave., New York 16, N. Y.  
*General Manager:* S. Charles Lerner.  
*Research staff:* A. D. Gellis, Chief Chemist. 2 chemists, 1 biologist, 1 engineer, 1 physician; additional personnel 3.  
*Research activities:* Foods, cosmetics, drugs. (Research initiated 1925.)  
*Library:* 100 volumes.
- 184. Associated Broadcasters, Inc.,** Mark Hopkins Hotel, Nob Hill, San Francisco 6, Calif.  
*President:* Wesley I. Dumm.  
*Laboratory:* Universal Research Laboratories, Radio Engineering Consultants, 1 Nob Hill Circle, Pine and Mason Sts., San Francisco 2, Calif.  
*Research staff:* Royal V. Howard, Director. 6 engineers; technical personnel 3.

*Research activities:* Radio engineering consultant work; transmitter and antenna field engineering, proof of performance tests, spectrum analyses, population counts, antenna design, audio facilities and studio construction, and other specialized laboratory problems. Specialized radio and audio equipment development. (Research initiated 1945.)

*Library:* 150 volumes.

**185. Associated Industrial Engineers, Inc., 1505 Race St., Philadelphia 2, Pa.**

*President:* F. G. Daveler.

*Research staff:* F. G. Daveler, Director; P. H. Aspen, Vice President; R. C. Clarkson, Jr., Chief Engineer. 1 chemist, 1 metallurgist, 3 engineers; technical personnel 1.

*Research activities:* Industrial and market research; powder metallurgy; heat-treating and welding. (Research initiated 1943.)

*Library:* 1,000 volumes.

**186. Associated Laboratories—Dallas Laboratories, 2411 South Harwood St., Dallas, Tex.**

*President:* Helman Rosenthal.

*Research staff:* Helman Rosenthal and R. L. Vandaveer, Officers in charge of research. 4 chemists, 2 biologists and bacteriologists; additional personnel 2.

*Research activities:* Industrial problems and patents. (Research initiated 1923.)

**187. Associated Research, Inc., 231 South Green St., Chicago 7, Ill.**

*President:* James F. Inman.

*Research staff:* James A. Umbarger, Chief Engineer. 3 engineers; technical personnel 1; additional personnel 3.

*Research activities:* Electrical measurements in the field of insulation resistance, ground resistance, and high voltage tests; instruments for the measurement of physiological and psychological response (lie detection); research and development work on new products and the improvement of existing products for outside organizations and individuals. (Research initiated 1936.)

*Library:* 100 volumes.

**188. Associated Seed Growers, Inc., 205 Church St., New Haven, Conn.**

*President:* A. Bryan Clark, Jr.

*Laboratories:* Milford, Conn.; Milpitas, Calif.; Hamilton, Mont.; Filer, Idaho; Franklin, Ind.; Robstown, Tex.

*Research staff:* Floyd L. Winter, Director, New Haven; G. W. Scott, in charge, Milpitas; W. H. Pierce, in charge, Hamilton; Paul Helsel, in charge, Franklin; W. C. Hemingway, in charge, Filer; Allen Trotter, in charge, Robs-

town; G. E. Nutile, in charge, New Haven. 9 biologists; technical personnel 10; additional personnel 16.

*Research activities:* The development of new varieties of vegetables to meet such specific needs as adaptation to particular climatic conditions, resistance to various forms of diseases and to kinds of insects, etc.; study of the mode of inheritance of various plant characters; study of factors affecting germination and longevity of seeds. (Research initiated 1920.)

*Cooperative research:* Three grants for research are made.

**189. Associated Spring Corporation, Barnes Gibson Raymond Division, 6400 Miller Ave., Detroit, Mich.**

*Vice President and General Manager:* Lyman D. Adams.

*Research staff:* F. P. Zimmerli, Director. 1 chemist, 2 metallurgists, 2 engineers.

*Research activities:* The improvement in spring materials and the processes of their manufacture. (Research initiated 1926.)

**190. Association of American Railroads, Transportation Bldg., Washington 6, D. C.**

*President:* J. J. Pelley.

*Laboratory:* Engineering Division Research Staff, 59 East Van Buren St., Chicago 5, Ill.

*Research staff:* G. M. Magee, Research Engineer. 11 engineers; technical personnel 6; additional personnel 2.

*Research activities:* Investigation leading to improvements in design, specification, and use of the elements composing track and bridge structures. (Research initiated 1940.)

*Cooperative research:* One grant for research is made.

**191. Association of Manufacturers of Chilled Car Wheels, 445 North Sacramento Blvd., Chicago 12, Ill.**

*President:* F. H. Hardin.

*Research staff:* C. M. Stoner, Director; S. C. Prest, Engineer of tests. 2 metallurgists, 3 engineers; technical personnel 2; additional personnel 6.

*Research activities:* The development of metals and designs to produce maximum wear resistance and strength in car wheels. Studies are based on castings produced in an electric melting furnace and cupola and tested in the Association's wear, impact, tensile, and hardness testing machines. Control and basic research: ferrous metallurgy in connection with chilled tread cast iron railroad car wheels. (Research initiated 1912.)

*Library:* 100 volumes.

- 192. Atchison, Topeka, and Santa Fe Railway Company, 80 East Jackson Blvd., Chicago 4, Ill.**  
*President:* Fred G. Gurley.  
*Laboratory:* Motive Power Bldg., Topeka, Kans.  
*Research staff:* E. E. Chapman, Mechanical Assistant, Chicago; Walter Bohnstengel, Engineer of tests, Topeka. 8 chemists, 9 engineers; technical personnel 12; additional personnel 13.  
*Research activities:* Laboratory and service tests of appliances, materials, and usages pertaining to locomotives, cars, track and structures, and their component parts. Locomotive tests include performance in train service, tonnage ratings, track stress, etc., as well as parts, appliances, and materials therefor. Car tests include loading, insulation, refrigeration or air conditioning materials for parts and appliances. Tests of rail, fastenings, ties, ballast, and structural materials are also made. The laboratory also analyzes metals, lubricants, fuels, preservatives, etc., including boiler waters, and prescribes treatments. The laboratory cooperates with other railroads and associations in research pertaining to the industry as a whole. (Research initiated 1907.)  
*Library:* 400 volumes.
- 193. Athol Manufacturing Company, 71 Chestnut Hill, Athol, Mass.**  
*President:* E. A. Clare.  
*Research staff:* R. B. Mitchell, Director. 2 chemists, 1 engineer; technical personnel 7.  
*Research activities:* The development of improved processes for the manufacture of coated fabrics. (Research initiated 1918.)  
*Library:* 100 volumes.
- Atlantic Gelatin Company. See General Foods Corporation.**
- 194. Atlantic Rayon Corporation, 86 Crary St., Providence 1, R. I.**  
*President:* Harold F. C. Wilcox.  
*Research staff:* Ernest A. Krueger, Superintendent of dyeing. 2 chemists, 2 chemical engineers; technical personnel 3; additional personnel 1.  
*Research activities:* Dyeing and processing of synthetic yarns and fibers. (Research initiated 1936.)
- 195. Atlantic Refining Company, 260 South Broad St., Philadelphia, 1, Pa.**  
*President:* Robert H. Colley.  
*Laboratories:* Philadelphia, Pa.; Dallas, Tex.  
*Research staff:* T. G. Delbridge, Manager, Research and Development Department; H. W. Field, Assistant Manager. 53 chemists, 7 physicists, 90 engineers; technical personnel 116; additional personnel 48.  
*Research activities:* Investigation of the chemical, physical, and engineering factors involved in the production and processing of petroleum and the utilization of its products, extending (for the study of processes) from exploratory laboratory research through pilot unit or semi-plant scale to plant application. Activities include fundamental work as well as technical service. (Research initiated 1900.)  
*Libraries:* Philadelphia: 1,500 volumes; Dallas: 275 volumes.  
*Cooperative research:* Ten grants for research are made.
- 196. Atlantic Zinc Works, Inc., 210 Van Brunt St., Brooklyn, N. Y.**  
*President:* W. Roy Manny.  
*Research staff:* John Ruzicka, Metallurgist.  
*Research activities:* The study of zinc in relation to photoengraving. (Research initiated 1936.)
- 197. Atlas Electric Devices Company, 361 West Superior St., Chicago 10, Ill.**  
*President:* C. W. Jameson.  
*Research staff:* 1 chemist, 2 engineers, technical personnel 1; additional personnel 1.  
*Research activities:* The development of testing equipment for determining light-fastness of colors, washability of fabrics, and weather resistance of organic films; photochemical reactions of sunlight and various artificial sources of visible and ultraviolet light; fluorescence; spectral characteristics of carbon arc, mercury vapor tubes, etc. (Research initiated 1919.)  
*Library:* A library is maintained.
- 198. Atlas Exploration Company, 1041 Mellie Esperson Bldg., Houston 2, Texas.**  
*Owner:* V. J. Meyer.  
*Laboratory:* 1911 West Alabama, Houston 6, Tex.  
*Research staff:* Sam P. Worden, Director. 2 physicists, 2 engineers; additional personnel 8.  
*Research activities:* Gravity meters. (Research initiated 1938.)  
*Library:* 500 volumes.
- 199. Atlas Powder Company, Wilmington 99, Del.**  
*President:* Isaac Fogg.  
*Research staff:* K. R. Brown, Director, Research Department; R. Max Goepf, Jr., Director, Organic Research; G. D. Jefferson, Technical Representative, Research Department; W. E. Fletcher, Director, Development Department; W. C. Lytle, Manager, Explosives Research Section, Explosives Department; E. H. Bucy, Assistant General Manager, Cellulose Products Division.

CENTRAL RESEARCH LABORATORY  
Wilmington, Del.

*Research staff:* R. S. Rose, Jr., Director. 14 chemists, 1 engineer, 6 consultants; technical personnel 15; additional personnel 9.

*Research activities:* New industrial organic chemicals; polyhydric alcohols—sorbitol and mannitol; surface active agents—emulsifiers, wetting and dispersing agents, detergents, insecticides, drying oils and resins, plasticizers, textile chemicals. (Research initiated 1944.)

*Library:* 2,000 volumes.

*Cooperative research:* One fellowship is supported.

ATLAS RESEARCH LABORATORY  
Tamaqua, Pa.

*Research staff:* J. D. Brandner, Director. 6 chemists, 3 engineers; technical personnel 17; additional personnel 5.

*Research activities:* Operation of semi-works laboratory and pilot plant to improve present products and to develop new derivatives from polyhydric alcohols and other organic chemicals. The laboratory obtains chemical engineering data for process improvement and carries out high pressure research and development. (Research initiated 1930.)

*Library:* 100 volumes.

REYNOLDS EXPERIMENTAL LABORATORY  
Reynolds, Pa.

(Mail: P. O. Box 271, Tamaqua, Pa.)

*Research staff:* Guy F. Rolland, Director. 7 chemists, 1 physicist, 6 engineers; technical personnel 20; additional personnel 7.

*Research activities:* Military and industrial explosives and assemblies; blasting caps and electric blasting caps. (Research initiated 1917.)

*Library:* 1,300 volumes.

ZAPON FINISHES LABORATORY, STAMFORD  
DIVISION  
Stamford, Conn.

*Research staff:* E. H. Bucy, Assistant General Manager; R. W. Gordon, Technical Director, Lacquer and Solution Section; H. Leupold, Technical Director, Oleoresinous Section; A. Stapleton, Technical Director, Ureaformaldehyde and Melamine Section; R. E. Bonner, Technical Director, Varnish and Resin Development; W. Riegler, Chief Chemist. 9 chemists; technical personnel 13; additional personnel 1.

*Research activities:* Industrial finishes, resins, and varnishes. (Research initiated 1917.)

ZAPON FINISHES LABORATORY, NORTH  
CHICAGO DIVISION  
North Chicago, Ill.

*Research staff:* W. L. Hensley, Director. 6

chemists; technical personnel 5; additional personnel 1.

*Research activities:* Industrial finishes, lacquers, and synthetic enamels. (Research initiated 1919.)

ZAPON-KERATOL (COATED FABRICS) LABORATORY  
Stamford, Conn.

*Research staff:* L. J. Patterson, Technical Director; J. R. Couture, Chief Chemist. 6 chemists; technical personnel 5; additional personnel 1.

*Research activities:* Coated fabrics.

Atlas Research Laboratory. See Atlas Powder Company.

200. Attapulugus Clay Company, 260 South Broad St., Philadelphia 1, Pa.

*President:* L. R. Streander.

*Research staff:* R. H. Hubbell, Jr., Technical Manager; W. S. W. McCarter, Director of research and development. 8 chemists, 6 engineers; technical personnel 8; additional personnel 4.

*Research activities:* Catalysis; adsorption. (Research initiated 1932.)

Atwood Division, Farrel-Birmingham Company, Inc. See Farrel-Birmingham Company, Inc.

201. Augusta Chemical Company, P. O. Box 660, Augusta, Ga.

*President:* John C. Boesch, Jr.

*Research staff:* 4 chemists.

*Research activities:* Sulfur dyestuff. (Research initiated 1937.)

*Library:* 100 volumes.

Ault and Wiborg Carbon and Ribbon Division of Interchemical Corporation. See Interchemical Corporation.

202. Austenal Laboratories, Inc., 224 East 39th St., New York 16, N. Y.

*President:* R. W. Erdle.

*Laboratories:* New York 16, N. Y.; 5932 Wentworth Ave., Chicago 21, Ill.

*Research staff:* C. H. Prange, Vice President in charge of research (New York). 5 chemists, 2 metallurgists, 6 engineers, 3 dentists, 1 ceramist; additional personnel 2.

*Research activities:* The application of precision casting techniques to industrial production of special castings in high temperature and corrosion fields; the development of alloys for these fields. The improvement of materials in prosthetic applications of a dental and surgical nature, and the design and development of equipment and techniques incidental to these applications. (Research initiated 1928.)

**203. Austin Company, 16112 Euclid Ave., Cleveland 12, Ohio.**

*President:* G. A. Bryant.

*Research staff:* J. K. Gannett, Vice President and Director of engineering and research; A. T. Waidelich, Assistant Director, Research Division. 6 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Building materials: investigation, selection, analyses, and tests. The design of structures: theory, analyses, construction, and tests. The study of mechanical facilities (heating, lighting, plumbing, sprinklers, building equipment, and machinery): investigation, selection, and tests. Construction: the investigation of methods and tests. (Research initiated 1921.)

*Library:* 725 volumes.

**204. Auto Coolers, Inc., 5308 Blanche Ave., S. E., Cleveland 4, Ohio.**

*President:* H. C. Troth.

*Laboratories:* Palo Alto, Calif.; Cleveland, Ohio.

*Research staff:* Lawrence Washington, Vice President in charge of research. 4 engineers; technical personnel 2; additional personnel 2.

*Research activities:* The designing of an automobile air conditioning unit; the design of self-contained, hermetically sealed air conditioning units in capacity up to one horsepower. (Research initiated 1945.)

**205. Autocar Company, Ardmore, Pa.**

*President:* R. P. Page, Jr.

*Research staff:* B. B. Bachman, Vice President in charge of engineering; G. R. Strohl, Experimental Engineer; W. J. Diederichs, Metallurgist. 1 metallurgist, 3 engineers; additional personnel 10.

*Research activities:* Internal combustion engines; automotive apparatus. (Research initiated 1915.)

*Library:* 500 volumes.

**206. Autogiro Company of America, 1616 Walnut St., Philadelphia 3, Pa. (Subsidiary of Firestone Tire and Rubber Company.)**

*President:* Harold F. Pitcairn.

*Laboratory:* Pitcairn Field, Willow Grove, Pa.

*Research staff:* Paul H. Stanley, Chief Engineer; Harris S. Campbell, Mechanical Engineer. 2 engineers; additional personnel 4.

*Research activities:* The study of rotary-wing aircraft problems to evolve more efficient types of this form of aircraft. This includes studies of application of new types of propulsive means, structure, and aerodynamic form; problems of vibration and its elimination. (Research initiated 1925.)

**207. Autographic Register Company, 10th, Clinton, and Grand Sts., Hoboken, N. J.**

*President:* K. D. Howard.

*Research staff:* M. H. Lustbader, Director; Fred A. Schimpf, Director of sales and market research. 1 chemist, 1 engineer; additional personnel 2.

*Research activities:* Printing papers, carbon papers, and special papers; inks; adhesives; paper coatings. Market research: field surveys concerning product acceptance, improvement, cost reduction, etc. (Research initiated 1937.)

**208. Automatic Electric Company, 1033 West Van Buren St., Chicago 7, Ill.**

*President:* W. J. Caverley.

*Research staff:* K. W. Graybill, Chief Engineer; C. F. Ffolliott, Technical Director of Laboratories Division. 3 physicists, 12 engineers; technical personnel 3; additional personnel 4.

*Research activities:* Improvements in electrical communications, techniques, and apparatus, and the introduction of new remote control systems for industry; design work on electromagnetic, mechanical, and acoustical devices. While the major part of the work is on industrial research and design, a small amount of research is conducted on fundamental physical laws. (Research initiated 1911.)

*Library:* 1,000 volumes.

*Scientific periodicals:* Strowger Technical Journal. Vol. I, 1932.

**209. Automatic Products Company, 2450 North 32nd St., Milwaukee, Wis.**

*President:* Roy W. Johnson.

*Research staff:* 1 chemist, 1 metallurgist, 10 engineers; technical personnel 10; additional personnel 6.

*Research activities:* Automatic controls for heating, refrigerating, air conditioning, etc. (Research initiated 1931.)

**210. Automatic Sprinkler Company of America, Box 360, Youngstown 1, Ohio.**

*President:* J. A. Coakley.

*Research staff:* H. N. Rider, Manager, Technical Division. 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Fire protection engineering; the development of fire protection apparatus and related subjects; fire alarm systems, etc. (Research initiated 1915.)

**211. Avedikian and Company, 58 Willow Ave., Larchmont, N. Y.**

*Partner:* Souren Z. Avedikian.

*Research staff:* Souren Z. Avedikian, Director. 1 chemical engineer; additional personnel 2.

*Research activities:* Textiles: fibers, coating

and finishing; foods and beverages; detergents; plastics; cosmetics. (Research initiated 1932.)  
*Library:* 300 volumes.

**212. Axelson Manufacturing Company, P. O. Box 98, Vernon Station, Los Angeles 11, Calif.**

*President:* J. C. Axelson.

*Laboratories:* Los Angeles, Calif.; St. Louis, Mo.

*Research staff:* Los Angeles: E. F. Green, Director. 1 chemist, 2 metallurgists. St. Louis: R. M. Pease Director. 1 metallurgist, 2 assistant metallurgists.

*Research activities:* Routine control, and the development of new ferrous and nonferrous materials for oil pumps. (Research initiated 1925.)

*Library:* 100 volumes.

**B. B. Chemical Company. See United Shoe Machinery Corporation.**

**213. B. G. Corporation, 136 West 52nd St., New York 19, N. Y.**

*President:* Richard Goldsmith.

*Research staff:* H. N. Walker, Director. 2 chemists, 1 physicist, 1 metallurgist, 5 engineers; additional personnel 12.

*Research activities:* Research in electricity and ceramics. (Research initiated 1935.)

*Library:* A library is maintained.

**214. BIC Manufacturing Corporation, 318-320 East 39th St., New York, N. Y.**

*President:* Howard Barry.

*Research staff:* Reiner Shellenbach, Director. Technical personnel 3; additional personnel 3.

*Research activities:* Food studies.

**B-L Electric Manufacturing Company. See Benwood-Linze Company.**

**215. Baash-Ross Tool Company, Los Angeles, Calif.**

*President:* L. F. Baash.

*Research staff:* G. D. Johnson, Chief Engineer. 1 metallurgist, 1 engineer; additional personnel 5.

*Research activities:* The development of new or improved oil well drilling and fishing tools; the study of manufacturing methods. (Research initiated 1924.)

**216. Babbitt Chemical Specialties Company, 36 Prospect St., New Bedford, Mass.**

*President:* George Thomas.

*Research staff:* T. A. Olson, Plant Manager. 2 chemists, 1 engineer.

*Research activities:* Plastics and sealants. (Research initiated 1943.)

**217. Babcock and Wilcox Company, and Babcock and Wilcox Tube Company, 85 Liberty St., New York 6, N. Y.**

*President:* A. G. Pratt.

*Laboratories:* Barberton, Ohio; Bayonne, N. J.; Beaver Falls, Pa. (Research initiated 1900.)

*Research staff:* L. S. Wilcoxson, Vice President in charge of research.

#### BARBERTON, OHIO LABORATORY

*Research staff:* Perry R. Cassidy, Executive Assistant; E. F. Wilson, Chief Metallurgist; J. B. Romer, Chief Chemist; James Fletcher, Chief Engineer. 8 chemists, 7 metallurgists, 9 engineers.

*Research activities:* The development and investigation of welding technique with plain and alloy steels; the development of heat-resisting and corrosion-resisting alloy steels; the development of wear-resisting irons and steels; investigations of water treatment; corrosion problems in fuels, combustion, etc.

#### BAYONNE, N. J. LABORATORY

*Research staff:* E. D. Grimison, Executive Assistant. 10 engineers, 4 ceramists.

*Research activities:* The development of refractory materials, of direct fired, high temperature combustion, heat transfer, and process equipment.

#### BEAVER FALLS, PA. LABORATORY

(Babcock and Wilcox Tube Company)

*Research staff:* H. D. Newell, Director of research. 12 chemists and metallurgists.

*Research activities:* The study of physical properties of materials at high temperatures; the development of alloys to resist high temperatures and corrosion; improvements in the manufacture of seamless and welded steel and alloy tubes.

*Cooperative research:* Three grants for research are made.

**218. Bacharach and Company, E. W., 800 Rialto Bldg., Kansas City, Mo.**

*President:* E. W. Bacharach.

*Research staff:* E. W. Bacharach, Director. 4 engineers.

*Research activities:* Water purification; chemical feeding equipment; mixing devices; automatic control equipment; filtering and softening devices. (Research initiated 1922.)

**219. Bacharach Industrial Instrument Company, 7000 Bennett St., Pittsburgh 8, Pa.**

*President:* Louis L. Vayda.

*Research staff:* J. A. Stein, Chief Engineer.

- 1 chemist, 4 engineers; technical personnel 1; additional personnel 2.  
*Research activities:* The measurement of cylinder pressures in internal combustion engines, the development of instruments for gas analysis, and low pressure measurements in general. (Research initiated 1921.)  
*Cooperative research:* One grant for research is made.
220. Bacon, Frederick S., 192 Pleasant St., Watertown 72, Mass.  
*President:* Frederick S. Bacon.  
*Research staff:* Philip D. Wilkinson, Director. 6 chemists, 1 bacteriologist; additional personnel 3.  
*Research activities:* Research and process development for clients in organic synthetics, pharmaceuticals, dyestuffs, etc.; bacteriological work on penicillin, germicides, and sterilized fabrics; vitamin assay; plastic molding and fabric coatings; resinous coatings and adhesives; development of textile processes; marine and special purpose adhesives; automotive products. (Research initiated 1939.)  
*Library:* 300 volumes.
221. Bacon Research Laboratories, Raymond F., New Rochelle, N. Y. •  
*Research staff:* Raymond F. Bacon, Director. 4 chemists.  
*Research activities:* Sulfur; food products. (Research initiated 1922.)
222. Baden, Martin W., 1219 East 9th Ave., Winfield, Kans.  
*Owner:* Martin W. Baden.  
*Research staff:* 1 engineer.  
*Research activities:* Photoelectric methods of determining both porosity and fluid content of oil-bearing formations, for the purpose of computing oil recoveries; the development of an electronic electroscopes for measuring radioactive materials; research in connection with ultraviolet rays (black light) for securing showings of oil in cores of formation cuttings secured from oil wells. (Research initiated 1915.)  
*Library:* 125 volumes.
223. Badger and Sons Company, E. B., 75 Pitts St., Boston 14, Mass.  
*President:* E. B. Badger.  
*Laboratory:* Cambridge, Mass.  
*Research staff:* J. R. Ghublikian, Laboratory Supervisor. 2 to 6 chemical engineers.  
*Research activities:* Distillation; theoretical and practical factors in column design; the analysis and treatment of petroleum products; process investigation for the chemical industry. (Research initiated 1924.)
224. Bailey and Company, E. W., Montpelier, Vt.  
*Research staff:* Raymond Smith, Director. 1 chemist; technical personnel 1.  
*Research activities:* Feed control; vitamin and mineral analysis on feeds and feedstuffs with view toward improving feeds and reducing their cost. (Research initiated 1940.)
225. Bailey Meter Company, 1050 Ivanhoe Road, Cleveland 10, Ohio.  
*President:* R. S. Coffin.  
*Research staff:* P. S. Dickey, Chief Engineer; C. Johnson, A. J. Hornfeck, J. F. Shannon. 1 chemist, 1 physicist, 7 engineers; technical personnel 3.  
*Research activities:* The development of metering and automatic control equipment. (Research initiated 1923.)
- Bakelite Corporation. See Union Carbide and Carbon Corporation.
226. Baker and Company, Inc., 113 Astor St., Newark 5, N. J.  
*President:* Charles Engelhard.  
*Laboratories:* Newark and East Newark, N. J.  
*Research staff:* Newark Laboratory: F. E. Carter, Director of physical research; E. F. Rosenblatt, Director of chemical research; K. Schumpelt, Director of electroplating research. 9 chemists, 2 physicists, 2 metallurgists, 1 engineer; technical personnel 8; additional personnel 4. East Newark: M. J. Stumbock, Director. 1 chemist, 3 metallurgists, 2 engineers; technical personnel 6; additional personnel 1.  
*Research activities:* Physical research: The properties of precious metals and alloys and their application to industry; metallographic, spectrographic, and X-ray research; powder metallurgy; electrical contacts. Chemical research: New uses for precious metals in the chemical fields, especially in the field of catalysis; the electrochemical behavior of precious metals; the improvement of refining processes; and the development of better methods for the analysis of precious metals. (Research initiated 1906.)  
*Library:* 3,000 volumes (Newark Laboratory).  
*Cooperative research:* Two fellowships are supported and one grant for research is made.
- Baker and Company, Inc., Walter. See General Foods Corporation.
227. Baker Castor Oil Company, 120 Broadway, New York 5, N. Y.  
*President:* Kendall Marsh.  
*Laboratory:* 35 Avenue A, Bayonne, N. J.  
*Research staff:* I. M. Colbeth, Director. 7

chemists, 1 physicist, 1 engineer; technical personnel 16; additional personnel 11.

*Research activities:* Cold-pressed castor oils; extracted castor oils; castor pomace; processed castor oils; plasticizers; synthetic resins; protein plastics; lacquers; aromatic chemicals; accelerators (rubber); cellulose esters; enamels; fats, fatty oils, and soaps; leather and leather goods; lubricants; paints, oils, and varnishes; plastics; waterproofing. (Research initiated 1937.)

*Library:* 500 volumes.

**228. Baker Chemical Company, J. T., Broad St., Phillipsburg, N. J.** (Subsidiary of Vick Chemical Company.)

*President:* H. H. Garis.

*Research staff:* Joseph R. Stevens, Director. 31 chemists, 1 biologist, 3 engineers; technical personnel 2; additional personnel 10.

*Research activities:* Development work on processes and products, and on the methods of testing reagents. (Research initiated 1904.)

*Library:* 1,500 volumes.

*Scientific periodicals:* Chemist Analyst. Vol. I, 1911.

*Cooperative research:* Two fellowships are supported and two grants for research are made.

**Baker Division, Franklin, General Foods Corporation.** See General Foods Corporation.

**229. Baker Oil Tools, Inc., 6000 South Boyle Ave., Los Angeles, Calif.**

*President:* R. C. Baker.

*Research staff:* K. J. Leeg, Director; Winnette Arnold, H. E. Willey. 3 chemists, 1 engineer; technical personnel 1; additional personnel 1.

*Research activities:* Plastics; chemical problems in the manufacture of oil tools.

*Library:* 250 volumes.

**230. Baldwin Company, 1801 Gilbert Ave., Cincinnati 2, Ohio.**

*President:* Lucien Wulsin.

*Research staff:* Lucien Wulsin, in charge of research. 1 chemist, 5 physicists, 7 engineers; additional personnel 3.

*Research activities:* Sound research; electronic research and development; basic investigations relating to piano design and tonal development. (Research initiated 1923.)

*Library:* A library is maintained.

**231. Baldwin Locomotive Works, Philadelphia 42, Pa.**

*President:* Ralph Kelly.

*Laboratories:* The Test Department, Gas Turbine Laboratory, Diesel Laboratory, Hydraulics Laboratory, and Electronics Laboratory, are all in Eddystone, Pa.

*Research staff:* Ralph Kelly, President and Supervisor of all research activities of the company. P. L. Irwin, Engineer of Tests, in charge of Chemical, Physical, Metallurgical, and Radiographic Laboratories; G. Q. Decker, Supervisor of Electronics Laboratory; A. K. Antonsen, Supervisor of Gas Turbine Laboratory; J. F. Holloway, Supervisor of Diesel Laboratory; R. B. Willi, Supervisor of Hydraulics Laboratory. 4 chemists, 2 metallurgists, 27 engineers, 3 radiographers; technical personnel 17; additional personnel 43.

*Research activities:* Research and development work of a basic nature in connection with improved efficiency of reciprocating and turbine steam locomotives, Diesel locomotives, electronic instruments (especially those for measuring stresses), hydraulic presses and testing machines, two-cycle free-piston Diesel gas-generator for gas turbines, Diesel combustion research, and hydraulic turbine and impulse wheel research to improve efficiency and reduce cavitation. Mechanical research involving dynamic models and the use of ultra-high-speed motion pictures. Metallurgical research in ferrous and nonferrous alloys and the white metals. (Research initiated 1899.)

*Library:* 500 volumes.

*Scientific periodicals:* SR-4 News Letter. (Concerning electric resistance strain gage developments.) Vol. I, 1944.

*Cooperative research:* One grant is made for research.

#### STANDARD STEEL WORKS DIVISION Burnham, Mifflin County, Pa.

*Research staff:* George S. Baldwin, Chief Metallurgist. 2 chemists, 5 metallurgists, 1 engineer; additional personnel 13.

*Research activities:* Railroad wheels, forgings, and springs.

*Library:* 300 volumes.

*Cooperative research:* Four grants for research are made.

See also Midvale Company.

**232. Ballantine Laboratories, Inc., Fanny Road, Boonton, N. J.**

*President:* Virginia O. Ballantine.

*Research staff:* Edmund Osterland, Chief Engineer. 1 chemist, 1 physicist, 2 engineers; technical personnel 2; additional personnel 10.

*Research activities:* Electronics, particularly radio communication and precision electrical measuring devices; high vacuum technique and special high vacuum devices. (Research initiated 1935.)

*Library:* 2,000 volumes.



- 233. Baltimore Biological Laboratory, 500 North Calvert St., Baltimore 2, Md.**  
*Manager and Proprietor:* Theo. J. Carski.  
*Research staff:* Harriette Dryden Vera, Director. 1 chemist, 1 bacteriologist; technical personnel 2; additional personnel 5.  
*Research activities:* Bacteriology; physiology; nutrition. (Research initiated 1936.)  
*Library:* 200 volumes.  
*Cooperative research:* Three grants for research are made.
- 234. Baltimore Paint and Color Works, 150 South Calverton Road, Baltimore 23, Md.**  
*Research staff:* Leroy W. Shuger, Director. 7 chemists; technical personnel 4; additional personnel 3.  
*Research activities:* Paints, varnishes, and pigments for the maintenance of homes, industrial plants, etc.; waxes and polishes for household, industrial, and automotive use; synthetic resins, oils, and plastics of the oil soluble types; baking and air-dry finishes for industrial use such as can coatings, etc.; new equipment for processes used in the manufacture of resins and varnish, and in the grinding of paint. (Research initiated 1925.)  
*Library:* 400 volumes.
- 235. Bancroft and Sons Company, Joseph, Rockford, Wilmington 99, Del.**  
*President:* John Bancroft, Jr.  
*Research staff:* Arnold L. Lippert, Chemical Director. 12 chemists and chemical engineers, 2 colorists; additional personnel 9.  
*Research activities:* Textile processing including bleaching, mercerizing, dyeing, printing, waterproofing, flameproofing, shrinkproofing, mildewproofing, sizing, and coating of cotton and rayon materials.  
*Library:* 500 volumes.
- 236. Barber Asphalt Corporation, 30 Rockefeller Plaza, New York 20, N. Y.**  
*President:* T. Rieber.  
*Laboratory:* Barber, N. J.  
*Research staff:* Thomas G. Murphy, Assistant General Manager, Manufacturing Department; H. C. Howell, Chief Chemist; R. E. Thurn, Senior Chemical Engineer. 1 chemist, 2 chemical engineers, 1 civil engineer; technical personnel 4; additional personnel 2.  
*Research activities:* Processing of petroleum and native asphalts, utilization of the products derived, and development of new products. (Research initiated 1896.)  
*Library:* 2,000 volumes.  
*Cooperative research:* One grant for research is made.
- 237. Barber-Colman Company, Rockford, Ill.**  
*President:* Harry A. Severson.  
*Research staff:* E. D. Lilja, Manager of development engineering; Royce E. Johnson, Chief Electrical Engineer. 3 chemists, 2 physicists, 1 metallurgist, 15 engineers, 2 mathematicians; technical personnel 9; additional personnel 12.  
*Research activities:* Electrical control devices; machine tools; textile machinery; air flow devices. (Research initiated 1926.)  
*Library:* 1,200 volumes.
- 238. Bareco Oil Company, Box 2009, Tulsa 2, Okla. (Subsidiary of Barnsdall Oil Company.)**  
*President:* O. L. Cordell.  
*Laboratories:* Barnsdall, Okla.; Wichita, Kans.  
*Research staff:* E. R. Wiles, Director of research and development; Guy S. Mitchell, Chief Chemist. 4 chemists, 1 engineer; technical personnel 4; additional personnel 10.  
*Research activities:* Microcrystalline waxes and petroleum products; refining processes and new products. (Research initiated 1919.)  
*Library:* 300 volumes.  
*Cooperative research:* Two fellowships are supported.
- Barium Products, Ltd. See Westvaco Chlorine Products Corporation.**
- 239. Barium Reduction Corporation, South Charleston, W. Va.**  
*President:* Thomas B. Jackson.  
*Research staff:* L. Preisman, Director. 3 chemists, 2 engineers.  
*Research activities:* Barium, sodium, and sulfur products; strontium salts; the prevention of scum and efflorescence in brick, tile, and ceramic products. (Research initiated 1918.)  
*Library:* 1,200 to 1,900 volumes.  
*Cooperative research:* Two fellowships are supported.
- 240. Barlin Laboratories, 4001 Main St., Philadelphia 27, Pa.**  
*Owner:* Samuel Weisfield.  
*Research staff:* Bernard Witlin, Bacteriologist.  
*Research activities:* Detergents, antiseptics, and insecticides. (Research initiated 1938.)
- 241. Barnes Company, W. F. and John, 301 South Water St., Rockford, Ill.**  
*President:* W. W. Barton.  
*Laboratory:* Chemical Division, 1930 Eleventh St., Rockford, Ill.

*Research staff:* F. F. Muenzer, Director. 3 chemists, 1 physicist; technical personnel 1; additional personnel 4.

*Research activities:* Oxides and other derivatives of the rare earths, also certain other metallic oxides. Major emphasis is on the use of these materials in the fields of glass and metal polishing. (Research initiated 1941.)

**242. Barnes Corporation, John S., 301 South Water St., Rockford, Ill.**

*Research staff:* Ernest J. Svenson, Vice President and General Manager. 2 physicists, 2 metallurgists, 11 engineers; technical personnel 3; additional personnel 5.

*Research activities:* Hydraulic transmission structures; metallurgy; electrical transmission and control structures. (Research initiated 1929.)

*Library:* 100 volumes.

**Barnes Gibson Raymond Division, Associated Spring Corporation. See Associated Spring Corporation.**

**243. Barnsdall Oil Company, Tulsa 2, Okla.**

*Vice President:* D. R. Snow.

*Laboratories:* Jennings and Shreveport, La.

*Research staff:* W. L. Horner, Director; J. T. Hayward. 2 engineers; technical personnel 2.

*Research activities:* Petroleum reservoirs and production technology. (Research initiated 1945.)

*See also* Bareco Oil Company.

**244. Barnstead Still and Sterilizer Company, Inc., 2 Lanesville Terrace, Forest Hills, Boston, Mass.**

*President:* A. J. Shadman.

*Research staff:* A. White, Director; T. Hartwell, Engineer. 1 chemist, 2 engineers.

*Research activities:* Distillation methods and equipment. (Research initiated 1932.)

**Baroid Sales Division, National Lead Company. See National Lead Company.**

**245. Barrett Company, Leon J., Worcester 1, Mass.**

*President:* Leon J. Barrett.

*Research staff:* William A. Hyde, Director. 1 chemist, 1 physicist, 1 engineer; technical personnel 2.

*Research activities:* Applications of centrifugal force to industrial problems in oil extraction, oil reclamation, washing, drying, enameling, galvanizing, filtering, and impregnation. (Research initiated 1931.)

*Scientific periodicals:* Barrett Service Bulletin. Monthly. Vol. I, 1937.

**Barrett Division, Allied Chemical and Dye Corporation. See Allied Chemical and Dye Corporation.**

**246. Barrow-Agee Laboratories, Inc., 121-125 South Front St., Memphis 1, Tenn.**

*President:* G. Worthen Agee.

*Laboratories:* Memphis, Tenn.; Jackson, Miss.; Shreveport, La.; Leland, Miss.; Cairo, Ill.; and Opelousas, La.

*Research staff:* G. Worthen Agee and E. R. Barrow, Directors. 35 chemists, engineers, and assistants.

*Research activities:* Consulting and analytical research in chemistry and in the testing and inspection of construction materials, including the field design and control of concrete mixtures and asphalt paving materials. (Research initiated 1917.)

*Library:* 1,500 volumes.

**247. Barsky and Strauss, Inc., 202 East 44th St., New York 17, N. Y.**

*President:* George Barsky.

*Research staff:* George Barsky, Director; Frank A. Strauss, Vice President. 3 chemists; additional personnel 2.

*Research activities:* Synthetic and natural resins, paints, varnishes, vegetable oils, compressed gases, metallurgical processes, heavy chemicals, etc. (Research initiated 1935.)

*Library:* 1,500 volumes.

**248. Bartlett Tree Expert Company, F. A., 60 Canal St., Stamford, Conn.**

*President:* Orville W. Spicer.

*Laboratories:* North Stamford, Conn.; Cynwyd, Pa.

*Research staff:* Stanley W. Bromley, Entomologist. 2 biologists; technical personnel 1; additional personnel 5.

*Research activities:* The investigation of injurious insects and fungus diseases, and methods for their control; the feeding and fertilizing of trees; methods and materials used in cavity work; camouflage paint research; investigations of weed killers. (Research initiated 1927.)

*Library:* 5,000 volumes.

*Scientific periodicals:* Scientific Tree Topics.

**249. Basca Manufacturing Company, Inc., 3019 Roosevelt Ave., Indianapolis 1, Ind.**

*President:* Gerald L. Canfield.

*Research staff:* C. S. Beyer, Director. 2 engineers; additional personnel 2.

*Research activities:* Improvement of the design and performance of automotive engine mufflers. (Research initiated 1938.)

*Library:* 100 volumes.

**250. Basic Food Materials, Inc.,** 806 Broadway, Cleveland 15, Ohio.

*President:* Ray F. Beerend.

*Research staff:* James C. Sanford, Director; J. R. Locke. 2 chemists.

*Research activities:* The blending of essential oils and spice extractives in the production of soluble seasonings for meat packers, canners, and processors of various types of food. (Research initiated 1942.)

*Library:* A library is maintained.

**251. Basic Refractories, Inc.,** 845 Hanna Bldg., Cleveland 15, Ohio.

*President:* H. P. Eells, Jr.

*Laboratories:* Bettsville and Maple Grove, Ohio.

*Research staff:* H. C. Lee, Vice President in charge of research; E. P. Pearson, Director. 6 chemists, 4 engineers; additional personnel 12.

*Research activities:* The constitution, manufacture, and use of basic neutral refractories; processing and use of magnesia and magnesian products; beneficiation and concentration of industrial minerals. (Research initiated 1924.)

*Library:* 200 volumes.

**252. Basic Vegetable Products Company,** Vacaville, Calif.

*Partners:* W. M. Hume and J. H. Hume.

*Research staff:* R. M. Stephenson, Chief Quality Control Chemist. 6 chemists, 2 biologists, 3 engineers, 1 home economist; technical personnel 18; additional personnel 2.

*Research activities:* The development and improvement of fresh and dehydrated onion and garlic products. (Research initiated 1933.)

*Library:* A library is maintained.

*Cooperative research:* Two grants for research are made.

**Bassick Company.** See Stewart-Warner Corporation.

**253. Bastian-Blessing Company,** 4201 West Peterson Ave., Chicago 30, Ill.

*President:* L. G. Blessing.

*Research staff:* W. C. Buttner, Director; H. L. Norway, Assistant Chief Engineer. 2 chemists, 1 metallurgist, 8 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Welding torches, soda fountains, ice cream freezers, and bar fixtures. (Research initiated 1919.)

*Library:* 225 volumes.

**254. Bates Chemical Company,** Lansdowne, Pa.

*President:* Joseph S. Bates.

*Research staff:* Joseph S. Bates, Director. 1 chemist.

*Research activities:* Certified food colors. (Research initiated 1924.)

**Bates Manufacturing Company.** See Androscoggin Mills.

**255. Battelle Memorial Institute,** Columbus 1, Ohio.

*Research staff:* Clyde Williams, Director; O. E. Harder, Assistant Director and Supervisor of Research in Physical Metallurgy. The following are *Assistants to the Director:* B. D. Thomas; John S. Crout; David C. Minton; Howard W. Russell; Verne H. Schnee; John D. Sullivan. *Supervisors of Research:* Chester R. Austin, Ceramics; Howard C. Cross, High-Temperature Properties of Metals; Frank C. Croxton, Organic Chemistry; Fred B. Dahle, Production Methods and Materials; Charles L. Faust, Electrochemistry; Bruce W. Gonser, Nonferrous Metallurgy; Charles T. Greenidge, Service Departments; Lloyd R. Jackson, Engineering Properties of Materials; C. H. Lorig, Foundry Metallurgy; H. R. Nelson, Industrial Physics; H. A. Pray, Inorganic Chemistry; A. C. Richardson, Ore Dressing and Coal Preparation; R. M. Schaffert, Graphic Arts; Ralph A. Sherman, Fuels; Clarence E. Sims, Steel Processing; J. Robert Van Pelt, Jr., Education; C. B. Voldrich, Welding; W. A. Welcker, Jr., Purchases and Buildings. H. W. Gillett, Chief Technical Advisor; Samuel L. Hoyt, Technical Advisor; Arthur M. Glover, Controller; R. O. Stith, Public Relations; Thelma R. Reinberg, Librarian. In addition to the executive staff, there are 260 metallurgists, chemists, ceramists, physicists, and engineers; 225 laboratory technicians; additional personnel 250.

*Research activities: Chemistry and chemical engineering:* Research is conducted on paints, varnishes, and lacquers; coke-oven by-products; synthetic resins and plastics; petroleum technology; wood and textile preservatives; agricultural chemistry and insecticides; natural and synthetic rubber; friction materials; dyes; inks; vegetable oils; drying oils; pigments; chemical engineering design and pilot plant operation; lignin, tall oil, and other wood derivatives; foundry core binders; grain products, proteins, and starches; plasticizers for rubber and resins; adhesives; paper technology; electro-organic chemistry; fuels chemistry; metallo-organic chemistry; leather; synthetic fibers; textiles; catalysis; chemical analysis; chemical kinetics; thermodynamics; pharmaceuticals; chemical microscopy; and industrial chemical economics. Other chemical activities are concerned with the general physical and inorganic chemistry of materials and processes; analytical procedure; corrosion of a wide variety of types and methods of corrosion prevention; and batteries and battery materials.

**Electrochemistry:** Research is conducted in electroplating, electropolishing, electroforming of metals as a manufacturing process, electro-winning, electrorefining, metal powders, porous metals by electrodeposition, electrochemical engineering, industrial electrolysis, pickling, anodizing, and the design and development of equipment for electroplating and other electrochemical operations.

**Fuels and combustion:** Investigations are conducted on the burning characteristics of solid, liquid, and gaseous fuels; the development of equipment for the smokeless combustion of coal in all types of hand-fired appliances; the control of smoke in stationary and locomotive boilers through the use of air and steam-air jets; the evaluation of coals for use in conventional, domestic stokers; study of the factors that influence wear of stoker screws; the development of fully automatic, ash-removing coal-fired stokers for domestic use; special combustion problems in the burning of fuels in locomotives and evaluation or development of improved design of combustion systems for locomotives; investigations of the behavior of deep fuel beds of coal and coke, as in gas producers and water-gas sets and determination of the characteristics of the gaseous products; evaluation of design requirements in gas-fired appliances; the development of pressure furnaces for the burning of pulverized coal in connection with the gas turbine; design of pressure furnaces for the burning of liquid fuels; the complete gasification of coal; control of the slagging properties of coal ash; evaluation of the erosive properties of ash obtained from the burning of pulverized coal; the development and operation of mechanical equipment for the pulverization of coal; the establishment of the flow characteristics of pulverized coal and air mixtures; the development of equipment for the control of flow of gases; the development of equipment for the transfer of heat; the determination of the output of space heaters; the development of methods of rating hand-fired coal-burning warm-air furnaces; investigation of the economic and engineering aspects of district heating; study of the relation of design to performance of chimneys; problems associated with the design and energy supply of residential cooling and air humidifying and dehumidifying; and the evaluation and development of methods for treatment of coal to reduce dustiness and to prevent freezing.

**Industrial ceramics:** Investigations in the field of industrial ceramics are extensive. Studies are conducted in acoustic materials and products, coatings for electrodes for arc-welding, vitreous enamels, structural clay products, glass technology, refractories, whiteware bodies and glazes, cement, concrete, plastics, insulation, pottery, and ceramic raw materials.

**Graphic arts:** Research is conducted on all

problems relating to printing, photoengraving, and allied industrial processes. Included are investigations pertaining to electrotypes, photoengravings, electrophotography, printing press plates, resists for metal, envelope manufacture, printing papers and inks, addressograph plates, lithographic plates, color process plate manufacture, letterpress printing, newspaper mechanical production, gravure, offset lithographic plates, printability of paper, type composition, stereotypes, plastic plates, rubber plates, and book and magazine production.

**Mineral dressing:** Activities in mineral dressing and raw materials beneficiation include research on all phases of processes applicable to the recovery of valuable constituents from ores and the preparation of coal. For ores, these include gravity concentration, heavy-medium separation, flotation, and electrical concentration, with the associated operations of grinding, classification, thickening, and filtering. For coal, they include washing, dewatering, and thermal drying. Hydrometallurgical and pyrometallurgical processes are applied to those ores that require leaching, volatilization, smelting, etc., for the recovery of the desired product. Research consists of the application of known processes to specific problems, and the development of new processes and equipment. Facilities are available for carrying a problem from preliminary evaluation through a pilot plant operation.

**Industrial physics:** Research in physics is both fundamental and applied. It includes general physics, special measuring problems, nuclear physics, electronics, electron microscopy, electron-diffraction investigations of surfaces, X-ray diffraction and radiography, acoustics and supersonics, optics, vacuum techniques, the study of surface finishes, investigations of gas-metal systems, vacuum-fusion and warm-extraction methods of gas analysis of metals, and mathematical investigation.

Engineering investigations in physics include the study of the proper application of materials to the design of structures and machinery; the study of the fatigue strength of materials and structures; the study of the plastic properties of metals and the effect of heat and cold work on the properties of materials; analysis of stress in structures by means of mechanical and electric strain gages, stress coat and photoelasticity; the measurement of internal stresses in materials by mechanical analysis or X-rays; the measurement of the fundamental properties of materials, such as elastic properties, electrical properties, magnetic properties, mechanical properties, etc., and the development of materials having special properties; the development of electrical equipment and the study of electrical phenomena, such as the development of rectifiers, and the study of rectification; the development of electrical heating devices and welding equipment; the ap-

plication of electronics to industrial control; and the study of heat flow and the application of heat to industrial processes.

*Iron and steel:* In the field of process ferrous metallurgy, research is conducted in two broad classifications—wrought and cast products. Specific interests are in the development of new alloys and steels, melting and fabrication problems, properties after hot and cold working, rolling, forging, wire drawing and extrusions, the properties of steels and alloys, problems in foundry techniques and processes, molding sands, investment casting methods, centrifugal casting, precision casting, plaster mold casting, cupola operations, and electrical furnace practice.

Fundamental studies are conducted to determine the relative powers of various deoxidizers for steel, the effects of hydrogen and nitrogen in cast steels, and the low-temperature properties of steel castings.

Applied research investigations are conducted on the utilization of chromium compounds in steels, the corrosion resistance of chromium steels, the applications of exothermic mixtures to steelmaking, the weldability of low-alloy steels and aircraft tubing, machinability of shell steel and free-cutting steels, metallurgical quality of ship plate, solidification characteristics of steel ingots, graphitization in steel piping, the development of methods of measuring deep-drawing properties, and the prevention of cracking and warping of cold-drawn steels.

Much work is in progress on problems in process nonferrous metallurgy—the formulation and casting of brasses, bronzes, zinc and lead-base alloys, and the light metals. Other activities in process metallurgy include ore reduction and smelting problems, purification of metals, salvaging of scrap, studies of heat transfer in metals and nonmetallic materials and of the physical chemistry of steelmaking.

*Physical metallurgy:* Studies are conducted on heat and corrosion-resistant alloys for furnace parts, exhaust valves, hard-facing alloys, and spark plug electrodes; zinc-base alloys, both wrought and cast; centrifugal castings; piercing points and guides for the production of seamless tubing; surface treatments of steels and other alloys, including nitriding, cyaniding, and alloying; machinability and the development of free-machining steels and other alloys; investment and precision casting; problems relating to metals in watch technology; abrasion-resistant alloys; deep-drawing steels; high-speed tool steels and cemented carbide tools; powder metallurgy; metal blasting and metal peening; heavy media for ore beneficiation; temperature measurement of high-melting alloys by both optical pyrometers and immersion thermocouples; and development of bearings and bearing testing.

*Nonferrous metallurgy:* Other metallurgical

activities include studies of age hardening, heat treatment, damping capacity, coloration, and mechanical properties of metals and alloys; applications of uncommon nonferrous metals, such as germanium, antimony, arsenic, bismuth, silicon, beryllium, boron, calcium, tantalum, columbium, tungsten, molybdenum, zirconium, polonium, and the precious metals; soldering and brazing and development of solder fluxes, solders, and brazing materials; the application of nonferrous metals and alloys as protective coatings, such as tinning, lead-base coating, galvanizing, chromizing, siliconizing, and antimoniizing; the application of controlled atmospheres and gaseous reactions to metallurgical processes; coatings by halide decomposition; and the development of processes for making and utilizing powdered metals.

*High-temperature properties of metals:* High-temperature properties of metals are studied and the studies are directed toward the development of materials for service above room temperature. These include tension, compression, hardness, impact, stress-rupture, creep, fatigue, damping capacity, and expansion tests on ferrous alloys, magnesium and aluminum alloys, and other metals and alloys at elevated temperatures. Other activities include the study of the effects of experimental heat treatments on metallographic structures, new alloy systems, the effects of melting and casting practice on the properties of presently-known alloys, the effects of deoxidation practice on the high-temperature properties of steel, the development of materials suitable for rocket nozzles, and the development and evaluation of various heat-resistant alloys.

*Welding research:* Research is conducted on the weldability of steels and other alloys, weld-metal defects, hardness and ductility of welds and weld joints, weld and parent-metal crack sensitivity, fusibility, porosity, welding under restraint, the influence of alloying elements on weldability, weld-bead hardness, the evaluation of welding standards for various structures, welding electrodes, resistance welding, gas welding, flame pressure welding, structural welding, welding techniques, flame cutting and flame hardening, brazing and soldering, methods of inspection of welds, and welding equipment.

*Wear studies:* Activity is devoted to the study of materials, design, and operating conditions involved in frictional service. Typical developments are concerned with new bearing materials, wear or scoring resistant materials, surface finish, fabrication methods for bearing, etc. Included are studies of hydrodynamic lubrication aimed at improving the design of special types of bearings.

*Production research:* The scope of activity in engineering studies and production research is broad and diversified. Engineering studies develop the design, or the principles of a design,

through the combination of engineering, research, and fundamental science. Activities in production research include the study of methods and processes for manufacturing industrial products and studies of applications of new developments to production lines in virtually any industrial field.

*Engineering-economic problems:* The Institute undertakes economic and technical surveys and counsels industry on the engineering aspects of economic problems.

(Research initiated 1929.)

*Library:* 12,000 volumes; 6,000 pamphlets; 60,000 patents; 500 current periodicals.

*Scientific periodicals:* Battelle Library Review. Semi-monthly.

*Cooperative research:* Through an "internship" plan known as Research Education, the Institute contributes to the advanced professional training of research scientists and, at the same time, prosecutes research in basic science as a public service.

**256. Battenfeld Grease and Oil Corporation,** 3148 Roanoke Road, Kansas City 8, Mo.

*President:* J. R. Battenfeld.

*Research staff:* C. J. Boner, Director. 5 chemists, 1 engineer; technical personnel 2; additional personnel 3.

*Research activities:* Lubricating greases, waterproofing materials, and paint specialties. (Research initiated 1938.)

*Library:* 150 volumes.

**Bauer and Black.** See Kendall Company.

**257. Bauer Brothers Company,** Springfield, Ohio.

*President:* Charles L. Bauer.

*Research staff:* M. D. Woodruff, Director of engineering; M. E. Ginaven, Director of technical sales. 2 engineers; additional personnel 2.

*Research activities:* Research leading to the development of machinery for grinding and separating various materials and to the development of processes for clients where grinding and separating is involved. (Research initiated 1926.)

**258. Baugh Companies,** 25 South Calvert Street, Baltimore 2, Md.

*President:* B. H. Brewster III.

*Laboratories:* Baltimore, Md.; Philadelphia, Pa.; Pittsburgh, Pa.

*Research staff:* E. P. Barrett, Director; S. M. Wilson, Technical Director. 7 chemists; additional personnel 4.

*Research activities:* Adsorbents, adhesives, fertilizers, and allied products. (Research initiated 1890.)

**259. Bausch and Lomb Optical Company,** 635 St. Paul St., Rochester 2, N. Y.

*President:* M. H. Eisenhart.

*Research staff:* Carl L. Bausch, Vice President in charge of research; W. B. Rayton, Director of Scientific Bureau; Frank Jones, Director of chemical research; O. H. Wolferts, Director of military developments. 14 chemists, 10 physicists, 4 biologists, 3 metallurgists, 57 engineers, 1 geologist; technical personnel 105; additional personnel 40.

*Research activities:* The development of new glasses, lenses, and optical instruments; research in properties of materials and in the functioning of instruments; the development of new methods, processes, and auxiliary materials for use in the factory. (Research initiated 1899.)

*Library:* 10,000 volumes.

*Scientific periodicals:* The Educational Focus. Two to four times a year. Vol. I, 1929.

*Cooperative research:* Ten fellowships are maintained and six grants are made for research.

**260. Baxter, Inc., Don.,** 1015 Grandview Ave., Glendale 1, Calif.

*President:* Emery S. Beardsley.

*Research staff:* Arthur Cherkin Director; Lloyd L. Ely, Medical Director. 5 chemists, 1 physician; technical personnel 3; additional personnel 2.

*Research activities:* Pharmaceuticals, particularly sterile solutions for injection; medical and surgical equipment. (Research initiated 1929.)

*Cooperative research:* Approximately three grants for research are made.

**261. Bay Chemical Company, Inc.,** Weeks, La.

*President:* Edward B. Benjamin.

*Research staff:* Alfred Lippman, Jr., Plant Manager. 2 chemists, 2 chemical engineers; technical personnel 2.

*Research activities:* Utilization of manufactured products, such as salt cake and muriatic acid; also, materials indigenous to this area, including salt, bagasse, natural gas, sulfur, petroleum, cotton, lumber, etc. (Research initiated 1928.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is supported and two grants for research are made.

**Bay Manufacturing Division, Electric Auto-Lite Company.** See Electric Auto-Lite Company.

**262. Bay State Abrasive Products Company,** Westboro, Mass.

*President:* O. S. Buckner.

*Research staff:* W. R. Morgan, Director. 5 chemists, 2 engineers; technical personnel 1; additional personnel 2.

*Research activities:* The improvement of existing abrasive products and the development of new ones. (Research initiated 1932.)

*Library:* 200 volumes.

**263. Bay State Chemical Company, 150 Main St., Peabody, Mass.**

*President:* Saul Palais.

*Research staff:* Saul Palais, Director; Samuel Robinson, General Manager. 2 chemists; additional personnel 2.

*Research activities:* Leather finishes and lacquers. (Research initiated 1920.)

**264. Beach-Russ Company, 50 Church Street, New York 7, N. Y.**

*President:* C. A. Beach.

*Laboratory:* 544 Union Ave., Brooklyn, N. Y.

*Research staff:* 3 engineers; additional personnel 1.

*Research activities:* Vacuum applications on industrial processes such as vacuum distillation, drying, impregnation, filling, etc.

**265. Beacon Milling Company, Inc., Cayuga, N. Y.**

*President:* Lloyd S. Riford.

*Research staff:* C. E. Lee and Paul Newman, Directors. 3 chemists, 5 biologists and bacteriologists; additional personnel 5.

*Research activities:* Poultry and animal nutrition and diseases; phases of management and equipment affecting nutrition; nutrition, diseases, and management of dogs, game birds, and furbearing animals. (Research initiated 1927.)

*Library:* 400 volumes.

**266. Beatrice Creamery Company, 1526 South State St., Chicago 5, Ill.**

*President:* C. H. Haskell.

*Research staff:* G. C. North, Director. 8 chemists; additional personnel 5.

*Research activities:* The development of new products, the utilization of by-products, and improvements in quality of dairy products. (Research initiated 1936.)

*Library:* A library is maintained.

**267. Becker, Moore and Company, Inc., North Tonawanda, N. Y.**

*President:* Percy P. Bowen.

*Research staff:* 1 engineer.

*Research activities:* The utilization of wood. (Research initiated 1927.)

**268. Bee Chemical Company, 63 East Lake St., Chicago 1, Ill.**

*President:* Johan Bjorksten.

*Laboratory:* 13799 South Avenue O, Chicago 33, Ill.

*Research staff:* Johan Bjorksten, Director. 2 chemists, 1 engineer.

*Research activities:* The development of superior machining media for use with carbide tools, and for special operations; grinding, cutting, and drawing media; corrosion control. (Research initiated 1945.)

*Cooperative research:* Two grants for research are made.

**269. Beech-Nut Packing Company, Canajoharie, N. Y.**

*President:* W. C. Arkell.

*Laboratories:* Canajoharie, Rochester, and Brooklyn, N. Y.

*Research staff:* J. V. Vosburgh, Vice President in charge of research; 8 chemists, 4 biologists, 2 engineers; technical personnel 16.

*Research activities:* Food and confectionery products; the improvement of present methods, and the development of new products. (Research initiated 1918.)

*Library:* A library is maintained.

*Cooperative research:* Six grants and fellowships are supported.

**270. Beechem Laboratories, 205 West McConell St., Saint Johns, Mich.**

*Research staff:* Henry A. Beechem, Director. 1 chemist, 1 physicist; additional personnel 2.

*Research activities:* Lithographic printing and detergents. (Research initiated 1940.)

*Library:* 300 volumes.

**271. Behr-Manning Corporation, Troy, N. Y.**

*President:* Francis E. Gallagher.

*Laboratory:* Watervliet, N. Y.

*Research staff:* Leon E. Hoogstoel, Technical Director; L. A. Hansen, abrasive and related research; C. S. Webber, resin research. 9 chemists, 1 biologist, 12 engineers; technical personnel 19; additional personnel 8.

*Research activities:* Abrasives and their mechanism with particular reference to coated abrasives; adhesives such as glues, synthetic resins, and rubber latex compounds; cloth finishes and paper treatments adapted to use in coated abrasives; gaskets; the development of new pile fabric products utilizing electrostatic coating methods originally developed for coated abrasives. (Research initiated 1872.)

*Library:* 620 volumes.

**272. Belden Manufacturing Company, 4647 West Van Buren St., Chicago 44, Ill.**

*President:* Whipple Jacobs.

*Laboratories:* Chicago, Ill. and Richmond, Ind.

*Research staff:* H. H. Wermine, Chief Engineer. 5 chemists, 14 engineers; technical personnel 6; additional personnel 2.

**Research activities:** Bare and insulated electrical cables; cord sets and cord assemblies; soft rubber attachment plugs and connectors. (Research initiated 1916.)

**Cooperative research:** One fellowship is supported.

**273. Belding Heminway Corticelli, 119 West 40th St., New York 18, N. Y.**

**President:** J. P. T. Armstrong.

**Laboratory:** Putnam, Conn.

**Research staff:** Richard T. Kropf, Director. 3 chemists, 2 engineers; technical personnel 7; additional personnel 4.

**Research activities:** The development of new products and processes specifically applied to textile threads of many types and fibers; physical, chemical, and engineering textile research as applied to various types of threads. (Research initiated 1932.)

**Library:** 175 volumes.

**274. Bell Aircraft Corporation, Buffalo 5, N. Y.**

**President:** Lawrence D. Bell.

**Laboratory:** Niagara Frontier Division, Niagara Falls, N. Y.

**Research staff:** Robert M. Stanley, Chief Engineer; William M. Smith, Chief of Laboratories. 5 chemists, 2 metallurgists, 20 engineers; technical personnel 33; additional personnel 10.

**Research activities:** Metallurgical, chemical, electronic, mechanical, and hydraulic research. (Research initiated 1939.)

**Library:** 800 volumes.

**275. Bell and Howell Company, 7100 McCormick Road, Chicago 45, Ill.**

**President:** J. H. McNabb.

**Research staff:** A. S. Howell, Vice President and Consulting Engineer; L. A. McNabb, Vice President in charge of electronics; B. E. Stechbart, Vice President in charge of mechanical engineering and optics; M. G. Townsley, Chief Research Engineer; P. C. Foote, Chief Optical Engineer; G. E. Stryker, Chief Metallurgist; A. L. Trendler, Assistant Chief Engineer of electronics; A. N. Leavitt, Supervising Engineer of electronics mechanical design; H. W. Bauman, Supervising Engineer of sound electronics design and research; S. F. Bushman, Supervising Engineer of radio and television electronics design research. 11 chemists, 6 physicists, 3 metallurgists, 46 engineers; technical personnel 71; additional personnel 27.

**Research activities:** Motion and still cameras, projectors and accessories, sound amplifiers, recorders, and pickups; television apparatus, lenses, and optics. (Research initiated 1928.)

**Library:** 850 volumes.

**276. Bell Telephone Laboratories, Inc., 463 West St., New York 14, N. Y.**

This company, a unit of Bell Telephone System, engages in fundamental research, development, and engineering for the American Telephone and Telegraph Company, and carries out development, design, and engineering services for the Western Electric Company, which company is the manufacturing unit of the Bell System.

**Executive Officers:** O. E. Buckley, President; M. J. Kelly, Executive Vice President; R. L. Jones, Vice President in charge of staff, patent, personnel, and publication.

**Laboratories:** The Laboratories carries on its technical work at 463 West St., New York 14, N. Y.; Murray Hill, N. J.; Whippany, N. J.; and at other New York City locations. Technical work requiring outdoor facilities is also carried on at Holmdel, Deal, and Chester, N. J., and in other locations. A proposed addition to the Laboratory at Murray Hill, N. J., will increase its capacity to about 2,000 employees.

**Technical Directors:** M. J. Kelly, Executive Vice President and Director of research; A. B. Clark, Vice President and Director of systems development; D. A. Quarles, Director of apparatus development.

**Research staff:** 99 chemists, 147 physicists, 22 metallurgists, 2,137 engineers, 555 technical assistants, 820 draftsmen, 59 patent solicitors, 949 laboratory and development mechanics; additional personnel 3,301. The technical staff on July 1, 1945, was almost double the prewar normal. The large increase in numbers was not in engineers and scientists, but rather in technical assistants, mechanics, and administrative personnel required to accelerate military developments to war speed.

**Research activities:** Researches in the sciences of physics, chemistry, mathematics, and metallurgy as sources of basic information for the development of telephone instrumentalities. The important areas of investigation in these researches comprise acoustics, high vacuum and solid state physics, electronics, magnetism, physical and organic chemistry, and physical metallurgy. Researches in telephone transmission, including speech and hearing; the transmission of telephone, telegraph, and television currents over wires, through wave guides and by radio; and the recording and reproducing of sound. Fundamental studies basic to the switching and control of telephone circuits, including studies of electromechanical, electronic, and other structures; the study of electrical contacts employed in switching; experimentation with radically new designs; and the application of the mathematical theory of probability to switching problems.

**Development and engineering activities:** The investigation, development, and design of appa-



ratus, including telephone instruments, cable, wire, and insulators, and means for their housing, protection, and support; central office switches, relays, condensers, coils, and other items required in switching and transmission systems for telephone and other forms of communication. The preparation of specifications and drawings for the manufacture of apparatus; continuing study of the service performance of Laboratories' designs as a basis for improvement; the development and application of standards of quality for communication apparatus and systems.

The study of requirements for, and development and design of, electrical communication systems combining, for efficient operation, communication apparatus and circuits, power equipment, and other equipment and electrical circuits essential to the control, switching, and supervision of communication circuits; transmission studies and development based on field and laboratory work, insuring adequate volume, intelligibility, and freedom from noise and other disturbing effects; continuing studies of current design; and preparation of information necessary for manufacturer, installer, and user.

*Other activities:* Current engineering work covering a great variety of problems which arise in the operating telephone field, such as those due to rearrangement of plant to meet changing field conditions, and those in connection with specific noise and protection matters on which the operating companies require assistance and advice; also problems involving apparatus design changes, such as those caused by changes in available supplies of materials or in their relative prices.

A small proportion of the total of the Laboratories' work covers the manufacture of apparatus which, by reason of its newness, requires close technical control by those responsible for its development.

During the war years, the greatly enlarged Laboratories' program was almost wholly devoted to the development of wartime communications and special devices for the Armed Services of the United States and its Allies. In addition, the Laboratories operated a large post-graduate school for Army and Navy officers.

Research was initiated about 1877 by the first commercial telephone company, which was a predecessor of the American Telephone and Telegraph Company; since 1925 research has been carried on under the name of Bell Telephone Laboratories, Inc.

*Library:* 35,000 volumes.

*Scientific periodicals:* Bell Laboratories Record. Monthly. Vol. I, 1923. Bell System Technical Journal. Published quarterly by the American Telephone and Telegraph Company. Vol. I, 1922.

*Cooperative research:* Several fellowships are supported.

277. Belle City Malleable Iron Company, 1442 Forest St., Racine, Wis.

*President:* C. S. Anderson.

*Research staff:* H. C. Stone, Metallurgist; R. J. Anderson, Works Manager; R. O. Flansburg, Superintendent of Malleable and Steel Finishing; A. R. Hermann, Foundry Superintendent, Steel Division; F. L. Harris, Superintendent, Malleable Division. 6 chemists, 2 metallurgists, 1 engineer.

*Research activities:* Metals with better physical properties for special application; new casting designs. (Research initiated 1916.)

278. Belmar Dye Works, Inc., 4024 Twentyssecond St., Long Island City 1, N. Y.

*President:* Martin D. Pollock.

*Research staff:* Martin D. Pollock, Director; William Dietz; Isabel Reilly. 1 chemist, 1 biologist, 1 engineer; technical personnel 5; additional personnel 11.

*Research activities:* Soaps, dyes, and chemicals; the toxicology of dyestuffs used in the manufacture of clothing; the fiber and construction of materials. (Research initiated 1931.)

*Library:* 300 volumes.

279. Belt Urologic Group, Elmer, 1893 Wilshire Blvd., Los Angeles 7, Calif.

*President:* Elmer Belt.

*Research staff:* Lucien A. Bavetta, Director. 1 chemist, 1 biologist, 5 physicians; technical personnel 5; additional personnel 30.

*Research activities:* Renal physiology; nutrition; virus research. (Research initiated 1935.)

*Library:* 2,000 volumes.

280. Bemis Bro. Bag Company, 601 South 4th St., St. Louis 2, Mo.

*President:* F. G. Bemis.

*Research staff:* A. F. Ottinger, Chief Chemist; 2 chemists; technical personnel 2.

*Research activities:* Package development, covering the investigation of synthetic resins, synthetic and natural rubbers, fabric and paper treatment, laminates, adhesives, protective coatings, and transparent films. (Research initiated 1930.)

*Library:* 500 volumes.

281. Ben Venue Laboratories, Inc., 1112 Park Bldg., Pittsburgh 22, Pa.

*President:* R. Templeton Smith.

*Laboratories:* 150 Northfield Road and 270 Northfield Road, Bedford, Ohio.

*Research staff:* D. Roy McCullagh, Director. 3 chemists, 1 biologist, 1 engineer; technical personnel 5; additional personnel 100.

*Research activities:* Hormones, antibiotics, human blood plasma, rare organic chemicals, high vacuum work. (Research initiated 1938.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported.

**282. Bendiner and Schlesinger, Inc.,** 3rd Ave. and 10th St., New York 3, N. Y.

*President:* Maurice F. Schlesinger.

*Research staff:* 4 chemists, 2 biologists, 1 physician; technical personnel 8; additional personnel 9.

*Research activities:* Chemical diagnosis. (Research initiated 1890.)

*Library:* 200 volumes.

**283. Bendix Aviation Corporation,** Fisher Bldg., Detroit 2, Mich.

*President:* Ernest R. Breech.

*Laboratories:* Laboratories are located at the following Divisions of the Corporation.

Bendix Aviation Research Laboratories, Detroit 1, Mich. A. A. Kucher, Director. General research.

Bendix-Eclipse of Canada, Ltd., Windsor, Ont. J. C. Blonde, Chief Engineer. Automotive brakes and carburetors.

Bendix Products Division, South Bend 20, Ind. K. M. Wise, Director of engineering. Aircraft landing gear, carburetors, and brakes; automotive carburetors, hydraulic brakes, vacuum braking and steering, and controls.

Bendix Radio Division, Towson, Baltimore 4, Md. W. L. Webb, Director of engineering and research. Aeronautical, railroad, and marine radios; home receivers.

Eclipse Machine Division, Elmira, N. Y. M. P. Whitney, Chief Engineer. Automotive starting equipment and controls.

Eclipse-Pioneer Division, Teterboro, N. J. R. C. Sylvander, Director of engineering. Aircraft instruments, accessories, and controls.

Friez Instrument Division, Towson, Baltimore 4, Md. V. D. Hauck, Chief Engineer. Meteorological, humidity, and temperature instruments and controls.

Hydraulic Brake Company, Detroit 1, Mich. L. E. LaBrie, Chief Engineer. Automotive brakes.

Marine Division, Brooklyn 5, N. Y. W. R. Ryan, Chief Engineer. Marine communication, navigation, instruments, and controls.

Marshall-Eclipse Division, Green Island, Troy, N. Y. D. J. Bonawit, Chief Engineer. Brake linings.

Pacific Division, North Hollywood, Calif. W. C. Trautman, Chief Hydraulic Development Engineer. H. Winchel, Chief Radio Development Engineer. Aircraft radio and hydraulic accessories and controls.

Philadelphia Division, Philadelphia 44, Pa. H. Loen, Senior Engineer. Aircraft instruments, accessories, and controls.

Red Bank Division, Red Bank, N. J. C. J. Townsend, Chief Engineer. Aircraft generators, dynamotors, and controls.

Scintilla Magneto Division, Sidney, N. Y. W. J. Spengler, Executive Engineer. Aircraft, automotive, industrial, and marine ignition and accessories.

Zenith Carburetor Division, Detroit 14, Mich. R. W. Sloane, Chief Engineer. Automotive carburetors. (Research initiated 1928.)

*Research staff:* 63 chemists, 14 physicists, 52 metallurgists, 891 engineers; technical personnel 963; additional personnel 1,648.

*Library:* Eight divisional libraries, having a total of 10,000 volumes, are maintained.

*Scientific periodicals:* Bendix Radio Engineer. Quarterly. Vol. I, 1944.

**Bendix-Eclipse of Canada, Ltd.** *See* Bendix Aviation Corporation.

**Bendix Products Division, Bendix Aviation Corporation.** *See* Bendix Aviation Corporation.

**Bendix Radio Division, Bendix Aviation Corporation.** *See* Bendix Aviation Corporation.

**284. Bendix-Westinghouse Automotive Air Brake Company,** 901 Cleveland Road, Elyria, Ohio.

*President:* D. O. Thomas.

*Research staff:* E. R. Fitch, Director of engineering; H. J. Williams, Experimental Engineer; T. J. Turek, Design Engineer, Aircraft Division. 2 consulting chemists, 2 consulting metallurgists, 8 engineers; technical personnel 4; additional personnel 4.

*Research activities:* Air power control for automotive brakes, clutches, transmissions, etc., and for aircraft brakes; the adaptation of new manufacturing processes to the company's products; research on heat transmission; lubrication and dry friction; air compression; noise control; instrumentation. (Research initiated 1930.)

*Library:* 300 volumes.

**Bennett Pumps Division, John Wood Manufacturing Company, Inc.** *See* Wood Manufacturing Company, Inc., John.

**285. Benwood-Linze Company,** 1811 Locust St., St. Louis 3, Mo.

*President:* Harold J. Wrape.

*Research staff:* Carl E. Peters, Vice President in charge of research. 3 chemists, 4 engineers; technical personnel 10; additional personnel 5.

*Research activities:* Selenium rectifiers and filter components; copper sulfide rectifiers;

transformers; chokes, and reactors; circuit design, regulating transformers, and relays; selenium photocells, and material analysis. (Research initiated 1921.)

*Library:* 300 volumes; large patent files.

**286. Benzol Products Company, 237 South St., Newark 5, N. J.**

*President:* Leo Stone.

*Laboratories:* Piscataway and Newark, N. J.

*Research staff:* A. Zimmerli (Piscataway) and Wm. F. Ringk (Newark), Directors. 8 chemists, 3 engineers; technical personnel 4; additional personnel 6.

*Research activities:* Synthetic organic chemistry on medicinals and pharmaceuticals. (Research initiated 1926.)

*Library:* 1,000 volumes.

*Cooperative research:* The company supports one fellowship.

**287. Berg Laboratories, Charles W., 1827 North 5th St., Philadelphia, Pa.**

*President:* Charles W. Berg.

*Laboratories:* 1827 North 5th St., and 269 South 19th St., Philadelphia, Pa.

*Research staff:* Walter Alkus, Director. 2 chemists, 1 engineer; additional personnel 3.

*Research activities:* The investigation of oils for use in leather, metals, and textiles. (Research initiated 1922.)

**288. Berk and Company, Inc., F. W., Wood Ridge, N. J.**

*Vice President:* M. H. McAllister.

*Research staff:* H. B. Glass, Director. 4 chemists, 1 metallurgist, 1 engineer; technical personnel 4; additional personnel 2.

*Research activities:* Mercury and its compounds; powdered alloys; boron. (Research initiated 1937.)

*Library:* 300 volumes.

**289. Berkshire Knitting Mills, Wyomissing, Pa.**

*President:* Ferdinand Thun.

*Research staff:* Hugo Hemmerich, General Superintendent in charge of research; Harold DeTurck, Chemical Director; Harold Hylton, Technical Director. 3 chemists; technical personnel 2; additional personnel 9.

*Research activities:* *Chemical laboratory:* Analytical work on oils, soaps, dyestuffs, finishes, etc., and the development of compounds useful in the knitting industry. *Technical laboratory:* The testing of yarn and knitted products pertaining to hosiery. (Research initiated 1929.)

**290. Bernat and Sons Company, Emile, 99 Bickford St., Jamaica Plain, Mass.**

*President:* Eugene Bernat.

*Research staff:* 1 chemist.

*Research activities:* The scouring of woolen and worsted yarns. (Research initiated 1934.)

**291. Berry Brothers, Inc., 211 Leib St., Detroit 7, Mich.**

*President:* Arthur Kiernan.

*Research staff:* Gale C. Smith, Chief Chemist. 3 chemists, 1 metallurgist, 4 engineers; technical personnel 5; additional personnel 10.

*Research activities:* Paint, varnish, and lacquer coatings.

*Library:* 130 volumes.

**292. Beryllium Corporation of Pennsylvania, Reading, Pa.**

*President:* Julian S. Gravely.

*Laboratory:* Temple, Pa.

*Research staff:* Henry C. Kawecki, Director. 4 chemists, 1 physicist, 2 metallurgists, 3 engineers; technical personnel 12; additional personnel 4.

*Research activities:* Extraction processes on ores of rare elements; metal reduction processes; alloy research. (Research initiated 1930.)

*Library:* 175 volumes.

**293. Best Foods, Inc., 88 Lexington Ave., New York 16, N. Y.**

*President:* L. G. Blumenschine.

*Laboratories:* Bayonne, N. J.; Buffalo, N. Y.; Chicago, Ill.; Indianapolis, Ind.; San Francisco, Calif.

*Research staff:* H. W. Vahlteich, Vice President in charge of research and quality control; A. R. Albright, T. E. Drisko, C. M. Gooding, H. A. Murray, R. H. Neal, and J. L. Schille, Chief Chemists. 30 chemists, 2 biologists, 2 engineers; technical personnel 24; additional personnel 20.

*Research activities:* Research on vegetable oils, margarin, shortening, confectioners' fats, mayonnaise, and cereals; wax polishes; dyes. (Research initiated 1903.)

*Library:* 1,000 volumes.

*Cooperative research:* Several fellowships are supported.

**294. Bethlehem Steel Company, Inc., 701 East 3rd St., Bethlehem, Pa. (Subsidiary of Bethlehem Steel Corporation.)**

*President:* E. G. Grace.

*Laboratories:* The Development and Research Department is located at Bethlehem, Pa.; plant control laboratories are located at Bethlehem,

Johnstown, Steelton and Lebanon, Pa.; and at Sparrows Point, Md., and Lackawanna, N. Y.

*Research staff:* R. S. A. Dougherty, Manager of development and research. 20 chemists, 2 physicists, 16 metallurgists, 14 engineers, 4 ceramic engineers, 9 patent engineers, 2 patent attorneys; technical personnel 13; additional personnel 9.

*Research activities:* Engineering, chemical, and metallurgical research and industrial development; patents. (Research initiated 1926.)

*Library:* A library is maintained.

**295. Better Fabrics Testing Bureau, Inc.,** 101 West 31st St., New York 1, N. Y.

*President:* Frank Stutz.

*Research staff:* 3 chemists, 5 engineers; technical personnel 16; additional personnel 10.

*Research activities:* Testing textile merchandise for consumer certification; research in size measurement standards; methods of grading merchandise for service to the consumer. (Research initiated 1928.)

**296. Betz, W. H. and L. D.,** Gillingham and Worth Sts., Philadelphia 24, Pa.

*President:* L. Drew Betz.

*Research staff:* H. L. Kahler and J. J. Maguire, Co-Directors; C. A. Noll, Chief Chemist. 7 chemists, 14 engineers; technical personnel 10; additional personnel 5.

*Research activities:* Municipal and industrial water problems, with particular emphasis on boiler feed water problems and on cooling water problems; studies on industrial waste disposal and sewage treatment; studies and research on methods of water analysis; work on removal of silica from water; steam purity; surface active phenomena, gums, etc. (Research initiated 1933.)

*Library:* 1,000 volumes.

**297. Bewley Mills, Fort Worth 1, Tex.**

*President:* W. P. Bomar.

*Research staff:* Rolfe L. Frye, Director. 1 chemist; additional personnel 1.

*Research activities:* Cereal products. (Research initiated 1882.)

**298. Bickford Research Laboratories, Avon, Conn.**

*Chairman of Executive Board:* J. K. Brandon.

*Research staff:* David E. Pearsall, Director. 1 chemist, 1 physicist, 1 engineer, 1 entomologist; additional personnel as needed.

*Research activities:* Research on the safety fuse and allied products; plastic insulations and waterproofings; explosives and pyrotechnic compositions; textiles and fibrous materials; electronic inspection apparatus; methods of insecticide distribution. (Research initiated 1941.)

*Library:* 800 volumes.

*Cooperative research:* Two grants for research are made.

**299. Biddle Company, James G.,** 1211 Arch St., Philadelphia 7, Pa.

*President:* D. Robert Yarnall.

*Research staff:* T. B. Whitson, Director of development and research. 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Electrical and mechanical testing and measuring instruments and control devices. (Research initiated 1944.)

**300. Bigelow-Sanford Carpet Company, Inc.,** 140 Madison Ave., New York 16, N. Y.

*President:* James D. Wise.

*Laboratories:* Amsterdam, N. Y.; Thompsonville, Conn.

*Research staff:* J. N. Dow, Technical Director; H. A. Reinhardt, Assistant Technical Director. 4 chemists, 12 engineers; technical personnel 36; additional personnel 6.

*Research activities:* The chemical and mechanical treatment of textile fibers; the development of textile machinery; the discovery and trial of new materials, e. g., rubber, plastics, synthetic fibers, etc.; product development; performance studies on products; the specification and testing of materials. (Research initiated 1929.)

*Library:* 1,000 volumes.

**301. Bijur Lubricating Corporation,** 43-01 Twenty-second St., Long Island City 1, N. Y.

*President:* T. R. Thomas.

*Research staff:* Fred C. Booth, Experimental Engineer. 1 mechanical engineer; technical personnel 1.

*Research activities:* The development of centralized lubricating apparatus and allied devices; the study of lubricants and applied lubrication design. (Research initiated 1924.)

**302. Binney and Smith Company,** 41 East 42nd St., New York 17, N. Y.

*President:* A. F. Kitchel.

*Laboratories:* New York 17, N. Y.; Easton, Pa.

*Research staff:* L. J. Venuto, Director of research; D. F. Cranor, Technical Director; J. W. Snyder, Assistant Technical Director. 6 chemists; technical personnel 6; additional personnel 4.

*Research activities:* Research on carbon black and its adaptation to the rubber, ink, paint, and allied industries. (Research initiated 1922.)

**303. Biological Research Laboratories, 234 East Colorado, Pasadena 1, Calif.**

*Research staff:* Royal C. Perkins, Director. 2 chemists, 1 biologist; technical personnel 2.  
*Research activities:* Mineral metabolism; human biochemistry; equine biochemistry and metabolism. (Research initiated 1934.)  
*Library:* 300 volumes.

**304. Bioproducts, Oreg. Ltd., Port Terminals, Astoria, Oreg.**

*President:* R. T. Carruthers.  
*Laboratories:* Astoria and Warrenton, Oreg.  
*Research staff:* R. T. Carruthers, Director; J. G. Ruggles, Chief Chemist. 3 chemists; additional personnel 3.  
*Research activities:* Production of vitamin A oils; utilization of fish proteins. (Research initiated 1919.)  
*Library:* 200 volumes.  
*Cooperative research:* One grant for research is made.

**305. Bioresearch Laboratories, 139 Eighth Ave., Newark 4, N. J.**

*Research staff:* Bernard Chiego, Director; William J. Plews, Electrical Engineer. 1 chemist, 1 engineer; additional personnel 4.  
*Research activities:* The applications of superheated high pressure steam to industrial processes; research and development in foods, chemicals, and cosmetics. (Research initiated 1942.)  
*Library:* 1,000 volumes.

**306. Bird and Son, Inc., East Walpole, Mass.**

*President:* Benjamin H. Roberts.  
*Laboratories:* East Walpole, Mass.; Chicago, Ill.; Shreveport, La.  
*Research staff:* Edwin M. Lines, Director. 20 chemists, 3 engineers; technical personnel 13.  
*Research activities:* Investigations on paper and its uses, paper felt and board-forming fibers, building products (primarily asphalt roofing), asphalts, hard-surfaced floor covering products in yard goods, rugs, and tiles, (Research initiated 1903.)

**307. Bird Machine Company, South Walpole, Mass.**

*President:* Phillips Dennett.  
*Research staff:* F. X. Ferney, Director. 3 chemists, 4 engineers; technical personnel 4.  
*Research activities:* Filtration; tests for the separation and classification of solids from liquids in both continuous and batch processes in chemical, cement, sewage, metallurgical, ceramic, and plastic fields; the development of patented processes and special applications for centrifugal and paper mill machinery. (Research initiated 1933.)

**Birds Eye-Snyder Laboratories. See General Foods Corporation.**

**Bireley Division, General Foods Corporation. See General Foods Corporation.**

**308. Bischoff Company, Inc., Ernst, Ivoryton, Conn.**

*President:* I. M. Bischoff.  
*Laboratories:* Pharmaceuticals: Ivoryton, Conn.; Plastics: 301 Walnut St., Memphis, Tenn.  
*Research staff:* Joseph Levy and James M. Church, Directors. 5 chemists, 1 physician; technical personnel 10; additional personnel 11.

*Research activities:* Pharmaceuticals: New drugs and compounds to be used in the treatment of disease; animal experimentation with new drugs developed by the company to determine toxicity, potency, and standardization; clinical research with new drugs to determine their efficacy in the treatment of disease. Plastics and compounds for commercial use. (Research initiated 1908.)  
*Library:* 300 volumes.  
*Cooperative research:* Eight grants for research are made.

**309. Bjorksten Laboratories, 185 North Wabash Ave., Chicago 1, Ill.**

*Owner:* Johan Bjorksten.  
*Laboratories:* 185 North Wabash Ave. and 13799 South Avenue O, Chicago, Ill.  
*Research staff:* Stuart O. Fiedler, Research Associate. 4 chemists, 2 engineers; technical personnel 1; additional personnel 2.  
*Research activities:* Research in industrial chemistry for clients on a contract basis. (Research initiated 1945.)

**310. Black Bear Company, Inc., 44-45 Twenty-third St., Long Island City 1, N. Y.**

*President:* Rowell A. Schleicher.  
*Research staff:* 1 chemist, 1 metallurgist, 1 engineer; technical personnel 1; additional personnel 3.  
*Research activities:* Lubricants and corrosion inhibiting films. (Research initiated 1889.)  
*Library:* A library is maintained.

**311. Black Clawson Company, Inc.; Shurtle Brothers Machine Company; Dilts Machine Works, Hamilton, Ohio.**

*President:* H. L. Kutter.  
*Laboratory:* Dilts Machine Works, Fulton, N. Y.  
*Research staff:* J. D. Haskell, Vice President in charge of research; S. A. Staeger, Chairman of Research and Development Committee. 3 chemists, 4 engineers, 1 machine designer, 2

draftsmen, 3 mechanics and testers; additional personnel 3.

*Research activities:* Pulp and paper mill process equipment: chests, agitators, thickeners, refiners, beaters, jordans, screens, pulpers, pumps, paper machines, converters, bleachers, etc. Pulp and paper mill processes: waste paper systems, bleaching, chemical preparation, cooking and digesting, coating, laminating, etc. Protective coatings and special materials of construction for pulp and paper mill machinery. (Research initiated 1937.)

*Library:* 200 volumes.

312. Black, Sivalls, and Bryson, P. O. Box 1714, Oklahoma City 1, Okla.

*President:* A. H. Black.

*Research staff:* G. O. Kimmell, Director; G. Raymond, Chief Engineer. 2 chemists, 1 physicist, 1 metallurgist, 12 engineers.

*Research activities:* The metallurgy of steel; autogenous welding of steel products; control work and research in paints, gasket materials, etc., used in product development; oil and gas separation. (Research initiated 1930.)

*Library:* 100 volumes.

313. Blair Laboratory, 143 West 20th St., New York 11, N. Y.

*Owner:* C. A. Blair.

*Research staff:* C. A. Blair, Director. 4 chemists; technical personnel 1.

*Research activities:* Leather and tanning materials; furs and fur dressing materials. (Research initiated 1911.)

314. Blanton Company and Blanton Mill, Inc., 3400 North Wharf, St. Louis 7, Mo.

*President:* D. A. Blanton.

*Research staff:* Raymond F. Moore, Director. 5 chemists.

*Research activities:* Oils and fats: cottonseed, soybean, peanut, corn, and cocoanut; free fatty acid soap stock, etc.; Sharples refinings and bleachings; oleomargarine, shortening, salad oils, and mayonnaise; soybean meal; crude soybean oil. (Research initiated 1926.)

315. Blaw-Knox Company, 2028 Farmers Bank Bldg., Pittsburgh 30, Pa.

*President:* William P. Witherow.

*Laboratory:* Groveton, Pa. Divisional laboratories: Lewis Foundry and Machine Division; National Alloy Steel Division; Pittsburgh Rolls Division; Union Steel Castings Division (Don V. Sherlock, President).

*Research staff* (Blaw-Knox Division): William P. Witherow, President and Director; Joseph J. Marsalka, Research Supervisor. 7 chemists, 3 metallurgists, 3 engineers; technical personnel 3; additional personnel 11.

*Research activities:* Iron and steel for special purposes, rolls and machinery for industry, chemical processes, welding. (Research initiated 1937.)

*Library:* 100 volumes.

#### BUFLOVAK EQUIPMENT DIVISION

1543 Fillmore Ave., Buffalo 11, N. Y.

*President:* C. W. Pearson.

*Research staff:* Guy N. Harcourt, Vice President in charge of engineering; D. B. Montgomery, Director. 2 analytical chemists, 2 metallurgists, 1 chemical engineer; 3 operating technicians; additional personnel 3.

*Research activities:* Laboratory and pilot plant drying and concentrating units are available for handling drying and evaporating problems in the chemical, pharmaceutical, food products, by-products, grease, and soap fields. The metallurgical department is equipped to make physical tests on metals as well as a complete analysis of the composition.

316. Bliss Company, E. W., 53rd St. and 1st Ave., Brooklyn 32, N. Y.

*President:* D. S. Harder.

*Research staff:* G. A. Landis, Metallurgist. 2 chemists, 1 metallurgist; technical personnel 1; additional personnel 2.

*Research activities:* Physical testing; heat treating; foundry work. (Research initiated 1940.)

*Library:* 150 volumes.

317. Bloch Brothers Tobacco Company, Wheeling, W. Va.

*President:* J. A. Bloch.

*Research staff:* W. B. Pattison, Director. 1 chemist, 1 biologist and bacteriologist; additional personnel 2.

*Research activities:* Tobacco. (Research initiated 1920.)

318. Bloede Company, Inc., Victor G., 701 South Caton Ave., Baltimore, Md.

*President:* N. C. Phillips.

*Research staff:* W. G. Kunze, Director. 2 chemists, 1 assistant chemist; additional personnel 1.

*Research activities:* Adhesive products, including dextrans, vegetable glues for built-up panel veneer and other woodwork, and special hydrolyzed starch products; sizings and gums for textile, carpet, and wallpaper manufacturing purposes, envelope and paper goods manufacturers, and paper box makers. (Research initiated 1920.)

- 319. Blue Diamond Corporation, 1650 South Alameda St., Los Angeles, Calif.**  
*President:* W. J. Van Valkenburgh.  
*Laboratories:* Los Angeles, Calif.; Blue Diamond, Nev.  
*Research staff:* W. G. Bradley, Vice President and Director; John D. Herbert, Research Engineer. 2 chemists, 2 engineers; technical personnel 2; additional personnel 1.  
*Research activities:* Gypsum products; Portland cement; rock, sand, and ready-mix concrete; miscellaneous building materials. (Research initiated 1924.)  
*Library:* 200 volumes.
- 320. Blumenthal and Company, Inc., Sidney, 1 Park Ave., New York, N. Y.**  
*President:* Herbert H. Schell.  
*Laboratory:* Shelton Looms, Shelton, Conn.  
*Research staff:* Harold H. Taylor, Technical Director. 7 chemists, 3 physicists; technical personnel 9; additional personnel 2.  
*Research activities:* The development of improved processes and products in connection with the manufacture of woven pile fabrics. (Research initiated 1915.)  
*Library:* 125 volumes.
- 321. Boeing Airplane Company, Wichita Division, Wichita 1, Kans.**  
*Vice President and General Manager:* J. E. Schaefer.  
*Research staff:* Harold W. Zipp, Chief Engineer; Cecil B. Barlow, Chief Staff Engineer. 1 chemist, 1 metallurgist, 6 engineers; technical personnel 3.  
*Research activities:* Applied research in the field of aircraft development. (Research initiated 1938.)  
*Library:* 4,000 volumes.
- 322. Bollman and Company, George W., Adamstown, Pa.**  
*Research staff:* Malcolm J. Reider, Director. 5 chemists, 1 engineer; technical personnel 3; additional personnel 1.  
*Research activities:* Basic research on wool and its constituent amino acids; felting and dyeing of wool; wool scouring and carbonizing; development of by-product utilization; development of new uses for wool felt. (Research initiated 1941.)  
*Library:* 125 volumes.
- 323. Bond Crown and Cork Company, 16th and Locust Sts., Wilmington 99, Del. (Division of Continental Can Company, Inc.)**  
*President:* George P. Edmonds.  
*Research staff:* L. F. Rogers, Director. 2 chemists, 1 engineer; technical personnel 4; additional personnel 1.  
*Research activities:* Composition cork with various types of binding materials; lithography (sheet metal); bottle crown and closure manufacture. (Research initiated 1910.)  
*Library:* 125 volumes.
- 324. Booth Chemical Company, P. O. Box 203, Elizabeth, N. J.**  
*President:* L. E. McGrath.  
*Laboratory:* 1139 East Jersey St., Elizabeth 2, N. J.  
*Research staff:* L. E. McGrath, Director. 1 chemist; additional personnel 2.  
*Research activities:* Water purification; improved coagulants for potable water; paper-making process water, including control at the point of sheet formation; improved sizing; mill effluents. (Research initiated 1918.)
- 325. Booth Company, Inc., F. E., San Francisco 11, Calif.**  
*President:* H. H. Fair.  
*Laboratory:* 1290 Powell St., Emeryville 8, Calif.  
*Research staff:* H. J. Almquist, Director; W. B. Atkinson. 7 chemists, 2 biologists, 1 engineer; technical personnel 3; additional personnel 3.  
*Research activities:* Vitamins A and D; proteins and amino acids; fish oils and by-products. (Research initiated 1930.)  
*Library:* 300 volumes.
- 326. Boott Mills, 79 Milk St., Boston, Mass.**  
*Treasurer and Manager:* Frederick A. Flather.  
*Laboratory:* Lowell, Mass.  
*Research staff:* F. Flather, Jr. and J. R. Flather, in charge of research. 1 chemist, 2 physicists, 1 engineer, 1 cotton classer.  
*Research activities:* Bleaching and dyeing; cloth and yarn testing; cotton blending; cotton processing and equipment; sales research. (Research initiated 1936.)
- 327. Borden Company, 350 Madison Ave., New York 17, N. Y.**  
*President:* Theodore G. Montague.
- NEW PRODUCTS RESEARCH LABORATORY  
350 Madison Ave., New York 17, N. Y.
- Research staff:* F. L. Seymour-Jones, Director. 3 chemists, 1 bacteriologist; technical personnel 2.  
*Research activities:* The development of new food products.

**MANUFACTURED PRODUCTS DIVISION RESEARCH  
LABORATORY**  
Syracuse, N. Y.

*Research staff:* Helge Shipstead, Director.  
5 chemists; additional personnel 1.

*Research activities:* Research in milk and  
milk products.

**CHEESE DIVISION RESEARCH LABORATORY**  
Plymouth, Wis.

*Research staff:* Arthur Ereksen, Director.  
2 chemists, 1 bacteriologist.

*Research activities:* Research in cheese of  
various types.

**CASEIN COMPANY OF AMERICA DIVISION**  
Bainbridge, N. Y. and Seattle, Wash.

*Research staff:* John F. Corwin, Chemical  
Director. 26 chemists, 1 engineer, 1 wood tech-  
nologist, 24 laboratory assistants; additional per-  
sonnel 12.

*Research activities:* Applied research on  
casein and resin adhesives, coatings, and other  
products for the paper, leather, textile, wood-  
working, foundry, and plastics industries.

**SPECIAL PRODUCTS DIVISION RESEARCH AND  
DEVELOPMENT LABORATORIES**

Elgin, Ill. (2); Bloomfield, N. J.;  
Oakland, Calif.; Waterloo, Iowa; Chi-  
cago, Ill. (2); Brooklyn, N. Y.;  
Salerno, Fla.; Bainbridge, N. Y.;  
New York, N. Y.

*Research staff:* F. H. Clickner, Director of  
research; H. N. Brocklesby, Coordinator of re-  
search. 16 chemists, 9 biochemists, 6 engineers,  
2 veterinarians, 1 bacteriologist, 1 nutritionist;  
technical personnel 12; additional personnel 20.

*Research activities:* Animal nutrition: de-  
velopment of special feeds and rations for live-  
stock, poultry, dogs, and fur bearing animals.  
Vitamins: biochemistry and physiology; assay  
methods, concentration, purification, and stabili-  
zation of oil-soluble vitamins, feeding oils and  
emulsions, and preparation of vitamins. Pro-  
teins, hydrolysates, amino acids: preparation  
and uses. Vegetable oils and derivatives: pre-  
paration and uses of oils, fat acids, sterols, and  
other lipids. Soybeans: chemical and industrial  
uses. Pharmaceuticals: liver factors, hormones,  
and veterinary biologicals. Specialized food  
products for the dairy, confectionery, bakery,  
and other food industries. Lactose, vitamin-free  
casein, lactalbumin, and specialized derivatives  
from milk.

**328. Borrowman Analytical and Research Labo-  
ratory, George, 9 South Clinton St., Chicago  
6, Ill.**

*Research staff:* George Borrowman, Director.  
2 chemists.

*Research activities:* Water purification; min-  
eral chemistry; zeolite chemistry including syn-  
thetic products. (Research initiated 1920.)

*Library:* 100 volumes.

*Cooperative research:* One scholarship is sup-  
ported.

**329. Boston Edison Company, 39 Boylston St.,  
Boston 12, Mass.**

*President:* James V. Toner.

*Laboratory:* 1165 Massachusetts Ave., Boston  
25, Mass.

*Research staff:* Chester A. Corney, Assistant  
Vice President and Superintendent of engineer-  
ing; Harold C. Hamilton, Head of Test and Re-  
search Section, Engineering Department; Ralph  
W. Chadbourn, Assistant Head of Test and  
Research Section, Engineering Department. 2  
chemists, 36 engineers, 13 testmen; additional  
personnel 4.

*Research activities:* Electrical, chemical, and  
mechanical problems pertaining to electric  
utility operation. (Research initiated 1900.)

*Library:* 300 volumes.

**330. Boston Wire Stitcher Company, East  
Greenwich, R. I.**

*President:* J. D. A. Whalen.

*Research staff:* J. D. A. Whalen, President  
and Director; A. H. Maynard; George H.  
Harred; Charles Linstram; Harry McClure.  
8 engineers.

*Research activities:* Designing stapling ma-  
chines, wire stitchers, and self-feeding hammers.  
(Research initiated 1914.)

**331. Boston Woven Hose and Rubber Company,  
Box 1071, Boston 3, Mass.**

*President:* J. N. Smith.

*Laboratory:* 79 Hampshire St., Cambridge,  
Mass.

*Research staff:* H. W. Sutton, Technical  
Superintendent; C. C. Davis, Chief Chemist.  
2 chemists, 10 engineers; technical personnel 4;  
additional personnel 12.

*Research activities:* The improvement of  
rubber products and the development of new  
products. (Research initiated 1911.)

*Library:* 250 volumes.

**332. Botany Worsted Mills, Passaic, N. J.**

*President:* Charles F. H. Johnson.

*Laboratories:* Five laboratories are main-  
tained.



- Research staff:* C. F. H. Johnson, Jr. Director; F. W. Noechel, Chief Physicist; F. R. Haigh, Chief Chemist. 7 chemists, 3 physicists; technical personnel 29; additional personnel 4.
- Research activities:* Lanolin, wool grease, sterols, vitamins, keratins; new processing chemicals, dyestuffs, dye methods; fiber and fabric modification; composition of wools; applied research on processing of synthetic fibers. (Research initiated 1905.)
- Library:* 500 volumes.
- Cooperative research:* One grant for research is made.
- 333. Bound Brook Oil-Less Bearing Company,** Bound Brook, N. J.
- President:* William F. Jennings.
- Research staff:* 1 metallurgist, 3 engineers; technical personnel 2.
- Research activities:* Powder metallurgy; sleeve bearing design and applications. (Research initiated 1922.)
- 334. Bowser, Inc.,** East Creighton Ave., Fort Wayne 2, Ind.
- President:* R. Hosken Damon.
- Research staff:* C. P. Griffith, Vice President in charge of engineering; H. E. Marvel, Director of research; H. L. Blum, Director of meter development. 2 chemists, 8 engineers; technical personnel 8; additional personnel 4.
- Research activities:* Liquid control devices.
- Library:* A library is maintained.
- See also* Weidenhoff, Inc., Joseph; and Johnson Fare Box Company.
- 335. Bowser Morner Testing Laboratories,** 141 Bruen St., Dayton 1, Ohio.
- Research staff:* R. R. Bowser, Director. 3 chemists, 3 metallurgists, 4 engineers, 1 radiologist; technical personnel 6; additional personnel 7.
- Research activities:* Metal fabrication, petroleum products, glazing compounds, and hydraulic fluids. (Research initiated 1911.)
- Library:* 300 volumes.
- 336. Boyce Thompson Institute for Plant Research, Inc.,** 1086 North Broadway, Yonkers, N. Y.
- Chairman:* Mrs. William Boyce Thompson.
- Research staff:* William Crocker, Managing Director. 3 chemists, 7 biochemists, 2 physical chemists, 1 biologist, 4 plant pathologists, 6 plant physiologists, 2 entomologists, 1 morphologist, 1 mycologist, 1 horticulturist, 4 library and photographic assistants, 27 laboratory assistants and helpers; additional personnel 52.
- Research activities:* Fundamental research and its application to various fields of plant production and utilization of plant products; seed storage and germination; atmospheric impurities affecting plants and animals; breaking dormancy in plants and plant parts; plant pests and effective insecticides and fungicides; plant hormones and the effect of environmental factors on plant development. (Research initiated 1924.)
- 337. Boyer Chemical Laboratory Company,** 2700 South Wabash Ave., Chicago 16, Ill.
- President:* Alden Scott Boyer.
- Research staff:* A. S. Boyer, Director. 2 chemists, 1 engineer, 2 in other scientific professions.
- Research activities:* Oils, waxes, polishing materials, cosmetics, heavy chemicals, and disinfectants. (Research initiated 1912.)
- 338. Brach and Sons, E. J.,** 4656 West Kinzie St., Chicago, Ill.
- President:* Emil J. Brach.
- Research staff:* C. O. Dicken, Vice President in charge of manufacturing; W. A. Melody, Factory Manager; F. A. Buese, Chief Industrial Engineer; K. Llewellyn, Chief Mechanical Engineer; L. H. Asbjornsen, Superintendent; O. H. Windt, Superintendent; A. R. Barton, Assistant Superintendent; C. E. Rimpila, Chief Chemist. 5 chemists and 4 laboratory assistants, 5 mechanical engineers, 6 industrial engineers.
- Research activities:* Applied research in the confectionery field; development of new products and new processes; quality improvement through the study of raw materials, methods of processing, and factors influencing storage life. (Research initiated 1916.)
- Cooperative research:* Four grants for research are made.
- 339. Braden Sutphin Ink Company,** 3800 Chester Ave., Cleveland, Ohio.
- President:* Albert C. Sutphin.
- Research staff:* G. L. Erikson, Director. 2 chemists; additional personnel 3.
- Research activities:* Pigments, oils, varnishes, dryers, printing inks, printing, lithographing, wetting and dispersion, drying of oils and inks, and the use of color in advertising. (Research initiated 1930.)
- Library:* 100 volumes.
- Cooperative research:* Research is carried on with three other competitive companies.
- 340. Bradley Laboratories, Inc.,** New Haven, Conn.
- President:* Charles D. Bradley.
- Research staff:* Charles D. Bradley, Director. 1 physicist, 2 engineers; technical personnel 2; additional personnel 2.
- Research activities:* Barrier layer phenomena;

photocells and dry disc rectifiers. (Research initiated 1939.)

**Brake Shoe and Castings Division, American Brake Shoe Company, See American Brake Shoe Company.**

**341. Branchflower Company, Lyle, 15th Ave., N. W. at Shilshole, Seattle 7, Wash.**

*President:* L. E. Branchflower.

*Research staff:* R. W. Harrison, Director of research and development; D. Verhagen, Chief Chemist; J. C. Drury, Production and Development Engineer. 5 chemists, 2 chemical engineers; technical personnel 2; additional personnel 2.

*Research activities:* Vitamin A bearing raw materials, vitamin A natural oils, and special fat soluble vitamin products; utilization of fishery waste materials in the manufacture of biological products other than vitamin A; fats and oils; protein concentrates. (Research initiated 1938.)

*Library:* 100 volumes.

*Cooperative research:* Two grants for research are made.

**342. Breck, Inc., John H., 115-119 Dwight St., Springfield 3, Mass.**

*President:* John H. Breck, Sr.

*Research staff:* Emery Emerson, Chief Chemist. 4 chemists.

*Research activities:* Detergents; cosmetics (hair, scalp, and skin). (Research initiated 1940.)

*Library:* 500 volumes.

**343. Brenette Medical Laboratory, 6253 Hollywood Blvd., Los Angeles 28, Calif.**

*Owner:* Herbert C. Brenon.

*Laboratories:* Los Angeles and Santa Monica, Calif.

*Research staff:* Herbert C. Brenon, Director. 2 chemists, 2 biologists, 1 engineer; technical personnel 2; additional personnel 1.

*Research activities:* Medical and mycological research; food products; biological analysis (medicinal and food). (Research initiated 1936.)

*Library:* 145 volumes.

**344. Breon and Company, Inc., George A., 2403-07 Grand Ave., Kansas City 10, Mo.**

*President:* George A. Breon.

*Research staff:* Willard M. Hoehn, Director. 17 chemists, 2 biologists; technical personnel 3; additional personnel 1.

*Research activities:* Biological assays; the toxicity of medicinal preparations; analytical methods; hormone synthesis; sulfanilamide derivatives; physiologically active amino com-

pounds; cardiac drugs. (Research initiated 1929.)

*Library:* 1,050 volumes.

*Cooperative research:* Three fellowships are supported and three grants for research are made.

**345. Brewer and Company, Inc., 12 East Worcester St., Worcester 4, Mass.**

*President:* Howard D. Brewer.

*Research staff:* Herman D. Ratisch, Director. 8 chemists, 1 biologist, 1 metallurgist, 1 engineer, 1 physician; technical personnel 2; additional personnel 5.

*Research activities:* Pharmaceutical, biochemical, and medical research; problems in chemistry, agriculture, and in the building and plastering trades. (Research initiated 1852.)

*Library:* 1,000 volumes.

*Cooperative research:* Four grants for research are made.

**346. Brewer and Gardner, 1505 Race St., Philadelphia 2, Pa.**

*Research staff:* J. Ed. Brewer and G. S. Gardner, Partners. 2 chemists; additional personnel 1.

*Research activities:* Investigations in gas chemistry, petroleum chemistry, etc. (Research initiated 1913.)

*Library:* 500 volumes.

*Scientific periodicals:* From the Laboratory. Irregular. Vol. I, 1938.

**347. Bridgeport Brass Company, 30 Grand St., Bridgeport 2, Conn.**

*President:* Herman W. Steinkraus.

*Research staff:* Alan Morris, Director. 4 chemists, 11 metallurgists; technical personnel 50; additional personnel 10.

*Research activities:* Problems incident to the manufacture, sale, use, and development of copper and copper alloys. (Research initiated 1895.)

*Library:* 500 volumes.

**348. Bridgeport Testing Laboratory, 2813 Dixwell Ave., Hamden 14, Conn.**

*Laboratories:* Hamden and Bridgeport, Conn.

*Research staff:* Allan V. DeMarco, Director. 3 chemists, 1 physicist, 1 biologist, 1 metallurgist; additional personnel 1.

*Research activities:* Metallography, chemistry, and radiography. (Research initiated 1909.)

*Library:* 200 volumes.

**349. Briggs Manufacturing Company, 11631 Mack Ave., Detroit 14, Mich.**

*President:* W. P. Brown.

*Research staff:* C. R. Wylie, Technical Director; P. V. Millard, Process Engineer. 6 chem-

ists, 3 physicists, 2 metallurgists, 4 engineers; technical personnel 2; additional personnel 3.

*Research activities:* The improvement and control of paints, metal cleaners, corrosion inhibitors, drawing compounds, cements, solvents, etc.; the study of stresses in stamping-presses; the determination of optimum conditions for the drawing of steel stampings; the electroplating of zinc, cadmium, and chromium; the development of more efficient methods of applying and drying paints, and of applying and burning vitreous enamel coatings. The improvement and reduction of costs of manufacturing automobile bodies, nonferrous castings, and plumbing ware. (Research initiated 1941.)

*Library:* 150 volumes.

**350. Bristol Company, Waterbury 91, Conn.**

*President:* H. H. Bristol.

*Research staff:* C. A. Mabey, Director. 1 chemist, 3 physicists, 1 metallurgist, 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Investigation and basic development of new and improved methods and devices for industrial measurements and automatic process control; study and testing of materials for above application. (Research initiated 1942.)

*Library:* 500 volumes.

*Cooperative research:* One grant for research is made.

**351. Bristol Laboratories, Inc., Box 657, Syracuse 1, N. Y.**

*President:* Philip C. Sayres.

*Research staff:* A. R. Menotti, Director of research; S. B. Binkley, Director of chemical research; George Valley, Director of bacteriological research. 17 chemists, 1 physician, 11 bacteriologists, pharmacologists, and physiologists; additional personnel 6.

*Research activities:* Antibiotics; synthetic drugs; pharmaceuticals. (Research initiated 1943.)

*Library:* A library is maintained.

*Cooperative research:* Three fellowships are supported.

**352. Bristol-Myers Company, 225 Long Ave., Hillside 5, N. J.**

*President:* Henry P. Bristol.

*Research staff:* William M. Springer, Director. 8 chemists, 1 physicist, 2 engineers, 1 psychologist; technical personnel 4; additional personnel 6.

*Research activities:* The improvement of existing products and of processes of manufacture; development of new products; research on saline laxatives and colloid systems. (Research initiated 1919.)

*Library:* 3,000 volumes.

*Cooperative research:* Five fellowships are supported and two grants for research are made.

**HARRIS LABORATORIES**

145 Main St., Tuckahoe 7, N. Y.

*Research staff:* Wm. M. Springer, Director; G. E. Milliman, Production Manager. 3 chemists; additional personnel 18.

*Research activities:* Nutrition products and pharmaceutical specialties. (Research initiated 1919.)

*Library:* 200 volumes.

*Cooperative research:* Three fellowships are supported and three grants for research are made.

*See also* Peterman, Inc., William.

**353. Broeman and Company, F. C., 3rd and Walnut Sts., Cincinnati, Ohio.**

*Research staff:* F. C. Broeman, Director. 3 chemists; additional personnel 3.

*Research activities:* Consulting research and analytical chemistry. (Research initiated 1905.)

**354. Brookfield Seed Company, Hector, Minn.**

*Partners:* Ben L. Tomlinson and W. E. Tomlinson.

*Research staff:* W. E. Tomlinson, Director. 2 biologists; technical personnel 2.

*Research activities:* Agronomy; seed processing; seed testing; grain and seed drying. (Research initiated 1940.)

**355. Brooklyn Union Gas Company, 176 Remsen St., Brooklyn 2, N. Y.**

*President:* Clifford E. Paige.

*Laboratories:* 191 St. James Place, Brooklyn, N. Y. and two at the company's plants.

*Research staff:* E. J. Murphy, Chief Chemist; J. G. Sweeney, Assistant Chief Chemist. 20 chemists, 5 engineers; additional personnel 15.

*Research activities:* Production, distribution, and utilization of gas. (Research initiated 1904.)

*Library:* 1,100 volumes.

*Cooperative research:* Two grants for research are made.

**356. Brown and Bigelow, 1300 University Ave., St. Paul 4, Minn.**

*President:* Charles A. Ward.

*Research staff:* Frank Ireland, Technical Director; Paul Felt, Assistant Vice President. 5 chemists, 4 engineers; technical personnel 3; additional personnel 8.

*Research activities:* Paper; photographic and printing process materials; electroplating; organic finishes; inks; plastics; leather. (Research initiated 1943.)

*Library:* 100 volumes.

*Cooperative research:* Five grants for research are made.

**357. Brown and Sharpe Manufacturing Company,**  
Box 1385, Providence, R. I.

*President:* Henry D. Sharpe.

*Research staff:* A. H. Bainter, Works Manager; L. H. Hammond, Director. 6 engineers.

*Research activities:* Testing, research, and development work in connection with machinery, tools, and processes. (Research initiated 1917.)

**358. Brown Company, Berlin, N. H.**

*President:* F. G. Coburn.

*Research staff:* G. A. Day, Director. 21 chemists, 1 engineer; additional personnel 68.

*Research activities:* Cellulose and cellulose products. (Research initiated 1915.)

*Library:* 1,700 volumes.

**359. Brown-Forman Distillers Corporation,**  
Louisville 1, Ky.

*President:* W. L. Lyons Brown.

*Research staff:* Frank M. Shipman, Vice President and Technical Director; J. W. Spanyer, Jr., Assistant Technical Director. 7 chemists, 2 engineers; technical personnel 4; additional personnel 2.

*Research activities:* Distillery, cooperage production, and feed development. (Research initiated 1934.)

*Cooperative research:* Three grants for research are made.

**360. Brown Instrument Company, Wayne and Roberts Aves., Philadelphia 44, Pa.** (Division of Minneapolis-Honeywell Regulator Company.)

*President:* Charles B. Sweatt.

*Research staff:* George M. Muschamp, Vice President in charge of research; Thomas R. Harrison, Technical Adviser. *Research and Development Division* (including control, fluid, electronics, and chemical analysis laboratories): Walter P. Wills, Director. 2 chemists, 6 physicists, 14 engineers, 32 research assistants and model makers. *Application Division* (including test laboratory and field research): Anker E. Krogh, Director. 37 mechanical and electrical engineers; additional personnel 42. *General Division* (including methods and quality research): Karl L. Maier, Director. 1 chemist, 2 metallurgists, 25 engineers; additional personnel 49. *Patent Division:* Charles B. Spangenberg, Director. 2 attorneys; additional personnel 4.

*Research activities:* Measurement and control of temperature, flow, pressure, liquid level, and humidity; chemical analysis and safety means for metallurgical, chemical, petroleum,

manufacturing, and other processes. (Research initiated 1869.)

*Library:* 600 volumes.

**361. Brown Laboratories, Leland, 306 South 69th St., Upper Darby, Pa.**

*Research staff:* Leland Brown, Director. 2 chemists, 1 physician, 1 bacteriologist; technical personnel 6; additional personnel 2.

*Research activities:* Clinical and pathological research. (Research initiated 1922.)

*Library:* 250 volumes.

**362. Bruce, Inc., Lawrence Richard, 375 Fairfield Ave., Stamford, Conn.**

*President:* Lawrence M. Gelb.

*Research staff:* Bernard Lustig, Director; Lawrence M. Gelb. 4 chemists; technical personnel 2; additional personnel 2.

*Research activities:* New methods for dyeing, bleaching, etc., of fur, hair, and wool; fundamental research on chemistry, chemical reactivity, and physical properties of keratin fibers (hair and wool), and application of the results toward the development of new products; synthesis of dyes. (Research initiated 1940.)

*Library:* 800 volumes.

*Cooperative research:* Two grants for research are made.

**363. Bruning Company, Inc., Charles, 100 Reade St., New York 13, N. Y.**

*President:* Paul J. Bruning.

*Laboratories:* New York City; Long Island City; Chicago; Los Angeles.

*Research staff:* Hugo Klein, Technical Director. 9 chemists, 4 engineers, 6 chemical technicians; additional personnel 5.

*Research activities:* Photographic investigations, particularly in the fields of diazotype and blueprint photography; mercury vapor photo-printing equipment and developing equipment; organic and inorganic synthesis and synthetic resins; drafting room supplies. (Research initiated 1920.)

*Library:* 500 volumes.

**364. Brunswick Laboratory, Box 441, Troy, N. Y.**

*Laboratory:* Eagle Mills, N. Y.

*Research staff:* T. R. Stenberg, Director. 1 chemist, 1 engineer.

*Research activities:* Product design and development: plastic materials, mechanical designs; special resin process; manufacturing processes. (Research initiated 1939.)

*Library:* 200 volumes.

- 365. Brunswick Pulp and Paper Company, Brunswick, Ga.**  
*President:* C. L. Van DeCarr.  
*Research staff:* E. A. Harper, Technical Director. 3 chemists, 2 engineers; technical personnel 9; additional personnel 2.  
*Research activities:* Manufacturing and bleaching of sulfate pine and gum pulps; chemical recovery and technical control of mill operation. (Research initiated 1938.)
- 366. Brush Development Company, 3311-25 Perkins St., Cleveland 14, Ohio.**  
*President:* A. L. Williams.  
*Research staff:* A. L. Williams, Chief Engineer. Department Heads: S. J. Begun, Vice President; Harry Shaper, Acoustic; Hans Jaffe, Crystal; T. Lynch, Electronics. 5 chemists, 3 physicists, 2 metallurgists, 10 engineers; technical personnel 30; additional personnel 45.  
*Research activities:* Piezoelectric devices; piezoelectric, elastic, and optic properties of crystals; methods of growing single crystals; acoustic and recording devices, instruments, transducers, ultrasonics, and magnetic recording equipment and materials. (Research initiated 1930.)  
*Library:* 450 volumes.  
*Cooperative research:* Three grants for research are made.
- 367. Brush Laboratories Company, 3714 Chester Ave., Cleveland 14, Ohio.**  
*President:* W. R. Burwell.  
*Research staff:* C. H. Tower, Director. 2 chemists, 1 physicist, 1 metallurgist, 1 engineer, 1 geologist; additional personnel 6.  
*Research activities:* Piezoelectric crystals of Rochelle salt; beryllium, beryllium alloys and compounds; powder metallurgy; nitrogen in steel. (Research initiated 1921.)  
*Library:* 500 volumes.
- 368. Bryant Heater Company, 17825 St. Clair Ave., Cleveland, Ohio.**  
*President:* Lyle C. Harvey.  
*Research staff:* W. R. Teller, Director of engineering and development; Keith T. Davis, Chief Engineer. 11 engineers; technical personnel 7; additional personnel 6.  
*Research activities:* The utilization of gas for heating and air conditioning purposes in buildings; new appliances and methods of utilization. (Research initiated 1928.)
- Buckeye Bumpers Division, Electric Auto-Lite Company. See Electric Auto-Lite Company.**
- 369. Buckeye Cotton Oil Company, Memphis Pulp Division, Binghamton, Memphis 1, Tenn. (Subsidiary of Procter and Gamble Company.)**  
*President:* R. R. Deupree.  
*Research staff:* L. N. Rogers, Director. 7 chemists; technical personnel 24.  
*Research activities:* Problems in connection with the purification and treatment of cotton linters for the manufacture of rayon, plastics, lacquers, explosives, and other materials. (Research initiated 1920.)  
*Library:* 1,000 volumes.
- 370. Buckeye Steel Castings Company, South Parsons Ave., Columbus, Ohio.**  
*President:* George T. Johnson.  
*Research staff:* F. H. Bonnet, Vice President in charge of research; W. W. Heimberger, Director. 2 chemists, 2 metallurgists; additional personnel 3.  
*Research activities:* Railroad steel casting. (Research initiated 1902.)
- 371. Buckman Laboratories, 1256 North McLean, Memphis 8, Tenn.**  
*President:* S. J. Buckman.  
*Research staff:* S. J. Buckman, Director; R. N. Meals, Research Chemist. 2 chemists, 1 biologist, 1 engineer; additional personnel 4.  
*Research activities:* Industrial microorganism control; general utilization of wood and fiber product; research for consumers on preservative and protective treatments for wood. (Research initiated 1945.)  
*Library:* 250 volumes.
- 372. Budd Manufacturing Company, Edward G., 25th and Hunting Park Ave., Philadelphia 32, Pa.**  
*President:* Edward G. Budd.  
*Research staff:* Metallurgical and Chemical Division: Joseph Winlock, Director; Engineering Research: E. J. W. Ragsdale, Director; Special Engineering: J. P. Tarbox, Director; Michael Watter, Development Engineer. 2 chemists, 4 physicists, 4 metallurgists, 25 engineers.  
*Research activities:* Automobile bodies; railway equipment, cars, streamlined trains, etc.; auto truck trailers; stainless steel chemical equipment. (Research initiated 1922.)  
*Library:* 500 volumes.  
*See also* Budd Wheel Company.
- 373. Budd Wheel Company, 12141 Charlevoix Ave., Detroit, Mich. (Affiliated with Edward G. Budd Manufacturing Company.)**  
*President:* Edwin G. Budd, Sr.  
*Research staff:* C. L. Eksergian, Chief Engi-

neer in charge of research; E. L. Morrison, Director. 6 chemists, 6 metallurgists, 5 engineers.

*Research activities:* Passenger cars, trucks, bus and railroad materials, with particular regard to wheels and brakes; induction hardening, as applied to the bores of cylinders; production control and material testing.

*Library:* 350 volumes.

*Cooperative research:* A number of grants for research are made.

**374. Buffalo Forge Company, P. O. Box 985, Buffalo, N. Y.**

*President:* E. F. Wendt.

*Laboratory:* 490 Broadway, Buffalo, N. Y.

*Research staff:* A. A. Criqui, Chief Engineer; 10 engineers.

*Research activities:* More exact information on air handling, fan engineering, air conditioning, heating and cooling, and dust control. (Research initiated 1902.)

*Scientific periodicals:* Fan Engineering. Issued every 3 to 5 years since 1914.

**Buflovak Equipment Division of Blaw-Knox Company. See Blaw-Knox Company.**

**375. Buggie and Company, H. H., Madison at 22nd St., Toledo 1, Ohio.**

*President:* H. H. Buggie.

*Research staff:* Edward A. Sprigg, Vice President and Director. 1 metallurgist, 6 engineers; technical personnel 6; additional personnel 4.

*Research activities:* Insulation materials for electrical make and break connectors; synthetic rubber used in fabric construction diaphragms for power transmission; mechanical research on absorption and dampening of low frequency vibrations. (Research initiated 1932.)

*Library:* 300 volumes.

*Cooperative research:* Two fellowships are supported.

**Buick Motor Division, General Motors Corporation. See General Motors Corporation.**

**376. Builders Iron Foundry, 9 Codding St., Providence 1, R. I.**

*President:* Henry S. Chafee.

*Research staff:* I. O. Miner, Chief Engineer. 1 chemist, 1 metallurgist, 5 engineers; additional personnel 3.

*Research activities:* Hydraulic and electrical research in connection with metering, proportioning, and controlling. (Research initiated 1924.)

*Library:* 116 volumes.

**377. Bull and Roberts, 117 Liberty St., New York 6, N. Y.**

*Partners:* Alfred E. Roberts, Alvin C. Purdy, and Henry M. Shields.

*Research staff:* Henry M. Shields, Laboratory Director. 8 chemists, 3 engineers; technical personnel 1; additional personnel 7.

*Research activities:* Chemical consulting and research service to the marine industry including designers, builders, operators, and repairers of ocean-going vessels; admiralty and insurance problems. (Research initiated 1903.)

*Library:* 2,000 volumes.

**378. Bulldog Electric Products Company, 7610 Joseph Campau, Detroit, Mich.**

*President:* William H. Frank.

*Research staff:* L. E. Fisher, Director. 5 engineers, 2 test engineers, 5 model makers; additional personnel 1.

*Research activities:* Laboratory study of the electrical characteristics of factory distribution systems; study of arcs in motion; the development of new products and the improvement of old products. (Research initiated 1915.)

**379. Bundy Tubing Company, 10951 Hern Ave., Detroit 13, Mich.**

*President:* Wendell W. Anderson.

*Research staff:* R. H. Hobrock, Vice President and Director; George S. Wiley, Associate Director. 2 chemists, 1 physicist, 3 metallurgists, 4 engineers; technical personnel 6; additional personnel 8.

*Research activities:* Metallurgical research; corrosion investigation; electrical heating and welding research; thermal conductivity and equilibria at high temperatures. (Research initiated 1936.)

*Library:* 450 volumes.

**380. Burgess Battery Company, Freeport, Ill.**

*President:* D. W. Hirtle.

*Research staff:* J. J. Coleman, Director; J. N. Mrgudich, Alternate to Director. 4 chemists, 2 physicists, 1 engineer; technical personnel 5; additional personnel 19.

*Research activities:* Electrochemistry. (Research initiated 1928.)

*Library:* 1,100 volumes.

*Cooperative research:* One fellowship is supported.

**381. Burgess Cellulose Company, Freeport, Ill.**

*President:* A. W. Schorger.

*Research staff:* 6 chemists, 1 engineer.

*Research activities:* Special papers; plastics.

- 382. Burkart Schier Chemical Company, Chattanooga, Tenn.**  
*President:* C. A. Schier.  
*Research staff:* A. J. Kelly, Chief Chemist. 3 chemists, 1 engineer; additional personnel 3.  
*Research activities:* Textile chemical auxiliaries; wetting agents and detergents; metal-working compounds. (Research initiated 1926.)  
*Library:* 300 volumes.
- 383. Burlington Instrument Company, Burlington, Iowa.**  
*Executive Partner:* A. R. Kramer.  
*Research staff:* F. H. Bulmahn, Engineer. 3 engineers.  
*Research activities:* The application of electrical indicating instruments and voltage control and the regulation of A. C. and D. C. generators.  
*Library:* 125 volumes.
- 384. Burndy Engineering Company, Inc., 107 Bruckner Blvd., New York 54, N. Y.**  
*President:* Philip F. Fried.  
*Research staff:* W. F. Bonwitt, Director of laboratory; F. Rogoff, Assistant Chief Engineer; I. Matthyse, Chief Design Engineer. 2 physicists, 2 engineers; technical personnel 4; additional personnel 2.  
*Research activities:* Mechanical and electrical research on electrical connectors and conductors; research on protective devices for electrical circuits; the improvement of existing alloys and finding suitable new alloys for items manufactured. (Research initiated 1930.)  
*Library:* A library is maintained.
- 385. Burnham Boiler Corporation, Main St., Irvington, N. Y.**  
*President:* Burnham Bowden.  
*Laboratories:* Irvington, N. Y.; Zanesville, Ohio.  
*Research staff:* 3 engineers; technical personnel 3; additional personnel 2.  
*Research activities:* The development and improvement of heating equipment; the designing of air conditioning equipment. (Research initiated 1930.)
- 386. Burnham Soluble Iodine Company, 430 Lexington St., Auburndale, Mass.**  
*President:* H. L. Burnham.  
*Research staff:* Walter S. Frost, Director. 1 chemist.  
*Research activities:* The development and production of iodine pharmaceuticals. (Research initiated 1930.)  
*Cooperative research:* Occasional grants are made for clinical research.
- 387. Burns Company, W. H. and Laver Company, Inc., C., 2601 N. Howard St., Philadelphia 33, Pa.**  
*Presidents:* E. G. Sprowles, Burns Co.; Cyril Lever, Lever Co.  
*Laboratories:* 2601 N. Howard St., Philadelphia 33, Pa.; 503 Rodman Ave., Jenkintown, Pa.  
*Research staff:* Cyril Lever, Director. 1 chemist.  
*Research activities:* Textile microscopy (cotton, wool, mohair, acetate and viscose rayon, and other synthetics); potential gradient effects on mixed colloids; synthetic dyestuffs and reversible colloidal pigments. (Research initiated 1926.)  
*Library:* 150 volumes.
- 388. Burrell Technical Supply Company, 1936-42 Fifth Ave., Pittsburgh 19, Pa.**  
*President:* George A. Burrell.  
*Laboratory:* 50 Pennsylvania Ave., Pittsburgh 22, Pa.  
*Research staff:* Lloyd V. Guild, Director. 3 chemists, 2 engineers; additional personnel 4.  
*Research activities:* Orsat gas analysis apparatus, gas fractionation apparatus, high temperature furnaces, shaking apparatus, potentiometric titration equipment, and grinding jars. (Research initiated 1920.)  
*Library:* A library is maintained.
- 389. Burroughs Wellcome and Company (U. S. A.), Inc., 9-11 East 41st St., New York 17, N. Y.**  
*President:* Guy S. Dunbar.  
*Laboratory:* The Wellcome Research Laboratories, Tuckahoe 7, N. Y.  
*Research staff:* Erwin E. Nelson, Director; Edwin J. de Beer, Assistant Director. 7 organic chemists, 5 biological chemists, 2 bacteriologists, 4 pharmacologists, 1 clinical pharmacologist, 1 librarian; technical personnel 4; additional personnel 12.  
*Research activities:* Medicinal and organic chemistry; the chemistry of vitamins, hormones, and enzymes; pure and applied pharmacology; experimental medicine; bioassay and biostatistics. (Research initiated 1928.)  
*Library:* 5,400 volumes.  
*Cooperative research:* Two fellowships are supported and six grants for research are made.
- 390. Burt Scientific Laboratories, R. C., 327 South Michigan Ave., Pasadena 5, Calif.**  
*Research staff:* R. C. Burt, Director. 2 physicists; additional personnel 2.  
*Research activities:* Acoustics; high frequency measurement; power transmission; short wave medical research. (Research initiated 1925.)

**391. Bush, Inc., Burton T., Givaudan-Delawanna, Inc., Givaudan-Virginia, Inc., Delawanna, N. J.**

*President:* Eric C. Kunz.

*Research staff:* Max Luthy, Director. 8 chemists, 2 bacteriologists; technical personnel 6; additional personnel 7.

*Research activities:* Research on synthetic organic chemicals for use in perfumery, cosmetics, industrial aromatics, flavors, pharmaceuticals, insecticides, bactericides, and fungicides. (Research initiated 1924.)

*Library:* 1,000 volumes.

*Scientific periodicals:* Givaudian. Vol. I, 1933.

*Cooperative research:* Eight grants for research are made.

**392. Byers Company, A. M., Clark Bldg., Pittsburgh, Pa.**

*President:* L. F. Rains.

*Laboratory:* Byers Plant, Economy Township, Beaver County, Pa.

*Research staff:* J. W. Marrinan, Vice President in charge of operations and research; Edward B. Story and L. T. Tobiasz, Metallurgists; F. E. Eckert, Chief Chemist; E. K. Foss; J. R. Macdonald. 3 to 6 chemists, 3 to 6 metallurgists, 2 engineers.

*Research activities:* The improvement and development of wrought iron pipe; corrosion; water treating. (Research initiated 1916.)

**393. Cabot, Inc., Godfrey L., 77 Franklin St., Boston 10, Mass.**

*President:* Godfrey L. Cabot.

*Laboratories:* 49 Beach St., Boston, Mass.; Pampa, Tex.

*Research staff:* C. A. Stokes, Director of research and development; W. R. Smith, Chief Research Chemist. Boston: 13 chemists, 4 engineers; technical personnel 7; additional personnel 7. Pampa: 3 chemists, 9 engineers; technical personnel 9; additional personnel 1.

*Research activities:* New grades and uses of carbon black, and research into fundamental properties of this material; the development of new uses for the products of the destructive distillation of pinewood; the use of pigments of all kinds, particularly as filling and reinforcing materials for rubber; production control, technical service, and the improvement of manufacturing methods. (Research initiated 1927.)

*Library:* 270 volumes.

*Cooperative research:* Two fellowships are supported and six grants for research are made.

**394. Cabot, Inc., Samuel, 141 Milk St., Boston, Mass.**

*President:* Samuel Cabot.

*Research staff:* Samuel Cabot; Warren C. Newbury; Ralph L. Godshalk; 2 assistants.

*Research activities:* Research on coal-tar dis-

tillates, disinfectants, paints, stains, varnishes, colloidal dispersions, and sound insulation. (Research initiated 1897.)

**Cadillac Motor Car Division, General Motors Corporation. See General Motors Corporation.**

**395. Caird, James M., Cannon Bldg., Troy, N. Y.**

*Research staff:* 6 to 14 chemists, biologists, and engineers.

*Research activities:* Water supply and sanitation. (Research initiated 1898.)

*Library:* A library is maintained.

*Cooperative research:* One grant for research is made.

**396. Calcium Carbonate Company, Quincy, Ill.**

*President:* T. P. Black.

*Laboratory:* 520 South 4th, Quincy, Ill.

*Research staff:* B. B. McHan, Director. 2 chemists, 1 physicist, 1 biologist, 4 technicians; additional personnel 1.

*Research activities:* Calcium carbonates and allied inerts and fillers, with particular attention to physicochemical properties of fillers as functions of size and shape of particles. (Research initiated 1930.)

*Library:* 500 volumes.

**Calco Chemical Division, American Cyanamid Company. See American Cyanamid Company.**

**397. Caled Products Company, Inc., Brentwood, Md.**

*President:* Warren K. Cooley.

*Laboratory:* 4200 Bladensburg Road, Cottage City, Md.

*Research staff:* Warren K. Cooley, Director; Ralph T. Mease, Chief Chemist; J. M. Persons. 3 chemists; technical personnel 2.

*Research activities:* Soaps, drycleaning, laundering, textiles, and solvents. (Research initiated 1930.)

*Library:* A library is maintained.

**Calgon, Inc. See Hagan Corporation.**

**398. Calibron Products, Inc., 51 Lakeside Ave., West Orange, N. J.**

*President:* Theodore M. Edison.

*Research staff:* Theodore M. Edison, Director. 1 physicist; additional personnel 1.

*Research activities:* The development and construction of special apparatus for other companies in the fields of mechanical and electrical engineering and applied mathematical physics. (Research initiated 1931.)

*Library:* 180 volumes.

*Scientific periodicals:* Calibron Notebook. Irregular. Volume 1, 1936.



- 399. California and Hawaiian Sugar Refining Corporation, Ltd.,** 215 Market St., San Francisco, Calif.  
*President:* L. R. Campiglia.  
*Laboratory:* Crockett, Calif.  
*Research staff:* E. C. Gillett, Director and Chief Chemist. 8 chemists, 3 chemical engineers, 1 bacteriologist; technical personnel 6; additional personnel 24.  
*Research activities:* Improvement in the quality of sugar and reduction in cost of refining. (Research initiated 1921.)  
*Library:* 1,000 volumes.
- 400. California Conserving Company, Inc.,** 1 Drumm St., San Francisco 11, Calif.  
*President:* M. E. Wangenheim, Sr.  
*Laboratories:* Research laboratory at Hayward, Calif.; control laboratories at Mountain View and Oakdale, Calif.  
*Research staff:* B. E. Lesley, Director. 3 chemists, 1 bacteriologist; technical personnel 8; additional personnel 2.  
*Research activities:* Process development on canned fruits, vegetables, juices, and fermentation products. (Research initiated in 1920.)  
*Library:* 250 volumes.  
*Cooperative research:* One grant for research is made.
- 401. California Flaxseed Products Company,** 3135 East 26th St., Los Angeles 23, Calif.  
*President:* W. A. Bush.  
*Research staff:* B. A. Stagner, Director. 6 chemists.  
*Research activities:* Protective coatings, plastics, resins, and drying oils. (Research initiated 1935.)  
*Library:* 1,000 volumes.  
*Scientific periodicals:* Califax. Vol. I, 1939.
- 402. California Fruit Growers Exchange,** 707 West 5th St., Los Angeles, Calif.  
*President:* C. C. Teague.  
*Laboratories:* 616 East Grove St., Ontario, Calif.; branch at Corona, Calif.  
*Research staff:* R. K. Pitzer, Director; W. E. Baier, Manager. 8 chemists, 1 biologist, 1 engineer, 1 bacteriologist, 1 librarian, 2 in other scientific professions; additional personnel 6.  
*Research activities:* The development of products from citrus fruits; uses of citrus products; chemical problems connected with production; the preparation and sale of citrus fruits.  
*Library:* A library is maintained.
- 403. California Ink Company, Inc.,** 545 Sansome St., San Francisco 11, Calif.  
*President:* C. M. Reed.  
*Laboratory:* 711 Camelia St., Berkeley 2, Calif.  
*Research staff:* Ross Cummings, Chief Chemist; J. Y. Minassian, Head Varnish Chemist; Maurice Adler, Factory Superintendent; J. B. Heymes, Superintendent of varnish department. 9 chemists; technical personnel 8; additional personnel 1.  
*Research activities:* The development and improvement of printing inks, dry colors, varnishes, and printers' rollers. (Research initiated 1903.)  
*Library:* 300 volumes.  
*Cooperative research:* Two grants for research are made.
- 404. California Laboratories,** 452 Clifton St., Oakland 9, Calif.  
*Research staff:* Andrew Guthrie, Research Director; J. M. Harding, Design Engineer; H. F. Weaver, Research Consultant; W. A. Wickett, General Manager. 2 physicists, 2 engineers.  
*Research activities:* Fundamental and applied physical research in the following fields: high vacuum studies, acoustics, physical optics and spectroscopy, electronic and mechanical instrumentation, and radioactivity and X-ray applications. (Research initiated 1945.)  
*Library:* 300 volumes.
- 405. California Milk Products Company,** Gustine, Calif.  
*President:* Mahlon K. Jordan.  
*Research staff:* J. Roberts Harrower, Director. 4 chemists, 1 bacteriologist; technical personnel 4; additional personnel 1.  
*Research activities:* Research on new products from milk; the development of improved plant procedures for increasing yields and product quality of casein, lactalbumin, and lactose. (Research initiated 1937.)  
*Library:* 190 volumes.
- 406. California Packing Corporation,** 101 California St., San Francisco 19, Calif.  
*President:* Alfred W. Eames.  
*Laboratories:* Central Laboratory at San Francisco; other laboratories at Emeryville and Monterey, Calif.  
*Research staff:* J. E. McConkie, Director. 17 chemists, 3 biologists and bacteriologists, 1 engineer; technical personnel 10; additional personnel 11. In addition, a Raw Products Research Group is maintained, staffed by qualified plant physiologists, agronomists, geneticists, plant pathologists, and technicians. This group embraces a personnel of about 30 with headquarters at scattered locations.  
*Research activities:* Food preservation and production. The development of new processes in food preservation and preparation; new products; extension of fundamental knowledge in

food chemistry, nutrition, bacteriology, and agronomy as it applies to the canning industry. Research in vitamin chemistry, including both the oil soluble group and water soluble group occurring in natural foods. (Research initiated 1920.)

*Library:* 700 volumes.

**407. California Research Corporation, 200 Bush St., San Francisco 4, Calif.** (Subsidiary of Standard Oil Company of California.)

*President:* R. A. Halloran.

*Laboratories:* Richmond, El Segundo, and Whittier, Calif.

*Research staff:* 105 chemists, 3 physicists, 1 metallurgist, 101 engineers, 2 geologists, 1 translator, 1 librarian, 6 pilot plant and shop foremen; 2 in personnel management.

*Research activities:* Problems pertaining to the production, transportation, refining, and utilization of petroleum and its products; petroleum chemicals. (Research initiated 1920.)

*Cooperative research:* One grant for research is made.

**408. California Spray-Chemical Corporation, Richmond, Calif.**

*President:* H. C. Davies.

*Laboratories:* Richmond, Calif.; Haddonfield, N. J.

*Research staff:* Leo R. Gardner, Director; Carroll C. Cassil, Chief Research Chemist; T. Walter Reed, Research Entomologist. 4 chemists, 5 biologists; technical personnel 1.

*Research activities:* Agricultural pest control. (Research initiated 1919.)

*Library:* 300 volumes.

**409. California Testing Laboratories, Inc., 1429 Santa Fe Ave., Los Angeles, Calif.**

*President:* M. B. Niesley.

*Research staff:* Frank Radovich, Director; Roy L. Cornell; Phil L. Grimes. 6 chemists, 1 physicist, 2 metallurgists, 5 engineers, 1 geologist; technical personnel 11; additional personnel 6.

*Research activities:* Petroleum; ore dressing and beneficiation; metallurgy; construction materials. (Research initiated 1925.)

*Library:* 500 volumes.

**410. California Water Service Company, 374 West Santa Clara St., San Jose, Calif.**

*President:* Ralph Elsmann.

*Research staff:* J. R. Rossum, Sanitary Engineer. 3 chemists; additional personnel 2.

*Research activities:* The investigation and development of water treatment processes with emphasis on plant design and operating control. (Research initiated 1922.)

*Library:* 200 volumes.

**411. Callaway Institute, Inc., La Grange, Ga.**

*President:* Robert W. Philip.

*Research staff:* Robert W. Philip, Executive Director; C. M. Asbill, Jr., Mechanical Research Engineer; S. P. Parker, Weaving Technologist; R. F. Jessen, Textile Technologist; F. S. Perkerson, Chief Chemist; W. P. Cofield, Jr., Chief Testing Engineer; Katherine F. Glass, Librarian. 4 chemists, 6 engineers, 1 textile tester; technical personnel 5; additional personnel 19.

*Research activities:* The development of new improved textile processes, products, equipment, and applications; training of textile personnel; testing of textiles. Laboratory testing facilities are available to clients. (Research initiated 1936.)

*Library:* 2,200 volumes.

**412. Callite Tungsten Corporation, 540 Thirty-ninth St., Union City, N. J.** (Subsidiary of Eisler Electric Corporation.)

*President:* Charles H. Kraft.

*Research staff:* J. Kurtz Director; H. Williams, Chief Chemist. 3 chemists, 1 physicist, 2 metallurgists, 2 engineers; technical personnel 4.

*Research activities:* Research on metals used in electronic tube construction; the development of tungsten and molybdenum wire, sheet, rod, and other products; research on radio products, insulators and tubes, and incandescent lamps; refractory carbides for tools and dies; powder metallurgy covering nonferrous metals and alloys, particularly refractory metals. (Research initiated 1932.)

*Library:* 200 volumes.

**413. Calorizing Company, 400 Hill Ave., Pittsburgh 21, Pa.**

*President:* B. J. Sayles.

*Research staff:* H. Schultz, Chief Metallurgist. 1 chemist, 1 metallurgist; technical personnel 1; additional personnel 4.

*Research activities:* Chiefly physical properties of heat enduring metals at high temperature; the work covers Calite, chrome-nickel alloys, and calorized steel. (Research initiated 1923.)

*Library:* 100 volumes.

**414. Calumet and Hecla Consolidated Copper Company, 1 Calumet Ave., Calumet, Mich.**

*President:* E. R. Lovell.

*Laboratory:* Lake Linden, Mich.

*Research staff:* G. L. Craig, Director. 1 chemist, 3 metallurgists, 1 engineer; additional personnel 2.

*Research activities:* Copper refining; secondary metals, including treatment and by-product recovery; copper chemicals; miscellaneous chem-

ical and metallurgical investigations. (Research initiated 1923.)

*Library:* 2,000 volumes.

*Cooperative research:* One fellowship is supported.

*See also* Wolverine Tube Division of Calumet and Hecla Consolidated Copper Company.

**Calumet Baking Powder Division, General Foods Corporation.** *See* General Foods Corporation.

**415. Cambridge Tile Manufacturing Company,** Station R, Box 71, Cincinnati, Ohio.

*President:* Charles H. Burchenal.

*Research staff:* H. E. Meyer, Vice President in charge of research; I. A. Balinken, Director. 2 chemists, 1 physicist, 1 metallurgist, 2 engineers; technical personnel 4.

*Research activities:* The study of color measurement of glazed tile; physical variations in burned tile; the development of new tile products, and new uses for old products.

**416. Cameron and Company, Inc.,** William, Waco, Tex.

*President:* E. R. Bolton.

*Research staff:* R. J. Tolson and E. C. Bolton, Directors; Frank Stevens; O. B. Smith; Corbin Sills; Nathe Bagby. 3 architects and engineers; additional personnel 5.

*Research activities:* Pre-fabrication of buildings; the development of improved building materials and their uses; building products that can be factory-manufactured, pre-fit, and assembled for installation.

**417. Campbell Soup Company,** 100 Market St., Camden, N. J.

*President:* A. C. Dorrance.

*Laboratories:* Camden, N. J.; Chicago, Ill.; Toronto, Ont.

*Research staff:* J. McGowan, Jr., Director of research and development; G. M. Bartlett, Assistant to Director. *Agricultural Research:* E. W. Montell, Director; D. R. Porter, Plant Pathologist and Geneticist; Jackson B. Hester, Soil Technologist. *Engineering Research:* E. H. Johannes, Manager; J. A. Blair, Plant Development Engineer. *Product Research:* P. W. Souder, Manager; C. D. Trombold, Assistant Manager; E. F. Kohman, Research Chemist. *Engineering Department:* G. K. Budd, Chief Engineer. *Plant Technology and Control Laboratory:* P. L. Gowen, Staff Technologist; Plant Technologists: W. N. Currier, Camden; H. E. Bernhardt, Chicago; J. L. Atchison, Toronto; Chief Chemists: A. D. Bowers, Camden; J. H. Bunting, Chicago; J. L. Atchison, Toronto. 18 chemists, 6 biologists, 3 engineers; technical personnel 10; additional personnel 16.

*Research activities:* New product formulation; new process development; food preservation; nutrition. The development of new and improved vegetable varieties; soil research. The design of new equipment; the development of new processes. (Research initiated 1905.)

*Library:* 300 volumes.

**418. Campbell Taggart Research Corporation,** 6211 Lemmon Ave., Dallas 1, Tex.

*President:* C. W. Skogsberg.

*Research staff:* Wendell Reeder, Director. 5 chemists, 1 engineer; technical personnel 2; additional personnel 3.

*Research activities:* Bakery products and production methods. (Research initiated 1927.)

*Library:* A library is maintained.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**Canadian Radium and Uranium Corporation.**  
*See* No. 2429 in *Addenda*.

**419. Canfield Oil Company,** 3216 East 55th St., Cleveland, Ohio.

*President:* J. A. Jackson.

*Research staff:* Louis W. Hodous, Director. 1 chemist, 1 engineer; additional personnel 1.

*Research activities:* Improvement in the quality of petroleum and in the processes of the industry. (Research initiated 1910.)

**Carbide and Carbon Chemicals Corporation.**  
*See* Union Carbide and Carbon Corporation.

**420. Carboloy Company, Inc.,** Box 237, Roosevelt Park Annex, Detroit 32, Mich.

*President:* W. G. Robbins.

*Research staff:* James R. Longwell, Director of engineering and research. 1 chemist, 1 physicist, 4 metallurgists, 3 engineers; technical personnel 16.

*Research activities:* Metals and carbides which are used for cutting tools, wire, bar and tube dies, sheet metal draw dies, blanking dies, and forming dies; carbides used as product materials for such parts as bearings, springs, wear parts, etc. (Research initiated 1940.)

*Library:* 1,000 volumes.

**421. Carborundum Company,** Buffalo Ave., Niagara Falls, N. Y.

*President:* Arthur A. Batts.

*Research staff:* George J. Easter, Director. 4 chemists, 4 metallurgists, 27 engineers, 11 in other scientific professions; technical personnel 13; additional personnel 37.

*Research activities:* The development of new and improved abrasive products and abrasive materials, and of new and improved refractory products; the designing of equipment for proc-

essing and testing abrasive and refractory products. (Research initiated 1918.)

*Library:* 2,500 volumes.

*Cooperative research:* Two fellowships are supported.

**422. Cardox Corporation, 307 North Michigan Ave., Chicago 1, Ill.**

*President:* Allyn Harris.

*Laboratories:* Monee, Ill.; Claremore, Okla.; Benton, Ill.

*Research staff:* Charles A. Getz, Vice President in charge of research; H. V. Williamson, Chief Engineer; John L. Gring, Chief Chemist. 7 chemists, 1 biologist, 8 engineers; technical personnel 4; additional personnel 4.

*Research activities:* The development of means and methods of dislodging coal, and for extinguishing fire; electrochemical salt preparation; the manufacture and use of carbon dioxide; the improvement of the method of handling and storing liquefied carbon dioxide; heating compounds; technical data on carbon dioxide. (Research initiated 1932.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported.

**423. Carey Manufacturing Company, Philip, Lockland 15, Ohio.**

*President:* Robert S. King.

*Laboratories:* Lockland, Ohio; Plymouth Meeting, Pa.

*Research staff:* H. W. Greider, Director; G. A. Fasold and Henri Marc, Assistant Directors; R. A. MacArthur, H. E. Callahan, and G. M. Armstrong, Senior Research Chemists. 13 chemists, 7 engineers; technical personnel 10; additional personnel 9.

*Research activities:* Asbestos products, magnesia products, thermal insulation materials, asphalt roofings, asbestos-cement rigid roofing and siding, road-building materials, industrial flooring tile, asphalt paints and plastic cements, insulated air ducts, marine panel board, automotive sound deadening material, mineral wool, acoustical correction materials, asphalt plywood, asphalt emulsions, wiping fabrics. (Research initiated 1921.)

*Library:* 800 volumes.

*Cooperative research:* Two fellowships are supported.

**424. Carey Salt Company, Hutchinson, Kans.**

*President:* Howard J. Carey.

*Laboratories:* Hutchinson, Kans.; Winfield, La.

*Research staff:* S. B. Horrell, General Manager of operations; Paul V. Imes, Director. 2 chemists, 1 chemical engineer, 1 engineer.

*Research activities:* The improvement of

salt processing, the development of salt products, and the improvement of existing products. (Research initiated 1923.)

*Library:* 500 volumes.

**425. Carlisle Tire and Rubber Company, College and B Sts., Carlisle, Pa. (Subsidiary of Pharis Tire and Rubber Company.)**

*Vice President and General Manager:* J. E. Warrell.

*Research staff:* L. J. Dete, Jr., Director. 2 chemists; technical personnel 3; additional personnel 1;

*Research activities:* Synthetic rubbers used in the production of air containers. (Research initiated 1920.)

*Library:* 200 volumes.

**426. Carmody Research Laboratories, Inc., 319 Arch St., Philadelphia 6, Pa.**

*President:* R. W. Ostermayer.

*Research staff:* Eldon V. Romaine, Director. 3 chemists, 3 laboratory assistants.

*Research activities:* Terpenes and terpene resins. (Research initiated 1939.)

**427. Carnation Company, Milwaukee 11, Wis.**

*President:* E. H. Stuart.

*Research staff:* E. S. Hartwick, Vice President in charge of research; E. B. Oberg, Director. 10 chemists, 2 biologists, 1 engineer; additional personnel 3.

*Research activities:* The technology of milk, malted milk, cereals, and feeds. (Research initiated 1939.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported.

**428. Carnegie-Illinois Steel Corporation, 434 Fifth Ave., Pittsburgh, Pa. (Subsidiary of United States Steel Corporation of New Jersey.)**

*President:* J. L. Perry.

*Laboratories:* 210 Semple St. and 121 Meyron St., Pittsburgh, Pa.; Clairton Works, Clairton, Pa.; Duquesne Works, Duquesne, Pa.; Edgar Thomson Works, Braddock Pa.; Farrell Works, Farrell, Pa.; Gary Works, Gary, Ind.; Homestead Works, Munhall, Pa.; Irvin Works, Dravosburg, Pa.; Lorain Works, Johnstown, Pa.; McDonald Works, Youngstown, Ohio; Ohio Works, Youngstown, Ohio; South Works, Chicago, Ill.

*Research staff:* E. C. Bain, Vice President in charge of research and technology; M. A. Grossman, Director of research; M. F. McConnell, Manager of Research and Development Division; M. W. Lightner, Assistant Manager of Research and Development Division; F. L. Toy,

Assistant to Manager of Research and Development Division. Research or Development Engineers: L. C. Bibber, C. B. Francis, J. M. Hodge, H. E. Johnson, J. R. Low, Edgar Marburg, R. F. Miller, S. C. Snyder, C. W. Stoker, E. S. Taylerson, and A. H. Ward. Approximately 75 persons devote full time to research and several hundred men at various plants devote part time to research and part time to routine investigations.

*Research activities:* Problems relating to the manufacture of steel in bars, sheets, plates, structural shapes, and railroad materials; steel-making, casting, rolling, surface quality, mechanical properties, metallography, heat-treatment, corrosion, abrasion, and fatigue; nonmetallic and metallic coatings, galvanized and tin plating; general improvements in processes and products. (Research initiated 1931.)

*Cooperative research:* Fellowships are supported and grants are made to research institutions.

429. Carnrick Company, G. W., 20 Mt. Pleasant Ave., Newark 1, N. J.

*President:* Millard Carnrick.

*Research staff:* C. F. Longfellow, Director. 4 chemists, 1 biologist, 1 physician; technical personnel 2; additional personnel 1.

*Research activities:* Organic synthetic compounds and naturally occurring substances giving estrogenic effects. (Research initiated 1909.)

*Library:* 1,000 volumes.

430. Carpenter and Company, L. E., 170 North Main St., Wharton, N. J.

*President:* L. E. Carpenter.

*Research staff:* R. A. Borton, Chief Chemist. 3 chemists; technical personnel 1; additional personnel 1.

*Research activities:* Artificial leather, or coated textiles. (Research initiated 1928.)

431. Carpenter Steel Company, 101 West Bern St., Reading, Pa.

*President:* J. Heber Parker.

*Research staff:* B. H. DeLong, Vice President and Chief Metallurgist; G. V. Luerssen, Assistant Chief Metallurgist; W. A. Schlegel and C. B. Post, Executive Metallurgists. 3 chemists, 2 physicists, 8 metallurgists, 2 engineers; 12 in other scientific professions; technical personnel 20.

*Research activities:* The development of improved grades of tool steel, and methods of manufacture; studies of improved methods of heat-treatment and testing of tools; the development of stainless steels in relation to improved corrosion-resisting and fabricating qualities. (Research initiated 1900.)

*Library:* A library is maintained.

432. Carrier Corporation, 300 South Geddes St., Syracuse 1, N. Y.

*President:* E. C. Wampler.

*Research staff:* Herbert L. Laube, Vice President in charge of engineering; C. M. Ashley, Acting Director of research. 2 chemists, 1 physicist, 52 engineers; technical personnel 62; additional personnel 25.

*Research activities:* The development of air conditioning, refrigeration, and heating equipment. This includes: The investigation of problems involving the creating and automatic control of conditions of temperature, humidity, air movement, air distribution, and air cleanliness; fundamental research in the properties of air and water vapor; the investigation of the effect of atmospheric conditions upon raw and manufactured materials; fundamental research in the properties of chemicals suitable for use as refrigeration media; fundamental research in various types of refrigeration such as reciprocating, centrifugal, absorption, and steam ejector. Extensive study in sound absorption has been made to reduce equipment noises in radio broadcasting and sound recording studios. Other developments of the laboratory are: Complete unitary air conditioning, heating, cooling, humidifying, and ventilating equipment for offices, stores, and homes. Centrifugal, reciprocating, and steam ejector refrigeration machines, commercial refrigeration equipment, air conditioning and processing equipment for industrial plants, and built-up central station systems for large air conditioning applications. Equipment for the processing and preservation of quick-frozen foods. (Research initiated 1915.)

*Library:* 1,200 volumes.

*Scientific periodicals:* Library Bulletin. Monthly. Volume 1, May 1944.

*Cooperative research:* One fellowship is supported and one grant for research is made.

433. Carter Carburetor Corporation, 2840 North Spring Ave., St. Louis 7, Mo.

*Vice President and General Manager:* Hugh H. C. Weed.

*Research staff:* G. M. Bicknell, Chief Engineer. 2 chemists, 1 metallurgist, 31 engineers; technical personnel 23; additional personnel 13.

*Research activities:* The development of automatic choke and manual choke carburetors, electric fuel pumps, and mechanical fuel pumps. (Research initiated 1929.)

434. Carter Fabrics Corporation, Shelby, N. C. (Affiliated with Cleveland Cloth Mills, Inc.; S. Slater and Sons, Inc.; Stanley Mill, Inc.)

*President:* W. J. Carter.

*Research staff:* John E. Bell, Director. 2 chemists, 2 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Fabrics: Improvement of manufacturing processes and of end product; the development of new products or modifications of old, and the evaluation of new processing equipment; control of existing processes and methods. (Research initiated 1937.)

*Cooperative research:* One grant for research is made.

435. Carter Oil Company, P. O. Box 801, Tulsa 2, Okla.

*President:* O. C. Schorp.

*Laboratory:* 1133 North Lewis, Tulsa, Okla.

*Research staff:* P. S. Williams, Chief of research. 5 chemists, 6 physicists, 11 engineers; technical personnel 4; additional personnel 3.

*Research activities:* The improvement of techniques, equipment, and methods of oil prospecting through fundamental studies; more efficient oil production practices through studies of the dynamics of reservoirs; the development of better production tools. (Research initiated 1935.)

*Library:* 850 volumes.

436. Carter's Ink Company, 239 First St., Cambridge 42, Mass.

*President:* Richard B. Carter.

*Research staff:* A. G. Weinz, Technical Director. 5 chemists; technical personnel 3; additional personnel 2.

*Research activities:* The development of new products and improvements in writing inks, adhesives, carbon papers, inked ribbons, and allied specialties. (Research initiated 1885.)

437. Carus Chemical Company, La Salle, Ill.

*President:* Edward H. Carus.

*Research staff:* Alwin C. Carus, Director. 5 chemists.

*Research activities:* Organic chemistry; plant control work. (Research initiated 1919.)

438. Case Company, J. I., Racine, Wis.

*President:* L. R. Clausen.

*Research staff:* O. R. Schoenrock, Chief Engineer. 6 chemists, 6 metallurgists, 22 engineers, 7 general laboratory aides; additional personnel 52.

*Research activities:* Soil preparation, seeding, planting, cultivating, and harvesting of farm crops; improvement in the quality and methods of fabrication of material used in the manufacture of farm machinery. (Research initiated 1893.)

439. Catalin Corporation of America, Fords, N. J.

*President:* Harry Krehbiel.

*Research staff:* W. R. Thompson, Technical

Director. 10 chemists, 2 engineers; additional personnel 3.

*Research activities:* Synthetic resins, phenol-formaldehyde, polystyrene, melamine-formaldehyde, and other plastic fields. Research includes work on cast and molded phenolics, liquid resins for the impregnation of various fibrous materials, laminating varnishes, plywood glues, special adhesives, etc., (Research initiated 1927.)

*Library:* 250 volumes.

*Cooperative research:* One fellowship is supported.

440. Catalyst Research Corporation, 201 North Braddock Ave., Pittsburgh 8, Pa.

*President:* George H. Deike, Sr.

*Laboratory:* 6101 Falls Road, Baltimore 9, Md.

*Research staff:* O. G. Bennett, Director. 8 chemists; additional personnel 17.

*Research activities:* Catalysis; ordnance. (Research initiated 1943.)

441. Cataract Chemical Company, Inc., 90 Rapin Place, Buffalo 11, N. Y.

*President:* S. K. Weil.

*Research staff:* Ralph H. Wilson, Director. 2 chemists; technical personnel 1.

*Research activities:* Leather and hides; tanning materials, leather finishes, etc.; shoe chemicals and finishes. (Research initiated 1915.)

*Library:* 200 volumes.

442. Caterpillar Tractor Company, Peoria 8, Ill.

*President:* L. B. Neumiller.

*Research staff:* C. G. A. Rosen, Director. 9 chemists, 4 physicists, 5 metallurgists, 54 engineers; technical personnel 32; additional personnel 94.

*Research activities:* Diesel engine, tractor, and earth moving design development. (Research initiated 1931.)

*Library:* 2,000 volumes.

443. Caulk Company, L. D., Milford, Del.

*President:* C. W. Conklin.

*Research staff:* Clyde A. Nelson, Director; W. Dean Kimmel, Director of Chemistry Department; James Cresson, Manufacturing Control; John Glenn, Chemist. 4 chemists, 1 dentist; technical personnel 5; additional personnel 2.

*Research activities:* The properties and application of materials used in dentistry. (Research initiated 1900.)

*Library:* 1,000 volumes.

444. Celanese Corporation of America, 180 Madison Ave., New York 16, N. Y.

*President:* Harold A. Blancke.

*Laboratories:* Cumberland, Md.; Newark and Summit, N. J.

*Research staff:* George Schneider, Vice President and Director. 100 chemists, 10 physicists, 60 engineers; technical personnel 225; additional personnel 35.

*Research activities:* Cellulose acetate; synthetic organic chemicals; dyestuffs; textile operations; plastics; petroleum chemicals. (Research initiated 1870.)

*Library:* 6,000 volumes.

*Cooperative research:* Several fellowships are supported and one grant for research is made.

**445. Celanese Corporation of America, Plastics Division, 290 Ferry St., Newark 5, N. J.**

*Vice President:* W. S. Landes.

*Research staff:* G. Schneider, Vice President in charge of research; Bjorn Andersen, Technical Director; Ralph H. Ball, Assistant Technical Director. 31 chemists, 3 physicists, 19 engineers; technical personnel 72; additional personnel 15.

*Research activities:* Cellulose derivatives, plastics, films and foils, and their manufacture; synthetic thermoplastics; plasticizers. (Research initiated 1927.)

**446. Celina Stearic Acid Company, 410 South Ash St., Celina, Ohio.**

*President:* August J. Spieler.

*Research staff:* 1 chemist, 1 engineer.

*Research activities:* Animal fats, vegetable oils, and fatty acids. (Research initiated 1907.)

*Library:* 150 volumes.

**447. Cellulose Products Company, 2010 Sixth Ave., Tacoma 6, Wash.**

*President:* E. D. Rich.

*Research staff:* E. D. Rich, Director. 3 chemists, 1 engineer; technical personnel 3; additional personnel 3.

*Research activities:* Plastic facing materials for plywood, plastic laminates, and specialties; the development of paper specialties in the fields of greaseproofing, waterproofing, moisture-vaporproofing, mildewproofing, and fireproofing; specialty chemicals for the treatment of paper and cloth. (Research initiated 1941.)

**448. Celotex Corporation, 120 South La Salle St., Chicago 2, Ill.**

*President:* Bror G. Dahlberg.

*Laboratory:* Marrero, La.

*Research staff:* Chris L. Christensen, Vice President in charge of research; Wallace Waterfall, Director of research; Emile Frederick, Jr., Technical Director. 8 chemists, 1 physicist, 3 engineers, 5 chemical engineers.

*Research activities:* The investigation of problems relating to the utilization of sugar cane bagasse in the manufacture of thermal insulation fiber board products, paper pulp products, and

the application of such products in building construction and in the industries; the manufacture of acoustical materials, and problems in sound relating to their application. (Research initiated 1926.)

**449. Centaur Company, 611 Forrest Road, N. E., Atlanta, Ga. (A division of Sterling Drug, Inc.)**

*Research staff:* Carroll F. Neff, Manager. 4 chemists, 1 biologist; technical personnel 2; additional personnel 2.

*Research activities:* Yeast vitamins; iron metabolism. (Research initiated 1929.)

*Library:* A library is maintained.

**450. Central Fibre Products Company, Inc., 111 West Washington St., Chicago 2, Ill.**

*President:* H. T. Cherry.

*Laboratory:* Quincy, Ill.

*Research staff:* H. M. Blandin, Director. 2 chemists.

*Research activities:* Improvement in paper-board used for paper boxes; improvement in box construction and design. (Research initiated 1920.)

**451. Central Paper Company, Inc., 2400 Lakeshore Drive, Muskegon, Mich.**

*President:* C. W. Smith.

*Research staff:* H. J. Hotz, Technical Director. 5 chemists, 1 physicist, 3 engineers; technical personnel 14; additional personnel 2.

*Research activities:* Chemical wood pulps; specialty and industrial papers; cellulosic products. (Research initiated 1924.)

**452. Central Research Laboratories, Inc., Red Wing, Minn.**

*President:* Frank G. Chesley.

*Research staff:* Technical Directors: Frank G. Chesley, chemistry; Demetrius G. Jelatis, physics; Gordon M. Lee, electrical engineering. 1 chemist, 1 physicist, 1 engineer; technical personnel 4; additional personnel 2.

*Research activities:* Fundamental and applied research and consultation in the fields of electrical engineering, physics, and chemistry. Electrical engineering and physics include high-speed oscillographic, high-voltage, and radio-frequency techniques, insulation materials and problems, transient problems, optics and optical instrumentation. Investigations of properties of materials; problems involving crystal chemistry, crystallography, X-ray and electron diffraction techniques; the development, design, and limited production of special research instruments electronic circuits, and devices. (Research initiated 1945.)

*Library:* 500 volumes.

- 453. Central Scientific Company, 1700 Irving Park Road, Chicago 13, Ill.**  
*President:* Caryl W. Dempsey.  
*Research staff:* M. N. States, Vice President in charge of research; H. M. Sullivan, Assistant Director of research. 1 chemist, 2 physicists, 2 engineers; technical personnel 2; additional personnel 2.  
*Research activities:* The development of scientific instruments. (Research initiated 1921.)  
*Library:* 2,000 volumes.
- 454. Central Soya Company, Inc., Fort Wayne 2, Ind.**  
*President:* R. H. Fletcher.  
*Laboratories:* Decatur, Ind.; Marion, Ohio; Gibson City, Ill.  
*Research staff:* J. K. Gunther, Director; N. F. Kruse, Technical Director; R. H. Holder, Director of Biological Laboratory. 22 chemists, 3 biologists, 8 engineers, 3 bakery engineers, 3 bacteriologists; technical personnel 23; additional personnel 15.  
*Research activities:* Soybean processing and product development; chemical, nutritional, biological, engineering, and bacteriological research. (Research initiated 1936.)  
*Library:* 750 volumes.  
*Cooperative research:* Four fellowships are supported.
- 455. Century Electric Company, 1806 Pine St., St. Louis 3, Mo.**  
*President:* E. S. Pillsbury.  
*Research staff:* Sam Wolff, Chief Engineer. 1 chemist and metallurgist, 3 engineers; additional personnel 5.  
*Research activities:* The design, manufacture, and application of motors and generators. (Research initiated 1918.)  
*Cooperative research:* Ten fellowships are supported and two grants for research are made.
- 456. Cerophyl Laboratories, Inc., 2438 Broadway, Kansas City 8, Mo.**  
*President:* L. H. Smith.  
*Laboratory:* 2100 Central, Kansas City, Mo.  
*Research staff:* W. R. Graham, Jr., Vice President in charge of research; G. O. Kohler. 3 chemists; technical personnel 11; additional personnel 4.  
*Research activities:* Vitamin content of dehydrated forage crops; hormone synthesis; vitamin concentrations. (Research initiated 1936.)  
*Library:* 700 volumes.  
*Cooperative research:* Four fellowships are supported and three grants for research are made.
- 457. Certain-teed Products Corporation, 120 South La Salle St., Chicago 3, Ill.**  
*President:* Rawson G. Lizars.  
*Laboratory:* 1230 West Jackson Blvd., Chicago 7, Ill.  
*Research staff:* Michele Crocc, Chief Chemist. 11 chemists, 7 plant chemists; additional personnel 5.  
*Research activities:* The development and improvement of prepared asphalt shingles and roll roofing; plasterboard, wall plaster, and other gypsum products; beaverboard and other fiberboard products; newsprint; the development of new products, processes, raw materials, and methods of testing. (Research initiated 1916.)  
*Library:* 100 volumes.
- 458. Certified Laboratories, Inc., 19 Hudson St., New York 13, N. Y.**  
*President:* Charles Paley.  
*Research staff:* Charles Paley, Director. 2 chemists, 2 biologists, 1 sanitarian.  
*Research activities:* The improvement of dairy products and the ingredients used in the manufacture of specialty dairy foods; research relating to the processing and the sanitary and laboratory control of foods. (Research initiated 1926.)  
*Library:* 300 volumes.
- 459. Chain Belt Company, 1600 West Bruce St., Milwaukee 4, Wis.**  
*President:* J. C. Merwin.  
*Laboratory:* 4501 West Greenfield Ave., Milwaukee 14, Wis.  
*Research staff:* G. K. Viall, Vice President in charge of research; Horace L. Smith, Jr., Research Engineer; Walter M. Albrecht, Chief Metallurgist. 7 chemists, 1 physicist, 1 biologist, 5 metallurgists, 4 engineers; technical personnel 15; additional personnel 7.  
*Research activities:* Research and development work on the metallurgy and fabrication of ferrous products; organic chemistry as applied to the disposal of trade and sanitary wastes; the chemical and physical aspects of the processing of foods; engineering research on the performance and cost reduction of chain belt and power transmission equipment, construction machinery, and conveying and process equipment. (Research initiated 1927.)
- 460. Chamberlain Laboratories, Inc., 702 Sixth Ave., Des Moines, Iowa.**  
*President:* L. H. Chamberlain.  
*Research staff:* L. H. Chamberlain, Director. 2 chemists, 1 biologist and bacteriologist.  
*Research activities:* Research on lotions and creams. (Research initiated 1933.)



**461. Chambersburg Engineering Company,**  
Chambersburg, Pa.

*President:* Eugene C. Clarke.

*Research staff:* Eugene C. Clarke, Director.  
3 engineers..

*Research activities:* The shaping of metal by impact.

**462. Champion Paper and Fibre Company,**  
Hamilton, Ohio.

*President:* Logan G. Thomson.

*Laboratories:* Hamilton, Ohio; Asheville,  
N. C.; Canton, N. C.; Houston, Tex.

*Research staff:* W. J. Montgomery, Director,  
Hamilton Division. 10 chemists, 3 physicists,  
21 engineers; 19 technicians and assistants;  
additional personnel 7.

*Research activities:* Research and develop-  
ment work on the manufacture and coating of  
paper and paperboard. (Research initiated  
1926.)

*Library:* 5,000 volumes.

HAMILTON LABORATORIES, INC.  
Asheville, N. C.

*Research staff:* 2 chemists.

*Research activities:* The development of  
bacteriological controls.

PULP DIVISION

Canton, N. C. and Houston, Tex.

*Research staff:* Reuben B. Robertson, Vice  
President in charge of research, Canton, N. C.;  
P. Lawrence, Acting Director. 1 chemist, 2 engi-  
neers, 2 assistants; administrative personnel 2.

*Research activities:* The utilization of south-  
ern woods; pulp and paper, and the conversion  
of numerous by-products from pulping opera-  
tions; chlorine and caustic soda; tanning and  
other extracts from wood. The work is devoted  
to fundamental matters and not to control  
methods. (Research initiated 1928.)

*Library:* 850 volumes.

*Cooperative research:* One grant for research  
is made.

**463. Champion Spark Plug Company,** Toledo 1,  
Ohio.

*President:* R. A. Stranahan.

*Research staff:* B. H. Sibley, Director of re-  
search and Factory Manager; H. H. Vogel, in  
charge of engineering. 1 chemist with 3 assis-  
tants, 3 engineers with 7 assistants; additional  
personnel 5.

*Research activities:* The development of spark  
plugs and electrode alloys.

CERAMIC DIVISION

8525 Butler Ave., Detroit 11, Mich.

*Research staff:* F. H. Riddle, Vice President  
and Factory Manager; Herbert F. Royal, Direc-

tor of research; Eldon B. Flu, in charge of  
plant control. 3 chemists, 1 physicist, 3 ceramic  
engineers, 1 electrical engineer, 1 mineralogist  
and petrographer; additional personnel 8.

*Research activities:* Ceramic investigations  
necessary for the improvement of ignition-  
porcelain manufacture, including the develop-  
ment of new bodies, methods of testing, manu-  
facture, and plant control; the operation of pilot  
plants when new processes are put in production;  
the development of furnaces, special refractories,  
and mullite products. Andalusite and dumor-  
tierite are the chief materials from which the  
mullite products are produced. Other types of  
materials, including aluminum oxide and rare-  
earth oxides, are also used extensively.

**464. Chance Company, A. B.,** 210 North Allen,  
Centralia, Mo.

*President:* F. Gano Chance.

*Research staff:* D. C. Hubbard, Director. 1  
chemist, 1 metallurgist, 4 engineers; technical  
personnel 2; additional personnel 3.

*Research activities:* Product development and  
improvement: pole line guying and anchoring;  
tools for pole line construction and maintenance;  
tools for working live power lines; power  
switches and fuses. (Research initiated 1907.)

*Library:* 125 volumes.

**Chance Vought Aircraft, Division of United  
Aircraft Corporation.** See United Aircraft  
Corporation.

**465. Charlotte Chemical Laboratories, Inc.,**  
Charlotte 1, N. C.

*President:* C. W. Gilchrist.

*Research staff:* R. D. Long, Director. 2  
chemists, 1 engineer; additional personnel 10.

*Research activities:* Sulfonation of mineral  
oils, the utilization of waste products, textile  
chemicals, fiber products, and refractories. (Re-  
search initiated 1913.)

*Library:* 1,200 volumes.

**466. Charlton Laboratories,** 2340 Southwest Jef-  
ferson St., Portland 1, Oreg.

*Owner:* David B. Charlton.

*Research staff:* 5 chemists, 1 biologist, 1  
metallurgist, 1 engineer.

*Research activities:* Research in food pres-  
ervation. Commercial testing of ores, minerals  
and metals, industrial and domestic water sup-  
plies, pharmaceuticals, concrete and building  
materials, oils and paints. (Research initiated  
1934.)

**467. Chase Brass and Copper Company, Inc.,**  
236 Grand St., Waterbury 91, Conn. (Sub-  
sidiary of Kennecott Copper Corporation.)

*President:* C. E. Hart.

*Laboratories:* Waterbury, Conn.; Cleveland,  
Ohio.

*Research staff:* D. K. Crampton, Director. 5 chemists, 15 metallurgists, 6 engineers, 4 spectrographists, 85 laboratory assistants and technicians; additional personnel 20.

*Research activities:* The development and modification of alloys and the improvement of properties and methods of manufacture of copper alloys; the investigation of steels, lacquers, fuels, lubricants, metal finishes, etc. (Research initiated 1915.)

*Library:* 1,000 volumes.

**468. Cheesman-Elliott Company, Inc.,** 639-647 Kent Ave., Brooklyn 11, N. Y.

*President:* J. Frank Case.

*Research staff:* Gilbert J. Ward, Director. 2 chemists; technical personnel 1; additional personnel 1.

*Research activities:* The development of new types of protective coatings; the investigation of new materials and processes in this field; improvement of the production of industrial protective paint coatings. (Research initiated 1922.)

**469. Chemical and Bacteriological Laboratories,** 1018 East 163rd St., Bronx, New York 59, N. Y.

*Owner:* Hyman M. Charm.

*Research staff:* Hyman M. Charm, Director. 4 chemists and biologists; technical personnel 4; additional personnel 3.

*Research activities:* Chemical and bacteriological examinations for the medical profession and public health authorities; improvement of procedures and new tests. (Research initiated 1924.)

*Library:* 2,000 volumes.

**Chemical and Pigment Company.** See Glidden Company.

**470. Chemical Manufacturing and Distributing Company,** Easton, Pa.

*President:* Carl E. Schaad.

*Research staff:* Benjamin Levitt, Director; Fred J. Staph, Superintendent. 1 chemist, 1 chemical engineer.

*Research activities:* Soaps; janitor supplies; disinfectants; insecticides; varnishes. (Research initiated 1938.)

**471. Chemical Process Company,** 58 Sutter St., San Francisco 4, Calif.

*President:* J. D. Dole.

*Laboratory:* 563 Second St., San Francisco 7, Calif.

*Research staff:* Gordon F. Mills, Director. 3 chemists, 1 physicist, 1 geologist; additional personnel 2.

*Research activities:* The preparation and ap-

plication of ion exchange resin. (Research initiated 1939.)

*Library:* 100 volumes.

**472. Chemical Service Laboratories,** 6227 North Broadway, Chicago 40, Ill.

*President:* Ulric A. Presta.

*Research staff:* Ulric A. Presta, Director of research; Lawrence M. Williams, Director of product development. 1 chemist, 1 engineer, 1 bacteriologist; technical personnel 1; additional personnel 2.

*Research activities:* Unknown food factors, bacteria viability, vitamin stability, product development and improvement. (Research initiated 1944.)

*Library:* 100 volumes.

**Chemico, Inc.** See Harrison and Morton Laboratories, Inc.

**473. Chemo Puro Manufacturing Corporation,** 48th Ave. and 5th St., Long Island City 1, New York.

*President:* Hugo Bamberger.

*Research staff:* J. I. Berber, Director. 3 chemists, 1 engineer; technical personnel 1; additional personnel 3.

*Research activities:* The production of synthetic, organic, and inorganic medicinal chemicals. (Research initiated 1941.)

*Library:* 300 volumes.

**474. Chemurgic Corporation,** Richmond, Calif.

*President:* Everett B. Luther.

*Research staff:* E. E. Luther, in charge of research; Cecil K. Harris; J. J. Jacobs; Albert L. Britz; Hugh P. Kyle.

*Research activities:* Insecticides, farm chemicals, and pyrotechnics.

**475. Cheney Brothers,** Hartford Road, Manchester, Conn.

*Executive Vice President:* Henry R. Mallory.

*Research staff:* Hamilton J. Bickford, Technical Director; Paul Massini, Chief Chemist; John P. Cheney, Jr., Chief of Textile Laboratory. 4 chemists, 1 physicist, 1 engineer, 5 in other scientific professions; technical personnel 19; additional personnel 2.

*Research activities:* General textile research, including natural and synthetic fibers and covering the range of manufacturing operations from the raw material to the finished fabric: textiles for airborne articles such as parachutes and tow targets; pile fabrics, upholstery fabrics, cravats, spun yarns, and the dyeing and finishing of fabrics. (Research initiated 1892.)

*Library:* 500 volumes.

*Cooperative research:* Two grants for research are made.

**476. Cherry-Burrell Corporation**, 427 West Randolph St., Chicago, Ill.

*President:* J. W. Ladd.

*Laboratories:* Chicago, Ill. Development Engineering Departments: Cedar Rapids, Iowa; Little Falls, N. Y.; Milwaukee, Wis.

*Research staff:* Charles Weinreich, Director of research; H. Fielder, in charge of engineering development; A. H. Boileau, Cedar Rapids, Iowa; T. Kummer, Milwaukee, Wis.; C. B. Dalzell and H. Wilson, Little Falls, N. Y. 3 chemists, 14 engineers; 2 in other scientific professions; technical personnel 5; additional personnel 4.

*Research activities:* Dairy processing and products. (Research initiated 1938.)

*Library:* A library is maintained.

**477. Chicago Belting Company**, 113-125 North Green St., Chicago, Ill.

*President:* Edward H. Ball.

*Research staff:* E. D. Ekkebus, Director. 1 chemist, 2 engineers; technical personnel 1.

*Research activities:* Leather, rubber, and plastic products. (Research initiated 1921.)

**478. Chicago Dairy and Food Laboratories**, 6930 North Clark St., Chicago 26, Ill.

*President:* V. G. Stebnitz.

*Research staff:* V. C. Stebnitz, Director. 2 chemists, 1 bacteriologist; additional personnel 1.

*Research activities:* Dairy and food products. (Research initiated 1939.)

**479. Chicago Fire Brick Company**, 1467 Elston Ave., Chicago 22, Ill.

*President:* W. G. Young.

*Laboratory:* Wellsville, Mo.

*Research staff:* L. E. Whitesell, Director; Wallace Thoreson. 1 chemist, 2 engineers, 1 ceramist; technical personnel 10; additional personnel 25.

*Research activities:* Refractories. (Research initiated 1932.)

**480. Chicago Hardware Foundry Company**, 2500 Commonwealth Ave., North Chicago, Ill.

*President:* E. B. Sherwin.

*Research staff:* R. J. Franklin, Director. 1 chemist, 2 metallurgists, 1 engineer; technical personnel 2; additional personnel 3.

*Research activities:* Gray cast iron; porcelain enamel; welding rod; control procedures. (Research initiated 1907.)

**481. Chicago Malleable Castings Company**, 1225 West 120th St., Chicago 43, Ill.

*President:* John T. Llewellyn.

*Research staff:* L. J. Wise, Director. 1 chemist, 1 metallurgist; technical personnel 1.

*Research activities:* The development of new products and the improvement of malleable castings. (Research initiated 1905.)

**482. Chicago Pharmacal Company**, 5549 North Ravenswood Ave., Chicago 40, Ill.

*President:* C. H. Taylor.

*Research staff:* Ibert Mellan, Director. 4 chemists, 1 biologist, 5 pharmacists; technical personnel 10.

*Research activities:* New drugs and drug manufacture. (Research initiated 1900.)

**483. Chicago Steel and Wire Company**, 10257 South Torrence Ave., Chicago, Ill.

*President:* Dana Summers.

*Research staff:* 2 chemists; additional personnel 3.

*Research activities:* The development of fusion welding methods, processes, supplies, and equipment; special reference is made to the significance of welding rods, both in practical applications and fundamental science. (Research initiated 1914.)

**484. Chicago Testing Laboratory, Inc.**, 536 Lake Shore Drive, Chicago, Ill.

*President:* Hugh W. Skidmore.

*Research staff:* Hugh W. Skidmore and Gene Abson, Directors. 2 chemists, 2 engineers; technical personnel 5; additional personnel 2.

*Research activities:* Paving materials and processes, including equipment; uses and manufacture of bituminous materials; uses and manufacturing processes of petroleum products; uses and products of waxes; the development of tests for materials. (Research initiated 1910.)

**485. Chicago Vitreous Enamel Product Company**, 1407 South 55th St., Cicero 50, Ill.

*President:* William H. Hogenson.

*Research staff:* B. T. Sweely, Director; R. L. Fellows, Assistant Director. 3 chemists, 6 engineers; additional personnel 5.

*Research activities:* Research and experimental development work on porcelain enamels. (Research initiated 1920.)

*Library:* 200 volumes.

*Scientific periodicals:* Better Enameling. Monthly. Vol. I, 1930.

**486. Chicopee Manufacturing Corporation**, Chicopee Falls, Mass. (Subsidiary of Johnson and Johnson.)

*President:* Norton L. Smith.

RESEARCH DIVISION, MAIN LABORATORIES  
Chicopee Falls, Mass.

*Research staff:* C. H. Plummer, Acting Director; Activities Leaders: S. A. Simon, chem-

istry; C. H. Plummer, manufacturing processes; J. L. Newbegin, engineering development. 3 chemists, 6 engineers, 1 textile technologist; technical personnel 6; additional personnel 2.

*Research activities:* Cotton textile manufacturing processes, cotton finishing, cotton fiber properties, and development work on machinery and products in the cotton gauze field. (Research initiated 1938.)

*Library:* 250 volumes.

*Cooperative research:* Two grants for research are made.

RESEARCH DIVISION, FIBER AND SPINNING  
LABORATORY

P. O. Box 235, Texas Tech Station,  
Lubbock, Tex.

*Research staff:* C. H. Plummer, Acting Director; George W. Pfeiffenberger, Supervisor of cotton research. 2 cotton technologists, 5 technicians; additional personnel 1.

*Research activities:* The spinning properties of cotton fibers, with associated laboratory work on fiber characteristics. (Research initiated 1945.)

487. Chipman Chemical Company, Inc., Bound  
Brook, N. J.

*President:* Oscar N. Bernuth.

*Research staff:* B. P. Webster, Vice President in charge of research; I. W. Bales, Director of field research; F. J. Seibert, Director of plant research. 4 chemists, 1 entomologist, 1 agronomist.

*Research activities:* The development of materials of insecticidal, fungicidal, and herbicidal value. (Research initiated 1917.)

488. Christina and Company, Vincent, 121-123  
East 24th St., New York 10, N. Y.

*President:* Vincent Christina.

*Laboratories:* New York City and Pawling, N. Y.

*Research staff:* Vincent Christina, Director. 4 chemists, 1 biologist and bacteriologist, 1 pharmacologist; technical personnel 10; additional personnel 9.

*Research activities:* Research on chemotherapeutics. (Research initiated 1935.)

*Library:* 200 volumes.

*Cooperative research:* One grant for research is made.

489. Chrysler Corporation, Detroit 31, Mich.

*President:* K. T. Keller. Fred M. Zeder, in charge of all engineering and research of Chrysler Corporation and subsidiaries.

*Laboratories:* The following experimental and research laboratories are maintained at Highland Park, Mich.: Mechanical (rear axle,

brake, transmission, clutch, life test, stress measurement, static and dynamic balance), Powerplant, Carburetion, Cooling Systems, Suspension, Structures, Electronics (including sound and vibration), Electrical (general electrical, car lighting, radio, physical optics, low temperature testing), Ferrous Metallurgical (physical testing, heat treat, fatigue, metallographic, bearings and superfinish, chemical analysis), Nonferrous Materials (physical testing, metallographic, corrosion, organic chemistry, inorganic chemistry, chemical analysis, fuels and lubricants, electroplating, spectroscopic, X-ray), Powdered Metals, Rubber and Plastics (including fabrics), Fluid Dynamics (including air conditioning and heating), Electro-Physical, Dynamics Research, Physical-Chemical Research (Electron-microscopy, ultra-centrifuge, organic chemistry, surface chemistry, dielectric constant).

*Research staff:* Carl Breer, Director; G. J. Huebner, Jr., Assistant Director; A. G. Herreshoff, Chief Engineer of research and development; Orlan M. Arnold, Supervisor of physical chemical research; R. N. Janeway, Supervisor of dynamics research. *General engineering and experimental staff:* O. R. Skelton, Director of engineering; J. C. Zeder, Chairman of engineering board; H. T. Woolson, Executive Engineer (chassis); O. H. Clark, Executive Engineer (bodies); P. C. Ackerman, Chief Engineer (laboratories); A. B. Couture, Chief Experimental Engineer (laboratories); F. W. Slack, Chief Engineer (chassis design); U. L. Thomas, Chief Engineer (body design); P. J. Kent, Chief Electrical Engineer; F. L. Sage, Chief Engineer (truck design); C. E. Davy, Operations Superintendent; J. K. Harness, Patent Counsel; W. H. MacDuff, Personnel Supervisor. 56 chemists, 18 physicists, 30 metallurgists, 286 engineers, 469 designers and draftsmen, 343 mechanical technicians, 176 experimental body shop personnel; additional personnel 515.

*Research activities:* Passenger automobiles; commercial vehicles; industrial engines; marine engines; industrial and domestic heating equipment; industrial and domestic cooling equipment; sintered metal bearings and parts for industrial and appliance uses; Diesel engines for automotive, industrial and marine purposes; automobile accessories. Fundamental research is conducted in the properties and uses of materials. (Research initiated 1923.)

*Library:* 6,000 volumes.

*Cooperative research:* Six grants for research are made.

The Chrysler Corporation includes the following:

Airtemp Construction Corporation, Dayton, Ohio. A. B. Newton, Chief Engineer; C. R. Neeson, Chief Designer.

Amplex Manufacturing Company, Detroit, Mich. G. E. Platzner, Chief Engineer.

- Chrysler Export Corporation, Detroit, Mich.  
J. P. Cummings, Division Chief Engineer.  
Chrysler Institute of Engineering—Graduate School in Engineering and Research.  
Chrysler Marine Engine Corporation, J. F. Bachman, Division Chief Engineer; Chrysler Motors of California, Chrysler Motor Parts Corporation, A. H. Fries, Division Chief Engineer; Chrysler Sales Corporation, Detroit, Mich., A. Loofbourrow, Division Chief Engineer.  
DeSoto Motor Corporation, Detroit, Mich., H. Chesebrough, Division Chief Engineer.  
Dodge Brothers Corporation, Detroit, Mich.  
G. B. Allen, Division Chief Engineer.  
Plymouth Motor Corporation, Detroit, Mich.  
N. F. Hadley, Division Chief Engineer.  
Dodge Brothers Truck Division, Fargo Motor Corporation. E. P. Lamb, Division Chief Engineer.
490. Church Manufacturing Company, C. F., P. O. Box 471, Holyoke, Mass. (Subsidiary of American Radiator and Standard Sanitary Corporation.)  
*President:* Richard A. Witherell.  
*Laboratory:* Monson, Mass.  
*Research staff:* G. W. Carlson, Treasurer; S. L. Young, Manager of Monson Plant; D. C. McRoberts, Chief Chemist. 1 chemist, 1 engineer; technical personnel 2.  
*Research activities:* Plastics and rubber. (Research initiated 1931.)  
*Library:* A library is maintained.
491. Ciba Pharmaceutical Products, Inc., LaFayette Park, Summit, N. J.  
*President:* J. J. Brodbeck.  
*Research staff:* Ernst Oppenheimer, Vice President in charge of medical research. 10 chemists, 4 physicians, 3 pharmacologists, 1 pharmacist; technical personnel 17; additional personnel 15.  
*Research activities:* The discovery, isolation, and synthesis of new hormones and pharmaceuticals, and laboratory and clinical testing of them in the field of human and veterinary medicine. (Research initiated 1938.)  
*Library:* 2,800 volumes.  
*Cooperative research:* Three fellowships are maintained and 26 grants for research are made.
492. Cinaudagraph Corporation, Stamford, Conn.  
*President:* Sherman R. Hoyt.  
*Research staff:* 4 engineers.  
*Research activities:* The development, design, and application of magnets. (Research initiated 1936.)  
*Library:* A library is maintained  
*Scientific periodicals:* Permanent Magnet Design. Vol. I, 1944.
493. Cincinnati Butchers Supply Company, Box D, Elmwood, Cincinnati 16, Ohio.  
*Laboratory:* Blade and Helen Sts., Elmwood Place, Cincinnati, Ohio.  
*Research staff:* Oscar Schmidt, Jr., Director. 2 engineers; technical personnel 3; additional personnel 5.  
*Research activities:* The investigation of problems regarding the design and manufacture of machinery for the meat packing industry and for both edible and inedible rendering, and research leading to the development of new processes in these industries. (Research initiated 1914.)  
*Library:* 100 volumes.
494. Cincinnati Milling Machine Company, Cincinnati 9, Ohio.  
*President:* F. V. Geier.  
*Research staff:* Hans Ernst, Director; Albert H. Dall, Assistant Director. Chemists, physicists, engineers, assistants, and technicians.  
*Research activities:* Basic physical and chemical research; investigations in the fundamentals of the metal cutting process, chip formation and cutting fluid action; investigations in high speed milling with carbides; the design and development of precision machine tools, including milling machines, die sinking machines, surface broaching machines, and grinding machines; hydraulic circuit research and development; research in electronics; development of improved cutting fluids; the testing and development of completed machine tools and component parts. (Research initiated 1926.)  
*Library:* A library is maintained.  
*Cooperative research:* One fellowship is supported.
- Circo Products Company. See No. 2430 in Addenda.
495. Cities Service Oil Company (Delaware), Refining Division, Bartlesville, Okla.  
*President:* H. R. Straight.  
*Laboratory:* Okmulgee, Okla.  
*Research staff:* T. E. De Villiers, Chief Chemist. 5 chemists, 2 engineers; technical personnel 4; additional personnel 2.  
*Research activities:* Petroleum research; refining processes; new products. (Research initiated 1918.)  
*Library:* A library is maintained.
496. Citizens Gas and Coke Utility, 47 South Pennsylvania St., Indianapolis 9, Ind.  
*General Manager:* Thomas L. Kemp.  
*Research staff:* B. P. Mulcahy, Research Engineer. 4 chemists, 2 engineers; technical personnel 2; additional personnel 1.  
*Research activities:* The identification, selection, and blending of coals, and the control of

coal carbonization; coke properties; by-products recovery. (Research initiated 1907.)

*Library:* 400 to 500 volumes.

497. Citrus Improvement Company, 205 Oak Ave., Sanford, Fla.

*President:* Randall Chase.

*Research staff:* Irving Feinberg, Director. 1 chemist.

*Research activities:* Preservatives, dyes, polishes, and other processes concerned with the conditioning of citrus fruits; improvements in the growing and storage of citrus fruits. (Research initiated 1930.)

498. Clapp and Son, Inc., Otis., 439 Boylston St., Boston 16, Mass.

*President:* Lowell T. Clapp.

*Laboratory:* 344 Newbury St., Boston, Mass.

*Research staff:* C. L. Beals, Director. 2 chemists; technical personnel 2; additional personnel 1.

*Research activities:* The origination and improvement of pharmaceutical products and nutritional specialties; the improvement of production processes and the reduction of costs. (Research initiated 1922.)

*Library:* 200 volumes.

*Scientific periodicals:* Bulletin, Vol. I, 1935.

499. Clapp Laboratories, Albert L., 105 Locust St., Danvers, Mass.

*Research staff:* Albert L. Clapp, Director. 2 chemists, 1 engineer, 2 assistants.

*Research activities:* Paper, pulp, and cellulose products; plastics and leather products. (Research initiated 1910.)

*Library:* A library is maintained.

500. Clark Controller Company, 1146 East 152nd St., Cleveland, Ohio.

*President:* W. H. Williams.

*Research staff:* Russell Ranson, Director. 2 physicists, 11 engineers; additional personnel 5.

*Research activities:* The development of mechanical and electrical apparatus, electronic tube circuits, and electrochemical processes. (Research initiated 1925.)

501. Clark Laboratories, Dudley B., Box 165, Palm Springs, Calif.

*President:* Dudley B. Clark.

*Research staff:* Dudley B. Clark, Director. 1 chemist, 2 physicists, 3 engineers; technical personnel 1; additional personnel 1.

*Research activities:* Industrial electronic equipment; electronic frequency converters; high power electronic tubes; electronic motor controls; cathode emission materials; rectifier de-

velopment; electronic oil well drilling equipment; electronic transmission for marine and automotive applications; high speed variable frequency induction motors. (Research initiated 1926.)

*Library:* 300 volumes.

502. Clark Thread Company, care of Spool Cotton Company, 745 Fifth Ave., New York 22, N. Y.

*President:* J. B. Clark.

*Laboratory:* Newark, N. J.

*Research staff:* F. W. Adams, Director. 2 chemists, 1 engineer; technical personnel 2; additional personnel 8.

*Research activities:* Textiles; thread production.

*Library:* 500 volumes.

*Cooperative research:* Three fellowships are supported.

503. Clarostat Manufacturing Company, Inc., 285 North 6th St., Brooklyn 11, N. Y.

*President:* John J. Mucher.

*Research staff:* George J. Mucher, Chief Engineer. 5 engineers; technical personnel 8; additional personnel 15.

*Research activities:* Composition element resistors; wire wound resistors; manufacturing methods. (Research initiated 1927.)

*Library:* 200 volumes.

504. Claycraft Company, Box 866, Columbus 16, Ohio.

*President:* C. Forrest Tefft.

*Research staff:* A. Curtis Jackson, Director. 3 engineers; technical personnel 2.

*Research activities:* The development of structural clay products, common ware, and ceramic glazed ware. (Research initiated 1926.)

505. Cleary Corporation, W. A., New Brunswick, N. J.

*President:* W. A. Cleary.

*Research staff:* Arthur J. Risetto, Director; L. Russell Cook, Vice President. 1 chemist; technical personnel 1; additional personnel 1.

*Research activities:* Interface agents. (Research initiated 1937.)

506. Cleaveland Laboratories and Manufacturing Company, Inc., Holland Ave., Peapack, N. J.

*President:* John F. Cleaveland.

*Research staff:* John B. Cleaveland, Director. 3 chemists; technical personnel 9; additional personnel 5.

*Research activities:* Nitrocellulose, cellulose acetate, lacquers, waterproofing, fireproofing, metal finishes, paper and textile coating. (Research initiated 1936.)

**Cletrac Division, Oliver Corporation.** *See* Oliver Corporation.

**Cleveland Cloth Mills, Inc.** *See* Carter Fabrics Corporation.

**Cleveland Diesel Engine Division, General Motors Corporation.** *See* General Motors Corporation.

**507. Cleveland Graphite Bronze Company, 17000 St. Clair Ave., Cleveland 10, Ohio.**

*President:* B. F. Hopkins.

*Research staff:* Max M. Pöensch, Chief Engineer. 24 chemists, 1 physicist, 11 metallurgists, 4 engineers, 1 radiographer; technical personnel 35; additional personnel 15.

*Research activities:* The development of materials for specific bearing applications and allied products, and the control of present production processes. (Research initiated 1924.)

*Library:* 1,300 volumes.

**Cleveland Paint and Color Company.** *See* Pratt and Lambert, Inc.

**508. Cleveland Punch and Shear Works Company, 3917 St. Clair Ave., Cleveland 14, Ohio.**

*President:* W. Chichester Sayle.

*Research staff:* W. F. Longfield, Chief Engineer; assistants.

*Research activities:* Basic investigations relating to problems encountered in the design and manufacture of power presses and related products, leading to new developments and new designs.

**509. Clifford Manufacturing Company, 564 East 1st St., South Boston, Mass.**

*President:* Walter B. Clifford.

*Research staff:* John E. Woods, Director. 1 chemist, 1 physicist, 1 metallurgist, 2 engineers.

*Research activities:* Metallurgical research on metallic bellows, and the organic chemistry involved in the filling of the bellows for the thermostatic operation; metallurgical research on aluminum aircraft heat exchangers. (Research initiated 1930.)

**Cliffs Dow Chemical Company.** *See* Dow Chemical Company.

**510. Climax Molybdenum Company, 500 Fifth Ave., New York 18, N. Y.**

*President:* Max Schott.

**CLIMAX MOLYBDENUM COMPANY OF MICHIGAN**  
14410 Woodrow Wilson, Detroit 3, Mich.

*Research staff:* Alvin J. Herzig, Vice President in charge of laboratory; Robert M. Parke,

Director; George A. Timmons and Frederick P. Bens, Research Supervisors. 3 chemists, 12 metallurgists, 1 mechanical engineer; technical personnel 4; additional personnel 11.

*Research activities:* The study of the properties of molybdenum steels and cast irons; the development of alloys of molybdenum; research on pure molybdenum and molybdenum products; metallurgical tests and consultation service with customers. (Research initiated 1931.)

*Library:* 500 volumes.

**CLIMAX MOLYBDENUM COMPANY OF PENNSYLVANIA**  
Langeloth, Pa.

*Research staff:* Arthur Linz, Vice President and Director. 8 chemists, 3 engineers; additional personnel 7.

*Research activities:* Research on molybdenum and molybdenum compounds. (Research initiated 1926.)

**511. Clinton Company, Clinton, Iowa.**

*President:* R. E. Clizbe.

*Research staff:* George T. Peckham, Jr., Research Supervisor; J. M. Newton, Assistant Research Supervisor. 10 chemists, 2 biologists, 4 engineers; technical personnel 23; additional personnel 3.

*Research activities:* Starches, syrups, sugars, lactic products, feedstuffs, edible vegetable oils. (Research initiated 1935.)

*Library:* 500 volumes.

*Cooperative research:* Two fellowships are supported and one grant for research is made.

**Clinton Laboratories of the Monsanto Chemical Company.** *See* Monsanto Chemical Company.

**512. Clopay Corporation, Clopay Square, Cincinnati 14, Ohio.**

*President:* S. J. Johnson.

*Research staff:* F. W. Rauskolb, Technical Director; W. F. Polfus, Quality Control Chemist. 2 chemists; technical personnel 8.

*Research activities:* The development of new paper-base products for household use. (Research initiated 1935.)

*Library:* 200 volumes.

**513. Clorox Chemical Company, 850 Forty-second Ave., Oakland 1, Calif.**

*President:* W. J. Roth.

*Research staff:* Larry J. Barton, Plant Superintendent. 2 chemists, 1 junior chemist, 2 engineers.

*Research activities:* Sodium hypochlorite manufacture and uses. (Research initiated 1913.)

**514. Cluett, Peabody and Company, Inc., 433 River St., Troy, N. Y.**

*President:* C. R. Palmer.

*Research staff:* Edward C. Pfeffer, Jr., Director. 5 chemists, 3 chemical engineers, 3 mechanical engineers, 1 textile engineer, 2 apparel designers, 10 laboratory assistants; additional personnel 5.

*Research activities:* The development of improved chemical fabric finishes and new chemical processes for fabrics; the development of special automatic equipment for manufacturing processes; fabric research and development; textile testing facilities and evaluation of fabrics for control and research purposes; product design and development. (Research initiated 1913.)

*Library:* 100 volumes.

**515. Cochrane Corporation, 17th St. and Allegheny Ave., Philadelphia, Pa.**

*President:* P. S. Lyon.

*Research staff:* A. E. Kittredge, Chief Engineer in charge of research; W. B. Heinz and J. Razek, Consultants; C. E. Joos; W. Melas. 3 chemists, 7 engineers.

*Research activities:* The treatment of boiler feed water; experimental development of flow meters and control instruments; water softening; the development of filters, traps, valves, steam and oil separators, etc.

**516. Cohn and Company, Sigmund, 44 Gold St., New York 7, N. Y.**

*Research staff:* Sigmund Cohn and Bert Brenner, Directors; Alvin H. Rosenbaum; Harold M. Lang. 2 chemists, 3 metallurgists, 1 engineer; technical personnel 3.

*Research activities:* The metallurgy of platinum, iridium, rhodium, ruthenium, osmium, palladium, and their alloys; electron-emitting surfaces; the accurate drawing of fine wire, and the rolling of ribbon strip and foil. (Research initiated 1932.)

*Library:* 100 volumes.

**517. Cole Laboratories, Inc., and Retort Pharmaceutical Company, Inc., 23rd St. and 37th Ave., Long Island City 1, N. Y.**

*President:* David D. Catts.

*Research staff:* Benedict Gordon and Harry Kaye, Directors. 2 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Disinfectants; insecticides; fire fighting chemicals. (Research initiated 1935.)

*Library:* A library is maintained.

*Cooperative research:* One grant for research is made.

**518. Coleman and Bell Company, Norwood 12, Ohio.**

*President:* A. B. Coleman.

*Research staff:* A. B. Coleman, Director; William H. Bell. 4 chemists; technical personnel 1; additional personnel 1.

*Research activities:* Synthesis of pure chemicals, stains, and indicators for use in scientific research. (Research initiated 1927.)

*Library:* 1,000 volumes.

**519. Coleman and Company, W. B., 9th and Rising Sun Ave., Philadelphia 40, Pa.**

*President:* W. B. Coleman.

*Research staff:* W. B. Coleman, Director. 4 chemists, 2 metallurgists, 2 engineers; technical personnel 10; additional personnel 6.

*Research activities:* Metallurgical, chemical, and spectrographic research. (Research initiated 1922.)

*Library:* 1,000 volumes.

**520. Coleman Instruments, 2020 Greenleaf St., Evanston, Ill.**

*General Manager:* E. D. Coleman.

*Research staff:* John J. J. Staunton, Director. 2 chemists, 1 physicist, 3 engineers, 1 psychologist; technical personnel 5; additional personnel 3.

*Research activities:* Research, design, and manufacture of scientific instruments. (Research initiated 1932.)

*Library:* 500 volumes.

**521. Colgate-Palmolive-Peet Company, 105 Hudson St., Jersey City 2, N. J.**

*President:* E. H. Little.

*Research staff:* Roy W. Peet, Vice President in charge of research; E. E. Dreger, Director. 48 chemists, 28 engineers; technical personnel 6; additional personnel 29.

*Research activities:* Soaps and detergents, fats and oils, toilet articles, cosmetics, essential oils, and glycerin. (Research initiated 1897.)

*Library:* 2,500 volumes.

*Cooperative research:* Five fellowships are supported and three grants for research are made.

**522. Collins and Aikman Corporation, 51st and Parkside Ave., Philadelphia 31, Pa.**

*President:* W. G. McCullough.

*Laboratories:* Philadelphia, Pa.; Bristol, R. I.  
*Research staff:* Whitworth F. Bird, Director; W. Rollin Keen, Assistant Director. 7 chemists, 1 physicist, 6 engineers; technical personnel 15; additional personnel 24.

*Research activities:* Textiles, chemicals, and textile mechanics. (Research initiated 1928.)

*Library:* 200 volumes.



- Collins Radio Company.** See No. 2431 in *Addenda*.
- 523. Colonial Radio Corporation, 1280 Main St., Buffalo 9, N. Y.** (Subsidiary of Sylvania Electric Products, Inc.)  
*President:* A. H. Gardner.  
*Research staff:* H. C. Forbes, Vice President; M. G. Nicholson, Research Engineer. 2 chemists, 2 physicists, 1 metallurgist, 60 engineers; technical personnel 65; additional personnel 20.  
*Research activities:* Radio. (Research initiated 1924.)  
*Library:* 150 volumes.
- 524. Col-Tex Refining Company, 1000 APCO Tower, Oklahoma City, Okla.**  
*President:* L. H. Prichard.  
*Laboratories:* Cyril, Okla.; Chicago, Ill.; Colorado City, Tex.  
*Research staff:* B. I. Scoggin, Director. Additional personnel 17 to 20.  
*Research activities:* The development of uses of petroleum products and processes in refining petroleum.
- 525. Columbia Broadcasting System, Inc., Engineering Research and Development Department, 485 Madison Ave., New York 22, N. Y.**  
*President:* William S. Paley.  
*Research staff:* Peter C. Goldmark, Director; Paul H. Reedy. 3 physicists, 20 engineers; technical personnel 55; additional personnel 22.  
*Research activities:* Television, recording, and audio research. (Research initiated 1936.)  
*Library:* 450 volumes.
- 526. Columbia Mills, Inc., 225 Fifth Ave., New York 10, N. Y.**  
*President:* H. E. Cook.  
*Laboratory:* Minetto, N. Y.  
*Research staff:* E. Myers, Director; E. Stannard. 3 chemists; technical personnel 2.  
*Research activities:* Textile finishing; paper saturating; paints and enamels. (Research initiated 1927.)
- 527. Columbia Recording Corporation, 1473 Barnum Ave., Bridgeport 8, Conn.**  
*President:* Edward Wallerstein.  
*Research staff:* James H. Hunter, Vice President in charge of manufacturing and engineering; George E. Jaycox, Chief Engineer; Leo Kosowsky, Chief Chemist. 3 chemists, 1 physicist, 2 engineers.  
*Research activities:* Research and development work in thermoplastics, acoustics, electroplating, machine design, and manufacturing methods. The improvement of the quality of recording is the major research activity of the company. (Research initiated 1888.)
- 528. Columbia Ribbon and Carbon Manufacturing Company, Inc., Glen Cove, N. Y.**  
*President:* F. R. Nichols.  
*Research staff:* Douglas A. Newman. 2 chemists; technical personnel 3; additional personnel 2.  
*Research activities:* Coated papers; coated papers for converting; offset and hectographic supplies; inked ribbons; business machine specialties. (Research initiated 1932.)
- 529. Columbia Steel Company, 235 Montgomery St., San Francisco, Calif.** (Subsidiary of United States Steel Corporation.)  
*President:* W. A. Ross.  
*Laboratories:* Pittsburg, Calif.; Torrance, Calif.; Provo, Utah.  
*Research staff:* G. L. von Planck, Chief Metallurgist; R. B. Freeman, Plant Metallurgist, Pittsburg, Calif.; T. J. Adams, Plant Metallurgist, Torrance, Calif.; George Willis Madsen, Chief Chemist, Provo, Utah. 20 chemists, 12 metallurgists, 2 engineers; technical personnel 22.  
*Research activities:* The metallurgy of iron and steel; metallography and the heat-treatment of steel, including carbon and alloy steel castings, sheets, wire, merchant bars and shapes; processes relating to galvanizing; pyrometry; corrosion; foundry processes and materials; open hearth practice and research; blast furnace practice and research. (Research initiated 1910.)  
*Library:* A library is maintained.
- 530. Columbian Carbon Company, 41 East 42nd St., New York 17, N. Y.**  
*President:* Reid L. Carr.  
*Laboratories:* 214 Forty-fourth St., Brooklyn 32, N. Y.; Monroe, La.  
*Research staff:* William B. Wiegand, Director; Harold A. Braendle, Wesley C. Ekholm, and Carl W. Sweitzer, Assistant Directors. 11 chemists, 4 physicists, 3 engineers; technical personnel 18; additional personnel 27.  
*Research activities:* Colloidal carbon; natural gas; rubber technology; oxides of iron. (Research initiated 1936.)  
*Library:* 700 volumes.  
*Scientific periodicals:* Columbian Colloidal Carbons. Vol. I, 1940.  
*See also* Levey Company, Inc., Frederick H.
- 531. Columbian Rope Company, Auburn, N. Y.**  
*President:* S. W. Metcalf.  
*Research staff:* K. H. Bowen, Director, New Products Laboratory; E. B. Johnson, Director, Chemical Laboratory. 4 chemists, 1 physicist, 6 engineers; technical personnel 25; additional personnel 40.  
*Research activities:* The improvement in

quality and the reduction in cost of rope and rope products; the development of new products. (Research initiated 1918.)

*Library:* 750 volumes.

**532. Columbus Laboratories, Inc.,** 31 North State St., Chicago 2, Ill.

*Research staff:* W. Kedzie Teller, Director. 5 chemists, 2 bacteriologists; additional personnel 2.

*Research activities:* Foods, milling, baking, methods of preserving; carbohydrates, enzymes and starch, drugs, cosmetics, and special products and preparations. (Research initiated 1893.)

**533. Columbus Pharmacal Company,** 330 Oak St., Columbus 15, Ohio.

*President:* F. A. Rostofer.

*Research staff:* H. W. Jones, Scientific Director; H. C. Prisk, Director of Biological and Ampul Department; R. F. Maize, Director of Control Laboratory. 5 chemists, 1 biologist, 1 engineer, 2 registered pharmacists; technical personnel 3; additional personnel 10.

*Research activities:* The development of new pharmaceutical products; improvement of existing assay methods. (Research initiated 1935.)

*Library:* 500 volumes.

**534. Columbus Vaccine Company,** 765 East Hudson St., Columbus 2, Ohio.

*President:* Robert W. Terry.

*Research staff:* Robert W. Terry, Director. 3 chemists, 2 biologists; additional personnel 5.

*Research activities:* The improvement of bacterial diagnostics for human beings and for poultry. (Research initiated 1921.)

*Library:* 325 volumes.

**535. Columbus Water and Chemical Testing Laboratory,** 58 Olentangy St., Columbus 2, Ohio.

*Owner:* F. J. McIntyre.

*Research staff:* F. J. McIntyre, Director. 1 chemist, 1 engineer, 1 bacteriologist.

*Research activities:* Swimming pool operation, treatment, and sanitation; pullorum blood testing. (Research initiated 1931.)

*Library:* 150 volumes.

**536. Colvin Laboratories,** Egbert Hill, Morris-town, N. J.

*Research staff:* Charles H. Colvin, Director.

*Research activities:* Aircraft instruments and controls; industrial instruments and products. (Research initiated 1933.)

**537. Combined Geophysical Service Company,** 346 Ridge Ave., State College, Pa.

*Owner:* Sylvain J. Pirson.

*Research staff:* Sylvain J. Pirson, Director. 1 physicist, 1 geologist; technical personnel 1; additional personnel 1.

*Research activities:* Geophysical prospecting. (Research initiated 1944.)

*Library:* 200 volumes.

**538. Combustion Engineering Company, Inc.,** 200 Madison Ave., New York 16, N. Y.

*President:* J. V. Santry.

*Laboratories:* New York, N. Y.; Chattanooga, Tenn.; Chicago, Ill. (Research initiated 1930.)

#### NEW YORK OFFICE

*Research staff:* B. J. Cross, Director.

*Research activities:* Field investigations of the combustion of fuels, furnace and burner design, water circulation in boilers, boiler design; water treatment; steam purification; corrosion in boilers.

#### HEDGE-WALSH-WEIDNER DIVISION Chattanooga, Tenn.

*Research staff:* A. J. Moses, Director.

*Research activities:* Boiler manufacturing problems; metallurgy; welding and X-ray inspection.

#### RAYMOND PULVERIZER DIVISION Chicago, Ill.

*Research staff:* Joe Crites, Director.

*Research activities:* Mill manufacturing problems; grindability of coal and minerals; air flotation and separation of dusts.

**539. Commander-Larabee Milling Company,** 600 Baker Arcade, Minneapolis, Minn. (Subsidiary of Archer-Daniels-Midland Company.)

*President:* Shreve M. Archer.

*Laboratories:* Minneapolis, Minn.; Buffalo, N. Y.; Kansas City, Mo.; Clinton, Mo.; Hutchinson, Kans.; Montgomery, Minn.; St. Joseph, Mo.

*Research staff:* W. L. Rainey, Director. 8 chemists; technical personnel 15; additional personnel 2.

*Research activities:* The improvement of current flour milling products and the development of new products. (Research initiated 1926.)

- 540. Commercial Paste Company, Columbus 8, Ohio.**  
*President:* A. L. Evans.  
*Research staff:* J. E. Herron, Director. 2 chemists; technical personnel 1.  
*Research activities:* Research in new materials for the manufacture of adhesives, and investigations in the use of adhesives. (Research initiated 1934.)  
*Research staff:* A. S. Wittnebel, Director. 6 chemists; technical personnel 5.  
*Research activities:* New products and new applications for textile and leather specialty products; the improvement of the quality of dyes. (Research initiated 1911.)  
*Library:* A library is maintained.
- 541. Commercial Solvents Corporation, Terre Haute, Ind.**  
*President:* T. P. Walker.  
*Research staff:* K. H. Hoover, Vice President in charge of research and development; Jerome Martin, Director; F. M. Crawford, Patent Counsel. 26 chemists, 7 biologists, 4 engineers; technical personnel 3; additional personnel 85.  
*Research activities:* The development of new microbiological processes such as those used for the production of riboflavin and penicillin; research on the use of solvents and plasticizers in the protective coating field; research on the nitroparaffins and their derivatives; research on antifreeze mixtures; investigation and development of new chemical processes. (Research initiated 1920.)  
*Library:* 5,600 volumes.  
*Cooperative research:* Eight fellowships are supported.  
*See also* Thermatomic Carbon Company.
- 542. Commercial Testing and Engineering Company, 307 North Michigan Ave., Chicago 1, Ill.**  
*President:* W. D. Langtry.  
*Laboratories:* Chicago, Ill.; Charleston, W. Va.  
*Research staff:* G. E. Keller, Chemical Director; H. C. Carroll, Director, Engineering Department. 10 chemists, 5 engineers; technical personnel 15; additional personnel 19.  
*Research activities:* Studies of analytical methods, apparatus, and equipment in relation to analysis of coal; washability studies of coal; determination of volatile matter in coal; grindability of coal; coal sampling; combustion problems; boiler tests; survey, design, and supervision of the installation and operation of power plants. (Research initiated 1918.)
- 543. Commonwealth Color and Chemical Company, Nevins, Butler, and Baltic Sts., Brooklyn 17, N. Y.**  
*President:* A. S. Wittnebel.  
*Laboratories:* Brooklyn, N. Y.; 448 North Wells St., Chicago 10, Ill.; 434 St. Peter St., Montreal 1, Que.; 117 Broad St., Gloversville, N. Y.  
*Research staff:* E. L. Luaces, Director and General Manager; W. R. Tucker, Vice President in charge of operations; Walter Ernst, Vice President in charge of engineering. 3 chemists, 1 physicist, 1 metallurgist, 13 engineers; technical personnel 11; additional personnel 6.  
*Research activities:* Research and development in chemistry, mechanics, and electronics; chemical plant design; high pressure hydraulics; plastics and coating compositions; electrostatic and induction heating; evaluation of industrial products, processes and designs; protective coatings for metals; pulp and paper; textiles; dyes and stains; recovery of waste products. (Research initiated 1931.)  
*Library:* 500 volumes.
- 544. Commonwealth Engineering Company of Ohio, 1771 Springfield St., Dayton 3, Ohio.**  
*President:* Daniel F. Comstock.  
*Laboratories:* 179 Fifth St., Cambridge 41, Mass.; 3986 Royal Ave., Niagara Falls, N. Y.  
*Research staff:* Cambridge: Daniel F. Comstock and Lyman F. Whitney, Directors. William E. Whitney, Russell A. Gulick. *Niagara Falls:* Ernest W. Wescott and Raymond G. Brown, Directors. 3 chemists, 3 physicists, 2 metallurgists, 7 engineers; technical personnel 7; additional personnel 22.  
*Research activities:* Research, development, and consulting work, including the atomic bomb project. Research on ferrous powder pressing methods to obtain mechanical parts of unusual physical characteristics. Metallurgical process development: recovery of sulfur and pure iron oxide from pyrites, nickel from lateritic ores, etc. Special electrolytic processes. The invention and development of a new system of refrigeration known as the "Stator" system. New machine development for special purposes. Color photography. (Research initiated 1912.)  
This firm, then Kalmus, Comstock and Wescott, Inc., was responsible for the invention and development of the original color motion picture process which Technicolor Motion Picture Corporation commercialized.  
*Library:* 1,200 volumes.
- 545. Comstock and Wescott, Inc., 58 Charles St., Cambridge 41, Mass.**  
*President:* Daniel F. Comstock.  
*Laboratories:* 179 Fifth St., Cambridge 41, Mass.; 3986 Royal Ave., Niagara Falls, N. Y.  
*Research staff:* Cambridge: Daniel F. Comstock and Lyman F. Whitney, Directors. William E. Whitney, Russell A. Gulick. *Niagara Falls:* Ernest W. Wescott and Raymond G. Brown, Directors. 3 chemists, 3 physicists, 2 metallurgists, 7 engineers; technical personnel 7; additional personnel 22.  
*Research activities:* Research, development, and consulting work, including the atomic bomb project. Research on ferrous powder pressing methods to obtain mechanical parts of unusual physical characteristics. Metallurgical process development: recovery of sulfur and pure iron oxide from pyrites, nickel from lateritic ores, etc. Special electrolytic processes. The invention and development of a new system of refrigeration known as the "Stator" system. New machine development for special purposes. Color photography. (Research initiated 1912.)  
This firm, then Kalmus, Comstock and Wescott, Inc., was responsible for the invention and development of the original color motion picture process which Technicolor Motion Picture Corporation commercialized.  
*Library:* 1,200 volumes.

**546. Cone Export and Commission Company,** 59 Worth St., New York 13, N. Y.

*President:* S. F. Dribben.

*Research staff:* J. B. Mellor, Head of Technical Department. 1 chemist, 1 textile technician; technical personnel 2; additional personnel 2.

*Research activities:* Quality control testing, including physical and chemical testing, with statistical and graphic analyses of test results; wear testing, to predetermine performance of fabrics, colors, and finishes in actual use; fabric development, and improvement of construction, dyeing, finishing, etc., using information obtained from quality control tests. (Research initiated 1937.)

**Cone Mills Laboratory.** See Proximity Manufacturing Company.

**547. Congoleum-Nairn, Inc.,** 195 Belgrove Drive, Kearny, N. J.

*President:* B. G. Steinetz.

*Research staff:* M. W. Banton, Director of research and engineering; D. H. Spitzli, Chief of chemical research; W. G. Farr, Chief Engineer. 15 chemists, 10 engineers; technical personnel 21; additional personnel 12.

*Research activities:* Research and development work on smooth surface floor and wall coverings, and in allied fields. Drying oils and resins are major materials used. (Research initiated 1927.)

*Library:* 900 volumes.

**548. Conkling Agricultural Research Laboratory,** W. Donald, Mount Dora, Fla.

*President:* W. Donald Conkling.

*Research staff:* W. Donald Conkling, Director; H. C. Henrickson; W. J. Patton. 2 chemists, 1 field agriculturist; additional personnel 2.

*Research activities:* Agricultural and horticultural projects; research looking towards the solution by means of biochemistry of some of the problems of major importance in plant physiology and plant pathology. (Research initiated 1934.)

**549. Conmar Products Corporation,** 140 Thomas St., Newark 1, N. J.

*President:* Alexander Konoff.

*Research staff:* Sigmund Katz, Chief Chemist. 2 chemists, 1 metallurgist, 2 engineers; technical personnel 4; additional personnel 2.

*Research activities:* The development of specialized mechanical apparatus; chemical research on plated finishes; metallurgical research on the ductility and cold working properties of commercially used alloys. (Research initiated 1941.)

*Library:* 200 volumes.

**550. Conn, Ltd., C. G.,** 1101 East Beardsley Ave., Elkhart, Ind.

*President:* C. D. Greenleaf.

*Research staff:* Earle L. Kent, Director. 4 chemists, 1 metallurgist, 7 engineers; technical personnel 35; additional personnel 4.

*Research activities:* Acoustical, electrical, and mechanical research as related to musical instruments, recording, and allied fields. (Research initiated 1928.)

*Library:* 850 volumes.

**551. Consolidated Distilleries, Inc.,** Old Colony Ave., East Taunton, Mass.

*President:* Isaac Naiditch.

*Research staff:* Mario L. Ottolenghi, Director. 1 chemist, 1 chemical engineer, 1 bacteriologist.

*Research activities:* By-products from fermentation of cereal grains and other starchy or sugar-containing materials; improvement of alcoholic fermentation yields; investigations on analytical methods for process control and fermentation efficiencies. (Research initiated 1943.)

**552. Consolidated Engineering Corporation,** 620 North Lake Ave., Pasadena 4, Calif.

*President:* Philip S. Fogg.

*Laboratory:* 1255 East Green St., Pasadena, Calif.

*Research staff:* Harold W. Washburn, Director of research; Paul F. Hawley, Director of engineering. 2 chemists, 3 physicists, 9 engineers, 2 mathematicians; technical personnel 7; additional personnel 6.

*Research activities:* Mass spectrometry; vibration and strain instruments; electronic computers; electrochemical analyzers. (Research initiated 1937.)

*Library:* 300 volumes.

**553. Consolidated Gas Electric Light and Power Company of Baltimore,** Lexington Bldg., Baltimore 3, Md.

*President:* Charles M. Cohn.

*Laboratory:* Pier 4, Pratt St., Baltimore, Md.

*Research staff:* S. Karrer, Director; E. W. Guernsey, Assistant Director. 4 chemists, 1 physicist, 2 engineers; technical personnel 3; additional personnel 2.

*Research activities:* The production, distribution, and uses of gas, electricity, and steam. (Research initiated 1926.)

*Library:* 4,000 volumes.

**554. Consolidated Lithographing Corporation,** 1013 Grand St., Brooklyn 6, N. Y.

*President:* Ralph D. Cole.

*Research staff:* L. Cahn, Director. 1 chemist.

*Research activities:* The analysis of paper, ink, and coatings. (Research initiated 1934.)

*Cooperative research:* One grant for research is made.

**555. Consolidated Vultee Aircraft Corporation, Lindbergh Field, San Diego 12, Calif.**

*President:* H. Woodhead.

*Laboratories:* San Diego, Calif.; Vultee Field, Calif.; Forth Worth, Tex.

*Research staff:* *San Diego Division:* Roy A. Miller, Chief Structural Research Engineer; K. R. Jackman, Chief Test Engineer and Director of Engineering Test Laboratories; E. D. Shannon, Chief of Flight Research Department. 6 chemists, 3 physicists, 7 metallurgists, 94 engineers, 2 physiologists, 5 pilots, 5 flight engineers; technical personnel 14; additional personnel 87. *Vultee Field Division:* H. O. Boyvey, Chief Test Engineer. 5 chemists, 2 metallurgists, 11 engineers; technical personnel 3; additional personnel 1. *Fort Worth Division:* R. S. Reade, Chief Test Engineer. 10 chemists, 11 metallurgists, 34 engineers; technical personnel 3; additional personnel 7.

*Research activities:* Structural dynamic and static tests; developments in new aircraft structural materials; instrumentation for flight research; production control tests; test control of incoming materials. (Research initiated 1932.)

**556. Consulting Chemical Service, 610 West Michigan St., Milwaukee 3, Wis.**

*President:* S. Richard Berg.

*Research staff:* S. Richard Berg, Director; C. H. Clinton. 3 chemists, 2 metallurgists, 2 engineers; technical personnel 1; additional personnel 2.

*Research activities:* Metallurgy, foods, paints and varnishes, plating, ceramics, cosmetics, pharmaceuticals, and commercial chemicals. (Research initiated 1925.)

*Library:* 100 volumes.

**557. Consumer's Yeast Company, 121 Ninth St., San Francisco 1, Calif.**

*President:* Harold A. Meyer.

*Laboratory:* 1384 Fifth St., Oakland 7, Calif.

*Research staff:* Wesley M. Noble, Chief Chemist; E. C. Saudek, Production Manager; Felix C. Karas, Superintendent. 2 chemists, 1 biologist; technical personnel 1; additional personnel 2.

*Research activities:* Bakers' yeast; active dry yeast; baking technology; industrial fermentations of alcohol and vinegar. (Research initiated 1920.)

*Library:* 300 volumes.

**558. Container Corporation of America, 111 West Washington St., Chicago 2, Ill.**

*President:* Walter P. Paepcke.

*Laboratories:* Ogden and 35th St., Chicago, Ill.; Wabash and Carthage, Ind.; Circleville, Cleveland, and Cincinnati, Ohio; Fernandina, Fla.; Philadelphia, Pa.; Boston, Mass.

*Research staff:* R. A. Diehm, Technical Director. 22 chemists, 1 biologist; technical personnel 40; additional personnel 8.

*Research activities:* The manufacture of heavy fiberboard shipping containers and cartons; protective coatings and impregnations; the development of test methods. (Research initiated 1943.)

*Library:* A library is maintained.

*Cooperative research:* One grant for research is made.

**559. Container Testing Laboratories, Inc., 45 East 22nd St., New York 10, N. Y.**

*President:* Theodore J. Gross.

*Laboratories:* New York, N. Y.; Chicago, Ill.; San Francisco, Calif.

*Research staff:* Theodore J. Gross, Director; A. C. Gault, Vice President, New York; C. J. Zusi, Vice President, Chicago; G. A. Pitman, Vice President, San Francisco. 2 chemists, 7 engineers; technical personnel 13; additional personnel 10.

*Research activities:* The testing, design, and development of containers for various commodities; tests, investigations, and design work on wooden and fiberboard boxes, crates, drums, bags, cans, and shipping and unit containers of different types, as well as materials and accessories used in, or with, containers; paper, paperboard, and paperboard products. (Research initiated 1923.)

**560. Continental Aviation and Engineering Corporation, 12801 East Jefferson Ave., Detroit 14, Mich.**

*President:* C. J. Reese.

*Research staff:* C. F. Bachle, Vice President in charge of research. 56 mechanical engineers, 70 mechanical workers; additional personnel 49.

*Research activities:* Aircraft power plants; automotive, marine, and industrial engines. (Research initiated 1933.)

*Library:* A library is maintained.

**561. Continental Can Company, Inc., 100 East 42nd St., New York 17, N. Y.**

*President and Chairman of the Board:* Carle C. Conway.

*Laboratory:* 4645 West Grand Ave., Chicago 39, Ill.

*Research staff:* Paul E. Pearson, Vice President in charge of equipment development and re-

search; Allen L. Malone, General Manager of research. 35 chemists, 1 electrochemist, 1 physicist, 3 biologists and bacteriologists, 4 metallurgists, 47 engineers, 2 entomologists, 1 spectrographer, 39 food technologists; additional personnel 113.

*Research activities:* Product, process, and packaging research on foods, including vitamin and nutrition studies; food products, beverages, industrial chemicals, etc. Research development of new metals, coatings and finishes, fibers, plastics, etc., for containers and other products; also engineering development of manufacturing standards and rendering of technological assistance to manufacturing plants of the company. Technological service and assistance to canners and packers of foods, food products, beverages, industrial chemicals, and other products. Chemical and physical control of materials used in the manufacture of the company's products. (Research initiated 1910.)

*Library:* 1,375 volumes.

*See also* Bond Crown and Cork Company.

**562. Continental Carbon Company, 295 Madison Ave., New York 17, N. Y.**

*President:* R. I. Wishnick.

*Laboratory:* Sunray, Tex.

*Research staff:* James F. Mackey, Director. 3 chemists, 1 engineer; technical personnel 3; additional personnel 1.

*Research activities:* Channel and furnace carbon blacks, rubber and paint chemistry, and pilot plant production development. (Research initiated 1936.)

#### WITCO CHEMICAL COMPANY

705 First Ave., Tudor City, New York, N. Y.

*Research staff:* L. H. Cohan, Director. 4 chemists; technical personnel 3; additional personnel 2.

*Research activities:* Rubber chemicals, paint chemicals, and pigments. (Research initiated 1945.)

#### WITCO CHEMICAL COMPANY

6200 West 51st St., Chicago, Ill.

*Research staff:* E. F. Wagner, Chief Chemist. 8 chemists, 4 engineers; technical personnel 7; additional personnel 2.

*Research activities:* Asphalt specialties, waxes, rubber chemicals, paint chemicals, and pigments. (Research initiated 1940.)

*Library:* 250 volumes.

**563. Continental Car-Na-Var Corporation, Brazil, Ind.**

*President:* James H. Longshore.

*Research staff:* 1 chemist, 2 engineers; technical personnel 30.

*Research activities:* The development of wax polishes, rug cleaners, and similar products concerned with floor treatment and maintenance. (Research initiated 1931.)

**564. Continental-Diamond Fibre Company, Newark, Del.**

*President:* J. P. Wright.

*Laboratories:* Newark, Del.; Bridgeport, Pa.; Valparaiso, Ind.

*Research staff:* A. H. Haroldson, Director. 6 chemists, 2 engineers; technical personnel 8; additional personnel 2.

*Research activities:* Synthetic resins; plastic compositions; engineering research on gears, bearings, and electrical insulation; paper products and cellulose; mica; related inorganic problems. (Research initiated 1920.)

*Library:* A library is maintained.

**565. Continental Electric Company, Inc., 325 Ferry St., Newark 5, N. J.**

*President:* Arthur W. Peterson.

*Research staff:* J. M. Kay, Director. 6 engineers; additional personnel 2.

*Research activities:* The design and testing of motors and generators and methods of their manufacture.

**Continental Foods, Inc. See** Thomas J. Lipton, Inc.

**566. Continental Foundry and Machine Company, 144th St. and Railroad Ave., East Chicago, Ind.**

*President:* W. C. Snyder, Jr.

*Research staff:* W. B. Libert, Director. 1 chemist, 2 metallurgists, 1 metallurgical engineer; additional personnel 2.

*Research activities:* Iron and steel rolls; special alloy steels; heat-treatment. The work of the laboratory also includes development of new cast products and methods for improvement of present products. (Research initiated 1925.)

*Library:* 200 volumes.

**567. Continental Industrial Engineers, Inc., 176 West Adams St., Chicago 3, Ill.**

*President:* W. A. Darrah.

*Research staff:* W. A. Darrah, Director. Additional personnel as needed.

*Research activities:* Electrical, chemical, and heating and drying problems; the commercial operation of special inert atmospheres and special gases; oxidation and reduction of gases and liquids by electrical means; the effect of special gases on metal at elevated temperatures; ceramics; plastics; metallurgy; electrolysis. (Research initiated 1921.)

**568. Continental Mills, Inc., Armat and Lena Sts., Philadelphia 44, Pa.**

*President:* Millard D. Brown.

*Research staff:* Rinaldo A. Lukens, Vice President and Director; H. C. Haller, Chief Chemist. 4 chemists, 1 experimental machinist.

*Research activities:* Material testing; production control; the development of improved formulae, equipment, and methods in textile manufacture. (Research initiated 1938.)

**569. Continental Oil Company, Ponca City, Okla.**

*President:* Dan Moran.

*Laboratories:* The company maintains the following research laboratories at Ponca City, Okla.: Geophysical Research Laboratory; Refinery Process Research Laboratory; Lubricating Oil and Engine Research Laboratory; Petroleum Production Engineering Laboratory. Refinery Control Laboratories are located at Artesia, N. Mex.; Baltimore, Md.; Denver, Colo.; Farmington, N. Mex.; Glenrock, Wyo.; Wichita Falls, Tex.; Ponca City, Okla.; Lake Charles, La.

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported and two grants for research are made.

**GEOPHYSICAL DEPARTMENT**

*Research staff:* L. F. Athy, Chief Geophysicist; H. R. Prescott, Assistant Chief Geophysicist. 1 physicist, 5 electrical engineers, and 2 instrument makers on research and development; 9 physicists, 11 electrical engineers, 9 civil engineers, and 5 geologists on operations; additional geophysical personnel 91.

*Research activities:* Applied research in connection with geophysical methods and apparatus. (Research initiated 1925.)

**REFINERY PROCESS RESEARCH**

*Research staff:* L. L. Davis, Supervisor; Bert H. Lincoln, Chief Chemist; L. S. Cannon, General Control Chemist. 10 research chemists, 11 process engineers, 16 experimental operators.

*Research activities:* Refinery process development, new petroleum products, and fundamental research on lubrication. (Research initiated 1918.)

**LUBRICATING OIL AND FUELS RESEARCH**

*Research staff:* B. E. Sibley, Chief Technologist; F. A. Suess, Assistant to Chief Technologist; Enos W. Cave, Research Engineer. 18 assistant research engineers.

*Research activities:* Research and testing problems pertaining to lubricating oils, lubricating greases and fuels, and equipment associated with such problems. (Research initiated 1920.)

**PETROLEUM PRODUCTION ENGINEERING RESEARCH**

*Research staff:* R. W. French, Assistant Manager, Production Department; L. E. Elkins, Production Engineer in charge. 2 laboratory production engineers, 20 field production engineers.

*Research activities:* Laboratory fundamental research and development of reservoir problems, fluid content of cores, relative permeability, thermodynamic and phase conditions, lithological exploration. Field research, development, and study of optimum production methods, pressure conservation, high pressure gas return, high pressure absorption, retrograde condensation and measurement and study of subsurface phenomena. (Research initiated 1945.)

**570. Continental Research Corporation, 1228 McKinley Ave., Chicago Heights, Ill.**

*President:* Julien O. Heppes.

*Research staff:* Frederick H. Gayer, Director; Charles E. Fawkes, Vice President. 3 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Research in fatty and resin acid chemistry and development of process for the refining and utilization of tall oil. (Research initiated 1937.)

*Library:* 300 volumes.

**571. Converse Rubber Company, Malden 48, Mass.**

*President:* Henry C. Berlin.

*Research staff:* L. D. Ackerman, Director. Additional personnel 5.

*Research activities:* The improvement in the manufacture, compounding, and vulcanization of rubber footwear. (Research initiated 1929.)

**572. Conwell and Company, E. L., 2024 Arch St., Philadelphia 3, Pa.**

*President:* A. S. Peiper.

*Research staff:* A. S. Peiper, A. W. Dudley, and J. P. McGlone, Directors. 7 chemists, 2 physicists, 1 metallurgist, 14 engineers, 1 bacteriologist; technical personnel 12; additional personnel 6.

*Research activities:* Construction materials, cements, limes, etc., and their products; the recovery and utilization of waste products; paints, varnishes, etc.; fuels, metals, bituminous products, and water. (Research initiated 1894.)

*Library:* A library is maintained.

**573. Cook Paint and Varnish Company, P. O. Box 389, Kansas City 10, Mo.**

*President:* Charles R. Cook.

*Laboratories:* Kansas City, Mo.; Detroit, Mich.

*Research staff:* J. W. Clark, Vice President and Director. 17 chemists; technical personnel 11; additional personnel 1.

*Research activities:* Formulation and testing of protective coatings. (Research initiated 1913.)

*Library:* 220 volumes.

**574. Cook Research Laboratories, 950 Crane St., Menlo Park, Calif.**

*Owner:* Lawrence H. Cook.

*Research staff:* Lawrence H. Cook, Director. 1 chemist, 4 engineers; technical personnel 8; additional personnel 2.

*Research activities:* Consulting industrial research, chemical and mechanical; problems concerning potable water; development work on geophysical instruments for the oil industry; development work on protein production. (Research initiated 1927.)

*Library:* 3,000 volumes.

**575. Cooper-Bessemer Corporation, Mt. Vernon, Ohio.**

*President:* Gordon Lefebvre. *Chairman of the Board:* B. B. Williams.

*Laboratories:* Mt Vernon, Ohio; Grove City, Pa.

*Research staff:* H. A. Gehres, Director of engineering research and development. 2 chemists, 1 physicist, 1 metallurgist, 15 engineers; additional personnel 7.

*Research activities:* The improvement of materials for use in the manufacture of gas and Diesel engines, and air and gas compressors; the improvement of designs and methods of production. (Research initiated 1930.)

**576. Coplay Cement Manufacturing Company, Coplay, Pa.**

*President:* Max E. Grunewald.

*Research staff:* W. J. Johnston, Director. 3 chemists; additional personnel 6.

*Research activities:* Problems in connection with portland cement and portland cement-making equipment. (Research initiated 1927.)

**577. Copolymer Corporation, Baton Rouge 2, La.**

*President:* A. L. Freedlander.

*Research staff:* Frank J. Soday, Technical Director; J. P. McKenzie, Manager, Research and Development Laboratory; H. A. Hopkins, Manager, Process Control and Evaluation Laboratory. 12 chemists; additional personnel 42.

*Research activities:* Synthesis of new types of synthetic rubbers; substitution of new monomers for butadiene and styrene in present synthetic rubber; investigation of the influence of reaction variables upon rubber composition and quality; latex compounding; the effect of different catalysts, modifiers, emulsifying agents, etc., upon rubber quality; develop-

ment of new methods for processing GR-S. (Research initiated 1943.)

*Library:* 200 volumes.

**578. Copperweld Steel Company, Glassport, Pa.**

*President:* S. E. Bramer.

*Laboratories:* Glassport, Pa.; Mahoning Ave., Ext., Warren, Ohio.

*Research staff:* L. C. Whitney, Chief Metallurgist; W. J. Buechling, Chief Metallurgist, Warren, Ohio, Division; B. S. Lorch, Chief Chemist, Copper and Bronze Division; Roy F. Lab, Chief Chemist, Steel Division; W. J. Reagan, Melt Shop Research Metallurgist. 8 chemists, 10 metallurgists; technical personnel 3.

*Research activities:* The production of bimetallic materials and the processing of bronzes and brasses; improved electric furnace melting practice; mold and ingot improvements. (Research initiated 1930.)

**Corcoran-Brown Lamp Division, Electric Auto-Lite Company. See Electric Auto-Lite Company.**

**579. Core Laboratories, Inc., 25½ Highland Park Shopping Village, Dallas 5, Tex.**

*President:* James A. Lewis.

*Research staff:* Frank C. Kelton, Manager, Research Department. 5 chemists; technical personnel 1.

*Research activities:* Petroleum production research; petroleum reservoir engineering; core analysis. (Research initiated 1940.)

*Library:* 400 volumes.

*Cooperative research:* One fellowship is supported.

**580. Corhart Refractories Company, Inc., 16th and Lee Sts., Louisville 10, Ky.**

*President:* Fred S. Thompson.

*Research staff:* T. E. Field, Technical Director; Harold T. Smyth, Director of research. 6 chemists, 1 physicist; additional personnel 6.

*Research activities:* The development of electrocast refractories for glass melting and other applications. (Research initiated 1934.)

*Library:* 550 volumes.

**Corn Mill Division, General Foods Corporation. See General Foods Corporation.**

**581. Corn Products Refining Company, 17 Battery Place, New York 4, N. Y.**

*President:* F. Morris Sayre.

*Laboratory:* Argo, Ill.

*Research staff:* E. W. Reid, Vice President in charge of research and development; Henry L. Cox, General Manager, Chemical Division;



W. B. Newkirk, Assistant to General Manager, Chemical Division; A. L. Elder, Director of research; W. E. Brinker, Director of engineering. 49 chemists, 2 biologists, 32 engineers; technical personnel 65; additional personnel 32.

*Research activities:* Development pertaining to the manufacture of starch and starch products, protein and protein products, vegetable oil and vegetable oil products involving fundamental research, process development, pilot plant operations, industrial adaptations of starches, proteins, and vegetable oils. (Research initiated 1910.)

*Library:* 4,500 volumes.

*Cooperative research:* Seven fellowships are supported.

**582. Corning Glass Works, Corning, N. Y.**

*President:* Glen W. Cole.

*Laboratories:* Corning, N. Y.; Charleroi, Pa.

*Research staff:* Eugene C. Sullivan, Director; Jesse T. Littleton, Associate Director; W. C. Taylor, Director of glass technology; C. A. Schuck, Director of mechanical development. 31 chemists, 25 physicists, 2 metallurgists, 44 engineers, 2 geologists; technical personnel 83; additional personnel 112.

*Research activities:* The development of glasses for technical, consumer, and bulb and tubing products. (Research initiated 1908.)

*Library:* 6,100 volumes.

*Cooperative research:* One fellowship is supported.

*See also* Pittsburgh Corning Corporation.

**583. Coronet Phosphate Company, 19 Rector St., New York 6, N. Y.**

*President:* J. R. Sheffield.

*Laboratory:* Plant City, Fla.

*Research staff:* E. J. Maust, Director. 1 chemist, 1 metallurgist, 1 engineer.

*Research activities:* Defluorination, flotation, and beneficiation of phosphate rock. (Research initiated 1933.)

*Library:* A library is maintained.

**584. Corson, Inc., G. and W. H., Plymouth Meeting, Pa.**

*President:* Philip L. Corson.

*Research staff:* L. John Minnick, Chief Chemist. 7 chemists, 3 engineers; additional personnel 3.

*Research activities:* Lime and lime products; dolomite products; refractories; mineral wool insulation; cements; resin products. (Research initiated 1937.)

**585. Cosma Laboratories Company, 1545 East 18th St., Cleveland 14, Ohio.**

*President:* H. Seymour Colton.

*Research staff:* H. Seymour Colton, Techni-

cal Director; R. W. Frischmuth, Assistant Technical Director; B. R. Krashin, Chief Chemist. 9 chemists, 1 biologist, 2 metallurgists, 2 engineers; additional personnel 10.

*Research activities:* Research, development, and testing for industrial clients: synthetic resins, principally phenol-formaldehyde and vinyl polymers; adhesives; mildew and mildewproofing compounds; silicic acid production; waste product utilization and disposal; metallurgical investigations. (Research initiated 1920.)

*Scientific periodicals:* The Chemical Consultant. Vol. I, 1945.

**586. Cotan Corporation, 341 Oliver St., Newark, N. J. (Subsidiary of Interchemical Corporation.)**

*President:* C. T. Melvin.

*Research staff:* John C. Emhardt, Director. 3 chemists; technical personnel 2.

*Research activities:* Resin, pyroxylin, and rubber coatings; artificial leather. (Research initiated 1924.)

*Library:* 100 volumes.

**587. Coughlin Chemical Consultants, 227 East 34th St., Brooklyn 3, N. Y.**

*President:* F. Aquino.

*Research staff:* M. Petersen, Director; M. M. Probst, Vice President. 2 chemists, 1 chemical engineer; technical personnel 3; additional personnel 1.

*Research activities:* Resins, plastics, textile chemicals, surface coatings, pharmaceuticals, fine organics, emulsifiers, cosmetics, industrial cleaners, plasticizers, stabilizers, etc.

*Library:* A library is maintained.

**588. Cowles Detergent Company, 7016 Euclid Ave., Cleveland 3, Ohio.**

*President:* Edwin Cowles.

*Laboratories:* Cleveland, Ohio; Syracuse, N. Y.; Lockport, N. Y.; Sewaren, N. J.

*Research staff:* Clinton W. MacMullen, Technical Director. 12 chemists, 1 metallurgist, 4 engineers; additional personnel 3.

*Research activities:* Detergents and chemicals for the laundry, textile, metals, electroplating, paper, food, and dairy industries. (Research initiated 1910.)

*Library:* 300 volumes.

*Scientific periodicals:* Cowles Laundry Tips. Vol. I, 1923.

*Cooperative research:* Two fellowships are supported and one grant for research is made.

**589. Cox and Fuller, 320 Broadway, New York 7, N. Y.**

*Research staff:* 3 textile engineers; additional personnel 2.

*Research activities:* Product improvement, new applications, machine or processing improvement, costs, yarns, fabrics, and finishes; synthetic materials; natural fibers. (Research initiated 1929.)

*Library:* 250 to 300 volumes.

**590. Cox Company, Charles M., 177 Milk St., Boston 9, Mass.**

*President:* Arthur H. Hopkins.

*Laboratory:* Wirthmore Research Laboratory, 259 Washington St., Malden, Mass.

*Research staff:* Richard O. Brooke, Chemist in charge. 5 chemists, 1 biologist; technical personnel 1.

*Research activities:* Nutritive value of ingredients used in commercial feeds; investigations looking toward the improvement of products and the reduction of cost of manufacture. (Research initiated 1933.)

**591. Cramer Company, Inc., R. W., Saybrook Road, Centerbrook, Conn.**

*President:* R. W. Cramer.

*Research staff:* N. E. Gibbs, Development Engineer and Director of laboratory; E. L. Schellens, Vice President in charge of engineering. 1 physicist, 1 engineer; technical personnel 1.

*Research activities:* The design and development of coding type radiosondes and meteorological equipment; industrial and electronic time devices. (Research initiated 1941.)

**592. Cranberry Cannery, Inc, Hanson, Mass.**

*President:* Marcus L. Urann.

*Research staff:* Walter A. Nealy, Director. 1 chemist, 1 engineer; technical personnel 1; additional personnel 2.

*Research activities:* Research on new products and processes; by-product utilization; improvement in the quality of canned cranberries. (Research initiated 1927.)

**593. Crane and Company, Inc., Dalton, Mass.**

*President:* W. M. Crane, Jr.

*Laboratories:* Pioneer Mill, Dalton, Mass.; Branch Laboratories: Old Berkshire and Bay State Mills, Dalton, Mass.; Government Mill, Pittsfield, Mass.

*Research staff:* Edward O. Reed, Director; L. B. Tucker, Assistant Director. 7 chemists; technical personnel 3; additional personnel 2.

*Research activities:* Investigations relative to the manufacture of bank note, safety, security and distinctive papers, cigarette and carbon tissues; new fibrous materials such as hemp, flax, ramie, and other domestic fibers. (Research initiated 1917.)

**594. Crane Company, 836 South Michigan Ave., Chicago 5, Ill.**

*President:* John H. Collier.

*Research staff:* P. R. Mork, Executive Vice President; John P. Magos, Director. 3 chemists, 2 physicists, 7 metallurgists, 30 engineers; technical personnel 8; additional personnel 12.

*Research activities:* Research related to materials used in the development of valves, fittings, plumbing, and heating and air conditioning equipment; metallurgy (ferrous and nonferrous), ceramics, enamel, welding, acoustics, and the phenomena of heat generation, transmission, and transfer; the improvement of processes, and development work; testing of the performance of the products. (Research initiated 1915.)

*Library:* 4,000 volumes.

*Cooperative research:* Six grants for research are made.

**595. Crane Packing Company, 1800 West Cuyler Ave., Chicago 13, Ill.**

*President:* Frank E. Payne.

*Research staff:* M. M. Main, Director of research; Carl E. Schmitz, Chief of engineering research. 5 chemists, 1 metallurgist, 6 engineers; technical personnel 21; additional personnel 6.

*Research activities:* The development of the most suitable packings, gaskets, and related materials for general and specific service; the development of special lubricants for packings, designed to resist the action of solvents and chemicals; processes for the preservation and protection of asbestos, flax, rubber, and other packing materials against various reagents. Engineering research activities are carried on for the development of mechanical seals of various types. (Research initiated 1929.)

*Library:* 250 volumes.

**596. Creamery Package Manufacturing Company, 1243 West Washington Blvd., Chicago, Ill.**

*President:* George E. Wallis.

*Laboratory:* Ft. Atkinson, Wis.

*Research staff:* George W. Putnam, Vice President in charge of research and development. 1 metallurgist, 6 dairy engineers, 3 dairy technologists.

*Research activities:* The development and improvement of equipment for processing milk, ice cream, butter, cheese, and other dairy products; the development of new and improved methods of operation for dairy plants. (Research initiated 1925.)

**597. Creamland Dairies, Inc., 321 North 2nd St., Albuquerque, N. Mex.**

*President:* Roy Campbell.

*Research staff:* Harry B. Tiedebohl, Direc-

tor. 1 bacteriologist; technical personnel 2; additional personnel 1.

*Research activities:* Fluid milk; butter; ice cream; cottage cheese. (Research initiated 1938.)

**598. Crescent Manufacturing Company, 657 Dearborn St., Seattle 6, Wash.**

*President:* Harry Jones.

*Research staff:* W. R. Gailey, Director. 3 chemists.

*Research activities:* Spices, extracts, baking powder, coffee, etc.; minor researches cover various production and handling problems, such as methods for making true fruit extracts, the effects of vacuum packing on coffee, the conditions surrounding the preservation of baking powder mixtures, etc. (Research initiated 1906.)

**599. Croll-Reynolds Company, 17 John St., New York, N. Y.**

*President:* S. W. Croll.

*Laboratories:* Jersey City, N. J.; Weatherly, Pa.

*Research staff:* P. E. Reynolds, Executive Officer in charge of research. Five of the regular employes work part time on engineering research and development. There is not a continuous research program.

*Research activities:* Steam jet vacuum refrigeration equipment and industrial vacuum process work. (Research initiated 1931.)

**600. Crompton and Knowles Loom Works, 93 Grand St., Worcester 3, Mass.**

*President:* John F. Tinsley.

*Research staff:* Victor E. Hillman, Director. 2 chemists, 2 physicists, 4 metallurgists, 2 engineers, 1 wood technician, 1 stress analyst; technical personnel 2.

*Research activities:* Studies in metallurgy and in the design of loom construction; the investigation of bearing materials; lubrication research; special high-strength metals such as alloy cast iron and short cycle malleable iron; paint research; heat-treatment. (Research initiated 1917.)

**601. Crosley Corporation, 1329 Arlington St., Cincinnati 25, Ohio.**

*President:* I. B. Babcock.

*Research staff:* Lewis M. Clement, Vice President in charge of research and engineering; John D. Reid, Manager of research. 4 chemists, 3 physicists, 1 metallurgist, 52 engineers; technical personnel 26; additional personnel 69.

*Research activities:* Radio; refrigeration; household appliances; television; aircraft communications; aircraft navigation. (Research initiated 1921.)

*Library:* 250 volumes.

*Cooperative research:* One grant for research is made.

**602. Crosse and Blackwell, 6801 Eastern Ave., Baltimore 24, Md. (Associated with Crosse and Blackwell, Ltd., of London.)**

*President:* John T. Menzies.

*Research staff:* B. W. Clarke, Chief Chemist. 3 chemists, 2 technicians; additional personnel 3.

*Research activities:* The development of new products; the improvement of processes; specialized food technology. (Research initiated 1930.)

**603. Crossett Lumber Company, Crossett, Ark.**

*President:* E. C. Crossett.

*Research staff:* K. G. Chesley, Director. 5 chemists; additional personnel 5.

*Research activities:* Chemical utilization of wood waste from selective cutting operations in forests and lumber manufacturing plants; improvements in pulp, paper, and wood distillation processes and products. (Research initiated 1941.)

*Library:* 200 volumes.

**604. Croton Chemical Corporation, 114 Liberty St., New York 6, N. Y.**

*President:* Thomas R. Davies.

*Research staff:* A. J. Wheaton, Jr., Director. 1 chemist, 1 engineer; additional personnel 3.

*Research activities:* Improvement of the methods of producing sodium and potassium nitrates; the development of compounds for the curing of meats, for the heat-treating of metals, for the refining of ferrous and nonferrous metals, for the flameproofing of textiles, and for use in various other fields. (Research initiated 1921.)

**605. Crowell-Collier Publishing Company, 250 Park Ave., New York 17, N. Y.**

*President:* Thomas H. Beck.

*Laboratory:* 254 West 54th St., New York 19, N. Y.

*Research staff:* Axel E. Lundbye, Director. 2 chemists, 3 engineers; additional personnel 5.

*Research activities:* High speed rotogravure press and other experiments; electroplating with chromium, copper, etc.; electroetching, i.e. producing a predetermined design for lubricating pockets; investigating light transmission and refraction of photographic lenses. (Research initiated 1939.)

*Library:* 500 volumes.

**606. Crown Cork and Seal Company, Inc., Baltimore 3, Md.**

*President:* Charles E. McManus.

*Laboratories:* Baltimore 3, Md.; Crown Can Co. (Subsidiary), Philadelphia, Pa.

*Research staff:* A. H. Warth, Chemical Director; V. A. Ryan, Research Director; Charles E. Glock, Chief Chemist of Metals Laboratory; Earl Graham, Chief Chemist of Crown Can Co. Laboratories. 25 chemists, 1 physicist, 1 biologist, 3 metallurgists, 2 engineers; technical personnel 10; additional personnel 4.

*Research activities:* Glues, cork, paper, rubber, plastics, pigments, and varnish materials; the development of new types of closures for glass containers; the study of beverages, processing of foods in glass, and bottle cap requirements for pharmaceuticals; the preservation of bottled milk; the development of composition cork materials for industrial purposes; the study of metals and alloys for trade and production machines; the study of tin plate for bottle cap and other closure manufacture; the study of waxes and lubricants. (Research initiated 1900.)

*Scientific periodicals:* The Crown. Vol. I, 1913.

*Library:* 500 volumes.

**607. Crown Zellerbach Corporation, Camas, Wash.**

*President:* J. D. Zellerbach.

*Research staff:* William R. Barber, Technical Director. 6 chemists, 1 physicist, 1 biologist, 2 engineers; additional personnel 5.

*Research activities:* Fundamental process research; paper grade development; process improvement; quality of product research. (Research initiated 1938.)

*Library:* 1,000 volumes.

*Cooperative research:* Two grants for research are made.

*See also* Western Waxed Paper Company.

**608. Crucible Steel Company of America, 405 Lexington Ave., New York, N. Y.**

*Chairman:* William P. Snyder, Jr.

*President:* William H. Colvin, Jr.

*Laboratories:* Harrison, N. J.; Syracuse, N. Y.; Pittsburgh, Pa. In addition to the mill laboratories there are two research laboratories devoted entirely to development and research work.

*Research staff:* L. L. Farrell, Director of metallurgy; Peter Payson, in charge of research; E. T. Walton, Assistant Director of metallurgy. 20 chemists, 67 metallurgists.

*Research activities:* Metallurgical and chemical research on steel. (Research initiated 1929.)

**609. Crystal Research Laboratories, Inc., 29 Allyn St., Hartford 3, Conn.**

*President:* Samuel I. Ward.

*Research staff:* Richard K. Blackburn, Chief of engineering and research; Ernest B. Lewis, Chief Crystallographer; Sydney E. Warner, Chief Radio Engineer; Charles G. Robb, Plant Chemist. 2 chemists, 3 physicists, 5 engineers; technical personnel 8; additional personnel 68.

*Research activities:* Quartz oscillating crystal applications; quartz crystals; electronic devices; electronic applications, both communication and non-communication. (Research initiated 1942.)

*Library:* 200 volumes.

**610. Crystal Tissue Company, Middletown, Ohio.**

*President:* E. E. Grant.

*Research staff:* Leo Fleischer, Director. 2 chemists, 2 engineers; additional personnel 1.

*Research activities:* The development and improvement of various kinds of tissue papers: wrapping, printed, transparent, laminating, etc. (Research initiated 1923.)

**611. Cudahy Packing Company, 221 North La Salle St., Chicago 1, Ill.**

*President:* F. W. Hoffman.

*Laboratories:* Omaha, Nebr.; East Chicago, Ind.; Memphis, Tenn.; Kansas City, Kans.; Los Angeles, Calif.

*Research staff:* John R. Shipner, Director; C. L. Hodgert, Vice President in charge of operations. 12 chemists, 2 biologists; technical personnel 2; additional personnel 3.

*Research activities:* Edible and inedible fats and oils, glues, canning and preserving of meat food products, curing meats, sewage disposal, detergents, and miscellaneous problems. (Research initiated 1900.)

*Library:* 1,500 volumes.

**612. Cummins Engine Company, Inc., Columbus, Ind.**

*President:* C. L. Cummins.

*Research staff:* H. L. Knudsen, Vice President in charge of engineering and research; D. J. Cummins, Laboratory Manager; H. H. Lurie, Metallurgist. 1 chemist, 1 metallurgist, 5 engineers; additional personnel 24.

*Research activities:* Diesel engine research. (Research initiated 1931.)

**613. Cuprinol, Inc., 7 Water St., Boston 9, Mass.**

*President:* David Murray.

*Research staff:* Malcolm C. Brock, Director. 2 chemists, 1 engineer; technical personnel 2; additional personnel 1.

*Research activities:* Metallic naphthanates; textile and wood preservation; fungicidal research. (Research initiated 1940.)

**614. Curley Company, 1432 North Randolph St., Philadelphia, Pa.**

*President:* Samuel Levin.

*Research staff:* Benjamin Levitt, Director; Franklin Levin, Vice President; George Golnitz, Chemical Engineer. 2 chemists, 1 engineer.

*Research activities:* Cosmetics and toilet preparations; detergents. (Research initiated 1933.)

**615. Curran and Company, M. D., 420 Lexington Ave., New York, N. Y.**

*President:* M. D. Curran.

*Laboratories:* 750 Big Bend Road, East, Kirkwood, Mo.; 375 Berry Road, Webster Groves, Mo.

*Research staff:* M. D. Curran, Managing Director; George P. Curran, Director of research. 1 chemist, 1 metallurgist, 1 technician; additional personnel 2.

*Research activities:* Coal: exploratory examinations for determination of swelling characteristics, coke reactivity, and other physical and chemical properties under varied conditions of carbonization. Asphaltic and petroleum materials: high temperature distillation for determination of degree of paraffin—aromatic conversion under varied temperature conditions and for the determination of possible yields of electrode carbon. Exploratory work on the reduction of metallic minerals.

**616. Curran Corporation, Dowling Bldg., Malden 48, Mass.**

*President:* A. F. Curran.

*Laboratories:* Lawrence, Mass.; Chicago, Ill.

*Research staff:* 4 chemists, 1 biologist, 1 engineer; technical personnel 3; additional personnel 2.

*Research activities:* Self-emulsifying, carbon digestant, paint stripping, and metal cleaning solvents. (Research initiated 1932.)

**617. Curtis Lighting, Inc., 6135 West 65th St., Chicago 38, Ill.**

*President:* Darwin Curtis.

*Research staff:* William Foulks, Chief Engineer. 1 chemist, 3 engineers.

*Research activities:* The development of reflectors and other products used for lighting; testing of lighting equipment; general inspection and research on various materials used in the manufacture of lighting equipment. (Research initiated 1900.)

**618. Curtiss-Wright Corporation, Airplane Division, Buffalo 5, N. Y.**

*President:* G. W. Vaughan.

*Research staff:* C. C. Furnas, Director; P. E. Hovgard, Head, Aerodynamics Department; C. G. Trimbach, Head, Developments and Armament Department; I. G. Ross, Head, Flight Research Department; G. H. Cartledge, Head, Materials Department; C. L. Frederick, Head, Physics Department; A. F. Donovan, Head, Structures Department. 7 chemists, 10 physicists, 5 metallurgists, 104 engineers, 19 aerodynamicists, 14 mathematicians; technical personnel 150; additional personnel 128.

*Research activities:* Wind tunnel research; theoretical aerodynamics; structural research; materials, components, instruments and controls; armament; manufacturing and flight research connected with the development and improvement of airplanes. (Research initiated 1916.)

*Library:* 4,000 volumes.

*Cooperative research:* One fellowship is supported, and four grants are made for research.

*Note:* On January 1, 1946, the Curtiss-Wright Corporation gave the above described laboratory to Cornell University. It is now known as Cornell Aeronautical Laboratory.

**619. Curts-Folse Laboratories, 70 Central Ave., Kansas City, Kans.**

*Research staff:* L. M. Curts, Chemist; C. D. Folse, Veterinarian; F. A. Hallier, Pharmacist.

*Research activities:* Chemotherapeutic research. (Research initiated 1918.)

**620. Cushman Motor Works, 920 North 21st St., Lincoln 1, Nebr.**

*General Manager:* Charles D. Ammon.

*Research staff:* R. M. Snyder, Chief Engineer. 1 engineer; technical personnel 7.

*Research activities:* Experimental work on parts and accessories for the company's products, which include gasoline engines and motor scooters. (Research initiated 1903.)

**621. Cutler-Hammer, Inc., 315 North 12th St., Milwaukee 1, Wis.**

*President:* G. S. Crane.

*Research staff:* E. W. Seeger, Vice President in charge of development. 2 chemists, 2 physicists, 1 metallurgist, 37 engineers; additional personnel 32.

*Research activities:* The development of control apparatus and auxiliary material, heating apparatus, lifting magnets and clutches, insulating material and appliance switches, and the application of vacuum tubes to industrial purposes.

*Library:* A library is maintained.

**622. Cutter Laboratories, 4th and Parker Sts., Berkeley 2, Calif.**

*President:* R. K. Cutter.

*Research staff:* Howard M. Winegarden, Vice President in charge of research and manufacturing; K. S. Pilcher, Associate Director of research. 11 chemists, 2 physicists, 9 biologists, 5 engineers, 1 pharmacologist; additional personnel 21.

*Research activities:* Biochemistry, pharmaceutical chemistry, microbiology, chemical engineering, and mechanical engineering. (Research initiated 1897.)

*Library:* A library is maintained.

*Cooperative research:* One scholarship is supported and various grants for research are made.

**623. D-A Lubricant Company, Inc., 1311 West 29th St., Indianapolis 8, Ind.**

*President:* Frank L. Binford.

*Research staff:* J. H. Coover, Director. 2 chemists.

*Research activities:* Lubrication; greases and engine oils. (Research initiated 1934.)

**624. Daggett and Ramsdell, 216 West 14th St., New York 11, N. Y. (Subsidiary of Stanco, Inc.)**

*President:* F. W. Moss.

*Research staff:* G. W. Fiero, Director. 3 chemists; technical personnel 1; additional personnel 1.

*Research activities:* Cosmetics. (Research initiated 1945.)

**625. Dahlstrom Metallic Door Company, Jamestown, N. Y.**

*President:* Paul N. Anderson.

*Research staff:* C. Harold Ashford, Chief Engineer, Contract Division; Carl Thierfeldt, Chief Engineer, Metal Specialties Division.

*Research activities:* Hollow metal elevator entrances and hollow metal doorwork and allied products, rolled metal mouldings, specialties in metal, stampings, housing cabinets and stands; the design, testing, and development of new products, and the study of processes of manufacturing the products. (Research initiated 1910.)

**Dairy Laboratories. See Dalare Associates; The Dairy Laboratories.**

**626. Dairy Products Laboratories, 2244 Carter Ave., St. Paul 8, Minn.**

*Manager:* Henry A. Healy.

*Research staff:* 2 chemists, 2 bacteriologists; additional personnel 2.

*Research activities:* Bacterial improvements on finished products manufactured by milk

plants, creameries, cheese plants, ice cream plants, and dry milk plants. Quality improvements on raw milks delivered by shippers into Twin City and vicinity plants. Investigation of sterilizing effect of washing powders used in can washing machines. (Research initiated 1932.)

**627. Dairymen's League Cooperative Association, Inc., 11 West 42nd St., New York 18, N. Y.**

*President:* H. H. Rathbun.

*Laboratory:* 810 Burnet Ave., Syracuse 1, N. Y.

*Research staff:* J. L. Hileman, Director of laboratories. 3 chemists, 1 bacteriologist; technical personnel 4; additional personnel 1.

*Research activities:* The chemistry and bacteriology of dairy products and the methods and equipment used in their manufacture. (Research initiated 1921.)

*Library:* 1,000 volumes.

**628. Dalare Associates; The Dairy Laboratories, 2300 Locust St., Philadelphia 3, Pa.**

*Senior Partners:* H. C. Campbell and C. H. Kimberly.

*Laboratories:* Philadelphia, Pa.; 120 Liberty St., New York, N. Y.; 210 East Lexington St., Baltimore, Md.; 1717 North Capitol St., Washington, D. C.

*Research staff:* H. C. Campbell and C. H. Kimberly, Directors; George Jaggard, D. W. Crisman. 5 chemists, 1 physicist, 1 biologist, 1 physician; technical personnel 25; additional personnel 7.

*Research activities:* Antiseptics and germicides; spectrochemical research on trace elements in foods, drugs, and metals; research for the treatment of allergy; problems of the dairy industry. (Research initiated 1912.)

*Library:* 200 volumes.

**Dallas Laboratories. See Associated Laboratories.**

**629. Dallons Laboratories, 5066 Santa Monica Blvd., Los Angeles 27, Calif.**

*Research staff:* Oscar Dallons and Franz Dallons, Partners and Directors. 2 physicists, 2 engineers, 1 physician; technical personnel 15; additional personnel 5.

*Research activities:* Electronics in the field of electrosurgical and electromedical technics and apparatus development; ultraviolet irradiation in control of airborne bacteria; sterilization. (Research initiated 1932.)

*Library:* 250 volumes.

630. **Darco Corporation**, Delaware Trust Bldg., Wilmington, Del.

*President:* Leland Lyon.

*Research staff:* George H. Scheffler, Director. 4 chemists; technical personnel 4; additional personnel 5.

*Research activities:* Manufacturing process development; decolorizing carbons. (Research initiated 1927.)

*Library:* A library is maintained.

631. **Davies and Associates**, Helen, 39 East 35th St., New York 16, N. Y.

*President:* Helen Davies.

*Research staff:* 5 chemists, 2 consulting physicists, 4 engineers, 1 consulting psychologist; ceramists, marketing specialists; 4 associate consultants; additional personnel 3.

*Research activities:* Foods, cosmetics, drugs, plastics, paper, ceramics, home appliances, and furnishings, including functional uses, patent development, and special product and market surveys and plans, with the objective of creating or determining wide consumer markets. Consultation.

*Library:* A library is maintained.

632. **Davies-Young Soap Company**, 400 North Findlay St., Dayton 1, Ohio.

*President:* R. H. Young.

*Laboratories:* Davies-Young Soap Co., and Tower Varnish and Drier Co., Dayton Ohio.

*Research staff:* R. B. Trusler, Vice President and Director. 4 chemists, 1 biologist; additional personnel 1.

*Research activities:* Insecticides; detergents; dry cleaning. (Research initiated 1930.)

633. **Davis and Bennett, Inc.**, 306 Main St., Worcester, Mass.

*President:* Elmer W. Bennett.

*Research staff:* Lewis Davis, Director; Elmer W. Bennett, Edwin C. Tuukkanen. 4 chemists, 2 biologists and bacteriologists; additional personnel 2.

*Research activities:* Gummed and coated papers; pharmaceutical products; cosmetics; oils and emulsions for textile purposes; the development of waterproof sealing tapes. (Research initiated 1925.)

**Davis and Geck, Inc.** See American Cyanamid Company.

634. **Davis Company**, R. B., 38-40 Jackson St., Hoboken, N. J.

*President:* George S. Jephson.

*Research staff:* R. A. Morck, Director. 4 chemists.

*Research activities:* The development of new food products and the investigation of dietetic values. (Research initiated 1920.)

635. **Davison Chemical Corporation**, 20 Hopkins Place, Baltimore 3, Md.

*President:* C. F. Hockley.

*Laboratory:* Curtis Bay, Baltimore, Md.

*Research staff:* T. O. Tongue, Chief Research Engineer. 11 chemists, 11 engineers; technical personnel 2; additional personnel 15.

*Research activities:* The development of new processes and the improvement of present products and product application. Major research is in the field of silica gel and gels of other types. Research on fluorides and fluosilicates, fertilizers, and heavy chemicals. (Research initiated 1920.)

*Library:* 300 volumes.

636. **Dawe's Vitamins, Inc.**, 4800 South Richmond St., Chicago 32, Ill.

*President:* Charles C. Dawe.

*Research staff:* Edwin F. Poland, Chief Chemist and Director; R. Messirov and Bernard Edelstein, Research Chemists. 4 chemists; additional personnel 1.

*Research activities:* Vitamin concentrates; products for enriching poultry and livestock feeds; products for enriching bakery goods and candy. (Research initiated 1938.)

*Library:* 200 volumes.

637. **Dayton Rubber Manufacturing Company**, Dayton, Ohio.

*President:* A. L. Freedlander.

*Research staff:* Joseph Rockoff, Director; O. A. Thompson; Thomas Wagner; Edward Kremer; W. G. Goodwin; Charles G. Miller; Norman Ritzert. 9 chemists, 6 engineers; additional personnel 10.

*Research activities:* Tires, tubes, belting rollers; metal to rubber adhesion; synthetic rubbers and plastics. (Research initiated 1911.)

638. **Dearborn Chemical Company**, 1029 West 35th St., Chicago 9, Ill.

*President:* Robert A. Carr.

*Research staff:* A. H. Reynolds, Directing Chemist. 7 chemists, 2 chemical engineers; technical personnel 8; additional personnel 10.

*Research activities:* Industrial water treatment; chemical prevention of corrosion in steam boilers; protective coatings for the prevention of oxidation in underwater, underground, and atmospheric exposure; waterproof and grease-proof packaging materials. (Research initiated 1887.)

*Library:* 3,000 to 4,000 volumes.

**639. DeBell and Richardson, Consulting Engineers, P. O. Box 240, Springfield 1, Mass.**

*Research staff:* John M. DeBell, chemical problems; Henry M. Richardson mechanical problems. 2 chemists, 3 engineers; additional personnel 4.

*Research activities:* The development of materials, processes, and products involving the use of synthetic organic plastics; the development and design of equipment for manufacturing, processing, or fabricating synthetic resins and their plastics; research toward the synthesis of new and better resins. (Research initiated 1945.)

*Library:* 200 volumes.

**640. Dee and Company, Thomas J., 1900 West Kinzie St., Chicago 22, Ill.**

*President:* Harry E. Radix.

*Research staff:* John S. Shell, Director. 1 chemist, 2 metallurgists; technical personnel 2; additional personnel 2.

*Research activities:* Noble metal alloys for dentistry and industry; precision castings (lost wax process); hydrocolloid impression material. (Research initiated 1925.)

*Library:* 200 volumes.

**641. Deep Rock Oil Corporation, Cushing, Okla.**

*President:* H. N. Greis.

*Research staff:* B. C. Frichot, Chief Chemist. 3 chemists; technical personnel 5.

*Research activities:* Petroleum and its products. (Research initiated 1929.)

*Library:* 200 volumes.

**642. Deere and Company, Moline, Ill.**

*President:* Charles Deere Wiman.

*Laboratories:* Moline, Ill. Subsidiary plant laboratories: John Deere Tractor Company, Waterloo, Iowa; Union Malleable Iron Company, East Moline, Ill.

*Research staff:* Hyman Bornstein, Director. 10 chemists 1 physicist, 9 metallurgists, 4 engineers; additional personnel 16.

*Research activities:* The development and study of materials used in implement manufacture, including steels and their heat-treatment and foundry metallurgy. (Research initiated 1911.)

**Deere Tractor Company, John. See Deere and Company.**

**643. de Forest Laboratories, Lee, 5106 Wilshire Blvd., Los Angeles, Calif.**

*Research staff:* Lee de Forest, Director. 1 physicist, 4 engineers; additional personnel 6.

*Research activities:* Short and ultra-short wave instruments, and efficient methods for their use on living animals, vegetable tissues,

and organisms; radio high-frequency communications. (Research initiated 1934.)

**644. Deister Concentrator Company, 901-935 Glasgow Ave., Fort Wayne, Ind.**

*President:* J. Ross McCulloch.

*Research staff:* D. N. Griffin, Chief Engineer; S. A. Stone. 2 metallurgists, 1 engineer; additional personnel 1.

*Research activities:* Gravity or table concentration of various minerals; special metallic and nonmetallic concentration problems and technique; washing of the finer sizes of coal (both anthracite and bituminous) below that which is usually handled on jigs, etc.; experimental tabling of both kinds of coal up to 2.5 inch size, even flat-fractured material; screening tests, problems of hydraulic sorting, and other sizing problems. The work is done in both small lots and in carload quantities. (Research initiated 1908.)

*Library:* A library is maintained.

**645. De Laval Separator Company, 165 Broadway, New York 6, N. Y.**

*President:* George C. Stoddard.

*Laboratory:* Foot of Pine St., Poughkeepsie, N. Y.

*Research staff:* George T. Willson, Director of research and development. 7 chemists, 2 metallurgists, 10 engineers; technical personnel 20.

*Research activities:* The development and testing of centrifugal machines, such as cream separators, milk clarifiers, milk standardizers, dairy equipment, centrifugal oil purifiers, clarifiers, and separators; insulating oil purifiers, turbine lubricating oils, Diesel fuel and lubricating oils, crank case oils, varnishes and pigments, oil and gasoline refining separators, vegetable and animal oil refining, oil washing, rubber latex concentration, wool grease recovery and purification, distillery slop concentration, blood serum purifiers, dyestuff and chemical separators, making and breaking emulsions; mechanical milkers and milk house equipment. (Research initiated 1923.)

**646. Delavan Manufacturing Company, 3009 Sixth Ave., Des Moines 13, Iowa.**

*Senior Partner:* Nelson B. Delavan.

*Research staff:* Henry F. Rothwell, Engineering Manager. 3 engineers; technical personnel 1; additional personnel 2.

*Research activities:* Spray nozzles; small air compressors; vacuum power pumps; hydraulic couplings. (Research initiated 1944.)

*Library:* 250 volumes.



647. Delaware, Lackawanna and Western Railroad, 140 Cedar St., New York, N. Y.

*President:* William White.

*Laboratory:* 148 Cedar Ave., Scranton, Pa.

*Research staff:* J. J. Laudig, Research Engineer. 2 chemists, 1 metallurgist, 1 engineer; technical personnel 1; additional personnel 1.

*Research activities:* The study of materials for the improvement of structures and rolling stock; the reclamation of materials; conditioning locomotive and stationary boiler waters; the heat-treatment of steel. (Research initiated 1912.)

*Library:* 2,000 volumes.

Delco Appliance Division, General Motors Corporation. See General Motors Corporation.

Delco Products Division, General Motors Corporation. See General Motors Corporation.

Delco Radio Division, General Motors Corporation. See General Motors Corporation.

Delco Remy Division, General Motors Corporation. See General Motors Corporation.

648. Delta Manufacturing Company, 600 East Vienna Ave., Milwaukee 1, Wis. (Subsidiary of Rockwell Manufacturing Company.)

*President:* C. G. Cushing.

*Research staff:* C. A. Wiken, Director of engineering. 2 engineers; additional personnel 10.

*Research activities:* Machine tools. (Research initiated 1924.)

*Library:* A library is maintained.

649. Delta Oil Products Company, Teutonia Ave. and Mill Road, Milwaukee, Wis.

*President:* Joseph A. Gitzen.

*Research staff:* J. A. Gitzen, Director; B. H. Rubner, Chief Chemist. 4 chemists.

*Research activities:* Petroleum and allied products. (Research initiated 1933.)

650. de Navarre Associates, Maison G., 14934 Harper Ave., Detroit 24, Mich.

*President:* Maison G. de Navarre.

*Research staff:* M. G. de Navarre, Director. 2 chemists; additional personnel 4.

*Research activities:* Product development; foods, drugs, and cosmetics. (Research initiated 1931.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported.

651. Dennis Company, Martin, 859 Summer Ave., Newark 4, N. J.

*President:* Harold Dennis.

*Research staff:* Francis W. Wolff, Chief

Chemist; Ralph E. Marlatt; F. C. Bersworth; J. B. Carpenter. 4 chemists, 5 laboratory assistants.

*Research activities:* Leather processing chemicals: bates, chrome tans, fat-liquors; chromium compounds; fatty acids; amines. (Research initiated 1893.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

652. Dennison Manufacturing Company, 300 Howard St., Framingham, Mass.

*President:* Henry S. Dennison.

*Research staff:* G. R. Alden, Research Division Manager; C. W. Stillwell, E. L. Kallander, and A. C. Lamoureux, Chemical Research Department Heads; E. G. Parker, Control Laboratory Department Head; A. A. Long, Engineering Research Department Head; C. A. Cole, Methods Research Department Head; R. B. Hulett, Administrative Department Head. 15 chemists, 12 engineers; technical personnel 13; additional personnel 8.

*Research activities:* The fabrication of paper products to meet special requirements; the development of processes for the printing, coating, coloring, impregnating, drying, and humidifying of paper; the formulation of lacquers, adhesives, inks, waxes, and special compounds required for such purposes; fiber furnishes for special uses; the origination, design and development of automatic and semi-automatic mechanical equipment for the processing and fabricating of paper products, and for the sealing and labelling of various merchandise. (Research initiated 1914.)

*Library:* 350 volumes.

653. Dentists' Supply Company of New York, 220 West 42nd St., New York 18, N. Y.

*President:* Leroy Frantz.

*Laboratories:* New York, N. Y.; York and Philadelphia, Pa.

*Research staff:* W. C. Whittemore, Director. 4 chemists, 1 ceramist, 2 dentists, 4 technicians; additional personnel 3.

*Research activities:* Ceramics, plastics, and precious metals. (Research initiated 1913.)

Denver and Rio Grande Western Railroad. See No. 2432 in *Addenda*.

654. De Pree Company, 130 Central Ave., Holland, Mich.

*President:* W. A. Diekema.

*Research staff:* A. M. Hyma, Director. 3 chemists, 1 biologist; technical personnel 2; additional personnel 3.

*Research activities:* Nutritional and biological research on vitamins, amino acids, and hormones. (Research initiated 1935.)

*Library:* 100 volumes.

**Derby Company.** *See* Stevens and Sons Company, M. T.

**De Soto Motors Corporation.** *See* Chrysler Corporation.

**Detroit Diesel Engine Division, General Motors Corporation.** *See* General Motors Corporation.

**655. Detroit Edison Company, 2000 Second Ave., Detroit 26, Mich.**

*President:* J. W. Parker.

*Research staff:* Henry S. Walker, Director. 3 chemists, 1 physicist, 1 metallurgist, 23 engineers; technical personnel 3; additional personnel 16.

*Research activities:* Applied and fundamental researches to effect improvements in the generation, transmission, distribution, and utilization of electricity, steam, and manufactured gas. (Research initiated 1913.)

*Library:* 1,700 volumes, in addition to company's library of 16,000 volumes.

**656. Detroit Lubricator Company, 5900 Trumbull Ave., Detroit 8, Mich.** (Subsidiary of American Radiator and Standard Sanitary Corporation.)

*President:* C. H. Hodges, Jr.

*Research staff:* G. B. Duffield, Executive Vice President and Director. 1 chemist, 2 metallurgists, 7 engineers; technical personnel 5; additional personnel 9.

*Research activities:* The development of temperature and pressure actuated control devices for heating, cooling, and air conditioning; varied product development. (Research initiated 1920.)

**657. Detroit Steel Casting Company, 4069 Michigan Ave., Detroit, Mich.**

*President:* S. W. Utley.

*Research staff:* 2 chemists, 1 metallurgist.

*Research activities:* Investigations and control methods on steel production for castings of both carbon and alloy steel; sand preparation for castings; heat-treatment of steel castings. (Research initiated 1930.)

**658. Detroit Sulphite Pulp and Paper Company, 9125 West Jefferson Ave., Detroit, Mich.**

*President:* G. N. Carleton.

*Research staff:* Leslie L. Larson, Technical Director. 5 chemists; additional personnel 10.

*Research activities:* Research on pulp and paper. (Research initiated 1930.)

**659. Detroit Testing Laboratory, 554 Bagley Ave., Detroit 26, Mich.**

*President:* W. P. Putnam.

*Research staff:* W. P. Putnam, Director; J.

D. Stoddard; W. R. DeGowin; Charles Greenlaw; H. J. Jameson; Warner Hocking; Morgan B. Smith. 8 chemists, 2 metallurgists, 3 engineers, 1 bacteriologist; technical personnel 9; additional personnel 7.

*Research activities:* Fuels; metallurgy; water problems, both domestic and industrial; low temperature coal distillation; ore dressing; protective coatings; corrosion. (Research initiated 1903.)

*Library:* 1,000 volumes.

**Detroit Transmission Division, General Motors Corporation.** *See* General Motors Corporation.

**660. Development Laboratory of Chicago, 1525 East 53rd St., Chicago 15, Ill.**

*Manager:* M. H. Daskais.

*Research staff:* Ellis K. Fields, Director. 2 chemists; technical personnel 1.

*Research activities:* Organic synthetic products; drugs; fungicides; insecticides; insect repellents. (Research initiated 1937.)

*Library:* 400 volumes.

**661. DeVilbiss Company, Detroit and Phillips Aves., Toledo 1, Ohio.**

*President:* Howard P. DeVilbiss.

*Research staff:* Donald J. Peeps, Chief Engineer. 4 chemists, 24 engineers; technical personnel 13; additional personnel 2.

*Research activities:* The development of spray coating equipment, exhaust systems, air compressors, hose, medicinal atomizers and vaporizers, and perfume sprays. (Research initiated 1910.)

**662. Devos and Reynolds Company, Inc., 787 First Ave., New York 17, N. Y.**

*President:* E. S. Phillips.

*Laboratories:* Louisville, Ky.; Malden, Mass.; Newark, N. J.; Detroit, Mich.

*Research staff:* J. S. Long, Director; H. N. Lyons, Administrative Manager. Laboratory personnel 107.

*Research activities:* Research and development in connection with paint, varnish, enamel, lacquer, and other protective coatings.

*Cooperative research:* Four fellowships are supported.

*See also* Jones Dabney Company.

**663. Dewey and Almy Chemical Company, 62 Whittemore Ave., Cambridge 40, Mass.**

*President:* Bradley Dewey.

*Research staff:* Charles H. Egan, Director; J. G. Mark; S. B. Neiley; W. A. Kalber; J. J. O'Brien; F. L. Chase, Jr.; M. S. Renner; C. A. Carey; E. E. Habib. 51 chemists, 1 biologist, 4 engineers; technical personnel 41.

*Research activities:* Colloidal chemistry and the utilization of aqueous dispersions; the manufacture of elastomeric products by coagulating from water dispersions; the protection of food-stuffs, processed and frozen; emulsion polymerization; surface active agents; portland cement and concretes; impregnation of fibers and fibrous bats; adhesives. (Research initiated 1919.)

*Library:* 2,000 volumes.

**664. Diamond Alkali Company, 535 Smithfield St., Pittsburgh 22, Pa.**

*President:* J. T. Richards. *Executive Vice President:* R. F. Evans.

*Laboratory:* Painesville, Ohio.

*Research staff:* J. E. Underwood, Director of research; L. T. Welshans, Manager of development. 39 chemists, 2 physicists, 1 metallurgist, 23 engineers; technical personnel 5; additional personnel 25.

*Research activities:* The development of new products and processes in the fields of inorganic and organic chemistry; improvement of present products and processes; development of uses and markets for products. (Research initiated 1940.)

*Library:* 1,300 volumes.

**665. Diamond Chain and Manufacturing Company, 402 Kentucky Ave., Indianapolis 7, Ind.**

*President:* Guy A. Wainwright.

*Research staff:* G. G. Mize, Chief Engineer; A. E. Focke, Director of metallurgical research. 2 chemists, 1 physicist, 3 metallurgists, 4 engineers; technical personnel 6; additional personnel 5.

*Research activities:* Research on problems involved in the transmitting of power or the moving of material by roller chains; research to eliminate breakage, to reduce wear, and to minimize noise. (Research initiated 1921.)

**Diamond Crystal Salt Division, General Foods Corporation. See General Foods Corporation.**

**666. Diamond Match Company, 30 Church St., New York, N. Y.**

*President:* William A. Fairburn.

*Laboratory:* Oswego, N. Y.

*Research staff:* Walter O. Augustine, Vice President in charge of research.

*Research activities:* Problems connected with the manufacture of matches.

**667. Diamond Power Specialty Corporation, P. O. Box 288, Detroit 31, Mich.**

*President:* Willis P. Thomas.

*Research staff:* Harry E. Brelsford, Director. 4 engineers.

*Research activities:* Methods of cleaning ash and slag deposits from boilers and furnaces; the

development of cleaning apparatus; the study of metals and alloys at high temperatures; the development of water gages and level indicators and alarms for high pressures. (Research initiated 1930.)

**Dibble Color Company. See Pratt and Lambert, Inc.**

**Dicalite Division, Great Lakes Carbon Corporation. See Great Lakes Carbon Corporation.**

**668. Dietaphone Corporation, 375 Howard Ave., Bridgeport, Conn.**

*President:* Merrill B. Sands.

*Research staff:* L. D. Norton, Director; Simon Yerkovich, Designing Engineer. 3 chemists, 9 engineers; technical personnel 16; additional personnel 7.

*Research activities:* Recording and reproduction of sound, including educational and military applications, primarily applying to dictation and transcription, recording media, and testing methods. (Research initiated 1926.)

*Library:* 100 volumes.

*Cooperative research:* One fellowship is supported.

**669. Di Cyan and Brown, Consulting Chemists, 12 East 41st St., New York 17, N. Y.**

*Research staff:* Erwin Di Cyan, Director. 1 chemist; technical personnel 1; additional personnel 1.

*Research activities:* The development of pharmaceuticals and cosmetics. (Research initiated 1936.)

*Library:* 1,000 volumes.

**670. Diebold, Inc., 1411 Fifth St., S. W., Canton 2, Ohio.**

*President:* George H. Bockius.

*Laboratory:* 818 Mulberry Road, S. E., Canton, Ohio.

*Research staff:* A. L. Abbott, Director of engineering research. 1 metallurgist, 2 engineers; additional personnel 1.

*Research activities:* Record, burglary, and robbery protection; record systems; thin armor plate; processing of ferrous alloys; office equipment. (Research initiated 1926.)

*Library:* 300 volumes.

**671. Dietary Laboratories, 3564 First Ave., San Diego, Calif.**

*President:* Michael J. Walsh.

*Research staff:* Michael J. Walsh, Director. Additional personnel 4.

*Research activities:* Dietary supplements, diet surveys, diet analyses, and marine algae. (Research initiated 1932.)

**672. Dietert Company, Harry W.,** 9330 Roselawn Ave., Detroit 4, Mich.

*Owner:* Harry W. Dietert.

*Research staff:* Harry W. Dietert, Director. 3 chemists, 1 engineer; technical personnel 2; additional personnel 2.

*Research activities:* Spectrographic research and sand testing. (Research initiated 1925.)

*Library:* 300 volumes.

*Scientific periodicals:* Modern Analysis.

**Dietetic Research Laboratories, Inc.** See U. S. Vitamin Corporation.

**673. Dietrich, Morse and Associates,** 316 Sixteenth St., Sacramento 14, Calif.

*Principal associates:* W. F. Dietrich; G. H. Morse.

*Laboratories:* Chemical and Metallurgical, Sacramento, Calif.; Ceramics, Capitola, Calif.

*Research staff:* G. H. Morse, Director of chemistry and hydrometallurgy; W. F. Dietrich, Director of ore dressing and ceramics. 2 chemists, 1 metallurgist, 1 mining and geological engineer; technical personnel as needed; additional personnel 2.

*Research activities:* Nonferrous metallurgy and ore dressing; industrial mineral preparation and processing; food products; ceramics, including refractories, whiteware, porcelain, glaze development, clays, and other raw materials. (Research initiated 1935.)

*Library:* 500 volumes.

**674. Dietzgen Company, Eugene,** 954 Fullerton Ave., Chicago 14, Ill.

*President:* W. H. Lerch.

*Research staff:* W. H. Lerch, Director; Paul Dieterle, Director, Chemical Research Laboratory; L. R. Halstead, Industrial Research Laboratory. 3 chemists, 3 engineers; additional personnel 6.

*Research activities:* Basic investigations relating to chemicals, dyes, inks, reproduction and drafting papers and cloths, and to problems encountered in the design and manufacture of drafting and engineering supplies, including surveying instruments, measuring tapes, drafting machines, drawing instruments, scales, slide rules, etc. (Research initiated 1910.)

*Library:* 100 volumes.

**675. Difco Laboratories, Inc.,** 920 Henry St., Detroit 1, Mich.

*General Manager:* H. A. Burnett.

*Research staff:* Henry G. Dunham, Director. 8 chemists, 2 assistant chemists, 8 bacteriologists, 4 assistant bacteriologists; additional personnel 6.

*Research activities:* The preparation of dehy-

drated culture media and standardized ingredients of culture media and serological reagents; the preparation and standardization of pharmaceutical products. (Research initiated 1913.)

*Library:* 2,100 volumes.

*Scientific periodicals:* Difco Manual. Vol. I, 1927.

*Cooperative research:* Two fellowships are supported and five grants for research are made.

**Dill and Collins Division, Mead Corporation.**  
See Mead Corporation.

**676. Dillon and Company, Inc., W. C.,** 5410 West Harrison St., Chicago 44, Ill.

*President:* W. C. Dillon, Sr.

*Laboratory:* 719 North Laramie Ave., Chicago, Ill.

*Research staff:* W. C. Dillon, Sr., Director; Ralph Richmond Dillon, Chief Engineer. 2 engineers; technical personnel 1; additional personnel 1.

*Research activities:* Physical testing of metals, rubber, cloth, fiber, wood, springs, glass, plastics, etc. (Research initiated 1941.)

*Library:* 300 volumes.

**Dilts Machine Works.** See Black Clawson Company, Inc.

**677. Disston and Sons, Inc., Henry,** Unruh and Milnor Sts., Philadelphia, Pa.

*President:* S. Horace Disston.

*Research staff:* E. K. Spring, Director. 5 chemists, 4 metallurgists, 5 engineers; 2 in other scientific professions; technical personnel 4; additional personnel 1.

*Research activities:* The development of tool steels and special steels, saws, knives, files, and other special tools. (Research initiated 1921.)

*Cooperative research:* One grant for research is made.

**678. Distillation Products, Inc.,** 755 Ridge Road, West, Rochester 13, N. Y.

*President:* Thomas J. Hargrave.

*Research staff:* Kenneth C. D. Hickman, Vice President in charge of research; Norris D. Embree, Assistant Director. 21 chemists, 5 physicists, 3 biologists, 9 engineers, 33 technicians; additional personnel 12.

*Research activities:* High-vacuum distillation; biochemistry of oil-soluble vitamins; design of instruments for high-vacuum technology. (Research initiated 1938.)

*Library:* 514 volumes.

*Cooperative research:* Three grants for research are made.

679. Ditto, Inc., 2243 West Harrison St., Chicago 12, Ill.

*President:* Theodore W. Robinson.

*Laboratories:* 2243 West Harrison St. and 2516 Pratt Blvd., Chicago, Ill.

*Research staff:* Ralph E. Malles, Chief Engineer; M. J. Holik, Acting Chief Chemist. 6 chemists, 10 engineers; additional personnel 3.

*Research activities:* Duplicating machines and supplies, including gelatin and direct process. (Research initiated 1910.)

680. Dixie Cup Company, Chicago, Ill.

*President:* Hugh Moore.

*Laboratory:* Easton, Pa.

*Research staff:* Arthur J. Nolan, Director; Raymond Stocker, Assistant. 1 chemist, 3 engineers; additional personnel 60.

*Research activities:* The improvement of production machinery and processes; the design of machinery to produce new kinds of paper cups, dishes, and food containers; machinery to fill and seal the containers; the development of new uses for old products and of markets for new products. (Research initiated 1921.)

*Library:* 200 volumes.

681. Dixie Fire Brick Company, Inc., Birmingham 3, Ala.

*President:* J. W. Lewis.

*Laboratory:* Kimberly, Ala.

*Research staff:* E. M. Davis, Director. Additional personnel 2.

*Research activities:* Fire brick and refractory materials. (Research initiated 1938.)

682. Dixon Crucible Company, Joseph, 167 Wayne St., Jersey City 3, N. J.

*President:* J. H. Schermerhorn.

*Research staff:* Sherwood B. Seeley, Director. 4 chemists, 4 engineers, 1 ceramist, 1 mineralogist; technical personnel 4; additional personnel 3.

*Research activities:* Graphitic refractories; pencils, crayons, and marking instruments; graphites; graphite lubricants; paints; moulded graphite products; rubber erasers; fine grinding. (Research initiated 1920.)

*Library:* 600 volumes.

*Cooperative research:* Two fellowships are supported.

683. DoAll Company, 254 North Laurel Ave., Des Plaines, Ill.

*Managing Partner:* L. A. Wilkie.

*Research staff:* W. T. Anderson, Chief Engineer. 1 physicist, 3 metallurgists, 5 engineers; technical personnel 7; additional personnel 3.

*Research activities:* The development of new

products; customer research service and improvement of products now on market: principally contour sawing machines, band filing machines, and cutting tools for ferrous and non-ferrous metals, plastics, and wood products; precision surface grinders; quality control inspection equipment (comparators, gage blocks, and instruments); speedmaster pulleys (infinitely variable speed control); coolants and cutting fluids; layout fluids; abrasive polishing bands; powder metallurgy equipment and metal powders. Research problems of the Savage Tool Company, Savage, Minn., also are handled by the laboratory of the DoAll Company. (Research initiated 1941.)

*Library:* 400 volumes.

684. Dodge and Olcott, Inc., 69 Avenue A, Bayonne, N. J.

*Vice President in charge of production:* C. A. Myers.

*Research staff:* Herman Wachs, Director. 3 chemists; technical personnel 3; additional personnel 1.

*Research activities:* The development of technique in the manufacture of essential oils, oleo resins, aromatic chemicals, and kindred products. (Research initiated 1934.)

*Library:* 1,000 volumes.

Dodge Brothers Corporation. See Chrysler Corporation.

Dodge Brothers Truck Division. See Chrysler Corporation.

685. Doehler-Jarvis Corporation, 386 Fourth Ave., New York 16, N. Y.

*President:* L. A. Jarvis.

*Laboratories:* Batavia, N. Y.; Toledo, Ohio; Pottstown, Pa.; Grand Rapids, Mich.; Chicago, Ill.

*Research staff:* J. C. Fox, Chief Metallurgist; C. Pack, Vice President. 5 chemists, 5 metallurgists; technical personnel 12; additional personnel 10.

*Research activities:* The development of improved die casting alloys, die materials, casting machines, and casting finishes and methods of finishing; spectrographic analysis, radiography, etc. (Research initiated 1911.)

*Library:* 600 volumes.

686. Dolge Company, C. B., Westport, Conn.

*President:* K. A. Dolge.

*Laboratory:* Saugatuck, Conn.

*Research staff:* C. L. Weirich, Director. 3 chemists, 1 chemical engineer, 1 bacteriologist; additional personnel 2.

*Research activities:* Disinfectants, fungicides, cleaning compounds, industrial sanitary main-

tenance specialties, and insecticides. (Research initiated 1927.)

*Library:* 200 volumes.

**687. Dome Precision Corporation, 63 Park Row, New York 7, N. Y.**

*President:* Alexander Carrod.

*Research staff:* Lloyd Motz, Vice President and Director. 1 chemist, 1 physicist, 3 engineers; additional personnel 20.

*Research activities:* Optical work; the designing, developing, and testing of precision optical instruments and lenses. (Research initiated 1943.)

**688. Dorr Company, Inc., 570 Lexington Ave., New York 22, N. Y.**

*President:* John Van Nostrand Dorr.

*Laboratory:* Westport Mill Research and Testing Laboratories, Westport, Conn.

*Research staff:* George M. Darby, Manager; Elliott J. Roberts, Research Director; W. A. Lutz, Chief Chemist; Robert B. Neill, Chief Analytical Chemist; Frank L. Bosqui, Metallurgical Engineer. 4 chemists, 1 physicist, 4 metallurgical engineers, 4 chemical engineers, 1 mechanical engineer, 1 electrical engineer, 2 sanitary engineers, 3 analytical chemists, 4 laboratory technicians; additional personnel 10.

*Research activities:* The purification of water, sewage, and trade wastes; the concentration, flotation, classification, and grinding of metallurgical ores; the manufacture of heavy chemicals, cement, fertilizers, etc. (Research initiated 1918.)

*Library:* 1,200 volumes.

**689. Doughboy Mills, Inc., New Richmond, Wis.**

*President:* E. J. Cashman.

*Research staff:* C. R. Arnold, Director. 2 chemists, 1 engineer; technical personnel 3; additional personnel 4.

*Research activities:* Chemicals from cereals; livestock feeds; packaging. (Research initiated 1943.)

*Library:* 100 volumes.

**690. Doughnut Corporation of America, Ellicott City, Md.**

*President:* A. Levitt.

*Research staff:* W. G. Epstein, Director; S. Aronson; E. G. Heyl. 6 chemists; technical personnel 14; additional personnel 1.

*Research activities:* Dehydration; modification of ingredients used in the company's products; bacteriological research. (Research initiated 1920.)

*Library:* 200 volumes.

*Cooperative research:* One grant for research is made.

**691. Douglas Aircraft Company, Inc., 3000 Ocean Park Blvd., Santa Monica, Calif.**

*President:* Donald W. Douglas.

*Laboratories:* Douglas Research Laboratories, Santa Monica, Calif.; Engineering Laboratories, El Segundo, Calif.

*Research staff:* A. E. Raymond, Vice President and Director of engineering; F. R. Colbohm, Technical Assistant to the Vice President. *Douglas Research Laboratories:* J. R. Goldstein, Chief. 3 chemists, 13 physicists, 2 metallurgists, 51 engineers; technical personnel 137; additional personnel 80. *Engineering Laboratories:* P. A. Dennis, Chief. 1 physicist, 11 engineers; technical personnel 40; additional personnel 8.

*Research activities:* Aeronautical structures; applied physics (acoustics, electronics); applied mechanics; materials. (Research initiated 1934.)

*Library:* Douglas Research Laboratories, 3,500 volumes. Engineering Laboratories, 500 volumes.

**692. Douglas Fir Plywood Association, Tacoma Bldg., Tacoma, Wash.**

*Managing Director:* W. E. Difford.

*Research staff:* N. S. Perkins, Technical Director; John Ritchie, Chief, Testing Department. 1 chemist, 1 biologist, 2 engineers; technical personnel 4; additional personnel 4.

*Research activities:* Plywood, Douglas fir: mechanical and physical properties; glue performance in panels; finishing paints, sealers; preservatives; plastic overlays; fabrication. (Research initiated 1936.)

*Library:* 150 volumes.

**693. Dow, Inc., A. W., 801 Second Ave., New York 17, N. Y.**

*President:* A. W. Dow.

*Research staff:* Carl Bussow, Director. 2 chemists, 1 physicist, 1 engineer; additional personnel 1.

*Research activities:* Bituminous paving and waterproofing. (Research initiated 1903.)

*Library:* 500 volumes.

**694. Dow Chemical Company, Midland, Mich.**

*President:* Willard H. Dow.

*Plant Laboratories:* Manufacture at the Dow Chemical Company comprises five distinct divisions, under which the general analytical laboratory and plant control laboratories are directly operative: Inorganic Chemicals Division, Ivan F. Harlow, Production Manager; Dyes and Organic Heavy Chemicals Division, C. J. Stro-sacker, Production Manager; Pharmaceutical and Allied Products Division, W. H. Williams, Production Manager; Cellulose Products, W. R. Collings, Production Manager; Dowmetal Fabrication, G. F. Dressel, Production Manager.

**Research staff:** Inorganic chemical research: Ivan F. Harlow, Director; A. W. Beshgetoor, Associate Director. Chemical engineering research: S. B. Heath, Director. Organic chemical research: Edgar C. Britton, Director; Howard S. Nutting, Associate Director. Dye research: C. C. Kennedy, Director. Physical research: J. J. Grebe, Director. Metallurgical research: J. D. Hanawalt, Director; C. E. Nelson, Associate Director. Spectroscopy: J. D. Hana:alt, Director; Norman Wright, Associate Director. Cellulose products research: W. R. Collings, Director; F. C. Peterson, Associate Director. Biological research: D. D. Irish, Director; E. E. Dunn, Associate Director. Semi-plant research: J. W. Britton, Director. 650 chemists, chemical engineers, physicists, biologists, mechanical engineers, metallurgists, and 500 additional personnel carry on the research work for the Dow Chemical Company and its subsidiaries and divisions.

**Research activities:** Metallurgy (magnesium); inorganic chemistry; organic chemistry; physics. (Research initiated 1897.)

**Library:** 23,000 volumes.

**Cooperative research:** Two to three fellowships are supported.

**GREAT WESTERN DIVISION**  
Pittsburg, Calif.

**Research staff:** R. L. Curtis, General Manager; W. Hirschkind, Director.

**TEXAS DIVISION**  
Freeport, Tex.

**Research staff:** A. P. Beutel, General Manager. (Research work carried on at Midland.)

**SEAL BEACH PLANT**  
Seal Beach, Calif.

**Research staff:** F. E. Lusk, Manager; D. T. Prendergast, Director.

**ANN ARBOR LABORATORY**  
Ann Arbor, Mich.

**Research staff:** O. C. Cessna, Manager; W. L. Badger, Consulting Engineer.

**DOWMETAL FOUNDRY DIVISION**  
Bay City, Mich.

**Research staff:** G. F. Dressel, Production Manager; Wesley Dove, Superintendent. (Research work carried on at Midland.)

**ETHYL-DOW CHEMICAL COMPANY**  
Wilmington, N. C.

**Research staff:** G. E. Cantwell, Plant Manager; H. T. Patterson and J. E. D. Clark, Assistant Managers.

**DOWELL INCORPORATED**  
Tulsa, Okla.

**Research staff:** A. P. Beutel, President; J. G. Staudt, General Manager; D. G. Hefley, Chief Research Engineer; P. H. Cardwell, Chief Chemist.

**CLIFFS DOW CHEMICAL COMPANY**  
Marquette, Mich.

**Research staff:** M. E. Putnam, President; R. W. Jenner, General Manager; A. W. Goos, Associate Director; A. A. Reiter, Associate Director. (Directed from Midland.)

**Dowell Incorporated.** See Dow Chemical Company.

**Dowmetal Foundry Division, Dow Chemical Company.** See Dow Chemical Company.

**695. Drackett Company, 5020 Spring Grove Ave., Cincinnati 32, Ohio.**

**President:** Harry R. Drackett.

**Laboratories:** Cincinnati and Sharonville, Ohio.

**Research staff:** Robert A. Boyer, Director of scientific research; Donald C. Spice, Chemical Director; J. N. Lawrence, Assistant Chemical Director; Frank H. Roninger, Chief Research Engineer. 24 chemists, 1 physicist, 1 biologist, 5 engineers; technical personnel 30; additional personnel 8.

**Research activities:** The development of products in the soybean industry: meals, oil, proteins, paints, fibers, films, paper coatings, foods, and chemical specialties. (Research initiated 1932.)

**Library:** 500 volumes.

**Cooperative research:** Three grants for research are made.

**696. Drakenfeld and Company, Inc., B. F., 45 Park Place, New York 7, N. Y.**

**President:** Scott J. Courtney.

**Laboratory:** Washington, Pa.

**Research staff:** R. R. Shively, Vice President in charge of research. Glass Colors Division: Ray Andrews, Director of research; V. H. Remington, Manager and Director of sales; A. William Samson, Technologist. Porcelain Enamel Colors Division: H. M. Brenner, Director of research; A. Sedenka, Chemical Engineer. Clay Wares Colors Division: Frank Jansma, Director of research; E. H. Ray, Assistant Manager; B. H. Morrison, Technologist. 11 chemists; technical personnel 10; additional personnel 22.

**Research activities:** The development of glass colors, china colors, and oxide colors; manufacturing methods and developments for the ceramic industry. (Research initiated 1920.)

**Library:** 200 volumes.

697. Driver Company, Wilbur B., 150 Riverside Ave., Newark 4, N. J.

*President:* Robert O. Driver.

*Research staff:* Charles P. Marsden, Technical Director. 3 chemists, 4 metallurgists, 2 engineers; technical personnel 3; additional personnel 7.

*Research activities:* Metallurgical and chemical investigations on resistance wire and alloys. (Research initiated 1936.)

698. Driver-Harris Company, P. O. Drawer 31, Harrison, N. J.

*President:* Frank L. Driver, Jr.

*Research staff:* M. A. Hunter, Director; J. M. Lohr, Manager of laboratory. 2 chemists, 1 physicist, 4 metallurgists, 2 engineers; technical personnel 8; additional personnel 2.

*Research activities:* Plant control and research on heat-resisting alloys, and on special nickel-chromium and similar alloys. (Research initiated 1917.)

*Library:* 300 volumes.

699. Drug Products Company, Inc., 19 West 44th St., New York 18, N. Y.

*President:* Joseph H. Moss.

*Laboratory:* 26-32 Skillman Ave., Long Island City 1, N. Y.

*Research staff:* Harland E. Heilig, Director; Stephen P. Joffre, Chief Chemist. 4 chemists; technical personnel 7; additional personnel 35.

*Research activities:* Pharmaceutical and medicinal research. (Research initiated 1913.)

*Library:* 625 volumes.

Dubin Laboratories, Inc., H. E. See U. S. Vitamin Corporation.

700. Duff and Sons, Inc., P., Grant Bldg., Pittsburgh 30, Pa. (Division of American Home Foods.)

*President:* Tex Roden.

*Laboratory:* 920 Duquesne Way, Pittsburgh, Pa.

*Research staff:* David L. Carpenter, Director. 3 chemists, 1 bacteriologist, 2 home economists; additional personnel 10.

*Research activities:* Cereal chemistry; sugar and molasses technology; food technology; chemical leavenings; enzymology. (Research initiated 1928.)

*Library:* 3,000 volumes.

*Cooperative research:* One grant for research is made.

701. Duff Norton Manufacturing Company, Box 1889, Pittsburgh 30, Pa.

*President:* W. I. Floyd.

*Research staff:* F. J. LaPointe, Director. 2

chemists, 1 metallurgist; technical personnel 3; additional personnel 2.

*Research activities:* Metallurgy. (Research initiated 1920.)

*Library:* 150 volumes.

702. Duncan Electric Manufacturing Company, 3rd and Mechanic Sts., Lafayette, Ind.

*President:* Frederick Holmes.

*Research staff:* R. A. Road, Chief Engineer; G. N. Burkhart, Assistant Chief Engineer. 5 engineers; technical personnel 2; additional personnel 14.

*Research activities:* The development and improvement of watt-hour meters and allied electrical measuring equipment. (Research initiated 1902.)

*Library:* 200 volumes.

*Cooperative research:* Three grants for research are made.

703. Dunham Company, C. A., 506 East 2nd St., Michigan City, Ind.

*President:* C. A. Dunham.

*Research staff:* D. N. Crosthwait, Jr., Technical Adviser; E. W. Werts, Assistant. 3 engineers; additional personnel drawn from development, office, and manufacturing staff as needed.

*Research activities:* Investigations leading to the development of new and improved heating systems, principally steam heating, including allied equipment such as thermostatic traps, vacuum pumps, centrifugal pumps, convectors, heat exchangers, unit heaters, air conditioners, temperature controllers, special control devices, etc.; the application of the Dunham sub-atmospheric method of steam heating to industrial purposes; the improvement of manufacturing processes and testing; data for selection and use of equipment. (Research initiated 1912.)

#### EXPERIMENTAL LABORATORIES, INC.

Dunham Bldg., Chicago, Ill.

*Research staff:* A. R. Dunham, Chemical Engineer.

*Research activities:* Research and development work on "Sav-T-heat," a new method of burning gas and utilizing the gas-vapor mixture for home heating; other gas burning processes. (Research initiated 1928.)

704. Dunlop Tire and Rubber Corporation, Buffalo 7, N. Y.

*President:* E. B. Germain.

*Research staff:* Howard E. Elden, Technical Manager. 10 chemists, 5 engineers; technical personnel 23; additional personnel 3.

*Research activities:* Tires and tubes; latex sponge rubber; electric-conducting rubber; sporting goods, including tennis balls and soft balls. (Research initiated 1923.)



*Cooperative research:* One grant for research is made.

**705. Duplan Corporation**, 512 Seventh Ave., New York 18, N. Y.

*President:* E. C. Geier.

*Laboratories:* Hazleton and Kingston, Pa.; Winston-Salem, N. C.

*Research staff:* W. S. Wheeler, Jr., Director. 2 chemists, 1 engineer; technical personnel 10; additional personnel 15.

*Research activities:* Improvement in the technique of processing, weaving, and knitting natural and synthetic yarns; the development of new fabrics and new uses for synthetic fibers. (Research initiated 1911.)

*Library:* 100 volumes.

**706. du Pont de Nemours Company, Inc., E. I.**, Wilmington 98, Del.

*President:* Walter S. Carpenter, Jr.

*Vice President, Research Adviser:* Roger Williams.

*Library:* 100,000 volumes; 2,400 trade journals; patents and patent indexes; business services; trade catalogues.

*Cooperative research:* An appropriation of \$44,500 has been made by the du Pont Company for fellowships for the academic year 1945-46 to cover the cost of thirty-five postgraduate fellowships. Each fellowship carries a stipend of \$1,000 and the cost of tuition.

#### AMMONIA DEPARTMENT

Wilmington, Del.

John S. Beekley, Chemical Director; 2 assistant chemical directors.

*Laboratory:* Experimental Station, Wilmington, Del.

*Research staff:* 85 chemists, chemical engineers, and other technical employees with 90 additional personnel; also 55 chemists and chemical engineers, 30 engineers and 2 metallurgists at the Belle, W. Va. Plant assigned to the improvement of plant processes under the direction of J. L. E. Cheetham, Production Manager.

*Research activities:* Ammonia, alcohol, and high-pressure syntheses including catalysis and gas purification; nylon intermediates; the development of new processes and products based on coal, air, and water as fundamental materials; hydrocarbon chemistry; product development work on fertilizers, antifreeze, solvents, hydraulic fluids, food products, and synthetic resins. (Research initiated 1924.)

#### CHEMICAL DEPARTMENT

Wilmington, Del.

Elmer K. Bolton, Chemical Director; Cole Collidge, Assistant Chemical Director.

*Laboratory:* Experimental Station, Wilmington, Del.

*Research staff:* A. P. Tanberg, Director; M. M. Brubaker, Assistant Director; 4 research supervisors. 163 chemists, 9 physicists, 4 engineers; additional personnel 690.

*Research activities:* Fundamental research in practically all fields of chemistry; pioneering research involving both organic and inorganic materials in connection with textile fibers, films, coating compositions, synthetic polymers, plastics, pesticides, textile chemicals, synthetic rubber, pigments; hydrogenations, and other processes involving catalysis and reactions under high pressure. (Research initiated 1904.)

#### ELECTROCHEMICALS DEPARTMENT

Wilmington, Del.

D. O. Notman, Director, Technical Division; C. W. Tucker, Director, Chemical Research; P. J. Carlisle, Manager, Field Research.

*Research staff:* *Niagara Falls, N. Y.:* H. J. Barrett, Manager, Chemical Research; W. H. Vining, Manager, Applied Research. *Perth Amboy, N. J.:* Campbell Robertson, Manager, Chemical Research. 156 chemists and engineers; additional personnel 50.

*Research activities:* Improvements in existing products and the development of new uses and processes; research on materials related to present products and present manufacturing processes. (Research initiated 1895 at Niagara Falls, and 1885 at Perth Amboy.)

#### ENGINEERING DEPARTMENT

##### DEVELOPMENT ENGINEERING DIVISION

Wilmington, Del.

##### Chemical Engineering and Metallurgical Laboratory

*Research staff:* C. M. Cooper, Director. 45 engineers.

*Research activities:* Research on process equipment design; chemical engineering unit operations; materials of construction primarily for chemical equipment; the improvement and utilization of corrosion resistant alloys; instrumentation and process control. (Research initiated 1931.)

##### Mechanical Development Laboratory

*Research staff:* J. E. Ross, Manager. 19 engineers.

*Research activities:* Development of automatic, semi-automatic, and special equipment. (Research initiated 1944.)

EXPLOSIVES DEPARTMENT

Wilmington, Del.

C. A. Woodbury, Manager, Technical Division; F. F. Chapman and L. A. Burrows, Assistant Managers.

*Research staff:* *Eastern Laboratory*, Gibbstown, N. J.: W. E. Kirst, Director. 36 chemists, 18 chemical engineers, 23 technicians; additional personnel 103. *Burnside Laboratory*, Carneys Point, N. J.: S. C. Lloyd, Director. 12 chemists, 7 chemical engineers, 6 physicists, 2 electrical engineers, 1 librarian, 2 laboratory technicians, 10 ballistic testing personnel; additional personnel 57.

*Research activities:* *Eastern Laboratory:* Control and development work on commercial high explosives, black powder, blasting caps, and explosive rivets. Development work and process improvement on ammonia oxidation, nitric and sulfuric concentration, ammonium nitrate, and other organic and inorganic products. (Research initiated 1902.) *Burnside Laboratory:* Investigations on smokeless powder and the raw materials for its preparation. Ballistics measurements; minor research in physics. (Research initiated 1905.)

FABRICS AND FINISHES DEPARTMENT

Wilmington, Del.

John Marshall, Director, Chemical Division; Dorman McBurney, Assistant Director; H. E. Eastlack, Staff Assistant.

*Research staff:* *Philadelphia, Pa.:* J. B. Bullitt, Jr., Laboratory Director. 60 chemists; technical personnel 55; additional personnel 29. *Parlin, N. J.:* G. E. Conde, Laboratory Director; Russell Morgan, Assistant Director. 40 chemists, 24 laboratorians; technical personnel 14; additional personnel 6. *Flint, Mich.:* R. B. Davis, Laboratory Director. 11 chemists, 10 laboratorians; additional personnel 5. *Fairfield, Conn.:* A. E. Schildhauer, Laboratory Director; G. T. Vaala, Assistant Director. 8 chemists, 13 laboratorians; technical personnel 4; additional personnel 12. *Newburgh, N. Y.:* R. E. Thomas, Laboratory Director. 13 chemists, 14 laboratorians; technical personnel 9; additional personnel 6.

*Research activities:* *Philadelphia, Parlin, and Flint:* Synthetic resins, varnishes, enamels, paints, undercoats, lacquers, plasticizers, softeners, nitrocellulose, and adhesives. (Research initiated 1927, 1909, and 1923 respectively.) *Fairfield:* Calendered rubber and synthetic resin-coated fabrics. (Research initiated 1910.) *Newburgh:* Solution-coated fabrics. (Research initiated 1910.)

GRASELLI CHEMICALS DEPARTMENT

Wilmington, Del.

J. C. Woodhouse, Director, Technical Division; W. H. Salzenberg, Assistant Director.

*Laboratories:* Fundamental Research; Process Development and Semiworks; Pest Control Research; Veterinary Medicine, Experimental Station, Wilmington, Del. Inorganic and Applied Research, Cleveland, Ohio. du Pont Semesan Laboratory, Minquadale, Del.

*Research staff:* 65 chemists, 15 biologists, 45 engineers; technical personnel 5.

*Research activities:* General research work in inorganic and organic fields; inorganic is primarily in connection with heavy chemicals, especially acids, silicates, metal derivatives, and electroplating chemicals; organic, with the synthesis of chemicals from petroleum hydrocarbons and chemicals for pest control and veterinary medicine purposes.

MEDICAL DIVISION

Wilmington, Del.

John H. Foulger, Director of research; Allan J. Fleming, Assistant Director of research.

*Laboratory:* Haskell Laboratory of Industrial Toxicology, Experimental Station, Wilmington, Del.

*Research staff:* 1 chemist, 1 physicist, 1 industrial hygienist, 1 pathologist, 5 medical technologists; additional personnel 7.

*Research activities:* Industrial toxicology (industrial and clinical). (Research initiated 1935.)

ORGANIC CHEMICALS DEPARTMENT

Wilmington, Del.

H. W. Elley, Chemical Director; H. A. Lubs, Assistant Chemical Director for research; W. S. Calcott, Assistant Chemical Director for development.

*Research staff:* *Jackson Laboratory*, Deepwater Point, N. J.: J. M. Tinker, Director; G. E. Holbrook, Assistant Director. 115 chemists and engineers; technical personnel 80; additional personnel 540. *Rubber Laboratory*, Deepwater Point, N. J.: H. G. Bimmerman, Manager. 23 technical men, 3 in scientific professions; additional personnel 50. *Petroleum Chemicals Testing Laboratory*, Deepwater Point, N. J.: E. L. Korb, Manager. 2 engineers, 1 engineer's assistant, 3 chemists; technical personnel 1; additional personnel 25. *Technical Laboratory*, Deepwater Point, N. J.: G. H. Schuler, Director; M. A. Dahlen, Assistant Director. 43 employees. *Biological Laboratory*, Jersey Ave. and Hay Street, New Brunswick, N. J.: James Waddell, Director. 6 research chemists, 3 junior research chemists; additional personnel 7.

**Research activities:** *Jackson Laboratory:* Intermediates, dyes, rubber chemicals, refrigerants, perfumes, detergents, wetting-out agents, permanent waterproofing agents, chemicals for the petroleum industry, photographic chemicals, synthetic camphor, synthetic rubber. *Technical Laboratory:* Standardization, field demonstration, and service work on intermediates, dyes, colored pigments, surface active agents, water repellents, mildew inhibitors, finishing agents for textiles, and other organic chemical specialties; training of men for field work. Research work: The development of new uses and the improvement of the present applications of the above products; the development of new specialties. *Rubber Laboratory:* Standardization, the development of new compounding technique, large-scale tests of new rubber products, service work in connection with rubber accelerators, antioxidants, plasticizers, colors, and synthetic rubbers. *Petroleum Chemicals Testing Laboratory:* The standardization of petroleum chemicals including gasoline gum inhibitors and antioxidants, lubricating oil stabilizers, and other synthetic chemicals used by the petroleum industry; the working out of new test methods to indicate serviceability of petroleum chemicals; service work in connection with commercial use of petroleum chemicals. *Biological Laboratory:* Research work on Vitamin D, the standardization of manufactured material, the development of more adequate tests for the control of manufacturing processes and the evaluation of final products.

**PHOTO PRODUCTS DEPARTMENT**  
Wilmington, Del.

E. B. Middleton, Director of research; F. Schulze, Assistant Director.

*Laboratories:* Parlin, N. J.; Towanda, Pa.; Rochester, N. Y.

*Research staff:* 32 chemists, 5 physicists; technical personnel 8; additional personnel 62. 38 technical and 120 additional personnel on control work.

*Research activities:* Photographic and radiographic emulsions, film base, photographic developers, photographic papers, X-ray and fluoroscopic screens, fluorescent powders.

**PIGMENTS DEPARTMENT**  
Wilmington, Del.

**WHITE PIGMENTS RESEARCH DIVISION**

J. E. Booge, Director; Ignace J. Krchma, Assistant Director.

*Laboratories:* Newport and Edge Moor, Del.; Baltimore, Md.

*Research staff:* 84 chemists and chemical engineers; technical personnel 25; additional personnel 59.

*Research activities:* Pigment titanium dioxide,

other titanium pigments, lithopone, and new product development in the non-pigment field.

**PIGMENT COLORS RESEARCH DIVISION**

E. R. Allen, Director; D. H. Dawson, Assistant Director.

*Laboratory:* Newark, N. J.

*Research staff:* 36 chemists and chemical engineers, 1 physicist; technical personnel 9; 35 laboratorians.

*Research activities:* The development and use of inorganic and organic pigment colors and corrosion inhibitive pigment including chrome yellow, zinc yellow, iron blue, organic lakes, and toners.

**PLASTICS DEPARTMENT**  
Wilmington, Del.

John L. Brill, Chemical Director; 4 technical assistants.

*Laboratory:* Arlington, N. J.

*Research staff:* Harold W. Paine, Laboratory Director; Frederick C. Hahn, Assistant Laboratory Director. 64 chemists, physicists, and engineers; additional personnel 98.

*Research activities:* Resins (methyl methacrylate, vinyl, nylon, polythene, tetrafluoroethylene, etc.) and cellulose derivatives, and their application in plastics.

**RAYON DEPARTMENT**  
Wilmington, Del.

M. du Pont Lee, Manager, Technical Division; E. B. Benger, General Assistant Manager; A. E. Buchanan, Assistant Manager.

*Research staff:* *Acetate Research Laboratory,* Waynesboro, Va.: F. H. Swezey, Director; G. S. Hooper, Assistant Director. 2 managers, 4 supervisors, 2 group leaders, 16 chemists, 3 engineers; additional personnel 59. *Cellophane Research Laboratory,* Buffalo, N. Y.: G. M. Karns, Director; W. L. Hyden, Assistant Director. 2 managers, 4 supervisors, 2 group leaders, 30 chemists, 1 physicist, 5 engineers; additional personnel 21. *Engineering Laboratories:* Buffalo, N. Y.; Richmond, Va.; Waynesboro, Va.; Wilmington, Del.: O. W. Gay, Director; J. E. Bickley, Assistant Director. 6 managers, 1 assistant manager, 6 supervisors, 3 group leaders, 51 engineers. *Nylon Research Laboratory,* Wilmington, Del.: G. P. Hoff, Director; W. W. Heckert, Assistant Director. 1 manager, 4 supervisors, 23 chemists, 4 engineers; additional personnel 106. *Pioneering Research Laboratory,* Buffalo, N. Y.: W. H. Charch, Director. 1 manager, 5 supervisors, 1 group leader, 27 chemists, 2 physicists, 4 engineers; additional personnel 36. *Viscose Rayon Research Laboratory,* Richmond, Va.: L. S. Sinness, Director; E. F. Wesp, Assistant Director.

1 manager, 6 supervisors, 29 chemists, 2 physicists, 3 engineers; additional personnel 54.

*Research activities:* Fundamental and applied chemical research in the fields of textile fibers, films, synthetic polymers, cellulose caps, bands and sponges; cellulose and synthetic polymer molding compounds; coating compositions; new intermediates and organic chemicals. Engineering, market survey, and patent studies in the above and related fields.

REMINGTON ARMS COMPANY, INC.  
Bridgeport, Conn.

(Subsidiary of E. I. du Pont de Nemours and Company, Inc.)

G. O. Clifford, Technical Director.

*Research staff:* E. L. Wemple, Manager, Development Division; R. E. Evans, Manager, Ammunition Division; G. R. McCormick, Manager, Arms Division; C. I. Bradford, Superintendent of research; R. A. A. Hentschel, Superintendent of engineering; P. B. Rutherford, Superintendent of design. 11 chemists, 3 physicists, 2 metallurgists; technical personnel 66; additional personnel 143.

*Research activities:* Sporting arms and ammunition; targets and traps; explosives; ballistics.

707. Durez Plastics and Chemicals, Inc., North Tonawanda, N. Y.

*President:* Harry M. Dent.

*Research staff:* Robert M. Crawford, Vice President in charge of development and research; Alvin F. Shepard; Lothar A. Sontag. 20 chemists, 3 engineers; technical personnel 29.

*Research activities:* Developmental research on plastic organic materials. (Research initiated 1926.)

*Library:* 1,000 volumes.

708. Durfee Company, Inc., W. C., 114 Federal St., Boston 10, Mass.

*President:* Walter C. Durfee.

*Research staff:* Walter C. Durfee, chemical and physical research; Edward S. Chapin, dye applications.

*Research activities:* Mordants and fixing salts (after treatments) for improving fastness of dyes, especially with colors on woolens and worsteds, and on mixed fibers and fabrics; adjustment and control of useful properties in specialties manufactured. (Research initiated 1885.)

*Library:* 100 volumes.

709. Duriron Company, Inc., P. O. Box 1019, Dayton 1, Ohio.

*President:* W. E. Hall.

*Research staff:* D. E. Jack, Vice President in

charge of engineering and sales. 3 chemists, 2 metallurgists, 3 engineers; technical personnel 5; additional personnel 10 to 15.

*Research activities:* The development of new corrosion resisting alloys and improvement in the quality of present corrosion resisting alloys. (Research initiated 1914.)

*Library:* 500 volumes.

710. Durite Plastics, Inc., 5000 Summerdale Ave., Frankford Station P. O., Philadelphia, Pa.

*President:* J. Stogdell Stokes.

*Laboratories:* Philadelphia, Pa.; 4851 South St. Louis Ave., Chicago, Ill.

*Research staff:* E. E. Novotny, Director; W. C. Wilson, Chief Technician; 15 chemists, 3 engineers; technical personnel 11; additional personnel 8.

*Research activities:* Potentially reactive resins of the phenolaldehyde type, particularly phenol-formaldehyde and phenol-furfural; oil soluble synthetic resins for varnish and paint production; molding compositions; special industrial bonds for electrical resistance, frictional surfaces, abrasive bodies, and plywood; methods of utilizing such materials in the industry. (Research initiated 1916.)

*Library:* 500 volumes.

Durkee Famous Foods. See Glidden Company.

711. Eagle Pencil Company, 710 East 14th St., New York 9, N. Y.

*President:* Edwin M. Berolzheimer.

*Research staff:* I. Chesler, Director; H. F. Stowe, N. Gonzalez, A. Pischel; 2 chemists, 1 physicist, 2 engineers; technical personnel 9; additional personnel 3.

*Research activities:* The investigation of thermal effects on ceramic materials; the investigation of plastic materials. (Research initiated 1920.)

*Library:* 700 volumes.

712. Eagle-Picher Company, American Bldg., Cincinnati 1, Ohio.

*President:* J. M. Bowlby.

*Laboratories:* Central Research Laboratories, Joplin, Mo. Plant Process and Product Development Laboratories: Joplin, Mo.; Galena, Kans.; Picher, Okla.; Henryetta, Okla.; Cincinnati, Ohio; Argo, Ill.; Hillsboro, Ill.

*Research staff:* R. L. Hallows, Executive Officer for coordinating research and Assistant to the President; E. W. McMullen, Director of research; H. R. Harner, Assistant Director. *Central Research Laboratory:* 10 chemists, 2 physicists, 2 metallurgists, 4 engineers, 1 geologist; technical personnel 13; additional personnel

11. *Plant Laboratories*: 6 chemists, 2 metallurgists, 2 engineers, 5 technicians.

*Research activities*: Process investigation and metallurgy; the development of lead and zinc products and their application to storage batteries, rubber, paint, inorganic colors, ceramics, oil refining, and insecticides; thermal insulation. (Research initiated 1914.)

*Library*: 1,500 volumes.

*Scientific periodicals*: Storage Battery Technology. Vol. I, 1936.

*Cooperative research*: One fellowship is supported.

**Eagle Printing Ink Company.** See Sun Chemical Corporation.

713. **Eagle Rubber Company, Inc.**, 710 Orange St., Ashland, Ohio.

*President*: John F. Sweeney.

*Research staff*: Parke H. Watkins, Technical Director. 2 chemists, 1 engineer; technical personnel 2; additional personnel 1.

*Research activities*: Rubber and rubber products. (Research initiated 1942.)

*Library*: 100 volumes.

714. **Early and Daniel Company**, Chamber of Commerce Bldg., 4th and Race Sts., Cincinnati, Ohio.

*President*: E. B. Terrill.

*Laboratory*: 1243 West 6th St., Cincinnati, Ohio.

*Research staff*: Robert L. Kemper, Director. 1 chemist, 1 biologist; additional personnel 1.

*Research activities*: Nutrition for livestock and poultry. (Research initiated 1926.)

715. **Eastern Clay Products, Inc.**, Eifert, Ohio.

*President*: Vernon F. Taylor.

*Laboratories*: Eifert, Ohio; Pontotoc, Miss.

*Research staff*: N. J. Dunbeck, Vice President in charge of research. 1 chemist, 2 engineers.

*Research activities*: Foundry bond clays. (Research initiated 1930.)

*Library*: 250 volumes.

716. **Eastern Corporation**, Bangor, Maine.

*President*: C. B. Morgan.

*Laboratory*: South Brewer, Maine.

*Research staff*: Clifford Patch, Director. 6 chemists, 5 engineers; technical personnel 8; additional personnel 4.

*Research activities*: Papers and pulps; cellulose products; chlorine and alkalis; plastics; miscellaneous by-products. (Research initiated 1908.)

*Library*: 900 volumes.

717. **Eastman Kodak Company**, Rochester 4, N. Y.

*President*: Thomas J. Hargrave.

*Research staff*: C. E. Kenneth Mees, Vice President and Director. Scientific personnel 255; technical personnel 68; additional personnel 66.

*Research activities*: The theory of photography; the development of new photographic apparatus, materials, and processes; the physical and chemical properties of natural and synthetic compounds of high molecular weight, including gelatin, cellulose acetate, and resins; studies of optics and new types of optical glass; studies of color theory and colorimetry; production of synthetic organic chemicals and stable isotopes. (Research initiated 1912.)

*Library*: 21,000 volumes.

*Scientific periodicals*: Abridged Scientific Publications. Vol. 1, 1913. Monthly Abstract Bulletin (of Photographic Literature). Vol. 1, 1915.

*Cooperative Research*: 24 fellowships and scholarships are supported.

See also Tennessee Eastman Corporation.

718. **Eaton Laboratories, Inc.**, 17 Eaton Ave., Norwich, N. Y. (Subsidiary of Norwich Pharmacal Company, Inc.)

*President*: Melvin C. Eaton.

*Research staff*: A. B. Scott, Director of organic research. 12 chemists, 1 physician, 3 bacteriologists, 1 pharmacologist; additional personnel 5.

*Research activities*: Antibacterial agents, pressor agents, and synthetic organic drugs. (Research initiated 1945.)

*Cooperative research*: Four fellowships are supported and eleven grants for research are made.

719. **Eaton Manufacturing Company**, 739 East 140th St., Cleveland 10, Ohio.

*President*: C. I. Ochs.

#### RESEARCH AND PATENT DEPARTMENT LABORATORY

East 65th and Central, Cleveland 10, Ohio

*Research staff*: C. B. McDonald, Director; Howard J. Findley, Manager; R. D. Beatty, Assistant Manager and Chief Engineer. 7 engineers; technical personnel 7; additional personnel 16.

*Research activities*: Automotive and aircraft parts and accessories. (Research initiated 1942.)

#### AXLE DIVISION EXPERIMENTAL LABORATORY 739 East 140th St., Cleveland 10, Ohio

*Research staff*: G. W. Carlson, Chief Engineer; Robert C. Russell, Experimental Engi-

neer. 3 metallurgists, 2 engineers; technical personnel 5; additional personnel 1.

*Research activities:* Axle and engine components.

**WILCOX-RICH DIVISION LABORATORY**

9771 French Road, Detroit 13, Mich.

*Research staff:* V. C. Young, Chief Engineer; Sidney Oldberg, Executive Engineer; Carl Voorhies, Research Engineer; Fred J. Kelly, Chief Metallurgist. 1 chemist, 1 physicist, 3 metallurgists, 13 engineers; technical personnel 13; additional personnel 31.

*Research activities:* Engine components. (Research initiated 1937.)

**720. Ecker Chemical Laboratories, Howard,**  
1630 Herald Avenue, Cincinnati 12, Ohio.

*Research staff:* Howard Ecker, Director. 2 chemists, 1 physicist; technical personnel 2.

*Research activities:* Organic intermediates as applied to paint, dry colors, and perfumes. (Research initiated 1928.)

*Library:* 2,000 volumes.

**Eclipse Machine Division, Bendix Aviation Corporation.** See Bendix Aviation Corporation.

**Eclipse-Pioneer Division, Bendix Aviation Corporation.** See Bendix Aviation Corporation.

**721. Economics Laboratory, Inc., 914 Guardian Bldg., St. Paul 1, Minn.**

*President:* M. J. Osborn.

*Research staff:* John L. Wilson, Director. 5 chemists, 1 engineer, 1 bacteriologist; technical personnel 16; additional personnel 2.

*Research activities:* Sanitation of eating utensils; detergents; germicidal detergents. (Research initiated 1931.)

*Library:* 650 volumes.

*Cooperative research:* One scholarship is supported and two grants for research are made.

**722. Ecusta Paper Corporation, P. O. Box 200,**  
Pisgah Forest, N. C.

*President:* Harry H. Straus.

*Research staff:* Milton O. Schur, Director. 10 chemists, 1 physicist, 2 biologists, 6 chemical engineers, 1 microscopist, 1 agronomist; technical personnel 12; additional personnel 6.

*Research activities:* Investigations relating to the manufacture and use of cigarette paper and other fine flax papers; the development of superior varieties of flax plants; study of the chemistry and physics of cellulose fibers of diverse origin. (Research initiated 1938.)

*Library:* 2,000 volumes.

**723. Edean Laboratories, 10-20 Pine St., South Norwalk, Conn.**

*Owner:* Edward C. Sterling.

*Research staff:* Edward C. Sterling, Director. 3 chemists; technical personnel 2; additional personnel 5.

*Research activities:* Organic chemistry. (Research initiated 1938.)

*Library:* 500 volumes.

**724. Edelbrew Brewery, Inc., 250 Meserole St., Brooklyn 6, N. Y.**

*President:* Edward B. Hittleman.

*Research staff:* Anton Keis, Director; Edward B. Hittleman. 1 chemist, 1 biologist.

*Research activities:* Fermentation problems. (Research initiated 1942.)

*Library:* A library is maintained.

**725. Edgar Brothers Company, Metuchen, N. J.**

*President:* Harold T. Edgar.

*Laboratories:* Metuchen, N. J. and McIntyre, Ga.

*Research staff:* C. Gerald Albert, Technical Director. 3 chemists, 1 engineer; technical personnel 3; additional personnel 1.

*Research activities:* Properties and uses of clay minerals; clay refining methods. (Research initiated 1925.)

*Library:* 200 volumes.

**726. Edison, Inc., Thomas A., 51 Lakeside Ave., West Orange, N. J.**

*President:* Charles Edison.

*Research staff:* A total of 152 persons, including chemists, physicists, engineers, metallurgists, designers, draftsmen, machinists, and others.

*Research activities:* Problems and processes related to various manufactured products. (Research initiated 1887.)

*Library:* 1,000 volumes.

**EDISON LABORATORY**

West Orange, N. J.

*Research staff:* F. G. Kelly, Manager; John Hornbostel, Physicist; J. L. Zar, Project Engineer. Additional personnel 5.

*Research activities:* Electrical indicators, mechanical time fuses, and sound recording.

**EDIPHONE DIVISION**

West Orange, N. J.

*Research staff:* S. G. Langley, Chief Engineer; R. M. Somers, Assistant to Chief Engineer. 1 chemist, 5 engineers; additional personnel 22.

*Research activities:* Electrical, acoustical, and mechanical research problems relating to the field of sound recording and reproduction.

EDISON STORAGE BATTERY DIVISION  
West Orange, N. J.

*Research staff* (Chemical and electrochemical): J. D. Moulton, Chief Chemist. 4 research chemists, 3 assistant research chemists, 12 chemists; additional personnel 4.

*Research activities:* Chemical, physicochemical, and electrochemical problems relating to storage batteries of the nickel-alkali-iron type.

*Research staff* (Electrical, mechanical, and materials): E. W. Allen, Manager of engineering; W. H. Patterson, Chief Engineer; F. C. Anderson, Electrical Engineer; S. H. Mills-paugh, Mechanical Development Engineer; W. Y. Stamper, Product Engineer; F. E. Reight, Methods and Rate Engineer; 8 engineers and technical assistants; additional personnel 28.

INSTRUMENT DIVISION  
West Orange, N. J.

*Research staff:* C. H. Odell, Assistant Manager; H. S. Jones, Chief Engineer. 2 physicists, 8 engineers; additional personnel 23.

*Research activities:* Design of electrical and mechanical aircraft instruments, aeronautical accessories, and industrial instruments; design of electrical control devices and timing relays, particularly those sealed in glass and operating in a controlled atmosphere.

EMARK BATTERY DIVISION  
Kearny, N. J.

*Research staff:* R. I. Bost, Chemical Engineer. 2 chemists, 3 engineers, 4 technical assistants, 1 draftsman.

*Research activities:* Battery-making equipment and lead storage batteries.

PRIMARY BATTERY DIVISION  
Bloomfield, N. J.

*Research staff:* L. S. Dunham, Director. 3 chemists, 1 physicist, 2 engineers; additional personnel 6.

*Research activities:* General research in regard to electric cells of the "Primary" type, both wet and dry.

MEDICAL GAS DIVISION  
Bloomfield, N. J.

*Research staff:* C. B. Gardenier, Director. 1 chemist.

*Research activities:* Medical gases, high pressure compression, carbon dioxide absorbents, and organic halides and sulfides.

*Library:* 1,000 volumes.

727. Edison General Electric Appliance Company, Inc., 5600 West Taylor St., Chicago 44, Ill. (Subsidiary of General Electric Company.)

*President:* R. W. Turnbull.

*Laboratory:* 1024 South Waller St., Chicago 44, Ill.

*Research staff:* J. C. Sharp, Vice President in charge of engineering. 4 chemists, 2 physicists, 1 metallurgist, 30 engineers, 1 ceramist, 1 stylist, 1 statistician, 18 designing draftsmen, 1 home economist, 14 skilled model makers; technical personnel 20; additional personnel 12.

*Research activities:* Applied research on new products and fundamental research on materials and processes for the electrical appliance field. (Research initiated 1918.)

*Library:* 1,500 volumes.

728. Edwal Laboratories, Inc., 732 South Federal St., Chicago 5, Ill.

*President:* Edmund W. Lowe.

*Research staff:* W. S. Guthmann, Vice President; W. B. Hendrey, Chief Chemist; John Krueger, Chief Research Chemist; J. F. Kaplan, Pilot Plant; W. L. Terre, Chief Analytical Chemist; T. T. Hill, Chief Photographic Chemist. 19 chemists; technical personnel 5; additional personnel 10.

*Research activities:* Organic syntheses; hydroponics; photographic processes; frozen eggs and egg products; cosmetics; detergents and dry cleaning agents; inks. (Research initiated 1933.)

*Library:* Several hundred volumes.

*Cooperative research:* One fellowship is supported and several grants for research are made.

729. Edward Valves, Inc., 1200 West 145th St., East Chicago, Ind. (Subsidiary of Rockwell Manufacturing Company.)

*President:* W. F. Crawford.

*Research staff:* L. H. Carr, Director. 3 chemists, 1 physicist, 4 metallurgists, 2 engineers; technical personnel 2; additional personnel 3.

*Research activities:* The characteristics of carbon and alloy steels under temperature, including both short and long time tests with or without stress and under the influence of corrosive elements; X-ray and gamma ray investigations of ferrous and nonferrous materials; the characteristics of packing and gasket materials, lubricants, and joint dopes; flow through pipe fittings and valves, including the characteristics of relief; volume control and automatically operated valves; the study of design formulas and detail, especially for extreme pressure and temperature conditions; welding and hard surfacing design details; photoelastic studies; abrasion and erosion characteristics of ferrous and nonferrous materials, including deposited and impregnated alloys. (Research initiated 1925.)

- Library:* 1,000 volumes.  
*Scientific periodicals:* Edward Laboratory Projects. Vol. I, 1931. Semi-annual.
- Edwards Manufacturing Company.** See Androscoggin Mills.
- Egyptian Powder Company.** See Olin Industries, Inc.
- 730. Ehrlich, J.,** 153 South Doheny Drive, Beverly Hills, Calif.  
*Research staff:* J. Ehrlich, Director. 2 chemists; additional personnel 2.  
*Research activities:* Synthetic organic chemical research, covering photographic developers, organic insecticides, pharmaceuticals, aromatics, and dyes; development and factory installation of processes; expert testimony. (Research initiated 1939.)
- 731. Eimer and Amend,** 635 Greenwich St., New York 14, N. Y.  
*President:* C. G. Fisher.  
*Research staff:* Harold Frediani, Director. 6 chemists, 1 biologist; additional personnel 6.  
*Research activities:* Inorganic, organic, and rare chemicals. (Research initiated 1851.)  
*Library:* 600 volumes.
- 732. Eisemann Corporation,** 32 Thirty-third St., Brooklyn 32, N. Y.  
*President:* John A. Seubert.  
*Research staff:* Lloyd H. Scott, Vice President in charge of engineering. 7 engineers; technical personnel 7; additional personnel 8.  
*Research activities:* The design and development of electric ignition systems for various types of internal combustion engines including industrial, automotive, marine, light and heavy aircraft, outboard motor, mobile and auxiliary power plants. (Research initiated 1914.)
- 733. Eisendrath Tanning Company,** B. D., Racine, Wis.  
*President:* David B. Eisendrath.  
*Laboratory:* B. D. Eisendrath Memorial Laboratory, Racine, Wis.  
*Research staff:* George D. McLaughlin, Director. 5 chemists, 1 biologist and bacteriologist; additional personnel 2.  
*Research activities:* The chemistry and histology of proteins; the fundamental principles of the conversion of animal skin into leather; physical chemistry and electrochemistry of aqueous solutions. (Research initiated 1931.)
- 734. Eitzen Company,** Louis C., 17 West 60th St., New York 23, N. Y.  
*Proprietor:* Louis C. Eitzen.  
*Research staff:* Louis C. Eitzen, Director. 2 engineers; technical personnel 2; additional personnel 4.  
*Research activities:* The design, development, and improvement of instruments and accessories for the measurement of hardness and related properties of ferrous and nonferrous metals and alloys. The measurement of viscosity and related properties of petroleum products. (Research initiated 1932.)  
*Library:* 500 volumes.
- 735. Ekroth Laboratories, Inc.,** 60 Freeman St., Brooklyn 22, N. Y.  
*President:* Paul S. Laverty.  
*Research staff:* Clarence V. Ekroth, Director. 3 chemists, 2 physicists, 2 biologists, 3 engineers, 1 physician; technical personnel 3; additional personnel 3.  
*Research activities:* Industrial problems connected with processes and products; food and nutrition; sanitary engineering; public health and hygiene. (Research initiated 1889.)  
*Library:* 15,000 volumes.
- 736. Elastic Stop Nut Corporation,** Union, N. J.  
*President:* John R. Munn.  
*Research staff:* William S. Watts, Chief Product Engineer. 2 chemists, 2 physicists, 2 metallurgists, 11 engineers; technical personnel 9; additional personnel 10.  
*Research activities:* Study of threaded connections, fastening devices, plastics, and powdered metals.  
*Library:* 700 volumes.  
*Cooperative research:* One fellowship is supported.
- 737. El Dorado Refining Company,** El Dorado, Kans.  
*President:* Charles G. Yankey.  
*Research staff:* C. M. Boone, Chief Chemist. 1 chemist; technical personnel 2; additional personnel 4.  
*Research activities:* The improvement of petroleum products and reduction of cost of manufacture. (Research initiated 1916.)
- 738. Electric Arc, Inc.,** 218 Jelliff Ave., Newark 8, N. J.  
*President:* F. B. Swankhous.  
*Research staff:* C. C. Kenlan, Chief Engineer; O. Kreisell, Electrical Engineer. 2 engineers.  
*Research activities:* Low frequency induction heating equipment; welding equipment; DC, gas, and motor driven welders; AC transformer type welders. (Research initiated 1925.)
- 739. Electric Auto-Lite Company,** Toledo, Ohio.  
*President:* Royce G. Martin.  
*Laboratory:* The company maintains central-



ized laboratory facilities and personnel for research, development, and testing of products manufactured by the subsidiary and associated companies listed below.

*Research staff:* Leslie H. Middleton, Vice President and Director in charge of research and engineering. 9 chemists, 2 physicists, 3 metallurgists, 106 engineers, 73 laboratory assistants and technicians, 52 model makers, 58 designers and draftsmen.

*Research activities:*

Alemite Die Casting and Manufacturing Company, Woodstock, Ill. Zinc and aluminum die castings for automotive, aviation, industrial, and household application.

American Enameled Magnet Wire Company, Port Huron, Mich. Automotive and aviation ignition cable; wiring harnesses; ignition coils; battery terminals and cables; commutator segments; flexible cable; radio cable and wire.

Bay Manufacturing Division, Bay City, Mich. Automotive and marine horns; flexible shafts and casings; stoplight switches; automotive and aviation instrument dials; radio and hood side grills; scuff plates; miscellaneous metal; lithographed and etched products.

Buckeye Bumpers Division, Springfield, Ohio. Automotive bumpers and bumper guards; spring covers; hub caps.

Corcoran-Brown Lamp Division, Cincinnati, Ohio. Automotive head, tail, cowl, fender, and fog lights; aviation lighting equipment; electrical meter test cabinets; transformer cabinets; aviation ground and riding lights.

Electric Auto-Lite Company, Champlain and Chestnut Sts., Toledo, Ohio.

Electric Auto-Lite, Ltd., Sarnia, Ont. Starting motors; drives and switches; AC and DC, generators; voltage and current regulators; circuit breakers; aviation and automotive ignition systems; condensers; resistors; electric horns and distributors.

Electric Auto-Lite Company, Spark Plug Division, Fostoria, Ohio. Auto-Lite spark plugs.

Electric Auto-Lite Company, Foundry Division, Fostoria Ohio. Manifold car heaters; automotive water pumps; grey iron castings.

Moto Meter Gauge and Equipment Division, LaCrosse, Wis. Speedometers and tachometers; electrical and thermal, fuel level gages; ammeters; direct and distant reading and recording thermometers; pressure and vacuum gages; voltage and current regulators; dash instrument panels; aviation instruments and controls; Warn-O-Lite signaling devices; exhaust gas analyzers; service test equipment; hub caps; tire testers.

Owen-Dyneto Corporation, Syracuse, N. Y. Electric windshield wipers; generators; starting motors; electric arc welders.

Prest-O-Lite Battery Corporation, Indianapolis, Ind. Storage batteries for automotive,

aviation, marine, telephone, telegraph, and radio application.

USL Battery Corporation, Niagara Falls, N. Y. Storage batteries for various applications, including automotive, marine, telephone, telegraph, and radio.

*Library:* 1,000 volumes.

*Cooperative research:* Fellowships and grants are supported at chosen universities.

**740. Electric Controller and Manufacturing Company, 2700 East 79th St., Cleveland 4, Ohio.**

*President:* R. G. Widdows.

*Research staff:* W. B. Brown, Supervisor of development. 4 engineers; additional personnel 11.

*Research activities:* The development of electric control apparatus, magnets, magnetic separators, brakes, etc. (Research initiated 1910.)

**741. Electric Service Manufacturing Company, 17th and Cambria Sts., Philadelphia 32, Pa.**

*President:* H. G. Lewis.

*Research staff:* J. R. McFarlin, Director; T. I. Eldridge, Jr., Research Electrical Engineer. 5 engineers.

*Research activities:* Research and development work on lightning arresters and lightning protective equipment for transmission and distribution electrical circuits involving high voltage, high current transients, cathode ray oscillography, etc.; high and low tension porcelain insulators; pole line hardware; headlights for steam and electric railways; lighting and illumination for railway cars and busses; floodlights and their various applications; manufacturing processes in connection with the products of the company. (Research initiated 1906.)

**742. Electric Specialty Company, 211 South St., Stamford, Conn.**

*President:* D. G. Shepherd.

*Research staff:* E. W. Borggrafe, Director. 2 engineers; technical personnel 6.

*Research activities:* The development of motors, generators, motor-generators and dynamotors smaller than fifteen horsepower.

**743. Electrical Testing Laboratories, Inc., 2 East End Ave. at 79th St., New York 21, N. Y.**

*President:* Preston S. Millar.

*Research staff:* F. Malcolm Farmer, Consulting Engineer; Gordon Thompson, Chief Engineer; Herman Koenig, Engineer in charge of electrical laboratory; Edwin S. Boegehold, Engineer in charge of mechanical and high voltage testing; Paul F. Wehmer, Chief Chemist; George L. Diggles, Engineer in charge of lamp inspection at factories; Raymond W. White, Superintendent of field lamp inspections; Leon-

ard J. Lewinson, Engineer in charge of lamp life testing; William F. Little, Engineer in charge of photometry; Ernest H. Salter, Research Engineer. 35 traveling representatives and 145 employees at main laboratories.

*Research activities:* The causes of defects in incandescent and fluorescent lamps and their effect upon performance; lighting by means of the various types of modern illuminants and their use; high-voltage power cable, domestic electric appliances, and electrical insulating materials; colorimetric analysis; air conditioning and refrigeration; radiant energy and spectral distribution; photometric problems. Much of the research work is incidental to problems connected with commercial testing and inspecting.

*Library:* 1,000 volumes.

744. Electro Manganese Corporation, Proctor St., Knoxville 4, Tenn.

*President:* E. M. Wanamaker.

*Research staff:* William L. Hammerquist, Research Engineer. 4 chemists; additional personnel 3.

*Research activities:* Testing of various manganese ores as follows: furnace reduction to manganous oxide; settling and filtration characteristics of leach slurries; purification of leach solutions; manganese deposition from purified solutions. Metallurgical plant balances for efficiency studies; improvement of purification methods and new impurity control; electrolysis experiments to improve current efficiency; furnace studies to improve reduction of manganese ores. (Research initiated 1939.)

745. Electro-Mechanical Research, Inc., 2712 Leeland Ave., Houston 3, Tex.

*President:* H. G. Doll.

*Research staff:* Charles B. Aiken, Vice President and Director of research. 1 physicist, 6 engineers; technical personnel 16; additional personnel 10.

*Research activities:* Electronic devices; thermal devices; geophysical development. (Research initiated 1942.)

*Library:* 350 volumes.

746. Electro-Medical Laboratory, Inc., Holliston, Mass.

*President:* Lovett Garceau.

*Research staff:* Lovett Garceau, Director. 1 physicist, 1 biologist; technical personnel 2; additional personnel 5.

*Research activities:* The theoretical and technical development of amplifying systems for electrophysiological phenomena, notably the Garceau Electroencephalograph; the development of electrical stimulators and neurosurgical instruments; war research for U. S. Navy and war industries on the development of ordnance chron-

ographs and direct-writing oscillographs. Current research on electroencephalography and neuropsychiatric disorders, also investigations of radiation phenomena. (Research initiated 1935.)

*Library:* 100 volumes.

*Scientific periodicals:* Electro-Medical Review. Vol. 1, 1937.

Electro Metallurgical Company. See Union Carbide and Carbon Corporation.

747. Electro Plastic Processes, 2035 West Charleston St., Chicago 47, Ill.

*President:* William Stahl.

*Research staff:* Erich Freund, Director; Frank Gordon, Engineer; E. N. McCoy, Electrochemist. 2 chemists, 1 engineer; technical personnel 3; additional personnel 4.

*Research activities:* Electroplating of plastic and nonconducting materials such as glass, ceramics, etc.; electroplating of aluminum and magnesium. (Research initiated 1941.)

748. Electro Products Laboratories, 549 West Randolph St., Chicago, Ill.

*Laboratory:* 482 Milwaukee Ave., Chicago, Ill.

*Research staff:* A. Crossley, Director. 4 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Detonation instruments; pressure measuring instruments (Pressure-graph); electronic measuring instruments. (Research initiated 1937.)

*Library:* 100 volumes.

749. Electro Refractories and Alloys Corporation, Vars Bldg., Buffalo 2, N. Y.

*President:* G. S. Diamond.

*Laboratory:* Willett Road, Blasdell Branch, Buffalo 19, N. Y.

*Research staff:* M. H. Berns, Director. 1 chemist, 1 metallurgist, 1 engineer, 4 ceramic engineers; technical personnel 4.

*Research activities:* The improvement of silicon carbide refractories and the revising of new refractories for both nonferrous and ferrous metals; the development of the Tercod crucible for brass melting and research on new compositions for steel and nickel melting crucibles; other ceramic researches are carried on, including the development of refractory linings for electric melting furnaces, copper refining furnaces, glass tanks, and pottery kiln furniture; resinoid abrasive wheel research. (Research initiated 1923.)

*Library:* A library is maintained.

*Cooperative research:* One scholarship is supported.

**750. Electronic Development Company, 1336 North Saddle Creek Road, Omaha 3, Nebr.**

*President:* George Risk.

*Research staff:* Leo T. Finn, Director. 1 physicist, 5 engineers; technical personnel 15; additional personnel 10.

*Research activities:* Electrical indicating instruments; electronic testing apparatus; electronic industrial apparatus. (Research initiated 1935.)

*Library:* A library is maintained.

**751. Elgin National Watch Company, Elgin, Ill.**

*President:* T. Albert Potter.

*Research staff:* George G. Ensign, Director. 2 chemists, 1 physicist, 1 metallurgist, 4 engineers; technical personnel 12; additional personnel 2.

*Research activities:* The development of new materials and machines; the analysis of problems encountered in production; theoretical developments in watch technology; experimental investigations concerned with timing apparatus. (Research initiated 1928.)

*Cooperative research:* Three fellowships are supported.

**752. Elgin Softener Corporation, 134 North Grove Ave., Elgin, Ill.**

*President:* Chester T. McGill.

*Research staff:* Elwood W. Scarritt, Vice President and Chemical Director; Benjamin F. Willey, Chief Chemist and Assistant Chemical Director. 10 chemists; technical personnel 3; additional personnel 1.

*Research activities:* Problems involving water softening, water clarification, boiler water conditioning and control, filtration, deconcentration, and the prevention of corrosion. The staff is also available for solving the individual problems of water users and steam plant operators. (Research initiated 1908.)

*Library:* 400 volumes.

*Cooperative research:* One grant for research is made.

**753. Elias Laboratories, 251 West 19th St., New York 11, N. Y.**

*Research staff:* N. M. Elias, Director. 2 chemists, 1 biologist and bacteriologist; additional personnel 1.

*Research activities:* Research in the synthesis of organic compounds, synthetic rubber and plastics, pharmaceutical products, and germicidal substances. (Research initiated 1926.)

**754. Elizabeth Bio-Chemical Laboratory, 1137 East Jersey St., Elizabeth, N. J.**

*President:* George Kucker.

*Research staff:* George Kucker, Director. 3

chemists, 2 pharmaceutical chemists, 4 biologists, 1 physician, 1 registered nurse.

*Research activities:* General medical biochemistry. (Research initiated 1935.)

*Library:* 1,000 volumes.

**755. Elliott Company, Jeannette, Pa.**

*President:* W. A. Elliott.

*Research staff:* Ronald B. Smith, Director and Vice President; Edward S. Dennison, Director of research and development; 1 physical chemist, 2 metallurgists, 27 engineers; technical personnel 48; additional personnel 16.

*Research activities:* The development of new types of power plant and process machinery, such as: gas turbines, gas and air compressors, turbo-expanders, air reduction and gas separation, heat exchange, deaerating heaters, centrifugal and axial flow blowers, superchargers (Buchli License). (Research initiated 1942.)

*Library:* 500 volumes.

**756. Ellis-Foster Company, 4 Cherry St., Montclair, N. J.**

*President:* Nathaniel L. Foster.

*Research staff:* Frank B. Root, Director. 6 chemists; additional personnel 4.

*Research activities:* Organic chemistry, specializing in synthetic resins and their plastics. (Research initiated 1907.)

**757. Ellis Research Laboratories, Inc., 400 North Michigan Ave., Chicago 11, Ill.**

*President:* F. C. Ellis.

*Research staff:* F. C. Ellis, Director. 1 engineer; 2 in other scientific professions.

*Research activities:* The development of methods and means for measurement of the electrolytic characteristics of living organisms. (Research initiated 1928.)

*Scientific periodicals:* Micro-dynamics. Irregular. Vol. I, 1933.

**758. Elmendorf Corporation, 322 West Washington St., Chicago 6, Ill.**

*President:* Armin Elmendorf.

*Research staff:* Armin Elmendorf, Director. 3 chemists, 2 engineers; technical personnel 3.

*Research activities:* The development of new or improved building materials; products made of wood or wood derivatives, such as: plywood and flexible veneer wall coverings, wallboards, insulation boards and synthetic hard boards, wood plastics, wood flooring and floor coverings, shingles, siding, plaster bases, acoustical materials, doors, and shipping containers. The development of machinery for manufacturing various wood derivatives. (Research initiated 1933.)

**759. Embalmers' Supply Company, Westport, Conn.**

*President:* A. H. Dolge.

*Research staff:* R. C. Beck, Director. 2 chemists.

*Research activities:* Embalming chemicals; apparatus and equipment for embalming. (Research initiated 1889.)

**760. Emerson Drug Company of Baltimore City, Lombard and Eutaw Sts., Baltimore 1, Md.**

*President:* Kenneth A. Bonham.

*Research staff:* Samuel T. Helms, Medical Director; Walter E. Lowthian, Associate Medical Director. 6 chemists, 2 physicians; additional personnel 2.

*Research activities:* The investigation of the physiological action of acetanilid and related analgesic drugs; the accumulation, distribution, and elimination of bromides; bone marrow studies with relation to the bone marrow changes following ingestion of large doses of various analgesic drugs; continuing investigation of the physical and chemical changes in the manufacture of effervescent salts. (Research initiated 1898.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported and three grants for research are made.

**761. Emerson Electric Manufacturing Company, 1824 Washington, St. Louis 3, Mo.**

*President:* O. C. Schmitt.

*Laboratory:* 2018 Washington, St. Louis, Mo.

*Research staff:* A. C. Dickson, Chief Engineer; R. I. Raithel, Director. 2 chemists, 2 engineers; additional personnel 4.

*Research activities:* Electric motors and fans. (Research initiated 1895.)

**762. Emerson Radio and Phonograph Corporation, 111 Eighth Ave., New York, 11, N. Y.**

*President:* Benjamin Abrams.

*Research staff:* Dorman D. Israel, Vice President in charge of engineering and production; Maurice Levy, Chief Engineer, Special Products Division; Alfred G. Rogers, Chief Engineer, Regular Products Division. 20 engineers; technical personnel 85; additional personnel 20.

*Research activities:* The design and development of radio, television, radar, and other electronic products. (Research initiated 1932.)

*Library:* 300 volumes.

*See also* Radio Speakers, Inc.

**763. Emery Industries, Inc., 4300 Carew Tower, Cincinnati 2, Ohio.**

*President:* J. J. Emery.

*Laboratory:* June and Long Sts., St. Bernard, Ohio.

*Research staff:* Latimer D. Myers, Director. 10 chemists, 3 chemical engineers; technical personnel 10; additional personnel 3.

*Research activities:* Production and uses of fatty acids, stearic acid, oleic acid and derivatives, and sulfonated mineral oils. Textile and dry cleaning specialties, plasticizers, resinous products, surface tension lowering. (Research initiated 1922.)

*Library:* 1,000 volumes.

**764. Empire State Varnish Company, Inc., 38 Varick St., Brooklyn, N. Y.**

*President:* Michael Doniger.

*Research staff:* Merritt T. Metz, Director; Richard J. Stark, Laboratory Chemist. 2 chemists, 1 engineer; additional personnel 1.

*Research activities:* Paint, varnish, and other protective coatings. (Research initiated 1934.)

**Emtec Research Associates. See No. 2433 in Addenda.**

**765. Emulsol Corporation; Epstein, Reynolds and Harris, 59 East Madison St., Chicago 3, Ill.**

*President:* Albert K. Epstein.

*Research staff:* Benjamin R. Harris, Vice President in charge of research; Herbert I. Bernstein, Director. 11 chemists, 2 biologists, 2 engineers; technical personnel 3; additional personnel 4.

*Research activities:* Organic synthesis, interface modifying agents, edible oils, fats, egg products, ore flotation reagents, and emulsifiers for food, textiles, paint, rubber, cosmetics, etc.; quaternary ammonium compounds, detergents, insecticides, acyl halides, germicides, and plasticizers. (Research initiated 1923.)

*Library:* 600 volumes.

*Cooperative research:* Two grants for research are made.

**766. Encyclopaedia Britannica Films, Inc., 20 North Wacker Drive, Chicago 6, Ill.**

*President:* E. H. Powell.

*Laboratory:* 1841 Broadway, New York, N. Y.

*Research staff:* Melvin Brodshaug, Director. 1 chemist, 1 physicist, 1 biologist, 1 psychologist; 4 in other scientific professions; technical personnel 2; additional personnel 4.

*Research activities:* Film development; school curricula; film evaluation; classroom film utilization; classroom film techniques; experimentation on film learning; publication of handbooks and guides. (Research initiated 1929.)

*Library:* 5,000 volumes.

*Cooperative research:* Fifteen fellowships are maintained.

**767. Endicott Johnson Corporation, Endicott, N. Y.**

*President:* George W. Johnson.

*Research staff:* R. G. Ashcraft, Director. 2 chemists, 1 engineer; technical personnel 9; additional personnel 2.

*Research activities:* Complete vegetable and chrome tanning operations; the manufacture of tanning solutions, sulfonated oils and finishes, and the utilization of waste materials and by-products. (Research initiated 1929.)

**768. Endo Products, Inc., 84-40. One Hundred and First St., Richmond Hill 18, Long Island, N. Y.**

*President:* Joseph Ushkow.

*Research staff:* Samuel M. Gordon, Vice President and Director. 20 chemists, 1 physician; technical personnel 15; additional personnel 35.

*Research activities:* Synthetic research in organic and inorganic chemistry for medicinal uses; hormone investigation; pharmacologic and pharmaceutical research; product improvement research. (Research initiated 1925.)

*Library:* A library is maintained.

*Cooperative research:* Four grants for research are made.

**769. Engineering Associates, St. Charles, Ill.**

*President:* S. H. A. Young.

*Research staff:* J. F. T. Berliner, Vice President and Director; R. A. M. Pulese, Chief Chemist; J. J. Jaeger, Chief Engineer. 2 chemists, 1 physicist, 1 metallurgist, 4 engineers, 1 wood technologist, 2 pulp and paper technologists; additional personnel 3.

*Research activities:* Resin impregnation and improvement of woods; molding, forming, and industrial development of pulp; plastics for wood and pulp impregnation and treatment; utilization and industrial conversion of wood wastes. (Research initiated 1943.)

*Library:* 500 volumes.

**770. Engineering Laboratories, Inc., 624 East 4th St., Tulsa 3, Okla.**

*President:* William G. Green.

*Research staff:* Jacob Neufeld, Director; E. B. Jones; R. D. Shrewsbury. 3 engineers; additional personnel 2.

*Research activities:* The development of instruments dealing with geophysical prospecting for oil, and the recovery and refining of petroleum. (Research initiated 1935.)

*Library:* 800 volumes.

**771. Ensign-Bickford Company, Simsbury, Conn.**

*President:* J. K. Brandon.

*Laboratories:* Simsbury and Avon, Conn.

*Research staff:* Chester D. Thompson, Direc-

tor; David E. Pearsall, Director of Bickford Research Laboratories; John D. Rich, Director of Technical Development Institute; W. F. Hamilton, Director of Engineering. 4 chemists, 1 biologist, 2 engineers; additional personnel 7.

*Research activities:* The investigation of the manufacture, characteristics, and use of safety and detonating fuses; the materials used in the fuses, and accessories related to their use; the development of new delays and possible applications of cord-like materials for uses other than mining. (Research initiated 1920.)

*Library:* A library is maintained.

**772. Eppley Laboratory, Inc., 12 Sheffield Ave., Newport, R. I.**

*President:* Marion Eppley.

*Research staff:* Marion Eppley, Director. 1 chemist, 2 physicists; technical personnel 25; additional personnel 7.

*Research activities:* Cadmium standard cells, physicochemical apparatus, standards of electromotive force, spectroscopy, the theory of solutions from the electrical standpoint, thermocouples for precise measurements, platinum resistance thermometry, thermopiles, and measurement of the intensity of solar radiation. (Research initiated 1920.)

*Library:* A library is maintained.

*Cooperative research:* One grant for research is made.

**Epstein, Reynolds and Harris.** See Emulsol Corporation.

**773. Equitable Gas Company, 435 Sixth Ave., Pittsburgh 19, Pa.**

*President:* Ward Perrott.

*Laboratories:* Industrial Gas Laboratory, 553 Seventh Ave., Pittsburgh, Pa.; Appliance Testing Laboratory, Duquesne Bldg., 120 Cecil Way, Pittsburgh, Pa.

*Research staff:* L. S. Maehling, Director; R. L. Melaney, Supervisor; P. W. Craig, Manager of the Industrial Gas Sales Department. 1 chemist, 8 engineers; additional personnel 2.

*Research activities:* Testing gas appliances, investigating gas utilization, air conditioning, heating, water heating, automatic control and process equipment and applications; industrial gas fuel applications, and the use of natural gas as a chemical medium. (Research initiated 1924.)

**Equitable Powder Company.** See Olin Industries, Inc.

**774. Erd Company, Inc., 225-233 Ringgold St., Waynesboro, Pa.**

*President:* M. H. Landis.

*Research staff:* M. H. Landis, Director; W.

R. Moore, Jr., Vice President. 1 chemist, 1 metallurgist, 2 engineers; technical personnel 16; additional personnel 5.

*Research activities:* Machine design; production equipment and methods. (Research initiated 1939.)

**775. Erickson, Wallace A.,** 842 North Wells St., Chicago 10, Ill.

*Owner:* Wallace A. Erickson.

*Research staff:* Alan E. Pierce, Director. 2 chemists; technical personnel 1; additional personnel 1.

*Research activities:* Special organic syntheses; plastics; dental products; diazo compounds and coupling components. (Research initiated 1939.)

*Library:* 250 volumes.

**776. Erie Resistor Corporation,** 644 West 12th St., Erie, Pa.

*President:* G. R. Fryling.

*Research staff:* F. X. Maida, Chief Electrical Engineer; R. A. Kling, Chief Mechanical Engineer; R. Heard, Mechanical Engineer; J. E. Toppari, Chemical Engineer; P. F. Siegrist, Ceramist; E. H. Eppley, Quality Control Manager; H. Karrfalt, Assistant to Quality Control Manager. 2 chemists, 1 physicist, 29 engineers, 1 ceramist; technical personnel 21; additional personnel 16.

*Research activities:* Dielectric properties of ceramic bodies; development of products employing ceramic and mica dielectrics; development of composition type resistors; molding and functional properties of thermosetting and thermoplastic plastics; development of manufacturing equipment and high-speed testing equipment for products; testing products to determine operating characteristics. (Research initiated 1928.)

*Library:* 196 volumes.

**777. Esmond Mills, Inc.,** Esmond, R. I.

*President:* Robert R. West.

*Research staff:* Willard F. Staples, Executive Vice President in charge of manufacturing; John Holden, Chemist. 1 chemist; technical personnel 15.

*Research activities:* Textile problems related to the manufacture of blankets made of cotton, wool, and of cotton-rayon-wool. (Research initiated 1945.)

**778. Esselen, Inc.,** Gustavus J., 857 Boylston St., Boston 16, Mass.

*President:* Gustavus J. Esselen.

*Research staff:* Gustavus J. Esselen, Director. 13 chemists, 5 chemical engineers; additional personnel 5.

*Research activities:* The application of the

principles of chemistry and chemical engineering to industrial, business, and legal problems in accordance with the requirements of clients; special experience in the cellulose industries, plastics, synthetic resins, foods, flavors, odors, detergents, textiles, and synthetic organic chemistry; industrial surveys and appraisals; technical audits; technical assistance on patent matters. (Research initiated 1921.)

*Library:* 1,000 volumes.

*Scientific periodicals:* Research Viewpoint. 8 times a year. Vol. I, 1940.

**779. Esterbrook Pen Company,** Camden, N. J.

*President:* Albert G. Frost.

*Research staff:* Harry C. Kofke, Director; Henry C. Klagges. 1 chemist, 1 engineer, 1 architect; technical personnel 2; additional personnel 1.

*Research activities:* New process and product development: fountain pens, mechanical pencils, steel pen nibs, desk sets, etc. (Research initiated 1932.)

*Library:* 100 volumes.

*Cooperative research:* One grant for research is made.

**780. Ethicon Suture Laboratories,** New Brunswick, N. J. (Division of Johnson and Johnson.)

*President:* D. C. Menzies.

*Laboratories:* New Brunswick and Milltown, N. J.

*Research staff:* H. L. Davis, Director. 6 chemists, 1 biologist; technical personnel 6; additional personnel 1.

*Research activities:* The development and improvement of surgical sutures—catgut and other materials; the development of forms of tantalum for surgical use. (Research initiated 1943.)

*Library:* 400 volumes.

**781. Ethyl Corporation,** Chrysler Bldg., New York 17, N. Y.

*President:* Earle W. Webb.

*Laboratories:* 1600 West Eight Mile Road, Ferndale 20, Detroit, Mich.; 2600 Cajon Road, San Bernardino, Calif.

*Research staff:* Earl Bartholomew, General Manager of research laboratories. Directors: George Calingaert, Chemical Research; R. V. Kerley, Aeronautical Research; J. B. Macauley, Engineering Research. 52 chemists, 48 engineers; technical personnel 38; additional personnel 131.

*Research activities:* The manufacture and use of fuel antiknocks; the interrelated problems of engines, fuels, and lubricants; fundamental research on the chemistry of hydrocarbons. (Research initiated 1927.)

*Library:* 2,000 volumes.

*Cooperative research:* Three fellowships are supported.

**DEVELOPMENT LABORATORY**  
Baton Rouge, La.

*Research staff:* J. H. Schaefer, Vice President in charge of manufacturing; O. E. Kurt, Head of Development Section. 21 chemists, 18 engineers; additional personnel 44.

*Research activities:* Process development in the manufacture of tetraethyllead, ethyl chloride, hydrogen chloride, ethylene, sodium, ethylene dichloride. (Research initiated 1939.)

*Library:* 700 volumes.

**Ethyl-Dow Chemical Company.** See Dow Chemical Company.

**782. Eureka-Williams, Inc., Detroit 2, Mich.**

*President:* Henry W. Burritt.

*Laboratory:* Williams Oil-O-Matic Corporation, Bloomington, Ill.

*Research staff:* Q. E. Nesmith, Director of engineering and research; K. M. Hammell, Chief Research Engineer. 2 chemists, 1 metallurgist, 5 engineers; technical personnel 12.

*Research activities:* Vacuum cleaners, electrical appliances, fluid fuel burners, heating and ventilation, refrigeration, and air conditioning. (Research initiated 1920.)

*Library:* 200 volumes.

**Euston Lead Company.** See Glidden Company.

**783. Evans Associates, Ralph L., 250 East 43rd St., New York 17, N. Y.**

*Laboratories:* New York, N. Y.; Waterloo, N. Y.

*Research staff:* Ralph L. Evans and E. G. McDonough, Directors. 62 chemists, 2 physicists, 10 engineers, 1 physician, 1 technical librarian, 1 microscopist; technical personnel 16; additional personnel 30.

*Research activities:* Organic chemistry, electrochemistry, physical chemistry, biochemistry, industrial chemicals, pharmaceuticals, cosmetics, hair, chemical engineering, optics, and photography. (Research initiated 1941.)

*Library:* A library is maintained.

*Cooperative research:* Ten to twelve grants are made for research.

**784. Everett and Barron Company, 359 Eddy St., Providence 2, R. I.**

*President:* Samuel A. Everett (retired). *Vice President:* Alfred E. Sebbens.

*Research staff:* James W. Hunter. Chief Chemist.

*Research activities:* Shoe dressings (chiefly women's shoes), waterproofing compounds,

emulsions, dyes, lacquers, paints, etc. (Research initiated 1907.)

**785. Exact Weight Scale Company, 944 West 5th Ave., Columbus 8, Ohio.**

*Vice President and Treasurer:* K. B. Neff.

*Research staff:* T. B. Flanagan, Director; James Sullivan; Charles Willis; M. D. Varney. 2 engineers; additional personnel 2.

*Research activities:* Scales and weighing problems. (Research initiated 1930.)

**786. Ex-Lax, Inc., 423 Atlantic Ave., Brooklyn 17, N. Y.**

*President:* Israel Matz.

*Research staff:* Max Kiss, Director; Max Hubacher, Chief Research Chemist; A. A. White, Jr. and B. A. Goodman, Consultants. 3 chemists, 3 physicians, 2 pharmacists, 1 pharmacologist; additional personnel 12.

*Research activities:* Search for new laxatives and other medicinal products which entail synthesis of known and new organic compounds and their subsequent pharmacological testing. A colony of Rhesus monkeys is maintained for experimental purposes. (Research initiated 1918.)

*Library:* 100 volumes.

*Cooperative research:* Two fellowships are supported and three grants for research are made.

**787. Exolon Company, Tonawanda, N. Y.**

*President:* William A. Harty.

*Laboratories:* Tonawanda, N. Y.; Thorold, Ont.

*Research staff:* S. F. Walton, Ceramic Engineer and Technical Director; D. M. Ramsey, Mechanical Engineer; E. L. Hauman, Electrochemical Engineer; J. S. Masin, Chemical Engineer. 3 chemists, 6 engineers; additional personnel 10.

*Research activities:* The development and plant control of electric furnace products, refractories, and abrasives; the development of ceramic processes; the development of mechanical processes and handling equipment; the development of magnetic separation, screening, grading, and concentration equipment. (Research initiated 1914.)

*Cooperative research:* One fellowship is supported.

**Experimental Laboratories, Inc.** See Dunham Company, C. A.

**788. Faber Laboratories, 1025 Georgia St., Los Angeles 15, Calif.**

*President:* Ralph L. Faber.

*Laboratories:* New York, Chicago, San Francisco, Seattle, and Los Angeles.

*Research staff:* Clifford R. Stewart, Vice President and Manager. 14 chemists, 3 physicists, 1 metallurgist, 4 engineers; technical personnel 5; additional personnel 16.

*Research activities:* Internal combustion engine fuels and lubricants. (Research initiated 1930.)

*Library:* 100 volumes.

**789. Fabric Research Laboratories, Inc.,** 665 Boylston St., Boston 16, Mass.

*President:* Ernest R. Kaswell.

*Research staff:* Walter J. Hamburger, Treasurer and Director; Kenneth R. Fox, Vice President. 2 chemists, 3 engineers, 1 statistician, 1 microscopist, 3 textile technologists; technical personnel 5; additional personnel 5.

*Research activities:* Research, development, and consulting research for the textile and allied industries. The staff and facilities are available for investigations involving the physics, chemistry, microscopy, photomicrography, and microbiology of textiles, paper, and leather. (Research initiated 1942.)

*Library:* A library is maintained.

**790. Factory Mutual Laboratories,** 184 High St., Boston 10, Mass. (Associated Factory Mutual Fire Insurance Companies, Inspection Department.)

*Manager:* O. W. Stewart.

*Laboratories:* Boston and Norwood, Mass.

*Research staff:* Norman J. Thompson, Director; A. L. Brown, Chief Engineer. 8 chemists, 1 physicist, 15 engineers; technical personnel 10; additional personnel 22.

*Research activities:* Fire and explosion prevention. (Research initiated 1887.)

*Library:* 1,000 volumes.

**791. Fafnir Bearing Company,** New Britain, Conn.

*President:* Maurice Stanley.

*Research staff:* 2 chemists, 3 metallurgists, 3 engineers; technical personnel 10; additional personnel 6.

*Research activities:* The development, improvement, application, design, and lubrication of ball bearings. (Research initiated 1925.)

*Library:* A library is maintained.

**792. Fairbanks Company,** 2-22 Glenwood Ave., Binghamton, N. Y.

*President:* George M. Naylor.

*Research staff:* Edward T. Adams, Director. 2 chemists, 1 metallurgist, 4 engineers.

*Research activities:* The chemical and physical analysis of raw materials and finished goods used in bronze and iron valves, and alloy materials of various kinds used for complete valves

or special components. (Research initiated 1917.)

**Fairchild Aerial Surveys Inc.** See Fairchild Camera and Instrument Corporation.

**793. Fairchild Camera and Instrument Corporation,** 88-06 Van Wyck Blvd., Jamaica, N. Y.

*President:* James S. Ogsbury.

*Laboratories:* Fairchild Camera and Instrument Corporation, 475 Tenth Ave., New York, N. Y.; Fairchild Aerial Surveys, Inc., 224 East 11th St., Los Angeles, Calif.

*Research staff:* *New York Laboratory:* Russell H. Lasche, Director of engineering and research, and Assistant Vice President; Herbert C. Roters, Engineer in charge of research. 9 physicists, 3 metallurgists, 53 engineers; technical personnel 92; additional personnel 101. *Los Angeles Laboratory:* Leon T. Eliel, Vice President. 20 engineers; technical personnel 25; additional personnel 25.

*Research activities:* *New York Laboratory:* The design, development, and testing of commercial and military cameras, photographic accessories, industrial control, sound recording equipment, radio compasses, navigational equipment and other precision, electronic, electric, photographic, and industrial instruments. *Los Angeles Laboratory:* The preparation of precision mosaic maps, air views, and photographic tax maps, and the design and development of new methods and apparatus for making such maps.

**794. Fairmont Aluminum Company,** Fairmont, W. Va.

*President:* L. M. Brile.

*Research staff:* T. J. Connel, Director; Carl Miller. 1 chemist, 1 metallurgist.

*Research activities:* Problems in connection with the melting, casting, rolling, annealing, and heat-treatment of aluminum and aluminum alloy sheet products. (Research initiated 1926.)

**795. Fairmont Canning Company,** 440 East 9th St., Fairmont, Minn.

*President:* A. F. Wentworth.

*Research staff:* E. W. Eickelberg, Director; Charles J. Meister, Assistant General Manager. 3 chemists, 3 agriculturists, 1 home economist, 1 bacteriologist; additional personnel 4.

*Research activities:* Food preservation by canning and freezing; the development of processing procedures; varietal investigations and comparisons; new product development. (Research initiated 1924.)

*Library:* 150 volumes.



**796. Falk Corporation, 3001 West Canal St., Milwaukee 8, Wis.**

*President:* H. S. Falk.

*Research staff:* E. J. Wellauer, Supervisor of research and metallurgy. 2 chemists, 4 metallurgists, 5 engineers; technical personnel 10.

*Research activities:* Gears and power transmissions; power transmission couplings; properties of materials, particularly ferrous metals, under melting, processing, and heat-treatment. (Research initiated 1917.)

*Library:* 1,000 volumes.

**797. Fansteel Metallurgical Corporation, 2200 Sheridan Road, North Chicago, Ill.**

*President:* R. J. Aitchison.

*Research staff:* L. F. Yntema, Director; F. H. Driggs, Vice President in charge of technical development. 23 chemists, 2 physicists, 14 metallurgists, 2 engineers; technical personnel 12; additional personnel 4.

*Research activities:* Tungsten, molybdenum, tantalum, columbium, and their alloys; special nonferrous alloys; electrical contacts and their application; rare metal carbides; hard carbides; powder metallurgy, especially of the rare refractory metals; wet electrolytic rectifiers and condensers; selenium rectifiers. (Research initiated 1916.)

*Library:* 1,168 volumes.

*Cooperative research:* One fellowship is supported.

**Fargo Motor Corporation. See Chrysler Corporation.**

**798. Farrand Optical Company, Inc., 4401 Bronx Blvd., New York 66, N. Y.**

*President:* C. L. Farrand.

*Research staff:* R. G. Piety, Chief Physicist. 5 physicists, 6 engineers, 1 mathematician; technical personnel 6; additional personnel 2.

*Research activities:* Optical instruments; electronic instruments. (Research initiated 1941.)

*Library:* 500 volumes.

**799. Farrel-Birmingham Company, Inc., 25 Main St., Ansonia, Conn.**

*President:* Franklin R. Hoadley.

*Research staff:* Austin Kuhns, Director; J. Erler, Chief Metallurgist; E. R. Gasser, Chief Physicist. 8 chemists, 6 physicists, 4 metallurgists; additional personnel 4.

*Research activities:* Chilled iron; alloy chilled iron; high test iron; steel. (Research initiated 1912.)

**ATWOOD DIVISION**

**Stonington, Conn.**

*Research staff:* A. E. Winslow, Chief Engineer. 4 engineers; additional personnel 7.

*Research activities:* The study of yarn tensions, uniformity of twist, package proportions, power consumption, high-speed spindle performance, vibration, etc. This is a physical laboratory for the study of twisting, winding, and spooling of all synthetic yarns, cotton, and worsted yarns. (Research initiated 1937.)

**800. Fedders Manufacturing Company, Inc., 57 Tonawanda St., Buffalo, N. Y.**

*President:* S. Giordano.

*Research staff:* R. W. Morgan, Chief Engineer. 3 chemists, 12 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Experimental research on automobile radiators, aircraft radiators and oil coolers, unit coolers and unit heaters, air conditioning units, refrigeration control valves, blast heating surfaces and other heat transfer devices, electric coolers for water and beverages. (Research initiated 1920.)

*Library:* 1,000 volumes.

**801. Federal Cartridge Corporation, Anoka, Minn.**

*President:* Charles L. Horn.

*Research staff:* C. F. Reed, Director; William King. 6 chemists, 3 engineers; technical personnel 20.

*Research activities:* Ballistics; organic compounds. (Research initiated 1929.)

**802. Federal Color Laboratories, Inc., 4633 Forest Ave., Norwood, Cincinnati 12, Ohio.**

*President:* Daniel M. Heekin.

*Research staff:* Francis E. Gleason, Chief Chemist. 2 chemists; technical personnel 4; additional personnel 1.

*Research activities:* The development of new forms of organic colors and pigment dyes suitable to the printing ink, coated paper, paint, and rubber industries. (Research initiated 1923.)

**803. Federal Glass Company, 515 East Innis Ave., Columbus 7, Ohio.**

*President:* E. A. Donnan.

*Research staff:* Henry H. Blau, Director. 2 chemists, 1 physicist, 1 engineer; additional personnel 2.

*Research activities:* Glass technology; high temperature studies; the physics and chemistry of glass. (Research initiated 1941.)

*Cooperative research:* Two fellowships are supported.

**804. Federal Laboratories, Inc.,** 185 Forty-first St., Pittsburgh 1, Pa. (Subsidiary of Breeze Corporations, Inc.)

*President:* R. B. Reynolds.

*Laboratories:* Pittsburgh and Tunnelton, Pa.

*Research staff:* C. R. Weinert, Technical Director; W. H. Durno, Chief Chemist. 5 chemists, 6 engineers; additional personnel 1.

*Research activities:* Tear gases; pyrotechnics; use of explosives for power; insecticides; special problems. (Research initiated 1930.)

*Library:* 120 volumes.

**805. Federal Manufacturing and Engineering Corporation,** 211-217 Steuben St., Brooklyn 5, N. Y.

*President:* D. H. Engelson.

*Research staff:* Morris Kaplowitz, Chief Engineer. 1 physicist, 10 engineers; technical personnel 6; additional personnel 5.

*Research activities:* Photographic, electrical, and electronic research. (Research initiated 1939.)

*Library:* 500 volumes.

**806. Federal-Mogul Corporation,** 11031 Shoemaker Ave., Detroit 13, Mich.

*President:* H. G. Muzzy.

*Laboratories:* Detroit, Mich.; Greenville, Mich.; San Francisco, Calif.

*Research staff:* G. S. Peppiatt, Executive Vice President; E. R. Darby, Director; L. A. Barera, Laboratory Superintendent; Gordon Le-Brasse, Senior Metallurgist; L. C. Blomstrom. 3 chemists, 1 physicist, 8 metallurgists, 5 engineers.

*Research activities:* The development of new friction bearing materials, and the improvement of present materials and manufacturing methods. Sleeve bearings and marine propellers and parts. (Research initiated 1932.)

*Library:* 1,000 volumes.

**807. Federal Portland Cement Company, Inc.,** P. O. Box 115, Buffalo 5, N. Y.

*President:* L. A. Beeghly.

*Laboratory:* Woodlawn, N. Y.

*Research staff:* J. F. Barton, Director. 3 chemists, 1 physicist; technical personnel 3; additional personnel 3.

*Research activities:* Pozzuolanic materials, natural and artificial; masonry cement and mortars; blended cements and concrete. (Research initiated 1933.)

*Cooperative research:* One grant for research is made.

**808. Federal Products Corporation,** 1144 Eddy St., Providence 1, R. I.

*President:* L. C. Tingley.

*Research staff:* Several mechanical engineers.

*Research activities:* The investigation and development of precision measuring instruments, including the control of accuracy of linear dimensions and of interchangeable parts; the standardization of dimensions of products such as textiles, rubber, paper, etc. (Research initiated 1936.)

*Library:* A library is maintained.

**809. Federal Seaboard Terra Cotta Corporation,** 10 East 40th St., New York 16, N. Y.

*President:* Peter C. Olsen.

*Laboratories:* Perth Amboy and South Amboy, N. J.

*Research staff:* O. E. Mathiasen, Chief Ceramist; A. Kindlich, Assistant. 1 ceramic engineer; additional personnel 3.

*Research activities:* Clay testing, glaze and body composition; color development. (Research initiated 1910.)

*Library:* A library is maintained.

**810. Federal Telecommunication Laboratories, Inc.,** 67 Broad St., New York 4, N. Y. (Subsidiary of International Telephone and Telegraph Corporation.)

*President:* H. H. Buttner.

*Research staff:* H. Busignies, Director of laboratories. 15 chemists, 31 physicists, 1 biologist, 128 engineers, 1 geologist; technical personnel 388; additional personnel 231.

*Research activities:* The development of systems and equipment in the field of advanced radio communication and the electronic and allied arts, such as, direction finder equipment, radio aids to aerial navigation, frequency modulation, dielectric research, television, and microwave systems. (Research initiated 1941.)

*Library:* 1,500 volumes.

*Scientific periodicals:* Electrical Communication. Vol. I, 1922.

*Cooperative research:* Two grants for research are made.

**811. Feedwaters, Inc.,** 140 Cedar St., New York 6, N. Y.

*President:* Franklin Lang.

*Laboratories:* 140 Cedar St., New York 6, N. Y. and 110 Imlay St., Brooklyn 31, N. Y.

*Research staff:* F. Lang, Director; L. M. Potts; C. C. Kern. 7 chemists, 2 physicists, 2 metallurgists, 4 engineers; additional personnel 12.

*Research activities:* Water conditioning as related to water supply systems, boiler plant equipment, humidification, refrigeration, and the clarification of aqueous mediums; metallurgy; colloids; insecticides; plant hormones. (Research initiated 1924.)

**812. Fellows, Albert Thomas, Consulting Chemist, Willow (Ulster County), N. Y.**

*Research staff:* A. T. Fellows, Director. 1 chemist; additional personnel 1.

*Research activities:* The development of new products and processes; physical and inorganic chemistry, metal powders, and powder metallurgy; general consulting work (Research initiated 1945.)

*Library:* 750 volumes.

**813. Felters Company, 210 South St., Boston 11, Mass.**

*President:* Lawrence H. Hansel.

*Laboratory:* Millbury, Mass.

*Research staff:* Raymond R. Stevens, Director of research; Gordon H. Wood, Vice President in charge of research. 1 chemist, 1 engineer; technical personnel 2; additional personnel 2.

*Research activities:* Wool felt manufacturing research and its application; the manufacture of synthetic felt. (Research initiated 1934.)

*Library:* 100 volumes.

**814. Felton Chemical Company, Inc., 599 Johnson Ave., Brooklyn 6, N. Y.**

*President:* Joseph Felton.

*Research staff:* Everett L. Saul, Director. 7 chemists, 1 engineer; technical personnel 3.

*Research activities:* Synthetic organic chemistry; essential oils; terpenes; drugs; analytical methods. (Research initiated 1923.)

*Library:* 200 volumes.

**815. Fermentation Laboratories, Inc., 4003-4005 Westminster Place, St. Louis 8, Mo.**

*President:* Frank A. Roth.

*Research staff:* J. Adolph Merten, Director. 3 chemists, 2 biologists; additional personnel 4.

*Research activities:* Fermentation industries: breweries, distilleries, wineries. (Research initiated 1933.)

*Library:* 140 volumes.

**816. Ferro Drier and Chemical Company, 877 Union Commerce Bldg., Cleveland, Ohio.**

*President:* W. B. Lawson.

*Laboratory:* Krick Road, Bedford, Ohio.

*Research staff:* S. B. Elliott, Technical Director and Assistant to the President. 4 chemists, 1 engineer; additional personnel 2.

*Research activities:* Metallic soaps for the following: paint and varnish driers, fungicides, lubricants; heavy metal salts. (Research initiated 1941.)

**817. Ferro Enamel Corporation, 4150 East 56th St., Cleveland 5, Ohio.**

*President:* Robert A. Weaver.

*Laboratories:* Cleveland, Ohio; Ferro Drier and Chemical Co., Forbes Road, Bedford, Ohio.

*Research staff:* Glenn H. McIntyre, Director; M. J. Bahnsen, Director of chemical research; E. E. Bryant, Director of ceramic research. 12 chemists, 1 metallurgist, 10 ceramists; technical personnel 12; additional personnel 40.

*Research activities:* Porcelain enamel glasses and ceramic products; inorganic chemicals; metallic soaps including fungicides and paint addition agents; war chemicals. (Research initiated 1919.)

*Library:* 1,200 volumes.

**818. Fertig, George J., Consulting Chemists and Metallurgists, Comer Bldg., Birmingham 3, Ala.**

*Research staff:* George J. Fertig, Director. 4 chemists, 1 metallurgist, 1 bacteriologist.

*Research activities:* Blast furnace operation, steel foundry problems, white and gray cast iron foundry problems, and allied research; natural spices. (Research initiated 1933.)

**819. Feuer and Associates, Bertram, 605 North Michigan Ave., Chicago 11, Ill.**

*Research staff:* Bertram Feuer, Director. 2 chemists, 2 bacteriologists, 2 clinicians, 1 pharmacologist, 1 technician.

*Research activities:* Biological chemistry and pharmacology; clinical experimentation; foods, drugs, microbiology, and sanitation. (Research initiated 1928.)

*Cooperative research:* From time to time fellowships are supported.

**820. Fiber Products Laboratory, Springfield, Ohio.**

*Chairman:* Charles L. Bauer.

*Research staff:* C. K. Textor, Director. 1 chemist, 2 engineers; technical personnel 3.

*Research activities:* Research in improved machinery and processes for the treatment of fibrous materials and the manufacture of pulp, paper, wallboard, etc. (Research initiated 1926.)

**821. Fibre Conduit Company, Orangeburg, N. Y.**

*President:* H. J. Robertson, Jr.

*Research staff:* B. G. LeMieux, Director; Emil J. Wall, Assistant Director; Robert D. Ellis, Development Engineer. 1 chemist, 2 engineers; technical personnel 1.

*Research activities:* Manufacturing processes; materials in the manufacture of bituminized or impregnated fibrous products used underground for electrical conduits, drains, sanitary sewers, and industrial wastes. The study and evaluation of field service conditions and behavior of prod-

uct under these conditions. (Research initiated 1932.)

*Library:* 500 volumes.

**822. Field and Company, Marshall, 121 North State St., Chicago 90, Ill.**

*President:* H. M. McBain.

*Research staff:* A. S. Eichlin, Manager of laboratory; Jean Reddin, Technician. 1 chemist, 2 technicians; technical personnel 1.

*Research activities:* Textile materials and wearing apparel. (Research initiated 1929.)

**823. Field Electrical Instrument Company, 109 East 184th St., New York 53, N. Y.**

*President:* Morris L. Rosenfield.

*Research staff:* M. Rosenfield, Director. 1 engineer; technical personnel 1.

*Research activities:* The development of precision vacuum thermocouples for the measurement of currents and voltages at high frequencies; the development of electrical measuring instruments or devices for the precision measurement of electrical quantities. (Research initiated 1936.)

**824. Fields Point Manufacturing Corporation, Municipal Wharf, Providence, R. I.**

*President:* Daniel Townend.

*Research staff:* Joseph L. Campanella, Director. 2 chemists, 3 chemical engineers; additional personnel 1.

*Research activities:* The production of chlorine and caustic soda, and their use, particularly in the fields of sanitation and textiles. (Research initiated 1920.)

**825. Filtrol Corporation, 634 South Spring St., Los Angeles 14, Calif.**

*President:* Wright W. Gary.

*Laboratory:* 3250 East Washington Blvd., Los Angeles 23, Calif.

*Research staff:* Robert B. Secor, Director. 14 chemists, 2 engineers; technical personnel 8; additional personnel 9.

*Research activities:* The manufacture and application of adsorbents, catalysts, and desiccants made from bentonite. (Research initiated 1922.)

*Library:* 200 volumes.

*Cooperative research:* Two grants for research are made.

**826. Finch Telecommunications, Inc., 10 East 40th St., New York 16, N. Y.**

*President:* W. G. H. Finch.

*Laboratory:* 4th and Virginia Sts., Passaic, N. J.

*Research staff:* W. G. H. Finch, Director;

Frank R. Brick, Jr., Chief Engineer. 1 chemist, 1 physicist, 5 engineers.

*Research activities:* The development of telecommunication recording equipment and telephotographs. (Research initiated 1935.)

**827. Finck Laboratories, J. L., 440 Rogers Ave., Brooklyn 25, N. Y.**

*Research staff:* J. L. Finck, Director. 1 chemist, 1 physicist; additional personnel 1.

*Research activities:* Problems in heat insulation; the development and improvement of products; refractory heat insulators; the utilization of waste products for heat insulation purposes. (Research initiated 1934.)

**828. Findlay Clay Products Co., Washington, Pa.**

*President:* J. M. Lambie.

*Research staff:* J. M. Lambie, Director. 2 chemists, 1 engineer; technical personnel 3.

*Research activities:* The study of refractories for use in glass furnaces. (Research initiated 1913.)

*Library:* 175 volumes.

*Scientific periodicals:* Vacuum Casting.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**829. Firestone Steel Products Company, Firestone Park, Akron, Ohio. (Subsidiary of Firestone Tire and Rubber Company.)**

*President:* William A. Baker.

*Development and control staff:* H. P. Coats, Chief Chemist. 3 chemists, 2 metallurgists.

*Research activities:* Electrodeposition of metals; corrosion tests on protective coating of ferrous metals and metallurgy. (Research initiated 1922.)

**830. Firestone Tire and Rubber Company, 1200 Firestone Parkway, Akron 17, Ohio.**

*Chairman of Board of Directors:* John W. Thomas.

*President:* Harvey S. Firestone, Jr.

*Research staff:* Frederick W. Stavely, Director; E. B. Babcock, Director of chemical laboratories. 49 chemists and chemical engineers, 10 physicists; technical personnel 10; additional personnel 52.

*Research activities:* The chemistry and physics of rubber, synthetic rubbers, plastics and compounding materials. (Research initiated 1908.)

*Library:* 4,750 volumes.

*Cooperative research:* Six fellowships are supported.

*See also* Autogiro Company of America, Firestone Steel Products Company, and Xylos Rubber Company.

**831. First Industrial Corporation, Micro Switch Division, Freeport, Ill.**

*President:* W. B. Schulte.

*Research staff:* A. L. Riche, Vice President in charge of research. 1 physicist, 3 engineers; technical personnel 10; additional personnel 15.

*Research activities:* The study of structures of precision snap acting switch devices, electrical contact materials, switching phenomena, and allied subjects. (Research initiated 1937.)

*Library:* 150 volumes.

*Cooperative research:* One grant for research is made.

**832. Fischer and Company, H. G., 2323-45 Wabansia Ave., Chicago 47, Ill.**

*President:* H. G. Fischer.

*Research staff:* H. G. Fischer, Director; P. P. Musket, Vice President. 7 engineers; technical personnel 2.

*Research activities:* X-ray short wave diathermy; galvanic and contractile current apparatus. (Research initiated 1924.)

*Library:* 105 volumes.

*Cooperative research:* Seven grants for research are made.

**833. Fischer and Porter Company, County Line Road, Hatboro, Pa.**

*President:* Kermit K. Fischer.

*Research staff:* Nathaniel Brewer, Director. 4 engineers, 8 design. men; additional personnel 9.

*Research activities:* The development of new methods for determining and controlling rates of fluid flow, and for forming glass to precise internal diameters. (Research initiated 1937.)

**834. Fisher Flouring Mills Company, West Waterway, Harbor Island, Seattle, Wash.**

*President:* O. D. Fisher.

*Laboratories:* Seattle, Wash.; Great Falls, Mont.

*Research staff:* William L. Haley, Director of products control; A. J. King, Chief Chemist. 6 chemists; additional personnel 3.

*Research activities:* New products and milling methods. (Research initiated 1912.)

*Library:* 200 volumes.

**835. Fisher Scientific Company, 711 Forbes St., Pittsburgh 19, Pa.**

*President:* Chester G. Fisher.

*Research staff:* David Richardson, Director. 4 chemists, 2 physicists, 3 engineers; technical personnel 5.

*Research activities:* The design and manufacture of new and improved scientific instruments and apparatus for chemists, metallurgists, and biologists. (Research initiated 1922.)

*Library:* 750 volumes.

*Scientific periodicals:* The Laboratory. Vol. I, 1928.

**836. Fiske Brothers Refining Company, 129 Lockwood St., Newark 5, N. J.**

*President:* F. J. Snyder.

*Laboratories:* Newark, N. J.; Toledo, Ohio.

*Research staff:* George E. Merkle, Vice President and General Manager. 5 chemists; technical personnel 6; additional personnel 4.

*Research activities:* Industrial lubrication; automotive lubricants; petroleum products other than lubricants, such as rust preventives, molding compounds, polishing compounds, etc. (Research initiated 1916.)

*Library:* 100 volumes.

**837. Fitchburg Paper Company, 642 River St., Fitchburg, Mass.**

*President:* George R. Wallace, Jr.

*Research staff:* D. D. Uong, Vice President in charge of engineering and research; A. M. Altieri, Assistant Director of research. 5 chemical engineers; technical personnel 5; additional personnel 2.

*Research activities:* Development and technical control in the paper industry. (Research initiated 1932.)

*Library:* A library is maintained.

**838. Flakice Corporation, 360 Furman St., Brooklyn, N. Y.**

*President:* Crosby Field.

*Research staff:* Crosby Field, Director. 1 chemist, 2 engineers; additional personnel 4.

*Research activities:* Freezing of water, chemicals, and comestibles; fatigue of nonferrous and ferrous materials; rubber and plastic bonding to metals; corrosion; compression of ice; the handling, storage, and distribution of Flakice frozen water ribbons; eutectic salt ice. (Research initiated 1919.)

**839. Flambeau Paper Company, Park Falls, Wis.**

*President:* J. B. Angle.

*Research staff:* Leonard Parkinson, Technical Superintendent. 2 chemists, 1 engineer; technical personnel 3.

*Research activities:* New grades of paper; pulping research. (Research initiated 1930.)

**840. Flee Corporation, Frank H., 1000 Diamond St., Philadelphia 22, Pa.**

*President:* G. B. Mustin.

*Research staff:* L. W. Mahle, Director. 1 chemist; additional personnel 3.

*Research activities:* New raw materials for chewing gum; improvement of processes; new

flavors and combinations. (Research initiated 1930.)

**Fleischmann Laboratories.** See Standard Brands, Inc.,

**841. Flintkote Company,** 30 Rockefeller Plaza, New York 20, N. Y.

*President:* I. J. Harvey.

*Laboratories:* East Rutherford, N. J.; Los Angeles, Calif.

*Research staff:* L. Kirschbraun, Director; John J. Stanko, Assistant Director. 26 chemists; non-technical personnel 16; additional personnel 7.

*Research activities:* Asphalt and asbestos roofing and siding; asphalt and rubber dispersions; automotive felts. (Research initiated 1915.)

*Library:* 500 volumes.

PIONEER DIVISION

2218 Terminal Annex, Los Angeles 54, Calif.

*General Manager:* L. M. Simpson.

*Laboratory:* 5500 South Alameda St., Los Angeles, Calif.

*Research staff:* Glenn W. Klingaman, Director. 20 chemists, 2 physicists, 1 metallurgist, 1 geologist; technical personnel 9; additional personnel 4.

*Research activities:* Paper, paper coatings, sizes, boxboard, and building materials; asphalt and asphalt products, emulsions, paints and protective coatings, rust inhibitors, resins, and oils; adhesives and laminants; sanitary and household materials, disinfectants, soaps, and cleaners. (Research initiated 1934.)

*Library:* 1,000 volumes.

*Cooperative research:* One grant for research is made.

**842. Flockhart Foundry Company,** 83 Polk St., Newark, N. J.

*President:* R. E. Moore.

*Research staff:* Robert E. Moore, Director. 3 engineers; additional personnel 1.

*Research activities:* Properties and engineering applications of gray cast iron. (Research initiated 1929.)

**843. Flood and Associates,** Merrill, 20 Nassau St., Princeton, N. J.

*President:* Merrill M. Flood.

*Research staff:* Merrill M. Flood, Director. 2 engineers, 2 mathematicians; technical personnel 1; additional personnel 2.

*Research activities:* Applications of mathematics and statistics to problems of research, development, production, testing, marketing, management, accounting, and public finance. Design,

development, and testing of precision instruments such as those used for artillery fire control or mapping from aerial photographs. (Research initiated 1942.)

*Library:* 100 volumes.

**844. Flood and Company,** Walter H., 6102 South Blackstone Ave., Chicago 37, Ill.

*Owner:* Walter H. Flood.

*Laboratories:* Chicago 37, Ill.; 1332-4 North Westnedge Ave., Kalamazoo 53, Mich.

*Research staff:* 3 chemists, 2 physicists, 3 engineers; technical personnel 3; additional personnel 4.

*Research activities:* Bituminous materials and pavements; portland cement and concrete materials; wetting agents. (Research initiated 1913.)

*Library:* 200 volumes.

**845. Florasynth Laboratories, Inc.,** 1513-1533 Olmstead Ave., Bronx 61, N. Y.

*President:* Alexander Katz.

*Research staff:* David Lakritz, Director. 3 chemists, 1 engineer; additional personnel 5.

*Research activities:* Synthetic organic chemicals for flavoring extracts and perfumery. (Research initiated 1928.)

**846. Florida Chemical Research, Inc.,** 206 East 50th St., New York 22, N. Y.

*President:* Guy Paschal.

*Laboratories:* 206 East 50th St., New York, N. Y.; P. O. Box 1540, Sarasota, Fla.; 235 East 47th St., New York 17, N. Y.; Sherman, Conn.

*Research staff:* William D. Turner, Director. 4 chemists, 3 biologists, 1 engineer; technical personnel 7; additional personnel 5.

*Research activities:* Odor research and control; food research; toiletries and medicinals. (Research initiated 1943.)

*Library:* 1,900 volumes.

*Cooperative research:* One fellowship is supported.

**847. Florida Citrus Cannery Cooperative,** Box 112, Lake Wales, Fla.

*President:* Harold Norman.

*Research staff:* J. L. Heid, Director. 1 chemist, 1 biologist; technical personnel 6; additional personnel 3.

*Research activities:* Quality control and improvement of citrus products; new product development; package research; nutrition investigations. (Research initiated 1943.)

*Library:* 200 volumes.

**848. Floridin Company, Inc.,** Warren, Pa.

*President:* A. C. Jackson.

*Research staff:* R. G. Capell, Director; R. C.

Amero, Assistant Technical Director. 2 chemists, 3 engineers; additional personnel 6.

*Research activities:* The investigation of methods to improve the adsorbent properties of fuller's earth and new uses for it; the development of new adsorbents, particularly for the petroleum industry. (Research initiated 1934.)

*Library:* 250 volumes.

849. Fluor Corporation, Ltd., 2500 South Atlantic Blvd., Los Angeles 22, Calif.

*President:* P. E. Fluor.

*Research staff:* Ira C. Bechtold, Chief Research Engineer. 3 chemists, 1 physicist, 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Petroleum technology, including research related to development of processes for natural gas and crude oil production and refining. Technology of chemical industries related to petroleum and natural gas production and refining. Research concerned with acoustical and mechanical vibration and pulsation problems in general industrial processes. (Research initiated 1942.)

*Library:* 650 volumes.

850. Fluorescence Laboratories, New Fliedner Bldg., Portland 15, Oreg.

*President:* Jack De Ment.

*Research staff:* Jack De Ment, Research Chemist; 1 chemist, 1 engineer, 1 mineralogist; technical personnel 2; additional personnel 5.

*Research activities:* Fluorochemistry; ultraviolet light; luminescence; luminescent minerals; radioactive minerals; X-rays and radioactivity; radiation biology; patents in the above fields. (Research initiated 1938.)

*Library:* 400 volumes.

851. Food Machinery Corporation, San Jose 5, Calif.

*President:* Paul L. Davies.

*Laboratories:* Central Research Laboratory, San Jose, Calif.; Florida Division Laboratory, Dunedin, Fla.; Riverside Division Laboratory, Riverside, Calif.; Bean Center Division Laboratory, San Jose, Calif.; Sprague Sells Division Laboratory, Hoopston, Ill.

*Research staff:* Paul C. Wilbur, Director of research. Chiefs of research of Divisional Laboratories: R. D. Gerwe, Dunedin, Fla.; A. Kalmar, Riverside, Calif.; A. Pancoast, Bean Center, San Jose, Calif.; H. Link, Hoopston, Ill. 16 chemists, 2 physicists, 1 biologist, 1 engineer, 1 chemical engineer, 1 bacteriologist, 2 entomologists, 4 plant pathologists; additional personnel 5.

*Research activities:* Control of mold and decay in fresh fruits and vegetables and the improvement of their appearance; packaging

of perishable products; canning technology; insecticides and fungicides. (Research initiated 1930.)

*See also* Niagara Sprayer and Chemical Company, Inc.

852. Food Research Laboratories, Inc., 48-14 Thirty-third St., Long Island City 1, N. Y.

*President:* Philip B. Hawk.

*Research staff:* Bernard L. Oser, Director; Daniel Melnick, Chief Chemist; Mona Oser, Supervisor of biological laboratories. 14 chemists, 12 biologists, 1 engineer, 2 bacteriologists; technical personnel 10; additional personnel 8.

*Research activities:* Consultation and investigations in biochemistry, nutrition, and toxicology; vitamin and amino acid assays; methodological studies; food, medicinal, and cosmetic products developed, tested, standardized, and placed on a plant production basis; industrial laboratories organized and directed; advertising and labeling problems; expert testimony. (Research initiated 1922.)

*Library:* 2,000 volumes.

853. Foote Mineral Company, 1609 Summer St., Philadelphia 3, Pa.

*President:* H. Conrad Meyer.

*Laboratory:* 4041 Ridge Ave., Philadelphia, Pa.

*Research staff:* Edgar C. Pitzer, Director. 15 chemists, 7 engineers, 1 metallurgist, 1 geologist; additional personnel 5.

*Research activities:* Research on the rarer elements and their compounds, both in their commercial manufacture and application; ceramic research, mining, and mineral and metal investigations; the development of the company's products; shielded arc welding electrodes. (Research initiated 1930.)

*Library:* 500 volumes.

*Scientific periodicals:* Foote-Prints. Semi-annual.

854. Forbes and Myers, 172 Union St., Worcester, Mass.

*Proprietor:* Allan W. Forbes.

*Research staff:* Allan W. Forbes, Director. 1 engineer.

*Research activities:* The development of electric motors and converters. (Research initiated 1913.)

855. Forbes Varnish Company, 3800 West 143rd St., Cleveland 11, Ohio.

*President:* Charles H. Reed.

*Research staff:* Donald R. Swan, Director of research; Robert F. Wysocki, Technical Director; Cameron H. Bell, Chief Chemist. 6 chem-

ists; technical personnel 6; additional personnel 6.

*Research activities:* Varnishes. (Research initiated 1924.)

**856. Ford Motor Company, Dearborn, Mich.**

*President:* Henry Ford II.

*Laboratories:* Dearborn, Highland Park, and Iron Mountain, Mich.

*Research staff:* W. S. James, in charge of automobile research; J. S. Laird, in charge of chemical engineering research. 50 chemists, 13 physicists, 7 biologists, 56 metallurgists, 20 engineers; additional personnel 9.

*Research activities:* The design and use of materials entering into automotive manufacture; improvements in materials, method of manufacture, and working conditions. (Research initiated 1906.)

*Library:* A library is maintained.

*Cooperative research:* Nine grants for research are made.

**857. Forest Products Chemical Company, 2753 Chelsea Ave., Memphis 8, Tenn.**

*President:* W. H. Matthews.

*Research staff:* G. A. Glossop, General Manager; Douglas S. Calder, Director. 3 chemists, 2 engineers.

*Research activities:* Process improvement and by-product recovery in wood distillation, with the emphasis on distillation and extraction. (Research initiated 1914.)

*Library:* 425 volumes.

**858. Forman, Ford and Company and General Finishes, Inc., 111-123 Second St., South, Minneapolis 1, Minn.**

*President:* L. A. Potter.

*Research staff:* A. H. Kohlhase, Senior Chemist; J. L. Jorgenson, Plant Superintendent. 3 chemists; additional personnel 5.

*Research activities:* Sealers and protective coatings for wood, fiber, metals, concrete, masonry, etc. Penetrating finishes, revealing and enhancing latent beauty of color and grain in wood and other materials. Rotproofing, mold and mildewproofing, and insectproofing coatings and impregnants for wood, cloth, fiberboard, etc. Corrosionproofing treatments and coatings for metals. General and specialty types of paints, varnishes, lacquers, waxes, and adhesives. Rubber sheeting, adhesives, rubber-base paints; other types of water and oilproof flexible and elastic coatings and impregnants. (Research initiated 1937.)

**859. Formica Insulation Company, 4614 Spring Grove Ave., Cincinnati 32, Ohio.**

*President:* D. J. O'Connor.

*Research staff:* George H. Clark, Director. 9

chemists, 7 engineers; technical personnel 12; additional personnel 8.

*Research activities:* The development of laminated plastics.

**860. Forstmann Woolen Company, 2 Barbour Ave., Passaic, N. J.**

*President:* Curt E. Forstmann.

*Laboratories:* Passaic and Garfield, N. J.

*Research staff:* Werner von Bergen, Director. 6 chemists; technical personnel 2; additional personnel 22.

*Research activities:* Standardization of test methods to establish quality of wool and other similar fibers; quality control by statistical means applied to woolen and worsted manufacturing processes; light and color physiology; thermal research; spectrophotometry. (Research initiated 1917.)

*Library:* 300 volumes.

*Cooperative research:* Two scholarships are supported and one grant for research is made.

**861. Fort Worth Laboratories, 828½ Monroe St., Fort Worth, Tex.**

*President:* F. B. Porter.

*Research staff:* R. H. Fash, Director. 8 chemists; additional personnel 3.

*Research activities:* The improvement of industrial processes; the development of new uses for by-products; cottonseed oil refining; boiler water; chemico-geological problems. (Research initiated 1912.)

**862. Foster Company, Benjamin, 1411 Walnut St., Philadelphia 2, Pa.**

*President:* Benjamin Foster, Jr.

*Research staff:* Wayne P. Ellis, Jr., Technical Director. 2 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Fire retardant compounds: resinous adhesive cements, coating and sealing compounds; bituminous compounds: adhesive cements, protective coatings, asphalt emulsions, sound and vibration dampening compounds; special purpose adhesives and coatings. (Research initiated 1912.)

**863. Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.**

*President:* H. S. Brown.

*Laboratories:* Carteret, N. J.; Dansville, N. Y.

*Research staff:* Martin Frisch, Director of engineering and development; John Blizard, Director of laboratory; F. Pyzel; R. F. Lunger; G. E. Tate; L. Nilssen. 5 chemists, 1 physicist, 20 engineers; additional personnel 30.

*Research activities:* The investigation of thermal and catalytic cracking, fractionation, hydrogenation, and solvent treatment of petroleum



and other hydrocarbons. Research on combustion with particular reference to power plant boilers, furnace construction, pulverized fuel firing and radiation; heat transfer as related to heat exchangers, condensers, direct and indirect process heating, reheating, vacuum refrigeration, and cooling towers. (Research initiated 1916.)

*Library:* 200 volumes.

**864. Four Wheel Drive Auto Company, Clintonville, Wis.**

*President:* W. A. Olen.

*Research staff:* James Sorenson, Director. 2 chemists, 1 metallurgist, 2 analysts; 2 in other scientific professions.

*Research activities:* The physical properties, structural composition, chemical composition, and heat-treatment of ferrous metals. (Research initiated 1927.)

**865. Fowler Laboratories, 900 North Franklin St., Chicago 10, Ill.**

*Research staff:* C. C. Fowler, Director. 1 biochemist; technical personnel 3; additional personnel 1.

*Research activities:* Bacteriology and chemistry of food, nutrition, water, sanitation, disinfectants, antiseptics, etc. (Research initiated 1923.)

*Library:* 100 volumes.

**866. Fox River Paper Corporation, Appleton, Wis.**

*President:* E. A. Oberweiser.

*Research staff:* H. P. Dixon, Director. 3 chemists; technical personnel 5.

*Research activities:* The development of paper products, equipment, and manufacturing methods, especially in reference to bond, ledger, blue print, direct process reproduction, and other reproduction papers; specialty papers in the writing paper class. (Research initiated 1925.)

*Cooperative research:* One fellowship is supported.

**867. Foxboro Company, Foxboro, Mass.**

*President:* B. H. Bristol.

*Research staff:* Wilfred H. Howe, Director. 1 chemist, 3 physicists, 1 metallurgist, 10 engineers; technical personnel 5; additional personnel 4.

*Research activities:* The application of physical laws to commercial measurement and control problems, including measurement and control of pressure, temperature, humidity, density, viscosity, etc.; the development of instruments for indicating and recording temperature, pressure, flow, etc.; the development of automatic control instruments and mechanisms for the control of temperature, pressure, etc.; investigations and

tests of flow coefficients; research and routine tests of physical properties of metals, paper, and other materials. (Research initiated 1926.)

*Library:* 900 volumes.

**868. Fram Corporation, Providence 16, R. I.**

*President:* Steven B. Wilson.

*Laboratory:* 55 Pawtucket Ave., East Providence, R. I.

*Research staff:* Earl G. Gunn, Vice President in charge of engineering. 1 chemist, 4 engineers.

*Research activities:* Oil filters. (Research initiated 1942.)

**869. France Stone Company, 1800 Second National Bank Bldg., Toledo, Ohio.**

*President:* George A. France.

*Laboratory:* 110 West 2nd St., Perrysburg, Ohio.

*Research staff:* Herbert F. Kriege, Technical Director. 2 chemists, 2 engineers; additional personnel 1.

*Research activities:* Crushing and screening efficiency in crushed aggregate production; chemical, physical, and microscopic properties of stone; the concrete-making properties of mineral aggregates (fine and coarse); soundness and durability of mineral aggregates and of concrete containing them; cement content of concrete (set); soil problems as affected by agricultural limestones; rates of dissolution of prepared agricultural limestones; the behavior of mineral aggregates as railroad ballast and sewage disposal media; factors affecting the stabilities of bituminous mixtures under moving wheel loads; properties of high calcium and dolomitic limes and hydrates in industrial and structural uses; the development of testing equipment for determining structural strength and texture of bituminous and stabilized mixes. (Research initiated 1926.)

**870. Franklin Glue Company, 1157 Cleveland Ave., Columbus 3, Ohio.**

*President:* Langdon T. Williams.

*Laboratory:* 888 Cleveland Ave., Columbus, Ohio.

*Research staff:* Robert F. Snider, Director. 1 chemical engineer; 2 in other scientific professions.

*Research activities:* The development of new industrial adhesives and improvement of existing ones. (Research initiated 1940.)

**871. Franklin Process Company, 564 Eddy St., Providence, R. I.**

*President:* W. Allen Traver.

*Research staff:* Robert W. Joerger, Chemist. 3 chemists.

*Research activities:* The improvement and development of dyeing methods.

**872. Franklin Research Company, 5134 Lancaster Ave., Philadelphia 31, Pa.**

*President:* Richards Jarden.

*Research staff:* W. J. LaRoche, Vice President and Director. 7 chemists; technical personnel 2; additional personnel 3.

*Research activities:* The development of wax emulsion formulae for use as protective coatings for floor surfaces; emulsion waxes applicable to use in paper, textile, jute, fruit and vegetable processing. Research on methods for quantitative analysis of wax emulsions to determine ingredients; work on synthetic waxes and emulsifying agents. (Research initiated 1932.)

*Library:* 150 volumes.

**873. Fraser Paper, Limited, Madawaska, Maine. (Subsidiary of Fraser Companies, Ltd.)**

*President:* Aubrey Crabtree.

*Research staff:* W. A. Ketchen, Chief Chemist; E. J. Ferrell, Division Chemist. 5 chemists, 2 chemical engineers; technical personnel 2; additional personnel 3.

*Research activities:* Paper manufacture and related uses. (Research initiated 1928.)

*Library:* 200 volumes.

*Cooperative research:* Three grants for research are made.

**874. Freeport Sulphur Company, 122 East 42nd St., New York 17, N. Y.**

*President:* L. M. Williams, Jr.

*Laboratories:* Freeport, Tex.; Grande Ecaille, La.; Cristo, Cuba.

*Research staff:* D. W. Mason, Technical Director; D. T. McIver, General Manager of Freeport and Grande Ecaille laboratories; F. Norcross, Vice President, Cristo, Cuba. 26 chemists and chemical engineers, 16 mining and metallurgical engineers, 1 plant pathologist, 1 entomologist; technical personnel 5; additional personnel 16.

*Research activities:* Sulfur and sulfur compounds; manganese. (Research initiated 1912.)

*Library:* 1,000 volumes.

*Scientific periodicals:* Brimstone Brevities. Vol. I, 1933.

*Cooperative research:* Occasional fellowships are supported.

**875. French and Associates, Dudley K., 503 Hawthorn Lane and 725 Elm St., Winnetka, Ill.**

*President:* Dudley K. French.

*Research staff:* Dudley K. French, Director. 2 chemists.

*Research activities:* Water analysis; boiler water problems and their solution; the control

of corrosion in industrial water. (Research initiated 1936.)

*Library:* A library is maintained.

**876. Freud Laboratories, Inc., 655 Sixth Ave., New York 10, N. Y.**

*President:* M. E. Freudenheim.

*Research staff:* Alfred Evan Villarejo, Director of food and related products research; Jac Siegel, industrial hygiene and biological products research. 3 chemists, 1 physicist, 1 biologist, 1 metallurgist, 1 engineer, 1 psychologist, 1 physician; additional personnel 2.

*Research activities:* Food and food products, especially fruit products; insecticides; industrial hygiene standards; amino acids. (Research initiated 1930.)

*Library:* 700 volumes.

**877. Friedheim, Ernst A. H., 333 West 52nd St., New York 19, N. Y.**

*Research staff:* Ernst A. H. Friedheim, Director. 3 chemists, 1 biologist; additional personnel 2.

*Research activities:* Fundamental research and chemotherapy; organic synthesis; experimental biological and clinical research on therapeutic activity and mechanism of therapeutic action of organic compounds. (Research initiated 1945.)

*Library:* 300 volumes.

**Friez Instrument Division, Bendix Aviation Corporation. See Bendix Aviation Corporation.**

**878. Froehling and Robertson, Inc., 814 West Cary St., Richmond 6, Va.**

*President:* Grant J. Durant.

*Laboratories:* Richmond, Va.; Norfolk, Va.; Baltimore, Md.; Washington, D. C.

*Research staff:* G. J. Durant, President; B. W. Marchant, Secretary; J. M. Weaver, Chief Chemist. 8 chemists, 5 physicists, 1 biologist, 2 metallurgists, 7 engineers, 5 bacteriologists; technical personnel 21; additional personnel 25.

*Research activities:* Portland cement and concrete; soil stabilization; asphalt; water treatment; stream pollution problems and surveys; wood preservatives; protective coatings; metals and alloys. (Research initiated 1881.)

*Library:* 500 volumes.

**879. Fromm Laboratories, Inc., Grafton, Wis.**

*President:* Edward Fromm.

*Research staff:* R. G. Green, Director; Heinz A. Siedentopf, Assistant Director. 1 physician, 1 bacteriologist, 1 veterinarian; technical personnel 4; additional personnel 18.

*Research activities:* Research on virus diseases of dogs and fur bearing animals; bacteriological research in secondary invaders of virus

infections; nutritional studies to determine the susceptibility of animals to virus infections. (Research initiated 1932.)

*Library:* Several hundred volumes.

*Cooperative research:* Two grants for research are made.

**880. Fruehauf Trailer Company, Detroit 32, Mich.**

*President:* H. C. Fruehauf.

*Research staff:* F. M. Reid, Director. 8 engineers; additional personnel 40.

*Research activities:* The design, processing, and testing of transportation vehicles and allied products. (Research initiated 1935.)

**881. Fruit Treating Corporation, 133 West Grant Ave., Orlando, Fla.**

*President:* Albert M. Austin.

*Research staff:* James Otis Handy, Director. 1 chemist.

*Research activities:* The cleaning, coloring, and coating of citrus fruits and other fruits and vegetables. (Research initiated 1935.)

*Library:* 100 volumes.

**Fuchs and Lang Manufacturing Company. See Sun Chemical Corporation.**

**882. Fuller Brush Company, 3580 Main St., Hartford 2, Conn.**

*President:* A. Howard Fuller.

*Research staff:* Avar E. Fuller, Assistant to the President; Alfred L. LeFebvre, Manager of research; Donald B. Peck, Chief Chemist; Henry Cave, Consulting Engineer. 1 chemist, 3 engineers, 2 laboratory technicians, 4 machinists and model makers; additional personnel 1.

*Research activities:* The development and design of products and tools for cleaning, and of machines and processes for manufacturing in the industry. (Research initiated 1923.)

**883. Fuller Company, H. B., 255 Eagle St., St. Paul 2, Minn.**

*President:* E. L. Andersen.

*Research staff:* R. E. Smith, Chief Chemist. 2 chemists; technical personnel 1.

*Research activities:* The development of industrial adhesives, including work with starches, dextrans, proteins, resins, etc. (Research initiated 1940.)

*Library:* 100 volumes.

**884. Fulton Sylphon Company, Knoxville, Tenn. (Subsidiary of Reynolds Metals Co.)**

*President:* J. V. Giesler.

*Research staff:* J. V. Giesler, Director; W. L. Chandler, Vice President and Chief Engineer; P. E. Cate, Executive Engineer; M. L.

Puster, Assistant Chief Engineer; C. D. Branson, Assistant Chief Engineer. 3 chemists, 2 metallurgists, 33 engineers, 15 laboratory assistants, 4 consultants; additional personnel 5.

*Research activities:* Investigation of the characteristics and properties of metals, and of various organic compounds; the investigation of metals and other materials suitable for use as bearings. (Research initiated 1904.)

**885. Furst-McNess Company, 120-130 East Clark St., Freeport, Ill.**

*President:* Charles W. Furst.

*Research staff:* C. H. Bollinger, Director. 5 chemists.

*Research activities:* Pharmaceuticals, food products, insecticides, and cosmetics. (Research initiated 1908.)

*Library:* 225 volumes.

**886. Fyr-Fyter Company, 221 Crane St., Dayton, Ohio.**

*President:* R. C. Iddings.

*Research staff:* John W. Wright, Director. 1 chemist; additional personnel 2.

*Research activities:* The development of methods, materials, and apparatus for first-aid fire protection; the determination of properties of materials affecting fire hazards, and methods of reducing such hazards. (Research initiated 1927.)

**887. G and W Electric Specialty Company, 7780 Dante Ave., Chicago, Ill.**

*President:* Paul F. Williams.

*Research staff:* A. E. Papp, Director; E. F. Bentley, Chief Draftsman. 2 engineers; technical personnel 4.

*Research activities:* The determination of high tension phenomena as affecting particular designs; the effect of various types of insulating barriers on behavior of terminal boxes under high voltage, as regards corona formation, etc. external voltage distribution on cable terminal bindings; transverse strength of molded plastic sheets; strength of insulator cements of various types; dielectric strength of porcelain glaze along the axis of the insulator; life tests on cable terminals; and extensive experiments on oil gasketing. (Research initiated 1928.)

**888. G-M Laboratories, Inc., 4300 North Knox Ave., Chicago, Ill.**

*President:* A. J. McMaster.

*Research staff:* A. J. McMaster, Director. 1 physicist, 6 engineers.

*Research activities:* Electric and photographic product design; electrical instruments; exposuremeters and galvanometers; projectors; electromagnetic relays; electrical appliances. (Research initiated 1925.)

GMC Truck and Coach Division, General Motors Corporation. *See* General Motors Corporation.

889. Gaertner Scientific Corporation, 1201 West Wrightwood Ave., Chicago 14, Ill.

*President:* William Gaertner.

*Research staff:* Samuel Jacobsohn, Vice President and Chief Physicist. 7 physicists, 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Optical measuring instruments; spectroscopic, spectrographic, and spectrophotometric equipment; interferometers; precise tuning forks, chronographs, and similar time-recording instruments; instrument lead screws of highest accuracy; high precision measuring instruments; dividing machines; astronomical and aeronautical equipment. (Research initiated 1896.)

*Library:* 200 volumes.

890. Gair Company, Inc., Robert, 155 East 44th St., New York 17, N. Y.

*President:* George E. Dyke.

*Laboratories:* Research Laboratory, New London, Conn. Mill Laboratories: Piermont, N. Y., Haverhill, Mass., and New London, Conn.

*Research staff:* Philip S. Bolton, Director; J. D. Malcolmson, Technical Director; Wm. Caddoo, Chief Chemist, Piermont, N. Y. 6 chemists, 3 packaging engineers; technical personnel 6.

*Research activities:* The manufacture of paperboard and paperboard products; moisture-proofing, waterproofing, and greaseproofing of paperboard; moistureproof adhesives; silicate of soda; paperboard package design; transparent cellulose films for windows in paperboard packages; insulation; printing; asphalted paperboard. (Research initiated 1930.)

*Cooperative research:* One fellowship is supported and two grants for research are made.

891. Galigher Company, 48 South 2nd East St., Salt Lake City, Utah.

*President:* John T. Potts.

*Laboratories:* Salt Lake City, Utah; Galigher Metallurgical Division, The British Mining Supply Company, Johannesburg, South Africa.

*Research staff:* J. W. Thompson, Vice President, Director, and Field Manager, Salt Lake City, Utah; L. H. Lange, Manager, Metallurgical Division; J. L. Peterson, Chief Engineer. 3 metallurgists, 4 engineers.

*Research activities:* Metallurgical research and the testing of ores and other products, particularly as applied to the flotation processes. (Research initiated 1932.)

892. Galvin Manufacturing Corporation, 4545 Augusta Blvd., Chicago 51, Ill.

*President:* Paul V. Galvin.

*Research staff:* Daniel E. Noble, Director; Henry Magnuski and Angus Tregidga, Project Supervisors. 1 physicist, 12 engineers; technical personnel 40; additional personnel 5.

*Research activities:* Home, automobile, and portable radios; automatic phonographs; radiotelephone communication equipment. (Research initiated 1940.)

*Library:* 200 volumes.

*Cooperative research:* One grant for research is made.

893. Gamble Brothers, Inc., Louisville 9, Ky.

*President:* C. D. Dosker.

*Research staff:* H. C. Moser, Director. 2 chemists, 1 engineer, 2 wood technologists; technical personnel 2.

*Research activities:* The utilization of synthetic resins in combination with wood. (Research initiated 1943.)

*Library:* Several hundred volumes.

894. Gar-Baker Laboratories, Inc., 110 West 18th St., New York 11, N. Y.

*President:* James H. Baker.

*Research staff:* Ira D. Garard, Director; James H. Baker, Chemist and Bacteriologist; Abraham Minton, Chemist. 4 chemists, 1 bacteriologist; additional personnel 1.

*Research activities:* Coating of fabrics with phosphorescent pigments and pressure sensitive adhesives; organic synthesis of medicinal chemicals and surface reducing agents; the investigation of germicidal properties of new chemicals; preservation of products against bacterial decomposition; the investigation of value of antioxidants in natural and synthetic oils; preparation and stabilization of various types of emulsions; the use in industry of new available chemicals. (Research initiated 1931.)

*Library:* 500 volumes.

Gardner Laboratory, Inc., Henry A. *See* Institute of Paint and Varnish Research.

895. Gardner Machine Company, Beloit, Wis.

*President:* L. Waldo Thompson.

*Research staff:* Ingle R. Shue, Director. 2 chemists, 8 engineers.

*Research activities:* Abrasive discs and wheels for use on disc grinders; the manufacture and development of disc grinding machines.

*Scientific periodicals:* Gardner Grinder. 3 to 6 times a year.

- 896. Gardner-Richardson Company, Middletown, Ohio.**  
*President:* E. T. Gardner.  
*Laboratories:* Research Laboratory, Lockland (Cincinnati), Ohio. Control Laboratories: Middletown and Lockland, Ohio.  
*Research staff:* Harry C. Fisher, Director. 4 chemists; technical personnel 5; additional personnel 2.  
*Research activities:* The manufacture and use of pulp, paper, and paperboard; printing on paperboard; packaging in paperboard cartons and other containers. (Research initiated 1932.)  
*Library:* 300 volumes.  
*Cooperative research:* One grant for research is made.
- 897. Garlock Packing Company, Palmyra, N. Y.**  
*President:* George L. Abbott.  
*Research staff:* F. C. Thorn, Director; D.S. Messenger, Assistant Director. 7 chemists, 1 engineer; technical personnel 6; additional personnel 3.  
*Research activities:* The development and testing of mechanical packings. (Research initiated 1923.)  
*Library:* 150 volumes.
- 898. Gascoyne and Company, Inc., 27 South Gay St., Baltimore 2, Md.**  
*President:* W. J. Gascoyne.  
*Research staff:* 3 chemists; additional personnel 2.  
*Research activities:* Feeds and fertilizers. (Research initiated 1887.)  
*Library:* A library is maintained.
- 899. Gasparcolor, Inc., 1050 Cahuenga Blvd., Hollywood 38, Calif.**  
*President:* George Converse.  
*Research staff:* Bela Gaspar, Director. 4 chemists; technical personnel 1; additional personnel 3.  
*Research activities:* Color photography and motion pictures; dye chemistry; organic chemistry. (Research initiated 1940.)  
*Library:* 2,000 volumes.
- 900. Gates Rubber Company, 999 South Broadway, Denver 17, Colo.**  
*President:* Charles C. Gates.  
*Research staff:* C. H. Mingle, Vice President and Director. 30 chemists, 3 physicists, 57 engineers; technical personnel 37; additional personnel 22.  
*Research activities:* Rubber; raw materials and product testing methods; production and process development; reclaiming processes. (Research initiated 1914.)  
*Library:* A library is maintained.
- 901. Gaylord Container Corporation, Mill Division, Bogalusa, La.**  
*President:* C. W. Gaylord.  
*Research staff:* W. F. Gillespie, Technical Director; Vertrees Young, Executive Vice President; A. Suter, General Superintendent. 2 chemists, 12 engineers; technical personnel 40 to 50; additional personnel 12.  
*Research activities:* Pulp and paper products, by-products; bag, carton, and container projects. (Research initiated 1927.)  
*Library:* 3,000 volumes.  
*Cooperative research:* Two fellowships are supported and two grants for research are made.
- 902. Geier Company, P. A., 540 East 105th St., Cleveland, Ohio.**  
*President:* A. H. Zirke.  
*Research staff:* E. Martinett, Chief Engineer. 1 engineer; technical personnel 4; additional personnel 7.  
*Research activities:* Engineering relating to the movement of air, the elimination of noise, and high speed motors and bearings in electric vacuum cleaners. (Research initiated 1905.)
- 903. General Abrasive Company, Inc., Niagara Falls, N. Y.**  
*President:* Alan V. Parker.  
*Research staff:* Raymond P. Trott, Director. 1 chemist, 1 metallurgist, 2 engineers, 3 ceramists; additional personnel 7.  
*Research activities:* Problems connected with the manufacture and application of electric furnace abrasives and abrasive products. (Research initiated 1924.)
- 904. General Alloys Company, 405 West 1st St., Boston 27, Mass.**  
*President:* H. H. Harris.  
*Research staff:* Roger Sutton, Chief Metallurgist. 2 chemists, 2 metallurgists, 5 engineers; additional personnel 5.  
*Research activities:* Problems pertaining to the metallurgy, the corrosion resistance, and the quality improvement of alloys of iron, chromium, and nickel of a variety of compositions as applied to a variety of services; the development of new compositions. (Research initiated 1920.)  
*Library:* A library is maintained.  
*Cooperative research:* Two grants are made for research projects.
- 905. General Aniline and Film Corporation, 230 Park Ave., New York 17, N. Y.**  
*President:* George W. Burpee.  
*Laboratories:* A central research laboratory and four research and process development laboratories in the several divisions, under divisional management, are maintained.

*Research staff:* W. E. Hanford, Director; J. H. Bruun, Chief, Process Development Department; F. M. Meigs, Director, Development Division.

*Library:* Each laboratory has a well equipped library.

*Cooperative research:* Ten fellowships are supported.

CENTRAL RESEARCH LABORATORY  
Easton, Pa.

*Research staff:* W. E. Hanford, Director; W. B. Converse, Assistant to the Director; C. E. Barnes, Polymers; W. F. Busse, Physics; J. M. Cross, Detergents; A. L. Fox, Applications; D. L. Fuller, Physical Chemistry; H. W. Grimmel, Dyestuffs; L. T. Hallett, Analytical; F. Max, Vat Dyestuffs; W. D. Peterson, Organic; W. A. Schmidt, Photography; C. G. Vogt, Intermediate Products. 85 chemists, 5 physicists, 4 chemical engineers; technical personnel 15; additional personnel 170.

*Research activities:* Dyes, intermediates for dyes, textile auxiliary agents, resins and polymeric products, photographic products, Ozalid products, and other organic chemical products and processes. (Research initiated 1942.)

GENERAL ANILINE WORKS DIVISION  
230 Park Ave., New York 17, N. Y.

*Chief of Process Development Departments:* J. H. Bruun.

PROCESS DEVELOPMENT DEPARTMENT  
Grasselli, N. J.

*Research staff:* P. Nawiasky, Manager; F. Ebersole, Assistant Manager; P. Kronowitt, Process Engineering; E. J. Wolthuis, Intermediates. 25 chemists, 3 chemical engineers; technical personnel 67; additional personnel 21.

*Research activities:* Dyestuffs, intermediate products, surface active agents, photographic chemicals, and other organic chemical derivatives.

PROCESS DEVELOPMENT DEPARTMENT  
Rensselaer, N. Y.

*Research staff:* J. C. Moessinger, Manager; D. B. Andrews, Intermediates; J. W. Lang, Process Engineering; D. W. Vollmer, Azo and Triphenylmethanes; W. H. Von Glahn, Naphthols. 17 chemists, 3 chemical engineers; technical personnel 78; additional personnel 27.

*Research activities:* Dyestuffs and intermediate products and other organic chemicals.

PROCESS DEVELOPMENT DEPARTMENT  
435 Hudson St., New York 14, N. Y.

*Research staff:* G. E. Goheen, Manager. 2

chemists; technical personnel 2; additional personnel 5.

*Research activities:* Planning and central files.

ANSCO DIVISION  
Binghamton, N. Y.

*Research staff:* F. W. H. Mueller, Director. 21 chemists, 6 physicists; technical personnel 3; additional personnel 32.

*Research activities:* The science and practice of photography and the development of photographic products and processes.

OZALID PRODUCTS DIVISION  
Johnson City, N. Y.

*Research staff:* S. C. Slifkin, Manager of Laboratory. 4 chemists, 1 chemical engineer; technical personnel 6; additional personnel 1.

*Research activities:* White print dry reproduction processes and products.

906. General Biological Supply House, Inc., 761 East 69th Place, Chicago 37, Ill.

*President:* C. Blair Coursen.

*Research staff:* Harvey M. Smith, Director. 12 biologists; technical personnel 14; additional personnel 24.

*Research activities:* Microtechnique and preparation methods in biology. (Research initiated 1914.)

*Library:* 2,500 volumes.

907. General Cable Corporation, 420 Lexington Ave., New York 17, N. Y.

*President:* D. R. G. Palmer.

*Laboratory:* Bayonne, N. J.

*Research staff:* D. M. Simmons, Vice President in charge of research; G. J. Shurts, Director of research. 37 chemists, 3 physicists, 4 metallurgists, 37 engineers; technical personnel 14; additional personnel 36.

*Research activities:* The fundamental properties of insulating materials and finishes applicable to the field of wire and cable, such as rubber, plastics, paper, oil, cotton, asbestos, glass, asphalts, tars, pitches, etc. The development and design of various types of electric wires and cables for all purposes from lowest to highest voltages and from lowest to highest frequencies. (Research initiated 1882.)

*Library:* 2,740 volumes.

General Chemical Company. See Allied Chemical and Dye Corporation.

908. General Dry Batteries, Inc., 13000 Athens Ave., Cleveland 7, Ohio.

*President:* Walter A. Onorato.

*Research staff:* C. G. Birdsall, Director of

laboratories. 5 chemists, 1 metallurgist, 2 engineers; technical personnel 10; additional personnel 4.

*Research activities:* The improvement and development of dry batteries and related products. (Research initiated 1922.)

*Library:* 100 volumes.

909. General Electric Company, Schenectady, N. Y.

*President:* C. E. Wilson.

RESEARCH LABORATORY  
Schenectady, N. Y.

*Research staff:* C. G. Suits, Vice President and Director. 1 associate director, 2 assistant directors, 1 executive engineer, 3 consultants. 50 chemists, 35 physicists, 16 metallurgists, 68 engineers, 409 research assistants, glass blowers, machinists, electricians, stenographers, clerks, and draftsmen.

*Research activities:* Research in pure science, physical, chemical, and metallurgical; developing new materials, processes, and apparatus; improving the products of the company. Work includes vacuum tubes, lamps, microwaves, insulation, synthetic resins, alloys, X-ray diffraction and electron microscope studies, magnetics, high voltage X-rays, nuclear physics, ceramics, and mechanical problems.

GENERAL ENGINEERING AND CONSULTING  
LABORATORY  
Schenectady, N. Y.

*Research staff:* D. C. Prince, Vice President; Everett S. Lee, Engineer; E. F. W. Alexander, Consulting Engineer. 17 physicists, 165 development engineers, 3 assistant engineers, 27 engineering assistants, 350 laboratory assistants, 260 instrument makers, machinists, electricians, clerks, stenographers, and maintenance workers.

*Research activities:* Development work in connection with electrical standards, magnetic materials and measurements, insulating materials and measurements, precision tests on electrical machinery and apparatus, high voltage apparatus and phenomena of short time duration, oscillographs, electric gages for dimension strain and pressure measurements, high frequency standard measuring apparatus and measurements, ultra high frequency developments, measurement of sound and vibration, measurement of color, heat transfer measurements, inductive coordination and apparatus developments involving the application of these facilities.

CHEMICAL DEPARTMENT  
RESIN AND INSULATION MATERIALS DIVISION  
Schenectady, N. Y.

*Research staff:* C. S. Ferguson, Engineer in

charge. 33 chemists and engineers, 14 laboratory assistants.

*Research, development, and technical service:* Protective coatings; lacquers; insulating varnishes and compounds; synthetic resins (Glyptal and Permafil); silicone products; adhesives; fabricated mica; coated fabrics; Formvar wire enamels.

WORKS LABORATORY  
Schenectady, N. Y.

*Research staff:* T. S. Fuller; 1 administrative assistant, 5 general assistants. 22 analytical chemists, 3 biologists, 4 metallurgists, 16 chemical engineers, 16 metallurgical engineers, 7 mechanical engineers, 2 electrical engineers, 2 ceramic engineers, 2 X-ray engineers, 9 welding engineers, 2 metallographists, 90 laboratory assistants.

*Research activities:* Major activities include the development and introduction of new manufacturing methods and equipment, improvement of existing methods, improved design of company products, for the purposes of increasing the scope of commercial fields and reducing costs. Among the more important projects are development, manufacture, and application of various compressed gases; development and application of fusion and resistance welding, and new insulations for high temperatures, fabrication, and stamping in lieu of forging and casting. In addition to development and research work, exhaustive tests and analyses are made to assure the quality of raw materials and finished parts entering into production. Methods include chemical, mechanical, microscopic, spectrographic, X-ray, and dielectric determinations.

WORKS LABORATORY  
West Lynn, Mass.

*Research staff:* J. H. Goss, Engineer. 3 chemists, 2 metallurgists, 3 executive assistant engineers, 4 development engineers (mechanical), 4 development engineers (electrical), 1 magnetic development engineer, 1 insulation engineer, 1 engineer on finishes, 1 process engineer, 18 assisting engineers, 38 assistants and technicians.

*Research activities:* The improvement of the products of the company; the development of new products, materials, and processes; the maintenance and improvement of primary standards of electrical measurement; metallurgical work particularly in the field of permanent magnet materials and nonferrous alloys for electrical uses. The important items of manufacture which are affected are: wattour meters, demand meters, electrical instruments, aircraft engine instruments and flight instruments including electrically driven gyroscopes, instrument transformers, time switches and photosensitive devices.

WORKS LABORATORY

APPLIANCE AND MERCHANDISE DEPARTMENT

Bridgeport, Conn.

*Research staff:* I. C. Eaton, Engineer in charge, 1 assistant. 25 chemists with 11 assistants, 2 metallurgists with 2 assistants, 7 engineers (mechanical, electrical, welding, etc.) with 6 assistants.

*Research activities:* Research on insulating materials and compounds, both rubber and synthetic, for cable and other products; organic and inorganic finishing of metals, detergents, special metallurgical problems, welding, fabrics, paper, plastics, etc.

WORKS LABORATORY

Erie, Pa.

*Research staff:* E. H. Horstkotte, Engineer in charge. 13 chemists, 3 metallurgists, 3 mechanical engineers, 6 chemical engineers, 1 ceramic engineer, 8 development engineers, 32 assistants.

*Research activities:* The improvement and reduction in cost of products manufactured at the Erie Works through the introduction of new methods, materials, and processes, or the improvement of old ones; the work includes mechanical design, insulation, welding, organic and inorganic finishes, control work on processes, standardization and calibration of measuring instruments.

WORKS LABORATORY

Philadelphia, Pa.

*Research staff:* Herman J. H. Huber, Engineer. 1 development engineer, 1 welding engineer and 1 assistant, 2 chemical engineers and 1 assistant, 1 metallurgical engineer and 1 assistant, 1 electrical engineer.

*Research activities:* The development of switchgear products; the investigation and development of new materials and equipment for factory processes, including studies on air, oil circuit breakers, air blast circuit breakers, switches, panels, cubicles, metal clad switchgears, relays, and fuses.

WORKS LABORATORY

Fort Wayne, Ind.

*Research staff:* Howard Miller, Engineer in charge; 2 assistants; 4 section leaders. 8 chemists, 3 physicists, 1 metallurgist, 5 chemical engineers, 5 electrical engineers, 3 mechanical engineers, 2 welding engineers, 7 engineering assistants, 50 laboratory assistants.

*Research activities:* Major activities include the development and application of new and improved materials and processes; development of electrical circuits and electronic devices used in design and test; control of the quality of materials used in production; preparation of

purchase specifications and general engineering service to the Fort Wayne Works. The work involves insulations, magnetic materials, metallurgy, welding, electrical engineering, mechanical engineering, organic and inorganic finishes and other activities involved in the design and manufacture of products of the Fort Wayne Works.

THOMSON LABORATORY

Lynn, Mass.

*Research staff:* J. I. Hull, Engineer in charge; E. N. Downing, Executive Assistant; 7 principal assistants, each in charge of the following operating sections: metallurgical, mechanical, welding, chemical, electrical, physics, general service. 11 chemists and chemical engineers, 1 physicist, 35 metallurgists and metallurgical engineers, 2 mechanical engineers, 7 electrical engineers, 7 welding engineers; additional personnel 325.

*Research activities:* Improving and originating products manufactured at the Lynn plant; developing and improving materials and processes.

PLASTICS LABORATORY

CHEMICAL DEPARTMENT

Pittsfield, Mass.

*Research staff:* J. J. Pyle, Director; 1 administrative assistant; 8 section heads. 46 chemists and chemical engineers, 5 laboratory assistants, 30 laboratory helpers.

*Research activities:* Research and development work on chemicals, chemical processes, and condensation and polymerization products that are used in the manufacture of all types of plastic materials.

WORKS LABORATORY

Pittsfield, Mass.

*Research staff:* A. McK. Gifford, Director; 1 administrative assistant; 1 technical assistant. 38 chemists, 6 physicists, 11 metallurgists, 9 chemical engineers, 19 electrical engineers, 8 mechanical engineers, 2 metallurgical engineers, 2 engineering physicists, 3 ceramists, 19 mechanics, 4 draftsmen, 22 technicians, 1 librarian and 1 assistant; 10 in service group; 90 semi-technical and non-technical laboratory operators; additional personnel 23.

*Research activities:* Research is devoted to the discovery, synthesis, and application of new and better liquid and solid insulating materials, metals, alloys, processes, and equipment required for the manufacture of transformers, capacitors, lightning arresters, induction voltage regulators, cutouts, and reactors. It includes basic investigations by modern methods and equipment in the chemical, electrical, metallurgical, mechanical, and ceramic fields; the normal acceptance



and control of materials; the establishment, control, and instrumentation of the most effective plant processes; the design and planning of equipment, particularly for chemical processes.

**HIGH VOLTAGE ENGINEERING LABORATORY**  
Pittsfield, Mass.

*Research staff:* J. H. Hagenguth, Engineer. 1 physicist, 7 electrical engineers.

*Research activities:* High voltage phenomena, including both power frequencies and impulse. Studies of protective measures for induction equipment and transmission and distribution lines; natural lightning.

**AIR CONDITIONING DEPARTMENT LABORATORY**  
Bloomfield, N. J.

*Research staff:* E. W. Roessler, in charge. 2 chemists and one assistant, 1 welding engineer, 1 test engineer.

*Research activities:* The development and testing of new products; works laboratory activities include process development and improvement and quality control services.

**ILLUMINATING LABORATORY**  
Schenectady, N. Y.

*Research staff:* A. F. Dickerson, Manager. 1 physicist, 1 engineering assistant, 3 application engineers, 1 engineer in charge of photometry and 3 assistants, 1 chief draftsman and 3 assistants, 1 decorative designer.

*Research activities:* The testing and application of outdoor lighting equipment and systems; engineering developments and investigation in collaboration with factory designing engineers.

**NELA PARK ENGINEERING DIVISION**  
Cleveland, Ohio

*Research staff:* Ward Harrison, Director. 72 engineers and physicists; additional personnel 65.

*Research activities:* Performance and characteristic data on light sources and lamp accessories; economics of light production and methods of utilization; the solution of fundamental problems related to street, highway, aviation, automotive, sign lighting, and general lighting for all classes of application.

**LIGHTING RESEARCH LABORATORY**  
Cleveland, Ohio

*Research staff:* Matthew Luckiesh, Director.  
*Research activities:* Studies in light, ultraviolet and infrared radiant energy supplying foundation for technology of useful applications; in science of seeing and many phases of color; in physical, biological, physiological, photochemical, and psychological aspects of light utiliza-

tion; bacteriological and other effects of ultraviolet energy; artificial sunlight, germicidal lamps, and sunlamps. Spectrophotometry; photometry; various physical properties of glass, metals, and other materials in controlling the use of light and radiant energy.

**LAMP DEPARTMENT**  
Nela Park, Cleveland, Ohio

**LAMP DEVELOPMENT LABORATORY**

*Research staff:* M. J. Hammer, Manager. 53 engineers, chemists, and physicists; additional personnel 252.

*Research activities:* Fundamental research on radiation, spectrum analysis, and light production; development of processes of manufacture of lamps; the investigation of the quality of the product; design of lamps; development of new types of lamps; the investigation of raw materials for lamp making; the testing of new processes and equipment.

**GLASS TECHNOLOGY LABORATORY**

*Research staff:* W. J. Bartlett, Manager. 3 chemists, 2 physicists, 2 ceramic engineers, 2 electrical engineers; additional personnel 39.

*Research activities:* Development work on glass, quartz, refractories, and other materials and processes related to the manufacture of parts for lamps.

**WIRE RESEARCH DIVISION**

*Research staff:* B. L. Benbow, Manager. 4 chemists, 1 physicist, 1 assistant to physicist, 2 metallurgists, 1 assistant metallurgist, 1 electrical engineer, 1 chemical engineer.

*Research activities:* Processes and analysis work on gases and filaments as related to lamp problems.

See also Edison General Electric Appliance Company, and Locke Insulator Corporation.

**General Finishes, Inc.,** See Forman, Ford and Company.

**910. General Fireproofing Company,** Youngstown, Ohio.

*President:* George C. Brainard.

*Research staff:* E. E. Wolters, Director. 1 chemist, 1 physicist, 2 engineers.

*Research activities:* The development of synthetic and enamel finishes, adhesives, and heat resisting insulations; the physical properties and fabrication of aluminum and its alloys, of upholstery materials (as for aluminum chairs), and of ferrous metals and alloys for steel furniture and fixtures. (Research initiated 1918.)

911. **General Foods Corporation**, 250 Park Ave., New York, N. Y.

*Chairman of the Board:* Clarence Francis.  
*President:* Austin S. Igleheart.

*Research and Development Department:* Thomas M. Rector, Vice President and Executive Officer; Charles W. Kaufman, Assistant Manager.

CENTRAL LABORATORIES

11th and Hudson Sts., Hoboken, N.-J.

*Research staff:* Aksel G. Olsen, Manager; Roland E. Kremers, Assistant Manager and Director of basic research; M. S. Fine, Staff Director of research; James V. Slade, Business Manager. 94 chemists, chemical engineers, mechanical engineers, microbiologists, and technologists; 25 laboratory assistants; 4 librarians; 41 administrative and clerical personnel; additional personnel 40.

*Research activities:* Central Laboratories is engaged in a broad program of research, both fundamental and applied, involving the several branches of chemistry and engineering. Some of the subjects receiving research attention are: the chemistry and technology of coffee, cacao, grains, coconut, pectin, flour, and gelatin; the technology of frozen foods; nutritive qualities of cereals and vegetables; preservation of foods; the oxygen absorption of edible oils; engineering studies of coffee decaffeination; baking technology; packaging engineering; the study of the adaptation of food products to consumer use. (Research initiated 1921.)

*Library:* 4,000 volumes; 180 journals.

*Scientific periodicals:* Weekly Abstract Bulletin.

*Cooperative research:* Three fellowships are supported.

SECTIONS AND DIVISIONS OF CENTRAL LABORATORIES

*Biochemistry Section:* H. K. Murer, Director. Division Heads: W. A. Mitchell, biochemistry; H. K. Murer (acting), biocolloids; R. Thiessen, biology.

*Organic Chemistry Section:* H. M. Barnes, Director. Division Heads: H. M. Barnes (acting), synthetic organic chemistry; T. R. Wood, phytochemistry; H. M. Cole, flavor chemistry; R. C. Reeves, organic development.

*Physical Research Section:* L. W. Elder, Director; A. C. Shuman, Assistant Director. Division Heads: A. C. Shuman (acting), physical research, and physical measurements; H. S. Levenson, physical chemistry; Robert DeS. Couch, packaging research; L. W. Elder (acting), analytical chemistry.

*Engineering Research Section:* R. H. Walters, Director. Division Heads: M. O. Ricker, chemical engineering; E. Seltzer, process engi-

neering; J. T. Settelmeyer, mechanical engineering; R. H. Walters (acting), engineering laboratory (Jersey City).

*Food Technology Section:* H. A. Campbell, Director. Division Heads: H. M. Burgess, processing technology; J. R. Davies, dessert products and prepared mixes, and formula control and test kitchen; A. Winston, marine products and by-products; W. A. Bender, colloid technology; H. S. Madsen, processing research; A. F. Stagmeier, mechanical development; V. M. White, product performance survey.

*Administrative Section:* L. R. Ferguson, Manager. Division Heads: W. E. Cochran, accounting; Wendel W. Holmes, purchase and stores.

*Post Products Research Section*, Battle Creek, Mich.: Mattison W. Alderman, Director. 5 chemists and other technical personnel. Research on new cereal product development, quality improvement, and process studies.

Research and development laboratories are maintained by the following subsidiary companies and divisions:

ATLANTIC GELATIN COMPANY

Woburn, Mass.

*Research staff:* Michael Briefer, Laboratory Director. 1 chemist, 4 laboratory assistants; additional personnel 2.

*Research activities:* Studies of gelatin behavior, improvement in photographic gelatin, stabilization of fats and oils, instruments for gelatin testing, and production studies.

BIRDS EYE-SNIDER LABORATORIES

383 Madison Ave., New York, N. Y.

*Research staff:* Clifford F. Evers, Director. *Food Technology Division:* 1 manager, 4 research chemists, 3 assistant chemists, 1 bacteriologist, 1 experimental mechanic, 4 laboratory assistants. *Horticultural Division:* 1 manager, 2 horticulturists, 2 assistant horticulturists, 1 agronomist, and 2 field assistants.

*Research activities:* Research in the freezing and canning of fruits, vegetables, meat, fish, and poultry; product and process improvement; development of new products; quality control methods and plant sanitation; seed breeding; testing new strains and varieties of fruits and vegetables; germination, fertilization, seeding rates, growing methods, and harvesting studies.

BIRELEY DIVISION

Hollywood, Calif.

*Research staff:* W. C. Platt, in charge; 3 laboratory department heads, 3 chemists, 2 assistant chemists, 3 laboratory assistants.

*Research activities:* Citrus products and process research.

**CALUMET BAKING POWDER DIVISION**  
Chicago, Ill.

*Research staff:* Peter Novitsky, Chief Chemist; technical personnel 3.

*Research activities:* Research work on baking powder and Jell-O products.

**DIAMOND CRYSTAL SALT DIVISION**  
St. Clair, Mich.

*Research staff:* H. W. Diamond, Director of development and research. 1 chemist, 3 laboratory assistants.

*Research activities:* Packaging materials and methods; engineering development for unit operations; corrosion problems.

**FRANKLIN BAKER DIVISION**  
Hoboken, N. J.

*Research staff:* John H. Henkel, Chief Chemist. 1 chemist, 5 laboratory assistants; additional personnel 4.

*Research activities:* Development work and practical research in connection with manufactured products.

**IGLEHEART BROTHERS, INC.**  
Evansville, Ind.

*Research staff:* Hamilton W. Putnam, Manager of laboratories. 3 chemists, 1 engineer, 1 home economist; additional personnel 4.

*Research activities:* Wheat flour research; process improvement; prepared flour mix developments.

**WALTER BAKER AND COMPANY, INC.**  
Dorchester, Mass.

*Research staff:* Norman W. Kempf, Manager of research. 4 chemists, 2 engineers; additional personnel 14.

*Research activities:* The chemistry and technology of chocolate and cocoa.

Control laboratories are maintained at the following divisions or subsidiaries of the Corporation:

Aberjona Division of General Seafoods Corporation, Woburn, Mass. William F. Hampton, Chief Chemist; 1 assistant.

Corn Mill Division, Kankakee, Ill. Laboratory personnel 4.

Jell-O Division, Le Roy, N. Y. Harold Gears, Chief Chemist; additional personnel 2.

Maxwell House Division, Hoboken, N. J. Frank S. Lenich, Department Head, Control Laboratory.

Minute Tapioca Company, Orange, Mass. R. F. Cadwell, in charge; additional personnel 2.

Northland Dairy Division, Evart, Mich. Henry Somers, Chemist.

Post Products Division, Battle Creek, Mich. C. E. Traut, Chief Chemist; staff of 9.

**912. General Industries, Company**, Taylor and Olive Sts., Elyria, Ohio.

*President:* Allan W. Fritzsche.

*Research staff:* D. L. Boyd, Chief Engineer. 9 in scientific professions; technical personnel 8; additional personnel 15.

*Research activities:* Small electric motors; home recordings for phonographs; reproduction for radio phonographs. (Research initiated 1928.)

*Library:* 125 volumes.

**913. General Latex and Chemical Corporation**, 666 Main St., Cambridge 39, Mass.

*President:* H. J. Elwell.

*Laboratories:* Cambridge, Mass; St. Remi, Napierville City, Quebec.

*Research staff:* H. B. Townsend, Director, Cambridge, Mass.; D. E. Murphy, Quebec. 7 chemists; technical personnel 7; additional personnel 2.

*Research activities:* Natural latex, synthetic latex, rubber dispersions, synthetic resin dispersions, synthetic resin emulsions. (Research initiated 1929 at Cambridge and 1934 in Canada.)

**914. General Mills, Inc.**, 400 Fourth St., South, Minneapolis 15, Minn.

*President:* H. A. Bullis.

*Laboratory:* 2010 East Hennepin Ave., Minneapolis 13, Minn.

*Research staff:* A. D. Hyde, Vice President and Director. Assistant Directors: R. H. Manley, chemical research; P. W. Salo, engineering research; A. E. Burnett, new products; M. J. Voigt, library and publications; W. B. Wade, business manager. 52 chemists, 1 physicist, 15 chemical engineers, 4 electrical engineers, 3 mechanical engineers, 4 bacteriologists, 2 home economists; technical personnel 39; additional personnel 76. About 86 chemists are engaged in control activities at 26 laboratories maintained at various manufacturing plants.

*Research activities:* The development of new food products; the improvement of existing products and processes, principally in the fields of human foods and animal feeds; development of milling by-products, particularly starch and gluten and their derivatives; study of fats and oils and their derivatives; development of home appliances; development and improvement of equipment for flour milling and food products manufacture; development of packaging methods and machinery; research on nutrition and vitamins. (Research initiated 1930.)

*Library:* 2,000 volumes.

*Cooperative research:* Three fellowships and scholarships are supported and two grants for research are made.

LARRO RESEARCH FARM

Box 68, North End Station, Detroit 2, Mich.

*Research staff:* H. Ernest Bechtel, Director of research; C. H. Schroeder, Director of poultry research. 4 chemists, 3 technical assistants, 1 pathologist, 1 technician; additional personnel 36.

*Research activities:* The development of information on animal nutrition, as applied to feeds and feeding methods for farm animals. Feeding investigations are conducted primarily with dairy cattle, chickens, swine, dogs, turkeys, rabbits, beef cattle, and game birds. (Research initiated 1920.)

915. General Motors Corporation, 3044 West Grand Blvd., Detroit 2, Mich.

*President:* Charles E. Wilson.

RESEARCH LABORATORIES DIVISION

*Research staff:* C. F. Kettering, General Manager; E. V. Rippingille, Assistant General Manager; H. C. Mougey, Technical Director. 18 chemists, 5 physicists, 7 metallurgists, 78 engineers, 1 mathematician, 1 hygienist, 6 designers, 8 draftsmen, 39 laboratory technicians, 27 project mechanics. Total laboratory personnel of 590 is divided into four groups and 21 departments. Administrative group: Laboratory Control, Technical Data (including library), Accounting (including purchasing and receiving), and Personnel (including plant protection). Engineering group: 7 mechanical engineering departments (including marine and aircraft laboratories). Science group: metallurgy, electrochemistry, general chemistry, organic chemistry, industrial hygiene, and physics-instrumentation. Shop group: pattern shop, instrument shop, processing shop, maintenance, and service.

*Research activities:* Automobiles and accessories, trucks and busses, household appliances, Diesel engines and locomotives. (Research initiated 1910.)

*Library:* 23,246 volumes; 1,398 scientific reports.

AC SPARK PLUG DIVISION

1300 Dort Highway, Flint 2, Mich.

*General Manager:* George Mann, Jr.

*Research staff:* Taine G. McDougal, Director; W. A. Bychinsky, Chief Ignition Engineer; Karl Schwartzwalder, Chief Ceramic Engineer. 7 chemists, 1 physicist, 3 metallurgists, 6 engineers, 6 ceramic engineers, 1 petrographer; technical personnel 27; additional personnel 18.

*Research activities:* Ignition phenomena, electrode alloys, spark gap tubes, plastic binders and coatings, ceramic and other high temperature insulations, electrical resistors, quantitative spec-

troscopy, industrial X-ray, bearing and die cast alloys. (Research initiated 1920.)

*Library:* 600 volumes.

AEROPRODUCTS DIVISION

METALLURGICAL LABORATORY

Municipal Airport, Dayton 1, Ohio

*General Manager:* W. J. Blanchard.

*Research staff:* R. E. Gould, Chief Engineer; J. F. Haines, William Shepherd, B. Muzzey, K. McFarland, R. R. LaMotte. 4 chemists, 1 physicist, 3 metallurgists; additional personnel 1.

*Research activities:* Metallurgy in connection with fabrication of aircraft propeller blades. (Research initiated 1940.)

*Library:* 100 volumes.

ALLISON DIVISION

Indianapolis 6, Ind.

*General Manager:* E. B. Newill.

*Research staff:* R. M. Hazen, Chief Engineer; T. S. McCrae, Assistant Chief Engineer; E. A. Canning, Foundry Research Director; E. G. Davis, Chief Bearing Engineer; C. J. McDowall, Chief Development Engineer; R. E. Lynch, Executive Engineer; J. C. Feters, Chief Turbine Engineer; D. Gerdan, Chief Reciprocating Engine Engineer; F. W. Luker, Production Engineer; H. L. Driffill, Foundry Research Engineer. 10 chemists, 24 metallurgists, 150 engineers; technical personnel 150; additional personnel 648.

*Research activities:* Aircraft and marine reciprocating engines, aircraft gas turbines, power shafting and remote reduction gear boxes, sleeve bearings, superchargers, marine transmissions, automotive transmissions and equipment, plastic, permanent, and sand molded aluminum and magnesium castings. (Research initiated 1929.)

*Library:* 3,500 volumes.

BUICK MOTOR DIVISION

Hamilton Ave., Flint 2, Mich.

*General Manager:* H. H. Curtice.

*Research staff:* C. A. Chayne, Chief Engineer; E. T. Ragsdale, Assistant Chief Engineer; R. B. Schenck, Chief Metallurgist. 14 chemists, 19 physicists, 24 metallurgists, 35 engineers; technical personnel 7; additional personnel 404.

*Research activities:* Automotive development, including engine and electrical research; complete chassis and body research, including acoustics, to improve automobile performance, endurance, riding, handling comfort, operating ease, and safety developments. (Research initiated 1903.)

*Library:* 655 volumes.

**CADILLAC MOTOR CAR DIVISION**

2860 Clark Ave., Detroit 32, Mich.

*General Manager:* Nicholas Dreystadt.

*Research staff:* C. F. Arnold, Director; 2 assistants. 1 assistant chemist, 1 chief metallurgist, 2 assistant chief metallurgists, 8 senior engineers, 3 junior engineers, 1 radio and accessory engineer, 3 dynamometer operators, 9 project mechanics, 7 metallurgical technicians, 7 chemical laboratory technicians, 2 assistant laboratory technicians, 4 X-ray operators, 1 spectrograph operator, 1 photographer; technical personnel 87; additional personnel 74.

*Research activities:* General Motors car product development and ordnance combat vehicles.

**CLEVELAND DIESEL ENGINE DIVISION**

2160 West 106th St., Cleveland 11, Ohio.

*General Manager:* G. W. Codrington.

*Research staff:* E. R. Brater, Assistant Chief Engineer and Director of research. 1 chemist, 2 physicists, 1 metallurgist, 10 engineers; technical personnel 6; additional personnel 20.

*Research activities:* The development of Diesel engines. (Research initiated 1940.)

*Library:* 100 volumes.

**DELCO APPLIANCE DIVISION**

379 Lyell Ave., Rochester, N. Y.

*General Manager:* Edward A. Halbleib.

*Research staff:* 1 chemist, 1 physicist, 1 metallurgist, 2 engineers; additional personnel 2.

*Research activities:* Automatic household heating, electric motors and generators, and gasoline engines.

**DELCO PRODUCTS DIVISION**

Dayton 1, Ohio

*General Manager:* F. H. Irelan.

*Research staff:* C. J. Werner, Chief Engineer. 1 chemist, 1 metallurgist, 29 engineers; technical personnel 12; additional personnel 115.

*Research activities:* Development and design of hydraulic and electrical apparatus including hydraulic shock absorbers, fractional and integral horsepower motor, electromechanical linear actuators, and AC and DC generators up to 100 kilowatt ratings. (Research initiated 1910.)

**DELCO RADIO DIVISION**

200 West Mulberry St., Kokomo, Ind.

*General Manager:* B. W. Cooper.

*Research staff:* B. A. Schwarz, Chief Engineer; A. G. Tynan; M. J. Manahan; H. M. Stelzl. 28 engineers; technical personnel 33; additional personnel 27.

*Research activities:* Pre-war and post-war automobile radios, antennas, tuning means, tuning mechanisms, indicators, and acoustics;

radio frequency and audio frequency amplifiers, indicators and modulators, power supplies, rectifiers, converters, ignition and interference suppressors, filters, etc. Also household radio, television, facsimile, speech and music recording and reproducing. (Research initiated 1936.)

*Library:* A library is maintained.

**DELCO REMY DIVISION**

2401 Columbus Ave., Anderson, Ind.

*General Manager:* O. V. Badgley.

*Research staff:* R. M. Critchfield, Chief Engineer; J. H. Bolles, Assistant Chief Engineer; W. C. Edwards, Assistant Chief Engineer; D. A. Cotton, E. M. Claytor, R. L. Seabury, and P. L. Schneider, Affiliates; L. W. Murray, in charge of Test Laboratory; R. L. Kessler, in charge of Process Laboratory; Fred Carl, in charge of Metallurgical Laboratories; R. A. Daily, in charge of Battery Laboratory; B. H. Short, in charge of Electronic Laboratories. 23 chemists, 13 physicists, 15 metallurgists, 52 engineers; technical personnel 30; additional personnel 23.

*Research activities:* Automotive electrical generating, regulating, starting, signaling, and switching equipment; batteries; processes; plastics; ferrous and nonferrous castings. (Research initiated 1915.)

*Library:* 1,000 volumes.

**DETROIT DIESEL ENGINE DIVISION**

13400 Outer Drive, Detroit 23, Mich.

*General Manager:* W. T. Crowe.

*Research staff:* G. P. Berry, Director. 1 chemist; technical personnel 70; additional personnel 5.

*Research activities:* Diesel and allied activities; Diesel combustion, lubricating, and fuel oils.

**DETROIT TRANSMISSION DIVISION**

5140 Riopelle, Detroit 11, Mich.

*General Manager:* V. A. Olsen.

*Research staff:* W. L. Carnegie, Chief Engineer; W. B. Herndon, Assistant Chief Engineer; C. W. Myers, Superintendent, Experimental Engineering Test and Research Division. 9 engineers; technical personnel 37; additional personnel 7.

*Research activities:* Hydra-Matic, Torqmatic, and automatic transmissions and their related problems. (Research initiated 1939.)

**GMC TRUCK AND COACH DIVISION**

660 South Blvd., East, Pontiac 11, Mich.

*General Manager:* M. D. Douglas.

*Research staff:* C. O. Ball, Chief Engineer; E. W. Allen, Coach Engineer; C. J. Bock, Truck Engineer; G. C. Farnsworth, Metallur-

gist; H. E. Fox, Structures Engineer; F. A. Franklin, Electrical Engineer; G. F. Roddewig, Experimental Engineer; H. O. Schjolin, New Development Engineer. 10 chemists, 4 physicists, 16 metallurgists, 78 engineers; technical personnel 237; additional personnel 90.

*Research activities:* Design and development of commercial automotive vehicles such as motor coaches and motor trucks, with their component parts, including a wide range of internal combustion engines. (Research initiated 1930.)

#### HARRISON RADIATOR DIVISION

Lockport, N. Y.

*General Manager:* F. M. Hardiman.

*Research staff:* L. P. Saunders, Director. 2 physicists, 4 engineers; technical personnel 12; additional personnel 62.

*Research activities:* Investigation of heat transfer phenomena with gas to liquid, and liquid to liquid surfaces. (Research initiated 1929.)

#### MORAINÉ PRODUCTS DIVISION

1440 Wisconsin Blvd., Dayton 1, Ohio

*General Manager:* B. A. Brown.

*Research staff:* R. P. Koehring, Chief Metallurgist. 4 chemists, 9 metallurgists, 5 engineers, 1 mechanical engineer; technical personnel 11; additional personnel 4.

*Research activities:* The development of powdered metal products, engine bearings, and vehicle brakes.

#### GENERAL MOTORS PROVING GROUND

Milford, Mich.

*Director:* H. H. Barnes.

*Research staff:* Paul Huber, Assistant Director; T. J. Carmichael, Experimental Engineer. 2 physicists, 10 engineers; technical personnel 54; additional personnel 161.

*Research activities:* Full-scale testing of automobiles, with research in progress on test methods, and on special problems, including noise control and high speed motion pictures. (Research initiated 1924.)

*Library:* 300 volumes.

#### INLAND MANUFACTURING DIVISION

Dayton, Ohio

*General Manager:* J. D. O'Brien.

*Research staff:* George M. Rowland, Director of laboratories; F. W. Sampson, Chief Engineer. 4 chemists, 7 metallurgists, 9 engineers; technical personnel 100; additional personnel 120.

*Research activities:* Rubber, synthetic rubbers, plastics, friction materials, rubber cements, surface finishing materials. (Research initiated 1926.)

*Library:* 200 volumes.

#### NEW DEPARTURE DIVISION

North Main St., Bristol, Conn.

*General Manager:* Frederick G. Hughes.

*Research staff:* O. S. Hart, Director; T. C. Delaval-Crow, Chief Engineer; L. D. Cobb, Executive Engineer. 6 chemists, 5 metallurgists, 7 engineers; technical personnel 7; additional personnel 5.

*Research activities:* Continuous studies of load carrying capacities of curved bodies in contact; the development of materials, heat-treating, and hot-working processes; the development of economical designs of industrial and automotive equipment involving antifriction bearings. (Research initiated 1911.)

*Library:* 300 volumes.

#### OLDSMOBILE DIVISION

1014 Townsend, Lansing 21, Mich.

*General Manager:* S. E. Skinner.

*Research staff:* J. F. Wolfram, Chief Engineer; F. R. Nethaway, Chief Metallurgist. 12 chemists, 6 metallurgists, 35 engineers; technical personnel 60; additional personnel 34.

*Research activities:* Developing and testing new automotive designs, fuels, and material. As new and better materials are available, possible improvements in design using the new materials are investigated. Studies of the properties and suitability of automotive metals and protective metal coatings; improvements in heat treatment standards for production and service requirements. (Research initiated 1897.)

*Library:* 150 volumes.

#### PACKARD ELECTRIC DIVISION

Warren, Ohio

*General Manager:* B. N. MacGregor.

*Research staff:* J. B. Littman, Director. 1 chemist; technical personnel 1; additional personnel 8.

*Research activities:* High tension ignition cables; flexible lacquers for cable finish. Plastics and synthetics for cable insulation; miscellaneous research pertaining to fractional horsepower motors. (Research initiated 1933.)

*Library:* 150 volumes.

#### TERNSTEDT MANUFACTURING DIVISION

6309 West Fort St., Detroit 9, Mich.

*General Manager:* J. W. Jackson.

*Research staff:* C. F. Nixon, Process Engineer. 3 chemists, 2 physicists, 2 metallurgists, 3 engineers; technical personnel 22; additional personnel 6.

*Research activities:* Electrodeposition, zinc base die castings, polishing and buffing, organic finishes, lubrication, control of production metals

and of product serviceability. (Research initiated 1923.)

*Library:* 250 volumes.

**General Motors Proving Ground, General Motors Corporation.** See General Motors Corporation.

**916. General Plastics Manufacturing Company,** 3423 South Union Ave., Tacoma 9, Wash.

*President:* L. W. Schatz.

*Research staff:* L. W. Schatz, Director. 1 chemist, 1 engineer; additional personnel 3.

*Research activities:* Plastic coatings and impregnating materials for wood, metal, cloth, and cordage. (Research initiated 1942.)

*Library:* 125 volumes.

**917. General Precision Equipment Corporation,** 92 Gold St., New York 7, N. Y.

*President:* Earle G. Hines.

*Research staff:* R. L. Garman, Director. 2 chemists, 11 physicists, 12 engineers; technical personnel 16; additional personnel 32.

*Research activities:* Motion picture reproducing equipment; marine instruments; industrial control instruments; television. (Research initiated 1945.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported and two grants for research are made.

**918. General Radio Company,** 275 Massachusetts Ave., Cambridge 39, Mass.

*President:* E. H. Locke.

*Research staff:* Melville Eastham, Chief Engineer; D. B. Sinclair, Assistant Chief Engineer. 23 engineers; technical personnel 20; additional personnel 7.

*Research activities:* The development of electronic instruments for the scientific and engineering fields. (Research initiated 1915.)

*Library:* 1,000 volumes.

*Scientific periodicals:* General Radio Experimenter. Vol. I, 1926.

*Cooperative research:* Several fellowships are supported.

**919. General Railway Signal Company,** 801 West Ave., Rochester 11, N. Y.

*President:* Paul Renshaw.

*Research staff:* O. S. Field, Director of engineering and research; C. S. Bushnell, Chief Engineer; E. H. Branson, Laboratory Director. 3 chemists, 2 metallurgists, 8 engineers; technical personnel 9; additional personnel 2.

*Research activities:* The development of devices and systems for use in the field of railway signaling, automatic train control, switching, car retarders, centralized traffic control,

highway crossing protection, etc.; the development of new materials and new uses for existing materials; improvement in the processes employed in the treatment and fabrication of materials. The aim of the research is to increase the safety and facility, and to decrease the cost of railway train operation. (Research initiated 1901.)

*Library:* 1,000 volumes.

**920. General Refractories Company,** 1600 Real Estate Trust Bldg., Philadelphia 7, Pa.

*President:* Floyd L. Greene.

*Laboratories:* Baltimore, Md.; Los Angeles, Calif.

*Research staff:* R. P. Heuer, Vice President in charge of research. 4 chemists, 4 engineers; technical personnel 5; additional personnel 5.

*Research activities:* Commercial research in connection with the manufacture, use, and properties of refractories comprising magnesite, chrome, sillimanite, high alumina, silica, fireclay, and acidproof materials. (Research initiated 1926.)

**921. General Textile Mills, Inc.,** 450 Seventh Ave., New York 1, N. Y.

*President:* Leonard P. Frieder.

*Laboratories:* New York, N. Y.; Carbondale, Pa.

*Research staff:* Leonard P. Frieder, Director. 2 engineers; technical personnel 20; additional personnel 3.

*Research activities:* Design of parachutes; molding of plastics; aeronautical mechanical devices. (Research initiated 1932.)

*Library:* 250 volumes.

**922. General Time Instruments Corporation,** 109 Lafayette St., New York 13, N. Y.

*President:* Arnold J. Wilson.

*Research staff:* Richard F. Deimel, Director; William A. Black, Manager. 4 engineers; technical personnel 9; additional personnel 1.

*Research activities:* Horological instruments. (Research initiated 1931.)

*Library:* 100 volumes.

**923. General Tire and Rubber Company,** 1708 Englewood Ave., Akron 9, Ohio.

*President:* W. F. O'Neil.

*Laboratories:* Akron, Ohio; Wabash, Ind.; Jeannette, Penn.; Barnesville, Ga.; Waco, Tex.; Mexico; Chile; Venezuela; Portugal; Guayule Project.

*Research staff:* C. J. Jahant, Vice President in charge of production; R. Iredell, in charge of engineering; H. B. Pushee, in charge of development; G. H. Swart, Director of research; H. T. Kraft, Chief Engineer in charge of engi-

neering development; C. J. Collins, Chief Plant Engineer; C. B. Orr, Chief Engineer in charge of tire design. Research Laboratory, Akron: 12 chemists, 18 assistants; Factory Laboratory, 9 chemists, 21 assistants; Engineering Laboratory, 1 physicist, 2 mechanical engineers, 1 tool designer, 3 draftsmen, 1 laboratory supervisor, 1 machinist, 2 A. and E. mechanics, 8 technicians. Wabash Factory Laboratory: 7 chemists, 6 engineers, 8 assistants. Waco Factory Laboratory: 1 chemist, 2 assistants. Pennsylvania Rubber Company Laboratory: 4 chemists. Mexico: 2 chemists, 1 assistant. Venezuela: 1 chemist, 1 assistant. Chile: 1 chemist, 1 assistant. Portugal: 1 chemist, 1 assistant. Guayule Project: 1 chemist, 1 assistant.

*Research activities:* Synthetic rubber; resins; new products in the fields of tires and accessories and of general mechanical goods. (Research initiated 1920.)

*Library:* 400 volumes.

*Cooperative research:* Three grants for research are made.

See also Pennsylvania Rubber Company.

**924. Geometric Tool Company, New Haven 15, Conn.**

*President:* H. L. Bill.

*Research staff:* R. M. Strickland, Development Engineer; Stuart E. Sinclair, Metallurgist. 1 metallurgist, 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* The development and testing of high speed and alloy steels and their products; the development of tools for producing screw threads.

**925. Geophysical Research Corporation, 2607 North Boston Place, Tulsa 6, Okla. (Subsidiary of Amerada Corporation.)**

*President:* B. B. Weatherby.

*Research staff:* W. T. Born, Director. 3 physicists, 2 engineers, 3 technical assistants; additional personnel 18.

*Research activities:* The development of geophysical instruments and methods, and experimental work on problems connected with the production of oil. (Research initiated 1925.)

**926. George Company, P. D., 4153 Bingham Ave., St. Louis, Mo.**

*Research staff:* P. D. George, Director; N. J. George; F. L. George; J. E. George; B. Scobel. 2 chemists, 1 engineer; technical personnel 5; additional personnel 10.

*Research activities:* Wire enamels; coatings for insulation and electrical industries; adhesives; industrial paints, lacquers, varnishes, and specialties.

*Library:* 100 volumes.

**927. Georgia Kaolin Company, 1185 Mary St., Elizabeth 3, N. J.**

*President:* Edward J. Grassman.

*Laboratories:* Dry Branch, Ga.; Elizabeth, N. J.

*Research staff:* S. C. Lyons, Technical Director. 4 chemists, 1 physicist, 1 metallurgist, 2 engineers, 1 ceramist; technical personnel 3; additional personnel 2.

*Research activities:* The development of clays for paper, paints, and protective coatings; for ceramic purposes; for rubber reinforcing, etc.; for general pigment applications; for chemical purposes such as catalysts; clays as source of aluminum compounds; clays for special refractory purposes; studies of colloidal behavior and viscous flow of fluid suspensions. (Research initiated 1935.)

*Library:* 300 volumes.

*Cooperative research:* Two grants for research are made.

**928. Geotechnical Corporation, 149 Sidney St., Cambridge 39, Mass.**

*President:* Roland F. Beers.

*Laboratories:* Cambridge 39, Mass.; 2800 Commerce St., Dallas, Tex.

*Research staff:* R. Maurice Tripp, Director of Cambridge Laboratory; Frank H. Kennedy, Jr., Director of Dallas Laboratory. 1 chemist, 2 physicists, 8 engineers, 4 geologists; technical personnel 7; additional personnel 25.

*Research activities:* The development of geophysical methods for exploration and engineering problems in the fields of petroleum and mining. (Research initiated 1940 at Cambridge and 1936 at Dallas.)

*Library:* 450 volumes.

**929. Gephart, Frank C., 23 East 31st St., New York 16, N. Y.**

*Research staff:* Frank C. Gephart, Director.

*Research activities:* Research and consulting work in chemistry, especially the chemistry of food and its industrial application.

**930. Gerber Products Company, Fremont, Mich.**

*President:* Dan F. Gerber.

*Laboratories:* Fremont, Mich.; Oakland, Calif.

*Research staff:* Lillian B. Storms, Director of research; Ray B. Wakefield, Director of quality control. 9 chemists, 2 bacteriologists; technical personnel 9; additional personnel 9.

*Research activities:* The development of new processes and food products; quality control. (Research initiated 1932.)

*Library:* 300 volumes.

*Cooperative research:* One grant for research is made.



931. Gerotor May Corporation, Maryland Ave. and Oliver St., Baltimore 1, Md.

*President:* E. E. Yaggy, Jr.

*Research staff:* Rivington Stone, Director. 3 engineers; technical personnel 3; additional personnel 3.

*Research activities:* The design and development of rotary hydraulic pumps, cylinders, valves, and complete hydraulic systems; domestic automatic oil burners. (Research initiated 1927.)

*Library:* 250 volumes.

932. Gerson Stewart Corporation, Buckeye and Lisbon Roads, Cleveland 4, Ohio.

*President:* L. H. Gerson.

*Research staff:* A. G. Bowers, Director. 2 chemists, 1 bacteriologist; technical personnel 1.

*Research activities:* Industrial, hospital, and military disinfectants, soaps, and sanitation items. (Research initiated 1925.)

*Library:* 500 volumes.

933. Giannini and Company, Inc., G. M., 161 East California St., Pasadena 5, Calif.

*President:* G. M. Giannini.

*Research staff:* A. J. Klose, Director. 2 physicists, 7 engineers; technical personnel 9; additional personnel 7.

*Research activities:* The development of jet propulsion engines and aircraft navigational instruments and components. (Research initiated 1944.)

*Library:* 1,000 volumes.

934. Gilbert Company, A. C., 319 Peck St., New Haven, Conn.

*President:* A. C. Gilbert.

*Research staff:* Marshall Frisbie, Director; professional personnel 6; additional personnel 11.

*Research activities:* The development of fractional horsepower appliances, electric trains, and construction toys. (Research initiated 1912.)

935. Gilbert Research Institute, Morristown, N. J.

*President:* Edgar Gilbert.

*Research staff:* Edgar Gilbert, Director. 1 chemist, 1 biologist; additional personnel 1.

*Research activities:* The etiology and therapeutics of cancer; the biochemistry of internal medicine. (Research initiated 1909.)

*Library:* 200 volumes.

936. Gillespie-Rogers-Pyatt Co., Inc., 80 John St., New York 7, N. Y.

*President:* John T. Gillespie.

*Laboratory:* 39 Greene St., Jersey City 2, N. J.

*Research staff:* Werner R. Kuebler, Chief Chemist; Herbert S. Cockeram, Assistant Chief Chemist. 3 chemists; technical personnel 2; additional personnel 1.

*Research activities:* The manufacture of bleached shellac; special products and derivatives of shellac for coatings, electrical use, etc. Natural varnish resins (African, Philippine, and East Indian copals, damars, etc.) fused and modified for protective coatings. (Research initiated 1942.)

*Library:* 750 volumes.

937. Gillette Safety Razor Company, 15 West 1st St., Boston, Mass.

*President:* J. P. Spang, Jr.

*Research staff:* T. L. Smith, Director. 4 chemists, 1 physicist, 1 metallurgist, 2 engineers; technical personnel 2.

*Research activities:* Surface and edge studies; abrasives; metallurgy; raw material inspection; new processes and products. (Research initiated 1910.)

*Cooperative research:* One fellowship is supported.

Gilmer Company, L. H. See United States Rubber Company.

938. Girdler Corporation, 224 East Broadway, Louisville 1, Ky.

*President:* George O. Boomer.

*Laboratories:* 2820 West Broadway, 3000 West Kentucky, 659 Ninth St., Louisville, Ky.

*Research staff:* H. G. Houlton, Technical Director; J. D. Mattimore; R. E. Reitmeir. 21 chemists, 3 physicists, 2 metallurgists, 13 engineers; technical personnel 11; additional personnel 35.

*Research activities:* Gases, food processes, petroleum, starch, resins, fats and oil, high frequency, wood, adhesives, plastic molding, metallurgy of welded fittings and piping materials, stress analysis, and hydraulics. (Research initiated 1928.)

*Library:* 1,500 volumes.

Givaudan-Delawanna, Inc. See Bush, Inc., Burton T.

Givaudan-Virginia, Inc. See Bush, Inc., Burton T.

939. Gladding, McBean and Company, 2901 Los Feliz Blvd., Los Angeles 7, Calif.

*President:* F. B. Ortman.

*Laboratories:* Glendale, Los Angeles, Lincoln, and Pittsburg, Calif., and Renton, Wash.

*Research staff:* Paul E. Thornton, Director of research; P. D. Helser, Executive Officer in charge of research; O. G. Caldwell; A. M.

Dinkfeld. 3 chemists, 10 ceramic engineers, 1 mining engineer, 10 laboratory assistants, 1 technical secretary.

*Research activities:* The development, improvement, and control of the following typical products: wall tile, pottery, china, ceramic veneer, refractories, insulation, acidproof cement, roof tile, acoustical products, and sewer pipe. (Research initiated 1898.)

*Library:* 100 volumes.

940. Gland-O-Lac Company, 1818 Leavenworth St., Omaha 1, Nebr.

*Research staff:* S. A. Rice, Director. 3 chemists, 2 veterinarians; technical personnel 2; additional personnel 1.

*Research activities:* Evaluation of drugs in the treatment of diseases of poultry; biologicals for infectious diseases of poultry; internal and external parasiticides; disinfectants and antiseptics. (Research initiated 1930.)

*Library:* 400 volumes.

941. Glens Falls Portland Cement Company, Box 440, Glens Falls, N. Y.

*President:* H. E. Harding.

*Research staff:* J. J. Fox, Director. 2 chemists; additional personnel 6.

*Research activities:* Investigations to improve quality of products; to lower cost of production; to extend the uses of products; to determine quality of concrete aggregates; and to improve durability of concrete. (Research initiated 1899.)

*Library:* 200 volumes.

942. Glidden Company, 1396 Union Commerce Bldg., Cleveland 14, Ohio.

*President:* Adrian D. Joyce.

*Chairman of Research and Manufacturing Committee:* W. J. O'Brien.

*Research activities:* Paints, enamels, nitrocellulose lacquers, synthetic gums, treated oils, insecticides, chemicals, pigments, lithopone, titanium oxide, cadmium red and cadmium yellow pigments, white lead, lead oxides, white metal alloys, powdered metals, copper oxides, type metal, babbitt, terne metals, grid metals, storage batteries, litharge, destructive distillation products, naval stores, soya protein, hormones, soybean products, soybean meal, feed mill products, vegetable oils, shortening, margarine, coconut, spices, and salad dressing.

The following divisions maintain research laboratories:

#### CHEMICAL AND LEAD DIVISION

Chemical and Pigment Company, St. Helena 22, Baltimore, Md. B. W. Allan, Director of research, Titanium Division; K. S. Mowlds, Director of research, Lithopone Division.

Chemical and Pigment Company, 766 Fiftieth Ave., Oakland 1, Calif. W. P. Stein, Director of research.

Chemical and Pigment Company, Collinsville, Ill. Otto C. Klein, Director of research.

Euston Lead Company, 500 Penn Ave., Scranton 3, Pa. E. D. Turnbull, Director of research.

Metals Refining Company, Hammond, Ind. J. E. Drapeau, Jr., Director of research.

#### FOOD DIVISION

Durkee Famous Foods, Elston Ave. and Logan Blvd., Chicago 47, Ill. L. A. Spielman, Technical Director, Durkee Division; Ray McGee, Director of research.

Durkee Famous Foods, 3702 Iron St., Chicago 9, Ill. E. W. Miles, Director of research.

Durkee Famous Foods, Corona Ave. and 94th St., Elmhurst, Long Island, N. Y. Morris Palmer, Director of research.

Durkee Famous Foods, Norwalk, Ohio. A. L. Ruffing, Director of research.

Durkee Famous Foods, 1303 Shelby St., Louisville 1, Ky. M. A. Beck, Director of research.

Durkee Famous Foods, 2900 Fifth St., Berkeley 2, Calif. C. E. McMichael, Director of research.

#### NAVAL STORES DIVISION

Nelio Resin Processing Corporation, Jacksonville 1, Fla. J. P. Bain, Director of research.

Southern Pine Chemical Company, Jacksonville 1, Fla. J. P. Bain, Director of research.

#### PAINT AND VARNISH DIVISION

Glidden Company, 11001 Madison Ave., Cleveland 2, Ohio. Edward Schulte, Technical Director, Paint and Varnish Division; T. A. Neuhaus, Director of research.

Nubian Paint and Varnish Company, 1856 North LeClaire Ave., Chicago 39, Ill. C. G. Moore, Director of research.

A. Wilhelm Company, Third and Bern Sts., Reading, Pa. L. F. Wagner, Director of research.

#### SOYA PRODUCTS DIVISION

Glidden Company, 5165 West Moffat St., Chicago 39, Ill. Percy L. Julian, Director of research.

943. Globe Knitting Works, Grand Rapids, Mich.

*President:* Grover C. Good.

*Research staff:* Joseph F. Feit, Director; Benjamin DeVries; Peter Meeuwesen. 3 chemists.

*Research activities:* Shrinkproofing of wool knit goods; creaseproofing and finishing of rayon knit gloves, dress fabrics, and other textiles. (Research initiated 1935.)

- 944. Globe Steel Tubes Company, 3839 West Burnham St., Milwaukee 4, Wis.**  
*President:* W. C. Buchanan.  
*Research staff:* H. K. Ihrig, Director. 4 chemists, 3 engineers, 7 metallurgists; technical personnel 13; additional personnel 3.  
*Research activities:* Metallurgical: iron and steel and nonferrous metals. Chemical: corrosion and utilization of waste products. (Research initiated 1930.)  
*Library:* 500 volumes.  
*Cooperative research:* Three grants for research are made.
- 945. Globe-Union, Inc., 900 East Keefe Ave., Milwaukee, Wis.**  
*President:* C. O. Wanvig.  
*Research staff:* J. Fletcher Harper, Vice President in charge engineering; J. S. Coldwell, Chief Mechanical Engineer; H. W. Rubinstein, Chief Engineer, Radio Products; G. M. Ehlers, Chief Ceramic Engineer; G. C. Appel, Chief Battery Engineer; John F. Schaefer, Chemist. 6 chemists, 3 metallurgists, 55 engineers, 16 draftsmen; technical personnel 66; additional personnel 8.  
*Research activities:* Devising, experimenting, and testing new batteries and materials and their method of manufacture; research in the ceramic field as applied to radio fixed resistors, capacitors, and spark plugs; research on variable resistors, tone, and volume controls for radio; the application of electronics to the measuring, testing, and manufacturing of various products. (Research initiated 1919.)  
*Library:* 500 volumes.
- 946. Globe-Wernicke Company, 5025 Carthage Ave., Norwood, Cincinnati 12, Ohio.**  
*President:* J. S. Sprott.  
*Research staff:* H. W. Deutemeier, Chief Engineer; 1 chemist, 3 engineers, 2 experimental mechanics.  
*Research activities:* Process improvement and the development of office equipment. (Research initiated 1925.)
- 947. Glyco Products Company, Inc., 26 Court St., Brooklyn 2, N. Y.**  
*President:* H. Bennett. *Executive Vice President:* E. Rosendahl.  
*Laboratories:* 230 King St., Brooklyn, N. Y.; Mexico City, D. F.  
*Research staff:* Gerald J. Leuck, Director. 18 chemists; additional personnel 3.  
*Research activities:* Emulsifiers; synthetic waxes and resins; plasticizers; glycerin substitutes. (Research initiated 1926.)  
*Library:* 2,000 volumes.
- 948. Golden State Company, Ltd., 425 Battery St., San Francisco 11, Calif.**  
*President:* Frank E. Buck.  
*Research staff:* Grover D. Turnbow, Executive Officer; Paul F. Sharp, Director; B. W. Hammer, Assistant Director. 15 chemists, 1 biologist, 22 engineers, 6 bacteriologists; technical personnel 57; additional personnel 11.  
*Research activities:* Research in milk and milk products, food products, evaporation, drying, processing, and engineering developments in the food field. (Research initiated 1921.)  
*Library:* 600 volumes.  
*Cooperative research:* Several fellowships are supported and one grant for research is made.
- 949. Goldsmith Brothers Smelting and Refining Company, 58 East Washington St., Chicago, Ill.**  
*President:* Marc S. Goldsmith.  
*Laboratory:* 1300 West 59th St., Chicago, Ill.  
*Research staff:* M. M. Goldsmith, Director. 4 chemists, 2 metallurgists, 2 engineers; additional personnel 2.  
*Research activities:* Precious metals, including gold, silver, platinum, iridium, osmium, ruthenium, rhodium, palladium, and their by-products; also lead, tin, antimony, mercury, antimonial lead, and allied products. (Research initiated 1909.)
- 950. Goodall-Sanford, Inc., Reading Division, Reading, Mass.**  
*President:* Elmer L. Ward.  
*Research staff:* J. R. Geenty, Chief Chemist. 3 chemists; technical personnel 4.  
*Research activities:* The development of coated fabrics in the artificial leather, synthetic rubber, and synthetic resin fields. The investigation of nitrocellulose, plastic resin, and rubber plasticizers, and the study of synthetic rubber and elastomer compounding. The study and development of mechanical rubber rolls made from rubber, synthetic rubber, and elastomers. The investigation of the uses of solvents for the above and other related fields. (Research initiated 1911.)
- 951. Goodrich Chemical Company, B. F., Rose Bldg., East 9th and Prospect Ave., Cleveland 15, Ohio. (Subsidiary of B. F. Goodrich Company.)**  
*President:* W. S. Richardson.  
*Laboratories:* Synthetic Rubber Development Laboratory, Akron, Ohio; Customer Service Laboratory, Rose Bldg., Cleveland, Ohio; Plastic Chemicals Development Laboratory, Avon-on-the-Lake, Ohio.  
*Research staff:* F. K. Schoenfeld, Technical Director. Akron: B. M. G. Zwicker, Technical

Manager; 3 chemists, 17 engineers; additional personnel 20. *Cleveland*: George Flanagan, Technical Manager. 22 chemists, 1 physicist, 9 engineers; additional personnel 18. *Avon*: Doctor Syverson, Plant Manager. 3 chemists, 27 engineers; additional personnel 60.

*Research activities*: Vinyl plastics; synthetic rubber; rubber chemicals; general organic chemicals. (Research initiated 1943.)

952. **Goodrich Company, B. F.**, 500 South Main St., Akron, Ohio.

*President*: John L. Collyer.

*Research staff*: H. E. Fritz, Director of research; H. L. Trumbull, Assistant to the Director; H. N. Stevens, Research Coordinator; D. B. Stewart, Operating Manager.

#### RESEARCH DIVISION

*Pioneering Research*: W. L. Semon, Director. Exploratory research in a number of scientific fields.

*Technical Service*: E. B. Newton, Director. Research and control analysis, microscopy, metallurgy, adhesives, and industrial hygiene.

*Organic Chemicals Research*: T. L. Gresham, Director. Antioxidants, accelerators, plasticizers, and other organic chemicals.

*Rubber Research*: R. A. Crawford, Director. Reclaimed rubber, rubber substitutes and extenders, reaction products, and research compounding.

*Physical Research*: J. M. Davies, Director. Electronics, dielectrics, mechanical properties, X-ray and electron diffraction studies, and apparatus development.

*Chemical Engineering*: A. B. Japs, Director. Pilot plant design, engineering and operation; research engineering on new and existing processes.

*Polymerisation Research*: C. F. Gibbs, Director. Polymerization studies of high molecular weight polymers; evaluation of raw materials such as monomers, plasticizers, pigments, etc.

*Textile Research*: H. L. Trumbull, Director. Synthetic fibers, fiber testing, textile treatments, and cord development.

*Synthetic Rubber Research*: H. L. Trumbull, Director. Organic synthesis, polymerization, research compounding, latex studies, and specialty polymers.

The staff of the Research Division includes 89 chemists, 15 physicists, 2 biological scientists, 1 metallurgist, 26 engineers, 1 mathematician; additional personnel 109.

#### PROCESSING TECHNICAL DIVISION

*Raw Materials Inspection and Development*: D. L. Flanders, Manager. 1 rubber expert, 1 fabric expert, 11 raw materials engineers, 5 assistants; additional personnel 7.

*Physical Testing and Process Control*: A. W. Carpenter, Manager. 17 engineers, 8 foremen, 5 supervisors, 75 assistants; additional personnel 8.

*Technical Service*: C. R. Ritchie, Manager. 17 chemical engineers; additional personnel 4.

*Plastics Product Development*: R. S. Price, Manager. 11 chemical engineers, 3 assistants; additional personnel 2.

*Cements and Rubberized Fabrics*: F. L. McNabb, Manager. 4 chemical engineers.

*Reclaimed Rubber Process Development*: Paul Dasher, Manager. 3 chemical engineers, 1 mechanical engineer; additional personnel 2.

*Technical Personnel*: Bert S. Taylor, Manager.

#### MACHINE AND PROCESS DEVELOPMENT DIVISION

C. W. Leguillon, Manager. 4 department managers, 30 project and experimental engineers, 88 technicians; additional personnel 7.

#### SUNDRIES DIVISION

M. O. Orr, Technical Superintendent. 13 chemists, 12 engineers; additional personnel 6.

#### TIRE DIVISION

Harold Gray, Technical Superintendent. 24 chemists, 50 engineers, 20 assistants, 9 draftsmen, 38 test operators; additional personnel 10.

#### INDUSTRIAL PRODUCTS TECHNICAL DIVISION

R. D. Hager, General Superintendent; W. L. Smith, Technical Superintendent. 24 chemists and chemical engineers, 29 engineers, 2 draftsmen; additional personnel 7.

#### GENERAL STAFF

5 engineers, 5 chemists.

In addition, technical staffs are maintained at branch factories in Los Angeles, Calif.; Oaks, Pa.; Cadillac, Mich.; Clarksville, Tenn.; Miami, Okla.; Tuscaloosa, Ala.

*Research activities*: Fundamental as well as applied scientific studies in synthetic rubber and plastics, organic chemicals, electronics, physical and mechanical properties of materials; rubber, reclaimed rubber, and mineral ingredients; the study of textiles, cords and fibers, and metals and alloys; vulcanization, processing, and other operations which modify rubber compositions; synthetic elastoplastic compositions; machine and process development; the design and structure of articles for a wide variety of industrial and domestic services. In addition, the staff is engaged cooperatively in development and control with the Processing, Tire and Industrial Products Divisions in the development of tests, and in collaboration with the Sales Development Divisions in securing the customer's ap-

praisal of manufactured products. (Research initiated 1895.)

*Library:* 9,000 volumes.

*Cooperative research:* Research work is financed in several educational and scientific institutions on a contract basis.

*See also* American Anode, Inc.; Hood Rubber Company, Inc.; Hycar Chemical Company; Goodrich Chemical Company, B. F.

**953. Goodyear Aircraft Corporation, Akron 15, Ohio.** (Subsidiary of Goodyear Tire and Rubber Company.)

*President:* P. W. Litchfield. *Vice President and General Manager:* H. E. Blythe.

*Research staff:* Karl Arnstein, Vice President in charge of engineering. 4 senior chemists, 42 development engineers, 7 flight engineers, 8 metallurgical and material engineers, 5 aerodynamicists, 75 designers, 6 stress analysts, 3 test pilots; technical personnel 200; additional personnel 150.

*Research activities:* Aeronautical engineering, including the development, design, testing, and construction of complete aircraft, rigid airships, and non-rigid airships. The design of aircraft components, structural assembly, etc., having high strength weight ratio; particular problems involving structural support of large spans and areas, subject to gust and other dynamical loads. The development of special instruments and devices for structural testing, including the tensiometer for measuring tension in wires and cables, the stress recorder for evaluating the varying loads on aircraft structures in flight, a new type of strain gage for measuring absolute strain, a gust indicator and a recording bow force indicator for airships, and several other specialized instruments for recording flight test data. The design and testing of scientific models of aircraft, including flutter research analysis and testing. The design and construction of production machines, tools, and equipment for improved manufacture of parts made from light weight materials. Welding processes and techniques; equipment for high frequency fatigue studies and tests; the application of rubber products to mechanical design; fabrics and related materials; new methods of forming plastic materials; adhesives and the application of such materials to the development of sandwich type construction; aircraft wheel and brake and other aeronautical accessories. (Research initiated 1924.)

*Library:* 650 volumes.

**954. Goodyear Tire and Rubber Company, Akron 16, Ohio.**

*Vice President in charge of research and development:* R. P. Dinsmore.

*Research staff:* L. B. Sebrell, Director; H. J.

Osterhof, A. M. Clifford, H. A. Endres, J. A. Merrill, Assistant Directors. 89 chemists, 9 physicists, 3 metallurgists, 19 engineers; technical personnel 35; additional personnel 17.

*Research activities:* Research in the chemistry and physics of rubber, rubber compounds, and products required in their manufacture. (Research initiated 1912.)

*Library:* 3,200 volumes.

*Cooperative research:* Two fellowships are supported.

*See also* Goodyear Aircraft Corporation.

**955. Gordon Company, Claud S., 3000 South Wallace St., Chicago 16, Ill.**

*President:* Claud S. Gordon.

*Research staff:* Harold L. Snavely, Director; G. A. Russ, Radiologist. 3 metallurgists, 5 engineers, 1 radiologist.

*Research activities:* High temperatures and their effect; the travel of heat through various materials; fusion points; the development of alloys; heat-treatment of steel and alloys; induction heating; X-ray metallurgical inspection, research and engineering. (Research initiated 1914.)

**956. Gorton-Pew Fisheries Company, Ltd., Gloucester, Mass.**

*President:* Thomas J. Carroll.

*Research staff:* M. P. Vucassovich, Director. 1 chemist, 1 biologist, 1 engineer, 1 food technologist, 1 dietician; technical personnel 5; additional personnel 2.

*Research activities:* Fish food products; oil soluble vitamins; fish by-products; amino acids. (Research initiated 1930.)

**957. Gotham Hosiery Company, Inc., 200 Madison Ave., New York, N. Y.**

*President:* R. E. Tilles.

*Laboratory:* Philadelphia, Pa.

*Research staff:* E. N. Ditton, Director. 2 chemists, 1 engineer; additional personnel 2.

*Research activities:* Textile dyeing and finishing; yarn sizing; the knitting of full-fashioned hosiery. (Research initiated 1935.)

**Grabur Silk Mills.** *See* May McEwen Kaiser Company.

**958. Gradwohl Laboratories, 3514 Lucas Ave., St. Louis 3, Mo.**

*President:* R. B. H. Gradwohl.

*Research staff:* R. B. H. Gradwohl, Director. 1 chemist, 7 biologists and bacteriologists; additional personnel 6.

*Research activities:* Problems in hematology; crime laboratory procedure; bacteriology. (Research initiated 1906.)

**959. Graham, Crowley and Associates, Inc.,** 407 South Dearborn St., Chicago 5, Ill.

*President:* A. Kenneth Graham.

*Laboratory:* 473 York Road, Jenkintown, Pa.

*Research staff:* A. K. Graham, Research Director; K. G. Soderberg, Director of laboratories. 9 chemists, 1 physicist, 2 metallurgists, 7 engineers; additional personnel 7.

*Research activities:* Electrochemistry, including electrodeposition, electrometallurgy, and electroorganic synthesis; paper processing and manufacture; iron salt and diazo process photography; general chemical engineering including process control, plant design, plant conversion, and the management of technical properties. (Research initiated 1944.)

*Library:* 3,000 volumes.

**960. Grammes and Sons, Inc., L. F.,** Allentown, Pa.

*President:* Fred Weindel, Jr.

*Research staff:* Robert Lamont, Director; Carl Swartz, Chief of chemical laboratory; Wilbur F. Price, Chief of engineering. 3 chemists, 4 engineers.

*Research activities:* Problems in plating and etching; the study of inks, lacquers, varnishes, and cements; various brasses, steel, zinc, aluminum, and other metals used in the production of etched, stamped, embossed, enameled, and lithographed products; the development of mass production of small manufactured articles.

**961. Grand Rapids Varnish Corporation,** 565 Godfrey Ave., S. W., Grand Rapids 2, Mich.

*President:* Howard C. Lawrence.

*Laboratory:* Steele Ave., Grand Rapids, Mich.

*Research staff:* Wayne R. Fuller, Director. 8 chemists; technical personnel 18; additional personnel 2.

*Research activities:* Protective coatings of lacquer, varnish, enamel, and paint, mainly for use on manufactured products, but also maintenance paints and 'shelf goods'. Research includes synthetic resins for use in the various types of coatings. (Research initiated 1905.)

*Library:* 140 volumes.

**962. Granite City Steel Company,** Granite City, Ill.

*President:* Hayward Niedringhaus.

*Research staff:* J. D. Streett, Director of research and development; J. C. Byers, Chief, Department of Metallurgy and Inspection; A. F. Mohri and W. R. Bowen, Metallurgists; J. R. Britt, Enameling Metallurgist; E. W. Miller, Chief Chemist. 3 chemists, 6 metallurgists, 6 engineers; technical personnel 33; additional personnel 8.

*Research activities:* The improvement, development and quality control of flat rolled

steel products, both coated and uncoated. (Research initiated 1895.)

**963. Grant Storage Battery Company,** 226 North 2nd St., Minneapolis 1, Minn.

*President:* M. Husebo.

*Laboratory:* 2600 North 2nd St., Minneapolis, Minn.

*Research staff:* E. E. Bicker, Chief Engineer. 1 chemist, 1 engineer; technical personnel 2.

*Research activities:* The development and improvement of the lead-acid storage battery. (Research initiated 1930.)

**Grasselli Chemicals Department, E. I. du Pont de Nemours and Company, Inc.** See du Pont de Nemours and Company, Inc., E. I.

**964. Graton and Knight Company,** 356 Franklin St., Worcester 4, Mass.

*President:* Arthur A. Williams.

*Research staff:* Sherman D. Lesesne, Director. 8 chemists, 3 engineers; technical personnel 2; additional personnel 10.

*Research activities:* Tannage research and development; leather impregnation; engineering development of transmission belting; mechanical packings and oil seals; textile leathers; and related chemical and engineering problems. (Research initiated 1897.)

*Library:* 1,800 volumes.

**965. Gravelle Laboratory,** 114 Prospect St., South Orange, N. J.

*Research staff:* Philip O. Gravelle, Director. 1 assistant microscopist, 1 assistant technical photographer, as required.

*Research activities:* Microcrystallography: crystal studies under the microscope with photomicrographic records. (Research initiated 1918.)

*Library:* 2,000 volumes.

**966. Graver Tank and Manufacturing Company, Inc.,** 4800 Tod Ave., East Chicago, Ind.

*President:* E. N. Gosselin.

*Research staff:* A. E. Bedell, Chief Engineer and Director; E. W. Welp, Technical Adviser. 3 chemists, 5 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Water softening and clarification both industrial and municipal; conservation of liquid in storage problems; waste removal; oil, water, and phenol separation. (Research initiated 1936.)

*Library:* 200 volumes.

**967. Great Atlantic and Pacific Tea Company,** 420 Lexington Ave., New York 17, N. Y.

*President:* John Hartford.

*Laboratories:* New York, N. Y. Plant labora-

tories at the following subsidiaries: Quaker Maid Company, Inc., Brockport, N. Y., Brooklyn, N. Y., and Terre Haute, Ind.; White House Milk Company, Manitowoc and West Bend, Wis.; A. and P. Fish Department, Boston 1, Mass.

*Research staff:* R. H. MacDonnell, Director. 35 chemists, 6 biologists; additional personnel 36.

*Research activities:* The development of new food products and new or improved processing methods; the control of raw materials; the control of finished products, including a comparative study of laboratory methods versus recording and automatic control instruments. (Research initiated 1934.)

*Library:* 250 volumes.

968. Great Lakes Carbon Corporation, 333 North Michigan Ave., Chicago 1, Ill.

*President:* George Skakel.

*Laboratory:* 8210 Austin Ave., Morton Grove, Ill.

*Research staff:* Martin de Simo, Vice President in charge of research. 7 chemists, 1 physicist, 7 chemical engineers; technical personnel 7; additional personnel 6.

*Research activities:* Electrode carbon; carbon products. (Research initiated 1941.)

*Library:* 600 volumes.

#### DICALITE DIVISION

756 South Broadway, Los Angeles 14, Calif.

*Laboratory:* WALTERIA, Calif.

*Research staff:* A. R. Bollaert, Technical Director; J. W. Kenney, Jr., Chief Chemist. 5 chemists, 3 chemical engineers; technical personnel 3; additional personnel 5.

*Research activities:* The development of new and improved filteraids and fillers; studies on improvements of plant processes; the development of new uses for diatomaceous silica. (Research initiated 1929.)

*Library:* 250 volumes.

969. Great Northern Paper Company, Millinocket, Maine.

*President:* William A. Whitcomb.

*Research staff:* Roy V. Weldon, Superintendent, Bureau of Tests. 2 chemists, 3 engineers; technical personnel 5; additional personnel 4.

*Research activities:* The development of methods and machines for pulp and paper mill work.

Great Western Division, Dow Chemical Company. See Dow Chemical Company.

970. Great Western Sugar Company, Terminal Box 5308, Denver, Colo.

*President:* F. A. Kemp.

*Laboratories:* Denver and Longmont, Colo.

*Research staff:* H. W. Dahlberg, Director. 5 chemists, 1 engineer, 4 agronomists; additional personnel 6.

*Research activities:* Investigations of the fundamental principles of processes and practices now in use in the refining of sugar; the examination of proposed new processes and apparatus; the study of the utilization of by-products and waste products; the recovery of organic acids from waste waters; soil studies; agronomic studies; sugar beet breeding, plant diseases. (Research initiated 1916.)

*Library:* 2,000 volumes.

971. Green Electric Company, Inc., W., 130 Cedar St., New York 6, N. Y.

*President:* L. W. Reinken.

*Research staff:* L. W. Reinken, Chief Engineer. 2 engineers; technical personnel 3; additional personnel 15 to 20.

*Research activities:* The development and construction of electrical rectifier equipment (conversion of AC to DC), laboratory or industrial, utilizing standard or specially developed circuits. Recent developments include stabilized low voltage high current metal plate rectifier units utilizing electronic control and motor-driven powerstat; stabilized grid control rectifier units providing excellent dynamic voltage regulation for telegraph, teletypewriter, and teleprinter supply. (Research initiated 1940.)

972. Green Fire Brick Company, A. P., Mexico, Mo.

*President:* A. P. Green.

*Research staff:* R. S. Bradley, Director. 5 engineers, 1 geologist; technical personnel 9; additional personnel 3.

*Research activities:* Problems in connection with the development of fire clay refractories, super refractories, and special refractory materials. (Research initiated 1920.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported.

Greenville Mills, Inc. See Warwick Mills.

973. Griffith Laboratories, Inc., 1415 West 37th St., Chicago 9, Ill.

*President:* Carroll L. Griffith.

*Laboratories:* Chicago, Ill.; Newark, N. J.; Toronto, Ont.

*Research staff:* Lloyd A. Hall, Chief Chemist. 10 chemists, 1 biologist, 2 engineers, 1 food

technologist; technical personnel 3; additional personnel 4.

*Research activities:* The investigation and development of products and processes used in the food industries, with special emphasis on baking, canning, and meat packing; new and improved methods of analysis for products manufactured by the company. (Research initiated 1925.)

*Library:* A library is maintained.

*Cooperative research:* Three grants for research are made.

974. Grinnell Corporation, 260 West Exchange St., Providence 1, R. I.

*President:* Russell Grinnell.

*Laboratories:* Providence and Cranston, R. I.

*Research staff:* Albert J. Loepsinger, Director of research; Ira W. Knight, Associate Director, Division of Research and Products Engineering. 2 chemists, 1 physicist, 2 metallurgists, 10 engineers; technical personnel 6; additional personnel 6.

*Research activities:* Fire detection and extinguishing apparatus; industrial piping including hangers, fittings, and fabrication for high pressure, high temperature, and chemical applications; industrial humidification, cooling, and heating. (Research initiated 1907.)

975. Gro-Cord Rubber Company, 819 North Jackson St., Lima, Ohio.

*President:* F. W. Cook. *General Manager:* Kyle Menuez.

*Research staff:* Lloyd Leatherman, Chief Chemist. 1 chemist; technical personnel 1.

*Research activities:* The development of soles and heels, and mechanical molded goods. (Research initiated 1920.)

976. Grosvenor Laboratories, Inc., W. M., 50 East 41st St., New York 17, N. Y.

*President:* W. M. Grosvenor, Jr.

*Research staff:* W. M. Grosvenor, Jr., Director; I. Miller and Jacques Errera, Vice Presidents. 6 chemists, 1 biologist, 1 engineer; technical personnel 5; additional personnel 3.

*Research activities:* Preparing, drying, and finishing of textiles; heavy chemicals and acids; papers; metallurgical research; plastics; molding compounds and adhesives; rubber products; the separation of minerals. (Research initiated 1911.)

*Library:* 2,500 volumes.

977. Grove Silk Company, 150 East Grove St., Scranton 10, Pa.

*President:* George J. Schautz.

*Research staff:* Walter L. Schautz, Executive Vice President and Director. 1 chemist, 1 physicist; technical personnel 6; additional personnel 1.

*Research activities:* The adaptation of nylon to various war uses; the study of its reactions to acids, waxes, and oils, to improve results obtained in its final use. A study of methods of preparing nylon for peacetime use to eliminate the need of water or extreme moisture to obtain desired results. Research on rayons pertaining to solutions which would strengthen and improve the yarn and eliminate the need of moisture in knitting processes. (Research initiated 1927.)

*Cooperative research:* One fellowship is supported.

978. Gruendler Crusher and Pulverizer Company, 2915 North Market St., St. Louis, Mo.

*President:* H. J. Shelton.

*Laboratory:* 1911 North Market St., St. Louis, Mo.

*Research staff:* William P. Gruendler, Director; Henry J. Shelton, Jr., Engineer. 3 engineers; additional personnel 4.

*Research activities:* The designing of equipment for materials in the crushing and pulverizing industries.

979. Grumman Aircraft Engineering Corporation, Bethpage, Long Island, N. Y.

*President:* L. R. Grumman.

*Research staff:* Oscar Erlandsen, Jr., Chief of Structures; Ralph H. Tripp, Chief of Dynamics Section. 7 engineers, 2 mathematicians; technical personnel 20; additional personnel 20.

*Research activities:* Research on dynamic and static loads, vibration, flutter, stress distribution, thermal effects, and other problems related to structural research including the development of new methods, materials, and processes in fabricating structural items. (Research initiated 1941.)

*Library:* 1,000 volumes.

*Cooperative research:* Ten scholarships are supported.

980. Guggenheim Airship Institute, Daniel, 1300 Triplett Blvd., Akron 6, Ohio.

*President:* H. E. Simmons.

*Research staff:* Fred E. Ayer, Dean; Curtis C. Myers, Resident Director; Theodor H. Troller, Director. 2 physicists, 7 engineers, 1 meteorologist; technical personnel 10; additional personnel 5.

*Research activities:* Aerodynamic research on air forces acting on aeronautical and other structures by means of wind tunnel and whirling arm; parachute tests in gust tunnel; hydrodynamic tests in water tank. (Research initiated 1929.)

*Library:* 22,000 volumes.



**981. Gulf Research and Development Company,**  
Drawer 2038, Pittsburgh 30, Pa. (Subsidiary  
of Gulf Oil Corporation.)

*Laboratories:* Harmarville, Pa.

*President and Executive Officers:* J. F. Drake, Chairman of the Board; F. A. Leovy, President; Paul D. Foote, Executive Vice President and Director; E. A. Eckhardt, Vice President and Assistant Director; Division Chiefs: R. J. S. Pigott, Engineering; Eugene Ayres, Chemistry; L. J. Peters, Geophysical Operations; R. D. Wyckoff, Geophysical Research and Development; B. B. Wescott, Materials and Production Chemistry; B. B. Cox, Geology; M. Muskat, Physics; H. W. Daugherty, Business Management; W. A. Gruse, Mellon Institute Gulf Multiple Fellowship.

*Research staff:* 213 chemists, chemical engineers, electrical engineers, entomologists, geologists, geophysicists, mechanical engineers, metallurgists, and physicists; 275 technical assistants; 519 field geophysicists and assistants; 91 draftsmen and instrument makers; 185 office and service personnel.

*Research activities:* Problems connected with the discovery of petroleum reserves: the production, storage, transportation, refining, and utilization of petroleum and its products. (Research initiated 1927.)

*Library:* 10,000 volumes.

*Cooperative research:* Eleven fellowships are supported.

**982. Gunn Company, Frank R.,** Ontario and  
Brabant Sts., Philadelphia 34, Pa.

*President:* Frank R. Gunn.

*Research staff:* Martin H. Silberman, Director. 2 chemists; technical personnel 1; additional personnel 3.

*Research activities:* Organic research. (Research initiated 1922.)

*Library:* 150 volumes.

**983. Gurley, W. and L. E.,** 514 Fulton St., Troy,  
N. Y.

*President:* C. I. Day.

*Research staff:* H. R. Larsen, Chief Engineer. 1 chemist, 1 physicist, 1 metallurgist, 4 engineers; technical personnel 8; additional personnel 2.

*Research activities:* Optical instrument design; mechanical and electronic instrumentation; the investigation of the uses, design, materials, and manufacture of engineering and optical instruments and measuring and testing equipment.

*Library:* 300 volumes.

**984. Gussack Machined Products Company,**  
10-20 Forty-fifth Road, Long Island City 1,  
N. Y.

*President:* M. H. Kimball.

*Research staff:* Lewis Balamuth and M. U. Cohen, Directors of research. 6 chemists, 3 physicists, 1 engineer; technical personnel 1; additional personnel 7.

*Research activities:* Optical and protective coatings; methods for machining metals, glass, and ceramics; general physicochemical, physical, and electronic research. (Research initiated 1943.)

*Library:* 500 volumes.

**985. Gutmann and Company, Ferdinand,** 3611  
Fourteenth Ave., Brooklyn 18, N. Y.

*President:* Ferdinand Gutmann.

*Research staff:* J. B. Eisen, Director. 2 chemists, 1 biologist, 1 engineer; technical personnel 1; additional personnel 1.

*Research activities:* Improvement in methods of manufacturing and in the quality of small tin boxes, bottle caps, and stampings. (Research initiated 1930.)

**986. Gwynn, M. H.,** Mountain Lakes, N. J.

*Owner:* M. H. Gwynn.

*Research staff:* 1 chemist.

*Research activities:* Catalysis; hydrogenation; butadiene production; hydrocarbon desulfurizing; glyceride refining; fatty and abietic acid derivatives. (Research initiated 1932.)

*Library:* 500 volumes.

**987. Haag Laboratories, Inc.,** 6101-09 South  
May St., Chicago 21, Ill.

*President:* Vernon W. Haag.

*Research staff:* Vernon W. Haag, Director. 1 chemist; additional personnel 1.

*Research activities:* Soaps and disinfectants. (Research initiated 1926.)

**988. Haas-Miller Corporation,** 4th and Bristol  
Sts., Philadelphia 40, Pa.

*President:* Charles J. Haas.

*Research staff:* H. L. Miller, Vice President and Technical Director. 2 chemists; technical personnel 2.

*Research activities:* Water soluble oils; textile finishing chemicals; glycerin substitutes; textile processing oils. (Research initiated 1936.)

**989. Hagan Corporation,** 323 Fourth Ave., Pitts-  
burgh 30, Pa.

*President:* J. M. Hopwood.

**HALL LABORATORIES, INC.**

323 Fourth Ave., Pittsburgh 30, Pa.

*Research staff:* R. E. Hall, Director; Everett P. Partridge, Director of research; J. W. Welsh, Director of engineering service; G. E. Kaufman, Group Head. 5 chemists, 32 engineers, 1 X-ray diffraction specialist; 1 microscopist; technical personnel 13; additional personnel 3.

*Research activities:* Conditioning of water for industrial use as process, cooling, or boiler-feed water; stabilization of natural or treated water to prevent deposition of scale; control of corrosion in water systems and steam boilers; phase-rule studies of aqueous systems at high temperatures and pressures; metallographic study of damage to metals used in boilers and other equipment in contact with water or steam; identification of solid phases in deposits from water by means of the polarizing microscope and X-ray diffraction. (Research initiated 1926.)

*Library:* 2,500 volumes.

**CALCON, INC.**

323 Fourth Ave., Pittsburgh 30, Pa.

*Research staff:* Everett P. Partridge, Director of research; Group Heads: K. Albrecht, E. T. Laurin, C. J. Munter, Owen Rice, C. T. Roland. 20 chemists, 3 chemical engineers, 1 bacteriologist, 2 librarians; technical personnel 1; additional personnel 5.

*Research activities:* Properties and industrial uses of complex phosphates; laundering; textile processing; industrial cleaning; metal protective coatings; corrosion control; food processing; stabilization of cooling, process, and sanitary water; leather tanning; dispersion of clays, pigments, and fillers; mechanical dishwashing; pulp and paper processing. (Research initiated 1934.)

*Library:* 2,500 volumes.

**990. Hale, George A.,** Consulting Chemical Engineer, 116-20 North 4th St., St. Louis 2, Mo.

*Research staff:* George A. Hale, Director. 1 chemist, 1 engineer; technical personnel 1; additional personnel 3.

*Research activities:* Chemical engineering; mechanical engineering; petroleum chemistry; fuel and combustion chemistry; paints; foods. (Research initiated 1935.)

**991. Hales and Hunter Company,** 166 West Jackson Blvd., Chicago 4, Ill.

*President:* Burton W. Hales.

*Laboratory:* Red Comb Laboratory, Riverdale, Ill.

*Research staff:* R. J. Karrasch, Laboratory Manager; L. G. Neel, Manager, Poultry Mash

Department; C. S. Woolman, Vice President and Manager, Feed Division. 2 chemists, 2 biologists; technical personnel 3; additional personnel 6.

*Research activities:* Practical application of the scientific principles of poultry feeding, and standardization of the quality of poultry feed ingredients. (Research initiated 1929.)

*Library:* 200 volumes.

**992. Hall China Company,** East Liverpool, Ohio.

*President:* F. I. Simmers.

*Research staff:* Lawrence H. Brown. 3 engineers, 3 laboratory assistants.

*Research activities:* Fundamental research on the coefficient of expansion of chinaware bodies; new products; new glazes; raw material testing; factory problems. (Research initiated 1927.)

**Hall Laboratories, Inc.** See Hagan Corporation.

**993. Hall Lamp Company, C. M.,** 1035 East Hancock, Detroit 7, Mich.

*President:* A. B. Hartz.

*Research staff:* B. A. King, Chief Engineer. 1 chemist, 1 physicist, 3 engineers; additional personnel 6.

*Research activities:* The development of illumination for various means of transportation; process research; the development of infrared heating and drying lamps and industrial infrared ovens. (Research initiated 1936.)

*Library:* 100 volumes.

**994. Halliburton Oil Well Cementing Company,** Duncan, Okla.

*President:* Erle P. Halliburton.

*Laboratories:* Duncan, Okla.; Houston, Tex.; field service laboratories located at Great Bend, Kans.; Flora, Ill.; Odessa, Tex.; Kilgore, Tex.

*Research staff:* William D. Owsley, Director and Chief Engineer; Hayden Roberts, Manager of Howco Laboratory; Phil Montgomery, Supervisor of Mechanical Research and Development; H. Clay Waters, Supervisor of Well Services Electrical Laboratories, Houston, Tex.; Bliss Adamson, Supervisor of Electrical Engineering at Duncan, Okla., and at Houston, Tex. 12 chemists, 1 metallurgist, 15 engineers; additional personnel 35.

*Research activities:* Cements; oil well acidizing; liquid resins applied to oil field use; electrical and electronic research for the electrical well logging; oil field hydraulics in the fields of oil well cementing, acidizing, and formation testing; mechanical research as applied to oil field service equipment. (Research initiated 1930.)

*Library:* 900 volumes.

- 995. Hallmark Laboratories**, South Main and Market Sts., Jamestown, N. Y.  
*President:* J. L. Miles.  
*Research staff:* J. L. Miles, Director. 1 chemist, 1 physicist, 1 biologist, 1 engineer; additional personnel 1.  
*Research activities:* Refining and compounding of vegetable oils for textile industries; remedies for poultry diseases; organic and inorganic analytical methods; utilization of waste protein materials; organic synthesis; refining of minerals. (Research initiated 1937.)  
*Library:* 800 volumes.
- 996. Halogen Chemicals**, 616 King St., Columbia 52, S. C.  
*President:* B. R. Whaley.  
*Laboratory:* 1601½ Home Ave., Hartsville, S. C.  
*Research staff:* Atherton M. Whaley, Director. 2 chemists; technical personnel 1; additional personnel 1.  
*Research activities:* The development of new processes for the preparation of organic aliphatic polyfluorides, polychlorides, and polybromides; alkyl chlorides and bromides; chloro-olefins. The preparation of special halides for pharmaceutical, synthetic rubber, plastic, and petroleum research. The investigation of the reaction of allylic type halides. The investigation of the preparation and properties of butane and pentane polychlorides. (Research initiated 1944.)  
*Library:* 100 volumes.
- 997. Haloid Company**, 6 Haloid St., Rochester 3, N. Y.  
*President:* Joseph R. Wilson.  
*Laboratory:* 282 Hollenbeck St., Rochester 5, N. Y.  
*Research staff:* John Dessauer, Director. 4 chemists, 1 physicist; technical personnel 7; additional personnel 4.  
*Research activities:* The creation, improvement, and control of light sensitive layers (photo emulsions); organic, colloidal, and physical research for better controlled photo illumination and optical requirements. (Research initiated 1935.)  
*Library:* 1,000 volumes.
- 998. Hamersley Manufacturing Company**, 65 River Road, Garfield, N. J.  
*President:* Walter L. Dawson.  
*Research staff:* Sumner C. Fairbanks, Director. 1 chemist; technical personnel 3.  
*Research activities:* The development of new papers for special uses and of protective coatings for paper. (Research initiated 1915.)  
*Library:* 300 volumes.
- 999. Hamilton and Sons, W. C.**, Miquon, Montgomery County, Pa.  
*President:* H. H. Hanson.  
*Research staff:* W. P. Dohne, Director. 2 chemists, 1 engineer; technical personnel 3; additional personnel 2.  
*Research activities:* Improvement in processes in order to reduce costs and improve quality; the development of new papers. (Research initiated 1922.)
- 1000. Hamilton Manufacturing Company**, Two Rivers, Wis.  
*President:* E. P. Hamilton.  
*Research staff:* C. S. O'Neil, Chief Engineer. 1 chemist, 4 engineers; technical personnel 5.  
*Research activities:* New products design, materials, production methods, and production cost analysis in the manufacture of dental and medical cabinets, examining tables, drafting room filing equipment, engineering desks and drawing boards, printer's cabinets, type storage and make-up tables, laboratory cabinets, work benches, and fume hoods for industrial institutions and schools; home laundry appliances. (Research initiated 1880.)  
*Library:* A library is maintained.
- Hamilton Standard Propellers, Division of United Aircraft Corporation.** See United Aircraft Corporation.
- 1001. Hammer Dry Plate and Film Company**, 2711 Miami St., St. Louis 18, Mo.  
*President:* E. S. Coombs.  
*Research staff:* Bernhard Landow, Technical Director. 2 chemists, 3 photographic research workers.  
*Research activities:* Photographic research and related studies in organic and physical chemistry. (Research initiated 1935.)
- 1002. Hammermill Paper Company**, East Lake Road, Erie, Pa.  
*President:* Norman W. Wilson.  
*Research staff:* Bjarne Johnsen, Director of laboratories; Donald T. Jackson, Assistant Director of laboratories. 8 chemists, 2 physicists, 1 engineer; technical personnel 7; additional personnel 4.  
*Research activities:* The process involved in the manufacture of pulp and paper, and the auxiliary processes connected with the industry; process control tests; raw materials, especially wood and fibrous materials; dye applications; water treatment; new processes; paper testing instruments; cellulose and by-products; resin and plastics. (Research initiated 1898.)  
*Library:* 3,000 volumes.  
*Cooperative research:* Four to six grants for research are made.

**1003. Hammond Drierite Company, W. A.,** 120 Dayton Ave., Xenia, Ohio.

*President:* W. A. Hammond.

*Research staff:* W. A. Hammond, Director. 2 chemists, 1 engineer.

*Research activities:* Industrial drying, and related problems of equipment design. (Research initiated 1934.)

*Library:* 1,000 volumes.

**1004. Hammond Research Corporation,** Hesperus Ave., Gloucester, Mass.

*President:* John Hays Hammond, Jr.

*Research staff:* John Hays Hammond, Jr., Director. 1 physicist, 2 engineers; additional personnel 5.

*Research activities:* Superselective radio signaling systems; sound recording and reproducing systems; radio and allied subjects. (Research initiated 1914.)

*Library:* A library is maintained.

**1005. Handy and Harman,** Bridgeport 9, Conn.

*President:* G. H. Niemeyer.

*Research staff:* R. H. Leach, Vice President and Director. 3 chemists, 6 metallurgists, 1 engineer; technical personnel 7; additional personnel 2.

*Research activities:* The development, production, and use of precious metals, and of alloys containing precious metals; fine silver; sterling silver; gold alloys; silver brazing alloys; industrial silver alloys; bimetals; metal powder products; the reclamation of precious metals from waste materials. (Research initiated 1919.)

*Library:* 550 volumes.

**1006. Hanks, Inc., Abbot A.,** 624 Sacramento St., San Francisco, Calif.

*President:* Herbert D. Imrie.

*Research staff:* 4 chemists, 3 physicists, 4 metallurgists, 3 engineers.

*Research activities:* Chemistry, metallurgy, soil mechanics, and materials of construction. (Research initiated 1866.)

**1007. Hanovia Chemical and Manufacturing Company,** 233 N. J. R. R. Ave., Newark 5, N. J.

*President:* Charles Engelhard.

*Research staff:* William T. Anderson, Jr., Director. 1 chemist, 1 physicist, 4 engineers; additional personnel 1.

*Research activities:* Ultraviolet radiations; infrared radiations; fused quartz research; short wave diathermy research; research on radio and radar components. (Research initiated 1905.)

*Library:* 200 volumes.

**1008. Hansen's Laboratory, Inc.,** Chr., 9015 West Maple St., Milwaukee 14, Wis.

*President:* Joh. Hansen, Copenhagen, Denmark; Karl J. Monrad, Vice President, Little Falls, N. Y.

DAIRY DIVISION LABORATORY  
Milwaukee, Wis.

*Research staff:* Raymond Helmer, Director of research. 2 chemists, 3 laboratory assistants.

*Research activities:* The manufacture of dairy preparations, cheese rennet, cheese color, butter color, lactic ferment, etc.; new processes; cheese making. (Research initiated 1878.)

*Library:* 120 volumes.

FOOD DIVISION LABORATORY  
Little Falls, N. Y.

*Research staff:* Ernst Reinecke, Manager of general laboratory and factory; Carl Nordgren, Director of research. 2 chemists, 3 laboratory assistants; additional personnel 1.

*Research activities:* The manufacture of food preparations: "Junket" brand, rennet tablets, rennet powder, freezing mix, Danish dessert, quick fudge mix; new products.

*Library:* 160 volumes.

*Cooperative research:* One grant for research is made.

**1009. Hanson, Van Winkle, Munning Company,** Matawan, N. J.

*President:* Van Winkle Todd.

*Laboratories:* Matawan, N. J.; Chicago, Ill.

*Research staff:* Myron B. Diggin, Technical Director. 3 chemists, 1 metallurgist, 2 mechanical engineers, 1 electrical engineer, 1 abrasive engineer, 2 outside consulting chemical engineers; additional personnel 36.

*Research activities:* Electroplating, cleaning, anodizing; low voltage generators, rectifiers, and accessories; conveyors for plating; continuous plating and cleaning machines for steel mills; buffing compositions for metal. (Research initiated 1870.)

*Library:* 1,000 volumes.

**1010. Harbison-Walker Refractories Company,** 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.

*President:* Raymond Willey.

*Laboratories:* Hays (Pittsburgh), Pa. Auxiliary Laboratories: Vandalia, Mo.; East Chicago, Ind.; Clearfield, Templeton, Chester, and Mt. Union, Pa.

*Research staff:* Raymond E. Birch, Director; Kenneth Seaver, Vice President; Earl Leatham, Assistant to the Director; C. L. Thompson, Laboratory Manager. 4 chemists, 1 metallur-

gist, 8 engineers, 1 geologist; additional personnel 11.

*Research activities:* The development and improvement of refractories of fireclay, silica, alumina, magnesia, chromite, magnesium silicates, etc.; processes of synthesis of magnesia, etc. (Research initiated 1910.)

*Library:* 1,200 volumes.

*Cooperative research:* Four fellowships are supported.

**Hardwick, Hindle, Inc.** See National Lock Washer Company.

**1011. Hardy Metallurgical Company, 420 Lexington Ave., New York 17, N. Y.**

*Executive Vice President:* A. F. Lichtenstein.

*Laboratory:* 305 East 46th St., New York 17, N. Y.

*Research staff:* J. J. Cordiano, Director. 1 chemist, 1 metallurgist, 1 engineer; technical personnel 2; additional personnel 5.

*Research activities:* Powder metallurgy. (Research initiated 1931.)

*Library:* 250 volumes.

*Cooperative research:* One fellowship is supported.

**1012. Harlan Associates, 11 Duboce Ave., San Francisco 3, Calif.**

*President:* H. R. Harlan.

*Research staff:* 1 chemist, 1 engineer, 1 librarian; additional personnel 2.

*Research activities:* Paints, varnishes, and lacquers; synthetic resins; pigment research; vegetable oil processing; marine coatings. (Research initiated 1931.)

*Cooperative research:* One grant for research is made.

**1013. Harnischfeger Corporation, 4400 West National Ave., Milwaukee 14, Wis.**

*President:* Walter Harnischfeger.

#### ELECTRIC AND ELECTRONIC LABORATORY

4400 West National Ave., Milwaukee 14, Wis.

*Research staff:* W. J. Oesterlein, Consulting Engineer; K. A. Blind, Chief Electrical Engineer. 1 physicist, 2 engineers; additional personnel 1.

*Research activities:* Electrical control, electronics, and electrical machinery. (Research initiated 1940.)

#### WELDING ELECTRODE DIVISION

2151 South Robinson Ave., Milwaukee 7, Wis.

*Research staff:* D. C. Smith, Chief Metallurgist; W. G. Rinehart, Research Metallurgist. 5 chemists, 3 metallurgists, 1 engineer; additional personnel 5.

*Research activities:* Arc welding electrode research, development, and control. (Research initiated 1937.)

#### METALLURGICAL LABORATORY

4400 West National Ave., Milwaukee 14, Wis.

*Research staff:* Morris T. Roberts, Chief Metallurgist. 2 chemists, 3 metallurgists, 1 X-ray technician; technical personnel 2; additional personnel 2.

*Research activities:* The application of steel, cast iron, and nonferrous bearing metals to heavy machinery. (Research initiated 1925.)

**1014. Harris Associates, Milton, 1246 Taylor St., N. W., Washington 9, D. C.**

*President:* Milton Harris.

*Research staff:* Milton Harris, Director. 17 chemists, 2 biophysicists, 1 engineer, 1 mathematician; technical personnel 5; additional personnel 2.

*Research activities:* Textiles; fibers (natural and synthetic); functional properties of fabrics; textile finishing processes: water-repellency, shrinkproofing, mildewproofing, flameproofing, etc.; cellulose chemistry and applications; protein chemistry and applications; synthetic organic chemicals; sizing materials; fundamental chemical and mechanical properties of natural and synthetic fibers. (Research initiated 1945.)

*Library:* 500 volumes.

**1015. Harris Laboratories, 1920 Jefferson Ave., Lincoln 2, Nebr.**

*President:* Lewis E. Harris.

*Research staff:* Lewis E. Harris, Director. 2 chemists, 1 biologist; technical personnel 1; additional personnel 1.

*Research activities:* Pharmaceuticals; foods; cosmetics; water treatment; miscellaneous. (Research initiated 1933.)

*Library:* 250 volumes.

**Harris Laboratories, Division of Bristol-Myers Company.** See Bristol-Myers Company.

**1016. Harris Seybold Potter, 4510 East 71st St., Cleveland 5, Ohio.**

*President:* A. S. Harris.

*Laboratories:* Cleveland and Dayton, Ohio.

*Research staff:* W. H. Wood, Director; C. W. Harrold, Chief Research Engineer, Cleveland; W. R. Spiller, Chief Research Engineer, Dayton. 2 chemists, 1 physicist, 1 metallurgist, 9 engineers; technical personnel 3; additional personnel 3.

*Research activities:* Lithographic processes and machinery; lithographic chemicals; paper cutting and stapling machinery; inks and metals; photographic chemicals and processes; gravure processes and machinery. (Research initiated 1936.)

*Library:* 500 volumes.  
*Scientific periodicals:* Harris Impressions. Vol. 1, 1941.

*Cooperative research:* Three grants for research are made.

**1017. Harrisburg Steel Corporation, 10th and Herr Sts., Harrisburg, Pa.**

*President:* Wilbert Wear.

*Research staff:* Wilbert Wear, Executive Officer in charge of research; J. H. Whitmoyer, Research Engineer; D. Sener, Assistant Research Engineer; Maurice Holland, Industrial Research Adviser; A. F. Whalen, Chief Metallurgist. 4 chemists, 1 metallurgist, 3 engineers, 2 laboratory technicians; technical personnel 2; additional personnel 2.

*Research activities:* The improvement of open hearth practice; development of steels for various applications; development of nonferrous metals for high pressure containers; research on abrasion resistant metals; research on non-corrosive metals; development of new products. (Research initiated 1899.)

*Library:* 250 volumes.

*Cooperative research:* Fellowships are supported.

**1018. Harrison and Morton Laboratories, Inc., 1745 Front St., Cuyahoga Falls, Ohio.**

*President:* M. M. Harrison.

*Research staff:* M. M. Harrison and H. A. Morton, Directors. 4 chemists; additional personnel 4.

*Research activities:* Chemicals for use in the rubber industry; the development and improvement of rubber (latex) surgical and laboratory tubings. The laboratory does research and development work for Chemico, Inc., and Rubber Latex Products, Inc. (Research initiated 1939.)

*Library:* 300 volumes.

**Harrison Radiator Division, General Motors Corporation. See General Motors Corporation.**

**1019. Harrower Laboratory, Inc., 920 East Broadway, Glendale 5, Calif.**

*President:* John L. Johnston.

*Research staff:* R. B. Haining, Medical Director. 3 chemists, 1 biologist, 3 physicians, 1 bacteriologist, 1 pharmacist; additional personnel 6.

*Research activities:* Endocrinology: antibiotics; general pharmaceutical research. (Research initiated 1918.)

*Library:* 4,000 volumes.

*Scientific periodicals:* The Hormone.

*Cooperative research:* Five grants for research are made.

**1020. Harshaw Chemical Company, 1945 East 97th St., Cleveland 6, Ohio.**

*President:* W. J. Harshaw.

*Research staff:* K. E. Long, Assistant to the President and Director of technical development; A. R. Bozarth, Chief Development Engineer; A. Aylies, Laboratory Manager. 50 chemists, 13 engineers; additional personnel 12.

*Research activities:* Inorganic chemical research, with particular emphasis on products manufactured by the company, including ceramic colors and opacifiers, porcelain enamel frit, electroplating chemicals, optical crystals, catalysts, fluorides, pigments and driers for paint. Organic research on new products with emphasis on metal organic compounds and processes using catalysts. (Research initiated 1930.)

*Library:* 4,500 volumes.

*Cooperative research:* Three fellowships are supported and three grants for research are made.

**1021. Hart Leather Finish Corporation, 925 Weed St., Chicago, Ill.**

*President:* James M. Hart.

*Research staff:* Parker F. Dewey, Director. 1 chemist, 1 engineer, 1 assistant.

*Research activities:* The development of cellulose lacquers, lacquer emulsions, and synthetic resin finishes for leather. (Research initiated 1921.)

**1022. Hart Products Corporation, 1440 Broadway, New York, N. Y.**

*President:* Ralph Hart.

*Laboratory:* Woodbridge, N. J.

*Research staff:* Morris B. Hart, Director. 8 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Synthetic detergents; the development of oil analysis; sulfonations; studies of emulsions and gels of products suitable for the leather and textile trades. (Research initiated 1932.)

**1023. Hartford-Empire Company, Box 1620, Hartford 1, Conn.**

*President:* F. Goodwin Smith.

*Research staff:* Karl E. Peiler, Acting Director. 8 chemists, 5 physicists, 23 engineers, 2 ceramists, 1 bacteriologist; technical personnel 11; additional personnel 29.

*Research activities:* Research in glass: the composition and properties, melting, feeding, forming, and annealing processes and equipment; refractories. (Research initiated 1912.)

*Library:* 2,000 volumes.

See also Plax Corporation.

- 1024. Hartford Rayon Corporation, Rocky Hill, Conn.**  
*President:* B. R. Armour.  
*Research staff:* W. Steinschneider, Director. 2 chemists, 1 engineer; technical personnel 5; additional personnel 4.  
*Research activities:* Cellulose chemistry and related problems; the application of chemistry and engineering to production problems in the manufacture of rayon yarn, and specialties such as visca straws and horsehair. (Research initiated 1924.)
- 1025. Hartley, Harry D., 4051 Washington Blvd., Indianapolis 5, Ind.**  
*Research staff:* H. D. Hartley, Director. 1 engineer.  
*Research activities:* Body comfort and health by air conditioning. (Research initiated 1927.)  
*Library:* 300 volumes.
- 1026. Hartman-Leddon Company, Inc., 6010 Haverford Ave., Philadelphia 31, Pa.**  
*President:* Milton I. Hartman.  
*Research staff:* Milton I. Hartman, Director. 3 chemists; technical personnel 2; additional personnel 3.  
*Research activities:* Synthesis and development of hydrogen-ion indicators and the improvement of colorimetric pH procedures; buffer solutions for use as electrometric reference standards; the improvement of biological stains. (Research initiated 1926.)  
*Library:* 300 volumes.
- 1027. Harvey Company, G. F., 5 Wells St., Saratoga Springs, N. Y.**  
*President:* G. Scott Towne.  
*Research staff:* Georg Cronheim, Chief Chemist. 3 chemists; technical personnel 3; additional personnel 1.  
*Research activities:* Chemical, pharmacological, and bacteriological researches. (Research initiated 1902.)  
*Library:* A library is maintained.
- 1028. Harvey Machine Company, Inc., 6200 Avalon Blvd., Los Angeles 3, Calif.**  
*President:* Leo M. Harvey.  
*Laboratories:* 6200 Avalon Blvd. and Institute of Product Research, 448 South Hill St., Los Angeles, Calif.; Long Beach, Calif.  
*Research staff:* Herbert M. Harvey, Director of research; M. M. Young, Director of Institute of Product Research; Lawrence A. Harvey. 1 metallurgist, 12 engineers; technical personnel 10.  
*Research activities:* Jet propulsion motors; internal combustion motors; hydraulic equipment; laundry methods and equipment; plastics; product and consumer research; electrical appliance development. (Research initiated 1920.)  
*Library:* Several thousand volumes.
- 1029. Harvey Radio Laboratories, Inc., 447 Concord Ave., Cambridge 38, Mass.**  
*President:* Frank Lyman, Jr.  
*Research staff:* Arthur L. Quirk, Director. 5 physicists; additional personnel 2.  
*Research activities:* Radio and electronic equipment. (Research initiated 1935.)  
*Library:* 500 volumes.
- Haskell Laboratory of Industrial Toxicology. See du Pont de Nemours Company, Inc., E. I., Medical Division.**
- 1030. Haskelite Manufacturing Corporation, 701 Ann St., Grand Rapids 2, Mich.**  
*President:* Paul Moore.  
*Research staff:* J. H. Tigelaar, Director; O. H. Basquin, Vice President in charge of research; J. A. Potchen, Chief Engineer. 4 chemists, 6 engineers, 7 draftsmen; technical personnel 3; additional personnel 5.  
*Research activities:* The development of new products and improvement in the process of manufacture of plywood and plastic laminates. (Research initiated 1918.)  
*Library:* 350 volumes.
- 1031. Haskins Laboratories, Inc., 305 East 43rd St., New York 17, N. Y.**  
*President:* Caryl P. Haskins.  
*Research staff:* Caryl P. Haskins, Director. 3 chemists, 3 physicists, 4 biologists and bacteriologists, 2 psychologists; additional personnel 16.  
*Research activities:* Biological, bacteriological, and medical applications of radiant energy; problems of bacterial nutrition; experimental cancer; sensory physiology. Instrument design and development. (Research initiated 1935.)  
*Library:* 500 volumes.  
*Cooperative research:* One fellowship and three grants for research are maintained.
- 1032. Hastings and Company, 819 Filbert St., Philadelphia 7, Pa.**  
*President:* J. V. Hastings, Jr. (Partner).  
*Research staff:* Philip Godley, Director. 1 chemist, 1 engineer.  
*Research activities:* The development and improvement of adhesive coatings for "Hot Press Stamping Foils"; industrial cathode sputtering processes. (Research initiated 1941.)
- 1033. Hatch Textile Research, 25 East 26th St., New York 10, N. Y.**  
*Research staff:* Herbert H. Hatch, Director. 2 textile technologists.

*Research activities:* Commercial textile testing of fibers, yarns, and fabrics; construction and serviceability tests. (Research initiated 1926.)

**1034. Hathaway Instrument Company, Denver 10, Colo.**

*President:* Claude M. Hathaway.

*Research staff:* Herbert Reno, Engineer in charge. 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* The development of new equipment, circuits, principles, and methods for measurement and control of physical quantities.

*Library:* 1,000 volumes.

**Haven Manufacturing Company.** See Surprenant Electrical Insulation Company.

**1035. Hawaiian Pineapple Company, Ltd., Honolulu 1, T. H.**

*President:* Henry A. White.

*Laboratories:* Honolulu; Wahiawa; Lanai.

*Research staff:* George Burgess, Research Engineer; R. M. Botley, Director of mechanical development of processing equipment; J. D. Pratt and James Munro, Directors of agricultural mechanical development; C. H. Wells, Chief Chemist, factory control laboratories.

*Research Department responsible for research relating to agricultural, processing, new products, and by-products:* F. P. Mehrlich, Director; G. T. Nightingale, Physiologist, in charge of agricultural research and control; George Felton, Research Chemist, in charge of product and by-product research; Kenneth Kopf, Geneticist, in charge of plant improvement program; C. E. Reppun, in charge of fruit quality control; James Medcalf and W. Y. Whang, in charge of respective agricultural field laboratories; technical personnel 29; additional personnel 71.

*Research activities:* Mechanical equipment; improvements in canning machinery and facilities; mechanical equipment for plantations; field experiments dealing with fertilization, crop density, and sundry points related to quality, quantity, and economy of production; the investigation of by-products. (Research initiated 1914.)

*Library:* A library is maintained.

*Cooperative research:* One grant for research is made.

**1036. Hawley Products Company, 333 North 6th St., St. Charles, Ill.**

*President:* J. B. Hawley.

*Research staff:* J. C. Williams, Director; Russell H. Curtis, Engineer. 1 chemist, 1 engineer; technical personnel 5; additional personnel 1.

*Research activities:* Plastics; sound dia-

phragms; molded fiber; filters. (Research initiated 1931.)

*Library:* 100 volumes.

*Cooperative research:* Two fellowships are supported.

**1037. Haynes Laboratories, Inc., C. W., 61 Chandler St., Springfield 4, Mass.**

*President:* Chester W. Haynes.

*Research staff:* Chester W. Haynes, Director; Irving F. MacKenna, Chief Chemist; Robert F. Atwood, Chemist. 4 chemists.

*Research activities:* The investigation and development of industrial finishes in the varnish, lacquer, synthetic resin, and stain industries. (Research initiated 1931.)

**Haynes Stellite Company.** See Union Carbide and Carbon Corporation.

**1038. Hazel-Atlas Glass Company, Wheeling, W. Va.**

*President:* J. H. McNash.

*Laboratories:* Zanesville, Ohio; Wheeling, W. Va.

*Research staff:* F. C. Flint, Director. 8 chemists, 1 metallurgist; 5 in other scientific professions; additional personnel 4.

*Research activities:* Glass composition; ceramic studies; combustion; the use of glass containers, metal caps, and liners; corrosion; fats and soaps; foods; lacquers; zinc. (Research initiated 1919.)

*Cooperative research:* Two fellowships are supported.

**1039. Hazeltine Corporation, 821 National Press Bldg., Washington 4, D. C.**

*President:* Jack Binns.

*Laboratories:* Hazeltine Electronics Corporation, 58-25 Little Neck Parkway, Little Neck, N. Y.; 325 West Huron St., Chicago, Ill.

*Research staff:* W. A. MacDonald, President and Director; Harold A. Wheeler, Vice President; Daniel E. Harnett, Chief Engineer. The engineering staff of Hazeltine Electronics Corporation includes in excess of 600 physicists, electrical engineers, mechanical engineers, chemists and other professional or skilled personnel.

*Research activities:* Research and development in the field of communication. The Little Neck laboratories deal with problems relating to the communication art. The Chicago laboratories deal with the immediate commercial development and engineering problems in cooperation with manufacturers of radio apparatus. (Research initiated 1924.)

**Hazeltine Electronics Corporation.** See Hazeltine Corporation.



**1040. Heald Machine Company, 10 New Bond St., Worcester 6, Mass.**

*President:* Roger N. Heald.

*Research staff:* Rolland C. Griffith, Director. 2 physicists, 4 engineers; technical personnel 1; additional personnel 24.

*Research activities:* Research in metal cutting relating to grinding and boring; investigations in the fields of friction, vibration, hydrodynamics, and surface finish; the development and use of special precision measuring instruments; testing and development of boring and grinding machines. (Research initiated 1918.)

*Library:* 350 volumes.

*Cooperative research:* Two scholarships are supported.

**1041. Heckethorn Manufacturing and Supply Company, Littleton, Colo.**

*President:* W. W. Heckethorn.

*Research staff:* R. V. Seaman, Director. 1 chemist, 1 metallurgist, 5 engineers; technical personnel 3; additional personnel 3.

*Research activities:* Research on mechanical devices to aid the photographic industry; research directed to improve tools and processes in company plant; resulting data made available to other plants. Chemical research on cutting oils, plating, die casting, etc. (Research initiated 1943.)

*Library:* 200 volumes.

**Hedge-Walsh-Weidner Division, Combustion Engineering Company, Inc. See Combustion Engineering Company, Inc.**

**Heidbrink Division, Ohio Chemical and Manufacturing Company. See Ohio Chemical and Manufacturing Company.**

**1042. Heiges Radio Electric, East State, Sharon, Pa.**

*President:* G. E. Heiges.

*Research staff:* 3 engineers; technical personnel 1; additional personnel 2.

*Research activities:* Radio communications, broadcast, and electronics. (Research initiated 1929.)

**1043. Heiland Research Corporation, 130 East 5th Ave., Denver 9, Colo.**

*President:* C. A. Heiland.

*Research staff:* John C. Hollister, Head of Development Department; C. A. Heiland. 1 physicist, 6 engineers, 2 geophysicists; technical personnel 2; additional personnel 2.

*Research activities:* Oscillograph recording; geophysical and photographic research. (Research initiated 1934.)

**1044. Heinz Company, H. J., P. O. Box 57, Pittsburgh 30, Pa.**

*President:* H. J. Heinz II.

*Laboratories:* Pittsburgh, Pa.; Medina, N. Y.; Holland, Mich.; Berkeley, Calif.; Leamington, Can.; Fremont, Ohio; Matthews, Ind.; Chambersburg, Pa.

*Research staff:* H. N. Riley, Director; L. H. Almy; F. C. Blanck. 38 chemists, 10 biologists, 4 engineers; technical personnel 16; additional personnel 20.

*Research activities:* New processes and new food products. (Research initiated 1903.)

*Library:* 800 volumes.

*Cooperative research:* One fellowship is supported.

**1045. Hemeco, Ltd., 2075 North Fair Oaks Ave., Pasadena, Calif.**

*Research staff:* Herbert Meyer, Director; M. G. Chamberlain, Associate Director. 3 chemists, 1 physicist; additional personnel 2.

*Research activities:* General industrial research, photographic chemistry and physics; organic synthesis; organometallic synthesis. (Research initiated 1945.)

*Library:* A library is maintained.

**1046. Henry Valve Company, Inc., 3260 West Grand Ave., Chicago 51, Ill.**

*President:* Guy J. Henry.

*Research staff:* D. K. McIlvaine, Chief Engineer. 3 engineers; technical personnel 3; additional personnel 4.

*Research activities:* Industrial control valves for refrigeration, electrical appliances, steam, water, and air. (Research initiated 1945.)

**1047. Heppenstall Company, 4620 Hatfield St., Pittsburgh 1, Pa.**

*President:* R. B. Heppenstall.

*Research staff:* James C. Hartley, Director; L. R. Cooper, Assistant to the Director; D. M. Kelman, Research Metallurgist. 2 physicists, 8 metallurgists; technical personnel 7; additional personnel 5.

*Research activities:* The development of die block, shear knife, and forging steels made from open-hearth and electric induction furnaces. (Research initiated 1917.)

*Library:* 500 volumes.

**1048. Hercules Powder Company, Delaware Trust Bldg., Wilmington 99, Del.**

*President:* Charles A. Higgins.

*Research Executives:* Emil Ott, Director of research; R. W. Cairns, Assistant Director of research.

*Scientific periodicals:* Explosives Engineer. Monthly. Vol. I, 1923. Paper Maker. Quar-

terly. Hercules Chemist. Irregular. Hercules Mixer. Monthly. Vol. I, 1919.

*Cooperative research:* Three fellowships and three scholarships are supported.

*Laboratories:* Eleven laboratories for research and experimental work are maintained as follows. This list does not include the company's plant control laboratories, which number twenty-three. (Research initiated 1918.)

HERCULES EXPERIMENT STATION  
Wilmington 99, Del.

*Research staff:* R. F. Schultz, Director; G. H. Pfeiffer, Business Manager; H. M. Spurlin, Technical Assistant to Director. 206 chemists and chemical engineers, 3 physicists; additional personnel 408.

Fields of research on processes, products, and their uses and the leaders for the various groups of the Experiment Station are as follows:

*Analytical:* W. A. Kirklin. Analyses, development, and standardization of chemical control methods.

*Cellulose:* P. Van Wyck. Development work and fundamental problems on chemical cotton pulp from cotton linters; sales development work in new fields.

*Cellulose Products:* J. S. Tinsley. Nitrocellulose, cellulose acetate, ethyl cellulose, carboxymethylcellulose, and other cellulose esters and ethers; fundamental research on the chemistry of cellulose and cellulose derivatives; chlorinated rubber and chlorinated paraffin.

*Explosives:* A. M. Ball. Dynamite and other high explosives, smokeless powder, blasting caps, and blasting supplies; chemicals such as nitric acid, ammonium nitrate, and synthetic ammonia; fundamental research on high explosives.

*General Research:* A. L. Glasebrook. Investigation of fundamental properties of company products and raw materials; exploratory work on chemistry of processes of possible future interest; development of techniques and processes of widespread chemical significance and practical application to problems of all fields of company interest; specialized services requiring special equipment such as distillation and hydrogenation.

*Naval Stores:* R. S. George. Rosin, turpentine, and pine oil; fundamental work on chemistry of rosin and terpenes, and preparation of their chemical derivatives.

*Paper Makers Chemical:* W. P. Campbell. Rosin and wax sizes, casein, alum, cleaners, and other papermaking and industrial chemicals.

*Physics:* W. P. Conner. Spectroscopy, microscopy, photometry, X-ray and electron diffraction, instrumentation, and electrical testing.

*Pilot Plant:* K. C. Laughlin. Development of new processes and modification of present pro-

cesses on pilot plant scale; preparation of large-scale samples for evaluation.

*Synthetics:* J. O. Small. Resins, plasticizers, and other synthetic organic chemicals for use in products such as protective coatings, adhesives, and printing inks.

*Testing:* I. C. Clare. Testing; standardization and development of physical testing methods; evaluation of products in specified industries such as paint and varnish, rubber, soap, foundry, plastics, and floor covering.

CELLULOSE LABORATORY  
Hopewell, Va.

*Research staff:* A. F. Martin, Chief Chemist. 7 chemists and chemical engineers.

*Research activities:* Development work and operating problems on chemical cotton pulp, bulk and sheet forms, from cotton linters; caustic soda; chlorine; sales service on chemical cotton pulp.

CELLULOSE PRODUCTS LABORATORIES  
Hopewell, Va.

*Research staff:* E. S. Elliott, Chief Chemist. 10 chemists and chemical engineers.

*Research activities:* Development work, operating problems, and sales service on ethyl cellulose.

Parlin, N. J.

*Research staff:* R. L. Stern, Chemical Superintendent. 25 chemists and chemical engineers.

*Research activities:* Development work, operating problems, and sales service on nitrocellulose, cellulose acetate, ethyl cellulose, carboxymethylcellulose, chlorinated rubber, chlorinated paraffin, acids, and plasticizers.

HIGH EXPLOSIVES LABORATORY  
Kenvil, N. J.

*Research staff:* H. H. Champney, Dynamite Research Supervisor. 3 chemists and chemical engineers.

*Research activities:* Development work, sales service, and operating problems on high explosives and black powder.

SMOKELESS POWDER LABORATORY  
Kenvil, N. J.

*Research staff:* H. B. Alexander, Smokeless Research Supervisor. 5 chemists and chemical engineers.

*Research activities:* Development work, sales service, and operating problems on smokeless powder.

**INITIATING EXPLOSIVES LABORATORY**

Port Ewen, N. Y.

*Research staff:* H. I. Etchells, Jr., Chief Chemist. 4 chemists and chemical engineers, 1 physicist.

*Research activities:* Development work, sales service, and operating problems on blasting caps and blasting supplies.

**NAVAL STORES LABORATORIES**

Brunswick, Ga.

*Research staff:* C. E. Tyler, Chief Chemist. 6 chemists and chemical engineers.

*Research activities:* Process development and operating studies on the manufacture of rosin, turpentine, pine oil, and derivatives.

Hattiesburg, Miss.

*Research staff:* R. J. Byrkit, Chief Chemist. 6 chemists and chemical engineers.

*Research activities:* Process development and operating studies on the manufacture of rosin, turpentine, pine oil and derivatives.

**PAPER MAKERS CHEMICAL LABORATORY**

Kalamazoo, Mich.

*Research staff:* R. T. Mashburn, Chief Chemist. 6 chemists and chemical engineers.

*Research activities:* Development work, operating problems, and sales service dealing with papermaking, paper coating, and industrial chemicals.

**SYNTHETICS LABORATORY**

Mansfield, Mass.

*Research staff:* R. P. Carter, Chief Chemist. 8 chemists and chemical engineers.

*Research activities:* Development and operating studies and sales service on resins, plasticizers, and other organic chemicals for protective coatings, adhesives, printing inks, etc.

**1049. Heresite and Chemical Company, 822 South 14th St., Manitowoc, Wis.**

*President:* Charles H. Hempel.

*Laboratories:* Manitowoc and Meadow Lane, Wis.

*Research staff:* Herbert E. Pleuss, Chief Chemist. 2 chemists, 2 engineers; technical personnel 7.

*Research activities:* Synthetic plastics of the phenolic type; synthetic fiber; synthetic resins, coatings, and synthetic rubber. (Research initiated 1935.)

*Library:* 350 volumes.

**1050. Herman Laboratory, John, 771 San Julian St., Los Angeles, Calif.**

*Research staff:* 4 chemists, 1 metallurgist.

*Research activities:* The investigation of minute amounts of impurities with the spectrograph and polarograph; ore testing; geological problems in the identification of samples; plant ash tests.

**1051. Herron Company, James H., 1360-64 West 3rd St., Cleveland 13, Ohio.**

*President:* James H. Herron.

*Research staff:* E. T. Holmberg, Director of Chemical Laboratories; L. F. Herron, Director of Metallurgical and Metallographical Laboratories; W. A. Carlson, Building Materials Engineer; R. J. Kriz, Welding Engineer; W. K. Lonsdale, Chief Radiographer; R. A. Placek, Spectroscopist. 9 chemists, 3 physicists, 2 metallurgists, 4 engineers, 1 geologist; technical personnel 34; additional personnel 9.

*Research activities:* Chemical, metallurgical, and metallographic research on metals and alloys, welding fluxes, welding and welded products, insulating materials, building and highway materials, cements, plasters, concrete, stone, lime, gypsum, clay products, and paints. The study of corrosion problems, complete soil investigation; the drilling of cores in rock and concrete. (Research initiated 1911.)

*Library:* 2,000 volumes.

**1052. Hershey Chocolate Corporation, Hershey, Pa.**

*President:* W. F. R. Murrie.

*Research staff:* S. F. Hinkle, Director. 4 chemists, 1 engineer, 1 bacteriologist; technical personnel 6; additional personnel 2.

*Research activities:* Plant and process development in chocolate and cocoa; experimental plant for the development of new products. (Research initiated 1914.)

*Library:* 500 volumes.

**1053. Hershey Machine and Foundry Company, Manheim, Pa.**

*President:* J. H. Nissley.

*Research staff:* W. T. Sheffield, Director of Metallurgical and Materials Laboratory; H. D. Merrill, Director of Automatic Stokers Laboratory. 1 chemist, 1 metallurgist, 2 engineers; additional personnel 1.

*Research activities:* Metallurgy; the testing of foundry materials; automatic anthracite stokers. (Research initiated 1928.)

**1054. Herstein Laboratories, Inc., 23 West 47th St., New York 19, N. Y.**

*Research staff:* Karl M. Herstein, Director; John S. G. Shotwell, Engineering Director. 2 chemists, 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Industrial organic research; the chemistry of tobacco and cigarette

smoke; organic light filtering agents and plastics; new organic industrial raw materials; automotive and brake fluids; the development of new flooring materials; preparation of rare chemicals, organic and inorganic. (Research initiated 1935.)

*Library:* 700 volumes.

**1055. Herty Foundation Laboratory, 510 West River St., Savannah, Ga.**

*Chairman of Board of Trustees:* Charles S. Sanford.

*Research staff:* Bruce Suttle, Director; Mary Boyce, Chemist; W. L. Hendrix, Plant Engineer.

*Research activities:* Experimental research in pulp and paper production. (Research initiated 1932.)

*Library:* 186 volumes.

**1056. Herzog Laboratory, Box 174, Gainesville, Fla.**

*Research staff:* H. Herzog, Jr., Director. 1 chemist.

*Research activities:* Growth promoting actions: auxins, indole, etc. (Research initiated 1893.)

*Note:* Laboratory discontinued March, 1946, due to the death of the Director.

**1057. Hess and Clark, Inc., Ashland, Ohio.**

*President:* H. M. Clark.

*Research staff:* Paul D. Harwood, Director. 1 chemist, 5 biologists, 1 dentist; additional personnel 6.

*Research activities:* The investigation of diseases and parasites affecting domestic animals and poultry. (Research initiated 1926.)

*Library:* 500 volumes.

*Cooperative research:* Occasional grants for research are made.

**1058. Hevi Duty Electric Company, 4212 West Highland Blvd., Milwaukee 1, Wis.**

*President:* Harold E. Koch.

*Research staff:* Bruno Werra, Director. 1 metallurgist, 2 engineers.

*Research activities:* Equipment and processes involving the use of electric heat. (Research initiated 1929.)

*Library:* 150 volumes.

**1059. Hewitt Rubber Corporation, 240 Kensington Ave., Buffalo 5, N. Y.**

*President:* Thomas Robins, Jr.

*Research staff:* Michael Berman, Manager of research and development; Norman J. Cyphers, Technical Superintendent. 20 chemists; technical personnel 12; additional personnel 9.

*Research activities:* The development of in-

dustrial rubber products, such as conveyor, elevator, and transmission belting; miscellaneous rubber hose for industry including air, steam, welding, water, and fire hose; oil hose and rotary hose for oil well drilling. Rubber latex foam sponge products for automotive, transportation, and furniture industries and miscellaneous consumer use; molded rubber goods and sheet rubber products; the development of synthetic rubbers; scientific studies of natural rubber; evaluation of chemical ingredients for use in rubber; development of new rubber products for industrial and consumer use. (Research initiated 1917.)

*Library:* 150 volumes.

**1060. Hewlett-Packard Company, 395 Page Mill Road, Palo Alto, Calif.**

*Research staff:* David Packard and William R. Hewlett, Directors. 9 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Electronic measurement. (Research initiated 1939.)

*Library:* 150 volumes.

*Cooperative research:* One fellowship is supported.

**1061. Heyden Chemical Corporation, 393 Seventh Ave., New York 1, N. Y.**

*President:* B. R. Armour.

*Laboratories:* Garfield, N. J.; Fords, N. J.; Princeton, N. J.; Brooklyn, N. Y.

*Research staff:* R. W. Harris, Vice President and Director. 48 chemists, 1 physicist, 10 biologists, 20 engineers, 1 physician; technical personnel 5; additional personnel 25.

*Research activities:* Organic synthesis, dye and medicinal intermediates; intermediates for plastics, antibiotics, etc. (Research initiated 1900.)

*Library:* Two libraries are maintained.

*Cooperative research:* Three fellowships are supported.

**1062. Heyman, Moses D., Sheridan Ave. and Broadway, Hewlett, Long Island, N. Y.**

*Research staff:* Moses D. Heyman, Director. 2 engineers; additional personnel 3.

*Research activities:* Electrical and labor saving machinery; automatic measuring devices; electrochemistry; investigations in the field of pure physics. (Research initiated 1935.)

**Hill Manufacturing Company. See Androscoggin Mills.**

**1063. Hille Laboratories, 1791 Howard St., Chicago, Ill.**

*President:* Hermann Hille.

*Research staff:* Hermann Hille, Director. 2 chemists, 1 physicist, 1 biologist and bacteriolo-

gist; 1 in another scientific profession; additional personnel 4.

*Research activities:* The production and therapeutic use of colloidal medicinals. (Research initiated 1908.)

*Cooperative research:* Two assistantships and one fellowship are supported and one grant for research is made.

**Hillyer Engineering Company.** See No. 2434 in *Addenda*.

**1064. Hilo Varnish Corporation,** 41-60 Stewart Ave., Brooklyn 6, N. Y.

*President:* Carl J. Schumann.

*Research staff:* Joseph J. Mattiello, Vice President and Technical Director. 5 chemists; technical personnel 3; additional personnel 2.

*Research activities:* Protective and decorative coatings for the paint, varnish, lacquer, and printing ink industry. (Research initiated 1900.)

*Library:* 500 volumes.

*Cooperative research:* Three grants for research are made.

**1065. Hilton-Davis Chemical Company,** 2235 Langdon Farm Road, Cincinnati 12, Ohio. (Division of Sterling Drug, Inc.)

*President:* L. A. Hoffman.

*Research staff:* C. H. Allen, Head of laboratories; D. S. Hirtle, Director of research laboratory. 23 chemists; technical personnel 14; additional personnel 4.

*Research activities:* Research on dyes, pigments, resins, and intermediates for dyes and pharmaceuticals. (Research initiated 1922.)

*Library:* 2,500 volumes.

**1066. Hinde and Dauch Paper Company,** Sandusky, Ohio.

*President:* Sidney Frohman.

*Laboratories:* Sandusky, Ohio; Hoboken, N. J.; Chicago, Ill.; Toronto, Ont.

*Research staff:* J. H. Macleod, Director; Fred Wohlers, (Containers); John Little (Chemical Engineering and Processes); Thomas Gagen (Special). 1 chemist, 12 engineers; technical personnel 6; additional personnel 6.

*Research activities:* Improvements in manufacturing processes, products, and design with particular reference to corrugated papers; container liners; corrugated board; corrugated and solid fiber shipping boxes; automotive and refrigerator insulation; glassine lined kraft food containers; colored papers for containers and display stands; proofing papers resistant to moisture, grease, and abrasion; adhesives. (Research initiated 1910.)

**1067. Hinderliter Tool Company,** 1150 North Peoria, Tulsa 1, Okla.

*President:* F. J. Hinderliter.

*Research staff:* Don R. Hinderliter and L.

W. Cashdollar, Directors. 1 chemist, 2 metallurgists, 2 engineers; technical personnel 4; additional personnel 9.

*Research activities:* Casing head and blowout prevention equipment; tool joints; specialties in oil well fishing tools. During war period: complete melting, forging, machining, heat treating, and testing of various gun tubes. (Research initiated 1927.)

*Library:* 200 volumes.

**1068. Hobart Brothers Company,** Hobart Square, Troy, Ohio.

*President:* E. A. Hobart.

*Research staff:* E. A. Hobart, Director. 1 physicist, 5 engineers; technical personnel 2; additional personnel 3.

*Research activities:* Welding of metals and electrical sources of supply for welding; electric motors and generators. (Research initiated 1943.)

*Library:* 600 volumes.

*Cooperative research:* Two grants for research are made.

**1069. Hobart Manufacturing Company,** Troy, Ohio.

*President:* David A. Meeker.

*Laboratories:* Troy and Dayton, Ohio.

*Research staff:* David A. Meeker, Director. 20 engineers; technical personnel 15; additional personnel 10.

*Research activities:* The development of electrically operated food preparing machinery, such as meat slicers, choppers, mixers, coffee mills, air whips or cream whips, dish washing machinery, scales, Kitchen Aid home appliances, etc., together with studies for the improvement of the materials and processes. (Research initiated 1902.)

*Cooperative research:* Three grants for research are made.

**1070. Hoberg Paper Mills, Inc.,** Green Bay, Wis.

*President:* J. M. Conway.

*Research staff:* C. R. Faulkender, Technical Director. 1 chemist, 1 engineer; technical personnel 12.

*Research activities:* The development and control of pulp and paper manufacture. (Research initiated 1892.)

*Library:* 1,500 volumes.

*Cooperative research:* One grant for research is made.

**1071. Hochstadter Laboratories,** 23 West 47th St., New York 19, N. Y.

*President:* Samuel Newmark.

*Research staff:* Samuel Newmark, Director. 2 chemists, 1 engineer; additional personnel 1.

*Research activities:* The manufacture and preparation of food and pharmaceutical prod-

ucts; road and pavement materials; problems relating to pure food regulation; top soil, humus, etc.; building materials; briquetting pitch and other coal tar products. A foreign department is maintained for consultation and research on products being manufactured abroad and imported into the United States, and also for supervising, inspecting, and testing products purchased in the United States by purchasers abroad. (Research initiated 1909.)

*Library:* 600 volumes.

**1072. Hoffmann-La Roche, Inc., Nutley 10, N. J.**

*President:* L. D. Barney.

*Research staff:* J. A. Aeschlimann, Assistant Director of research. *Group chiefs:* M. W. Goldberg, J. Lee, and W. Wenner, organic and biological chemistry; R. J. Schnitzer, chemotherapy; G. Lehmann, pharmacology; B. Tabenkin, microbiology. 30 chemists, 2 physicists, 16 biologists, 4 physicians; technical personnel 38; additional personnel 14. *Pilot and Development:* A. J. Frey, Technical Director. *Pharmaceutical Research:* M. F. Furter, Director in charge of laboratories; W. Lauter, 1 chemist, 2 pharmacists. *Microanalysis:* A. Steyermark. 5 chemists. *Clinical Research:* R. D. Shaner, Director. 3 physicians.

*Research activities:* Organic, synthetic, and pharmaceutical chemistry; pharmacology; hormones; vitamins; antibiotics; hypnotics; analgesics; opiates; amino acids. (Research initiated 1929.)

*Library:* 5,000 volumes in scientific library; 3,000 volumes in medical library.

*Cooperative research:* Several grants for research are made.

**1073. Hogaboom, Jr. and Company, G. B., 44 East Kinney St., Newark 2, N. J.**

*Co-directors:* G. B. Hogaboom, Jr. and Nathaniel Hall.

*Research staff:* G. B. Hogaboom, Jr., Director. 2 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Metal finishing; electroplating and corrosion prevention. (Research initiated 1934.)

*Library:* A library is maintained.

**1074. Holland Color and Chemical Company, Holland, Mich.**

*President:* C. R. Trueblood.

*Research staff:* R. D. Eash, Vice President and Director; Otto Dressel; John Huff. 5 chemists; technical personnel 3.

*Research activities:* Dry and flushed colors; organic pigments; intermediates; chemicals; furnace cement; methyl violet and methyl violet base. (Research initiated 1935.)

**1075. Holley Carburetor Company, 5930 Vancouver Ave., Detroit 4, Mich.**

*President:* Earl Holley.

*Research staff:* A. W. Orr, Jr., Chief Research Engineer. 5 engineers, 4 draftsmen, 3 testers, 7 experimental machinists; additional personnel 2.

*Research activities:* Carburetion of aircraft engines; fuel controls for prime movers; carburetion and ignition of automobile, truck, tractor, and marine engines; automotive fuel pumps.

**1076. Hollingshead Corporation, R. M., 840 Cooper St., Camden, N. J.**

*President:* R. M. Hollingshead, Jr.

*Laboratory:* 16th and Mickle Sts., Camden, N. J.

*Research staff:* T. J. Bagley, Director; V. M. Mantz, Assistant Director; A. E. Moore, Assistant Chief Chemist. 9 chemists; additional personnel 17.

*Research activities:* The development and uses of compounds, dressings, polishes, etc. (Research initiated 1909.)

*Library:* A library is maintained.

**1077. Hollingsworth and Vose Company, 112 Washington St., East Walpole, Mass.**

*President:* Louis E. Vose.

*Laboratories:* East Walpole and West Groton, Mass.

*Research staff:* 1 chemist; technical personnel 10.

*Research activities:* The investigation of the physical and chemical properties of papermaking fibers; the study of new processes and improvements in present processes; the maintenance of uniform quality in the products manufactured. (Research initiated 1920.)

**1078. Hollingsworth and Whitney Company, 60 Battery March St., Boston 2, Mass.**

*President:* James L. Madden.

*Laboratory:* Waterville, Maine.

*Research staff:* John L. Parsons, Director.

*Research activities:* Pulp and paper: evaluation of raw fibrous materials for pulp; study of pulping processes and paper manufacturing operations; process and product improvement; development of testing methods; new processes and products. (Research initiated 1945.)

*Library:* 300 volumes.

**Hollup Corporation Laboratory.** See National Cylinder Gas Company.

- 1079. Hollywood Testing Laboratories, 1257 North La Brea Ave., Hollywood 38, Calif.**  
*President:* Ralph S. Willard.  
*Research staff:* 2 chemists, 1 physicist, 2 biologists, 1 metallurgist, 1 engineer; technical personnel 2; additional personnel 2.  
*Research activities:* Biological chemistry; chemistry of cellulose and pulp; organic synthesis; metallurgy; industrial research and development. (Research initiated 1925.)  
*Library:* 480 volumes.
- 1080. Holophane Company, Inc., 342 Madison Ave., New York, N. Y.**  
*President:* Charles Franck.  
*Laboratory:* Newark, Ohio.  
*Research staff:* T. W. Rolph, Director. 1 chemist, 5 engineers; additional personnel 4.  
*Research activities:* Methods of using prismatic action for controlling light; glass characteristics; the development of new types of luminaires using prismatic glass. (Research initiated 1914.)
- 1081. Homasote Company, Trenton 3, N. J.**  
*President:* Basil Outerbridge.  
*Research staff:* Hubert L. Becher, Chief Chemist. 2 chemists, 2 engineers; technical personnel 3.  
*Research activities:* Fiber insulation boards and their application; plastics, with special application to the shoe trade. (Research initiated 1913.)  
*Library:* 120 volumes.
- 1082. Hommel Company, O., 209 Fourth Ave., Pittsburgh, Pa.**  
*President:* E. M. Hommel.  
*Laboratory:* Carnegie, Pa.  
*Research staff:* C. H. Wolff, Director. 3 chemists, 1 engineer; additional personnel 6.  
*Research activities:* The development of ceramic colors, glazes, and porcelain enamels.  
*Cooperative research:* One fellowship is supported.
- 1083. Hood and Sons, Inc., H. P., 500 Rutherford Ave., Boston, Mass.**  
*President:* Harvey P. Hood II.  
*Laboratories:* Boston, Mass.; St. Johnsbury, Vt.; Newport, Vt.; Auburn, Maine; St. Albans, Vt.; Eagle Bridge, N. Y.  
*Research staff:* Arthur C. Fay, Director. 6 chemists, 5 biologists and bacteriologists.  
*Research activities:* Quality control of milk, ice cream, condensed milk, and cheese; the development of new products and of new operating control methods.
- 1084. Hood Rubber Company, Nichols Ave., Watertown 72, Mass. (Division of B. F. Goodrich Company.)**  
*President:* C. Lawrence Münch.  
*Research staff:* Raymond H. Blanchard, Vice President in charge of manufacturing and research; A. A. Glidden, Manager of development; N. E. Tousley, Manager of technical service; W. E. Glancy, Manager of laboratories and engineering process service; J. H. Clarke, Superintendent of processing division, mechanical goods, and asphalt products. 35 chemists and chemical engineers, 9 engineers; additional personnel 32.  
*Research activities:* Research, development, plant control, and manufacturing methods relating to the manufacture of rubber footwear, tiling, battery boxes, molded hard rubber goods, gloves, coated fabrics, and other rubber composition and plastics products. (Research initiated 1896.)  
*Library:* 1,000 volumes.
- 1085. Hooker Electrochemical Company, Niagara Falls, N. Y.**  
*President:* E. R. Bartlett. *Chairman of the Board:* H. M. Hooker.  
*Research staff:* R. L. Murray, Vice President in charge of development and research; J. H. Babcock, Manager of development and research. 30 chemists, 1 physicist, 10 engineers; technical personnel 11; additional personnel 4.  
*Research activities:* The chemistry of chlorine derivatives, both organic and inorganic; lubrication addition agents; the quality improvement of caustic soda and derivatives; electrolytic cells; hydrogen and hydrogenation. (Research initiated 1913.)  
*Library:* 2,000 volumes.  
*Cooperative research:* Two fellowships are supported.
- 1086. Hoosier Cardinal Corporation, 601 West Eichel Ave., Evansville 7, Ind.**  
*President:* Thomas J. Morton, Jr.  
*Research staff:* C. A. Bauer, Vice President and Director. 2 chemists, 1 physicist, 2 engineers; technical personnel 3; additional personnel 4.  
*Research activities:* Materials, finishes, and fabricating processes using plastics and decorative metals. (Research initiated 1939.)  
*Library:* 500 volumes.  
*Cooperative research:* One grant for research is made.
- 1087. Hooton Chocolate Company, 351 North 5th St., Newark 7, N. J.**  
*President:* G. W. Dodd.  
*Research staff:* Leo Freundlich, Director. 1 chemist, 1 assistant.

*Research activities:* The development and improvement of cocoa and chocolate products and of manufacturing processes; fundamental and applied research pertaining to chocolate. (Research initiated 1931.)

1088. Hoover Company, North Canton, Ohio.

*Vice President:* H. Earl Hoover.

*Research staff:* H. Earl Hoover, in charge of research; D. G. Smellie, Chief Engineer; G. P. Daiger, Executive Engineer. 9 chemists, 2 physicists, 1 metallurgist, 30 engineers; technical personnel 54; additional personnel 37.

*Research activities:* Electric cleaners, refrigerators, and other household products; the development and use of materials; the design of products; manufacturing processes, and necessary test procedures and special apparatus; methods for cleaning carpets and rugs; causes of rug wear; human energy requirements; the bacteriological aspects of house dirt, etc. (Research initiated 1920.)

*Library:* 1,500 volumes.

1089. Hoover Laboratories, C. M., American Solder Flux Company, Newark, Ohio.

*President and General Manager:* B. B. Hoover.

*Research staff:* 1 metallurgist; technical personnel 2; additional personnel 3.

*Research activities:* Cohesion-adhesion with specific reference to the flow of solder on various metals. (Research initiated 1911.)

1090. Hopkins and Company, Inc., J. L., 220 Broadway, New York 7, N. Y.

*President:* J. L. Hopkins.

*Laboratory:* 477 Keap St., Brooklyn, N. Y.

*Research staff:* G. P. Nunziata, Director. 5 chemists, 1 engineer, 3 pharmacists; technical personnel 15; additional personnel 25.

*Research activities:* The manufacture of botanical derivatives, with the aim of retaining all important virtues in the finished extracts, including volatile substances; the extraction of active constituents in high grade of purity, such as alkaloids, glucosides, resins, tannins, etc; setting up of qualitative and quantitative tests to determine the purity and composition of new products manufactured. (Research initiated 1890.)

*Library:* 500 volumes.

1091. Horix Manufacturing Company, Corliss Station, Pittsburgh 4, Pa.

*President:* Frank B. Fairbanks.

*Research staff:* 3 engineers; additional personnel 1.

*Research activities:* Developing and testing new and improved filling machines for liquids and semi-fluids. (Research initiated 1929.)

1092. Horlick's Malted Milk Corporation, Racine, Wis.

*President:* A. J. Horlick.

*Research staff:* Frank E. Hartman, Director. 3 chemists, 1 biologist; technical personnel 2; additional personnel 2.

*Research activities:* Malted milk and related food products; research in manufacturing processes.

*Library:* 1,000 volumes.

Horn Company, A. C. See Sun Chemical Corporation.

1093. Houdaille-Hershey Corporation, 2188 National Bank Bldg., Detroit 26, Mich.

*President:* Charles Getler.

*Research committee:* Sandford Brown, Chairman; Ralph F. Peo and Don S. Devor, Vice Presidents.

*Cooperative research:* Two grants for research are made.

#### HOUDE ENGINEERING DIVISION

537 East Delavan Ave., Buffalo 11, N. Y.

*Vice President in charge of Division:* Ralph F. Peo.

*Research staff:* Gervase M. Magrum, Research Manager. 1 chemist, 2 assistant chemists, 1 metallurgist, 2 test engineers, 4 design engineers, 8 testers, 20 experimental technicians.

*Research activities:* Automotive shock absorbers, vehicular suspensions, vibration control, hydraulic mechanisms, aircraft landing gear shimmy dampers, and steering controls. (Research initiated 1928.)

*Library:* A library is maintained.

Houde Engineering Division, Houdaille-Hershey Corporation. See Houdaille-Hershey Corporation.

1094. Houdry Process Corporation of Pennsylvania, Box 427, Marcus Hook, Pa.

*President:* A. V. Danner.

*Laboratory:* Linwood, Pa.

*Research staff:* E. A. Smith, Head of research and development. 28 chemists, 1 physicist, 39 engineers; technical personnel 9; additional personnel 314.

*Research activities:* Development of catalytic processes for use in the petroleum refinery field, particularly catalytic cracking. (Research initiated 1930.)

*Library:* 500 volumes.

*Scientific periodicals:* Houdry Pioneer. Vol. I, 1945.



**1095. Houghton and Company, E. F.,** 303 West Lehigh Ave., Philadelphia 33, Pa.

*President:* Aaron E. Carpenter. *Vice President in charge of operations:* Richard H. Patch.

*Laboratories:* 240 West Somerset St., Philadelphia, Pa.; 3534 Shields Ave., Chicago, Ill.; N. W. corner Quint St. and Davidson Ave., San Francisco, Calif.

*Research staff:* James T. Eaton, Research Assistant to the Vice President. 26 chemists, 3 metallurgists, 2 engineers; technical personnel 11.

*Research activities:* Lubrication; products for the metal working industries; leather oils and greases; textile processing oils; industrial leathers; wetting agents, synthetic detergents. (Research initiated 1915.)

**1096. Housholder, E. Ross, Engineering Research Laboratories,** 429 East Spring St., Kingman, Ariz.

*Research staff:* E. Ross Housholder, Director. 1 chemist, 1 metallurgist, 1 engineer, 1 geologist.

*Research activities:* Metal mining and milling methods; materials handling methods; production line research; gang progress improvement research; elimination of lost time. (Research initiated 1919.)

*Library:* 400 volumes.

**Howco Laboratory.** See Halliburton Oil Well Cementing Company.

**1097. Huber Company, Walter,** 100 Gold St., New York 7, N. Y.

*Owner:* Walter Huber.

*Research staff:* C. E. Irion, Director. 3 chemists, 1 in another scientific profession; technical personnel 2; additional personnel 5.

*Research activities:* General technical service including graphic arts and textiles. (Research initiated 1944.)

*Library:* 1,500 volumes.

**1098. Huber Corporation, J. M.,** Borger, Tex.

*President:* H. W. Huber.

*Laboratories:* Borger, Tex.; Brooklyn, N. Y.; Huber, Ga.

*Research staff:* Ira Williams, Director. 12 chemists, 1 physicist, 2 engineers, 1 geologist; technical personnel 3; additional personnel 7.

*Research activities:* Carbon black; kaolin processing; inorganic pigments; printing ink; rubber chemicals.

*Library:* 1,500 volumes.

**Hudnut Dermatological Research Laboratories.** See Warner and Company, Inc., William R.

**1099. Hudson Motor Car Company,** 12601 East Jefferson Ave., Detroit 14, Mich.

*President:* A. Edward Barit.

*Research staff:* H. Murray Northrup, Vice President in charge of research; M. H. Toncray, Director. 7 chemists, 1 physicist, 7 metallurgists, 52 engineers; technical personnel 6; additional personnel 210.

*Research activities:* Research in connection with the manufacture of automotive vehicles. (Research initiated 1914.)

**1100. Hughes Tool Company,** Box 2539, Houston 1, Tex.

*President:* Howard R. Hughes.

*Laboratory:* 300 Hughes St., Houston, Tex.

*Research staff:* F. L. Scott, Director of research engineering; H. B. Woods, Assistant Director of research engineering; W. R. White, Laboratory Director. 6 chemists, 3 metallurgists, 6 engineers; technical personnel 12; additional personnel 16.

*Research activities:* Mechanical, metallurgical, and chemical development in connection with the manufacture of rotary rock bits, core bits, tool joints, and high pressure valves and fittings for well production control. (Research initiated 1924.)

*Library:* 1,500 volumes.

**1101. Humble Oil and Refining Company,** Houston 1, Tex.

*President:* H. C. Wiess.

*Manager of Research and Development:* H. D. Wilde.

#### GEOLOGIC, LEASE, AND SCOUTING DEPARTMENT

*Research staff:* W. M. Rust, Jr., Manager of geophysics research. 8 physicists, 9 engineers, 1 mathematician; technical personnel 43; additional personnel 3.

*Research activities:* The development and improvement of methods for petroleum prospecting based on geophysical techniques. (Research initiated 1928.)

#### PRODUCTION DEPARTMENT

*Research staff:* S. E. Buckley, Manager of production research. 8 chemists, 10 engineers; technical personnel 6; additional personnel 4.

*Research activities:* The study of petroleum reservoir behavior; improved methods in the production of petroleum from the standpoint of efficiency and conservation; the investigation of drilling fluids; improved drilling techniques; causes and prevention of corrosion; development of methods for petroleum prospecting based on geochemical techniques. (Research initiated 1929.)

REFINING DEPARTMENT  
Baytown, Tex.

*Research staff:* H. H. Meier, Manager, Technical and Research Division; S. S. Shaffer, Manager, Research and Development Laboratory. 31 chemists, 1 physicist, 35 engineers; technical personnel 162; additional personnel 65.

*Research activities:* The development of new products from petroleum and new processes for refining petroleum, and the improvement of existing processes and products; causes and prevention of corrosion; analytical methods for hydrocarbons. (Research initiated 1924.)

*Library:* 6,000 volumes.

1102. Humitube Manufacturing Company, Peoria, Ill.

*President:* H. J. Neumiller.

*Research staff:* H. J. Neumiller.

*Research activities:* The manufacture and development of transparent containers such as bags, envelopes, tubes, drinking straws, etc., made from cellophane; rigid transparent containers made from cellulose acetate materials. (Research initiated 1927.)

1103. Hungerford and Terry, Inc., Atlantic Ave., Clayton, N. J.

*President:* Churchill Hungerford, Jr.

*Research staff:* C. Edwards, Chief Chemist. 3 chemists, 3 engineers; technical personnel 1.

*Research activities:* Water purification; the development of water softening zeolites, including synthetic resins; process control. (Research initiated 1908.)

*Library:* A library is maintained.

1104. Hunt Company, Robert W., 175 West Jackson Blvd., Chicago 4, Ill.

*President:* W. L. Cooper.

*Laboratories:* Chicago 4, Ill.; 59 Murray St., New York 7, N. Y.; Professional Bldg., Pittsburgh 22, Pa.; Syndicate Trust Bldg., St. Louis 1, Mo.; 251 Kearny St., San Francisco 8, Calif.; Chamber of Commerce Bldg., Los Angeles 15, Calif.; Arctic Bldg., Seattle 4, Wash.; Montreal and Toronto, Canada; London, England.

*Research staff:* F. M. Randlett, Vice President and General Manager; W. A. Chapman, Manager of Laboratories. *Chicago:* G. B. Girault, L. J. Gill, R. H. Vose, W. H. Bolger, Cromwell Bowen, E. Steffens, T. W. Painter, and assistants. *New York:* M. E. Golding, A. M. Klein, and assistants. *Pittsburgh:* E. Godfrey, A. E. Eckberg, and assistants. *St. Louis:* S. B. Roberts, C. A. Bester, and assistants. *San Francisco:* G. D. Tollen, E. O. Ritter, and assistants. *Los Angeles:* H. L. Elright, and assistants. In all the laboratories there are 41 chemists, 1 physicist, 7 metallurgists, 26 engineers; additional personnel 43.

*Research activities:* Cement, concrete, and materials of construction; ceramics; corrosion; foundry practice; alloys; ferrous and nonferrous metals; radiographic research on metals; water treatment; bituminous products; paper and paper products. (Research initiated 1888.)

1105. Huntington Laboratories, Inc., Huntington, Ind.

*President:* J. L. Brenn.

*Research staff:* T. P. Annan, Jr., Director of research; George Dolby, Laboratory Director. 2 chemists, 2 engineers; technical personnel 1.

*Research activities:* Liquid soaps; floor waxes; insecticides; disinfectants. (Research initiated 1921.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is supported.

1106. Huron Milling Company, Inc., Harbor Beach, Mich.

*President:* George J. Jenks.

*Research staff:* J. V. Jenks, Vice President and Chemical Director; A. J. Patten, Director of research. 5 chemists, 1 biologist and bacteriologist.

*Research activities:* Starches; adhesives; food seasonings from hydrolyzed proteins; amino acids. (Research initiated 1927.)

*Library:* 100 volumes.

1107. Hurst Laboratories, 514 Thirty-seventh St., North, St. Petersburg 6, Fla.

*President:* Thomas F. Hurst.

*Research staff:* Thomas F. Hurst, Director. 3 chemists, 2 physicists, 2 biologists, 1 electronic engineer, 1 bacteriologist, 1 glass technician; technical personnel 2; additional personnel 3.

*Research activities:* Fluorescence and phosphorescence; ultraviolet and other light research; electronics; essential oils; tropical plants and products. (Research initiated 1932.)

*Library:* 3,000 volumes.

1108. Hutchinson and Son, Inc., W. H., 1031 North Cicero Ave., Chicago 51, Ill.

*President:* J. S. Kelley.

*Research staff:* Fred E. Domke, Vice President; F. Arndt, Director. 1 chemist; additional personnel 2.

*Research activities:* The development of linings for crown bottle caps; the development of cork substitutes; improvement of the product. (Research initiated 1937.)

1109. Huyck and Sons, F. C., Kenwood Mills, Albany, N. Y.

*President:* W. W. Weed.

*Laboratory:* Rensselaer, N. Y.

*Research staff:* Wm. H. Horne, Director. 4 chemists, 1 biologist, 1 engineer; technical personnel 5.

*Research activities:* Wool products and processing; physical and chemical properties of textiles. (Research initiated 1920.)

*Library:* 500 volumes.

**1110. Hycar Chemical Company, 335 South Main St., Akron 8, Ohio.** (Owned by B. F. Goodrich Company and Phillips Petroleum Company.)

*President:* Ross W. Thomas.

*Laboratory:* Customer Service Laboratory, Maiden Lane, Akron 8, Ohio. Fundamental and applied research conducted at the Akron and Cleveland, Ohio, laboratories of the B. F. Goodrich Co., and at the Bartlesville, Okla., and Borger, Tex., laboratories of Phillips Petroleum Co.

*Research staff, Customer Service Laboratory:* W. D. Parrish, Manager of Technical Service. 4 chemists, 2 engineers; technical personnel 1; additional personnel 11.

*Research activities: Customers Service Laboratory:* Properties, compounding and handling of synthetic rubbers, principally of oil resistant type.

**Hydraulic Brake Company.** See Bendix Aviation Corporation.

**1111. Hydrol Chemical Company 4424-30 Market St., Philadelphia, Pa.**

*President:* H. F. Haabestad.

*Research staff:* E. H. Haabestad, Vice President and Director. 1 chemist, 1 biologist.

*Research activities:* Bacteriology, germicides, and various chemical applications. (Research initiated 1929.)

*Library:* 100 volumes.

*Cooperative research:* Two grants for research are made.

**1112. Hyland Laboratories, 4534 Sunset Blvd., Los Angeles 27, Calif.**

*President:* C. M. Hyland.

*Laboratory:* 1956 Hillhurst Ave., Los Angeles 27, Calif.

*Research staff:* Maurice J. Schlatter, Director. 2 chemists, 1 biologist; technical personnel 4; additional personnel 2.

*Research activities:* Product development research: plasma, convalescent serums, and related products; typing serums and other biologicals; hospital solutions and related products. (Research initiated 1944.)

**1113. Hynson, Westcott and Dunning, Inc., 1030 North Charles St., Baltimore 1, Md.**

*President:* H. A. B. Dunning.

*Research staff:* J. H. F. Dunning, Director;

H. A. B. Dunning, Jr., Director of chemical research; John H. Brewer, Director of biological research. 5 chemists, 6 biologists and bacteriologists; technical personnel 4; additional personnel 4.

*Research activities:* The discovery and preparation of new drugs, involving research work in chemistry, bacteriology, and pharmacology. (Research initiated 1889.)

*Cooperative research:* Five fellowships are supported and fifteen grants for research are made.

**1114. Ideal Cement Company, 507 Denver National Bldg., Denver 2, Colo.**

*President:* C. Boettcher.

*Laboratories:* Ada, Okla.; Boettcher, Colo.; Portland, Colo.; Trident, Mont.; Devil's Slide, Utah; Superior, Nebr.; Hanover, Mont.; Okay, Ark.; Houston, Tex.

*Research staff:* G. C. Wilsnack, General Chemist. 10 chemists; additional personnel 5.

*Research activities:* Portland cement. (Research initiated 1900.)

**1115. Ideal Electric and Manufacturing Company, Mansfield, Ohio.**

*President:* S. Glen Vinson.

*Research staff:* C. W. Noel, Director. 3 to 5 engineers.

*Research activities:* Electrical machine design: new types and new applications. (Research initiated 1903.)

**1116. Ideal Novelty and Toy Company, 23-10 Forty-third Ave., Long Island City, N. Y.**

*President:* David Rosenstein.

*Laboratory:* 184-02 Jamaica Ave., Jamaica, Long Island, N. Y.

*Research staff:* Charles W. Kleiderer, Director. 4 chemists, 1 metallurgist, 1 engineer; technical personnel 1.

*Research activities:* Plastics, rubber, and latex.

*Library:* A library is maintained.

**1117. Ideal Roller and Manufacturing Company, 2512 West 24th St., Chicago 8, Ill.**

*President:* W. A. Lippincott.

*Research staff:* B. W. Hubbard, Director. 4 chemists, 6 engineers; technical personnel 4; additional personnel 1.

*Research activities:* The development of printing rolls and other accessories for the graphic arts industry such as printing plates, roller coating, and sectioning machines; also the development of rubber mechanical goods for aircraft, industrial equipment, and the dairy industry. (Research initiated 1931.)

1118. **Ideal Tooth, Inc.**, 90 Hamilton St., Cambridge 39, Mass.

*President:* Simon Myerson.

*Research staff:* Simon Myerson and Martin Myerson, Directors. 1 chemist, 3 engineers, 2 dentists; technical personnel 1; additional personnel 4.

*Research activities:* Ceramics; mechanical engineering; plastics. (Research initiated 1922.)

*Library:* A library is maintained.

**Igleheart Brothers, Inc.** See General Foods Corporation.

1119. **Ilg Electric Ventilating Company**, 2850 North Crawford Ave., Chicago 41, Ill.

*President:* John M. Frank.

*Research staff:* Frank P. Bleier, Director; Walter H. Rietz, Vice President in charge of manufacturing; Arthur G. Sutcliffe, Chief Engineer; Raymond V. Pfautsch, Assistant Chief Engineer; Richard I. Hanford, Electrical Engineer. 1 physicist, 8 engineers; technical personnel 2; additional personnel 1.

*Research activities:* The development of electric motors, propeller fans, tubeaxial fans, vaneaxial fans, centrifugal fans, pressure blowers, heating units, cooling units, mostly in the following fields: applied aerodynamics investigations of the airflow through various types of fan units; fundamental research on blade shapes of airfoil design for high efficiency operation; sound level control, including study of sound patterns and reduction of total noise generated; electric motors and electric unit heaters; heat transmission, as applied to the design of heating and cooling apparatus. (Research initiated 1906.)

*Library:* 250 volumes.

*Cooperative research:* Two fellowships are supported.

1120. **Illinois Cereal Mills, Inc.**, Paris, Ill.

*President:* Spencer H. Werner.

*Research staff:* William F. Henry, Director.

1 chemist; additional personnel 1.

*Research activities:* New product development in cereal chemistry, food technology, and oil and fat chemistry; improvements in the dry milling processes. (Research initiated 1943.)

*Library:* 100 volumes.

1121. **Illinois Clay Products Company**, 214 Barber Bldg., Joliet, Ill.

*President:* Otis L. Jones.

*Research staff:* 1 engineer, 1 ceramist.

*Research activities:* The properties of fine clay and fine brick; high temperature insulation. (Research initiated 1918.)

*Cooperative research:* One fellowship is supported.

**Illinois Northern Utilities Company.** See Utilities Research Commission.

1122. **Illinois Powder Manufacturing Company**, 730 Pierce Bldg., St. Louis 2, Mo.

*President:* Arthur H. Harter.

*Laboratories:* Grafton, Ill.; Spanish Fork, Utah.

*Research staff:* A. W. Baker, Director. 2 chemists, 3 engineers; additional personnel 2.

*Research activities:* The improvement of dynamite. (Research initiated 1907.)

*Library:* 200 volumes.

1123. **Illinois Testing Laboratories, Inc.**, 420 North La Salle St., Chicago 10, Ill.

*President:* J. A. Obermaier.

*Research staff:* J. A. Obermaier, Director; A. A. Obermaier, Assistant Director. 2 physicists, 8 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Electrical equipment and instruments; power plant tests; magnetism; pyrometry; temperature measuring instruments; air velocity measurements; humidity measurements. (Research initiated 1918.)

*Library:* A library is maintained.

1124. **Illinois Tool Works**, 2501 North Keeler Ave., Chicago, Ill.

*President:* Harold Byron Smith.

*Research staff:* 2 chemists, 1 metallurgist, 2 physicists, 5 engineers, 1 engineer in charge of patents, 7 draftsmen, 5 technicians; additional personnel 4.

*Research activities:* The development of methods and means for testing and recording surface changes, particularly in connection with gears; the development of metal cutting tools such as milling cutters, gear and thread-cutting hobs, testing equipment, etc. *Electronic Division:* The development and manufacture of high induction heating equipment. (Research initiated 1928.)

#### SHAKEPROOF LOCK WASHER COMPANY

(Division of Illinois Tool Works)

*Research activities:* The development of new products and methods of manufacture in the field including lock washers, lock nuts, locking screws, tapping screws, and stampings for electrical applications; the discovery of new applications for the products.

1125. **Illinois Zinc Company**, 2959 West 47th St., Chicago 32, Ill.

*President:* James A. Hill.

*Laboratories:* Chicago and Peru, Ill.

*Research staff:* H. M. Byrkit, Metallurgical Engineer. 2 chemists, 1 metallurgist, 2 engineers.

*Research activities:* Rolled zinc alloys. (Research initiated 1923.)

**1126. Imperial Paper and Color Corporation,**  
Glens Falls, N. Y.

*President:* K. R. McBride.

*Research staff:* A. E. Van Wirt, Director. Laboratory Heads: H. S. Davidson, Inorganic; J. F. Birmingham, Organic Pigments; A. R. Gray, Organic Intermediates; M. E. Averill, Analytical; E. O. Benson, Wall Paper. 20 chemists, 3 engineers.

*Research activities:* Pigment colors; chrome chemicals; organic intermediates (pigment types); vanadium, tungsten, and related group; optical and electron microscopy; paper; wall paper. (Research initiated 1917.)

*Library:* 700 volumes.

*Cooperative research:* Two grants for research are made.

**In-Tag Division, Interchemical Corporation.** See Interchemical Corporation.

**1127. Independent Biscuit Manufacturers' Company, Technical Institute,** 7002 North Clark St., Chicago 7, Ill.

*Secretary:* H. D. Butler.

*Research staff:* Thomas E. Hollingshead, Director. 3 chemists.

*Research activities:* The selection of flour, fats, sugar products, and other raw materials for use in biscuits and crackers; manufacturing technology and problems. (Research initiated 1922.)

**1128. Indiana Steel Products Company,** 6 North Michigan Ave., Chicago 2, Ill.

*President:* A. D. Plamondon, Jr.

*Laboratory:* 700 Valparaiso St., Valparaiso, Ind.

*Research staff:* Wayne E. McKibben, Research Engineer. 1 chemist, 2 metallurgists, 1 engineer; technical personnel 2; additional personnel 9.

*Research activities:* Permanent magnetism and the metallurgy of permanent magnet materials and alloys; heat and corrosion resistant alloys. (Research initiated 1941.)

*Cooperative research:* Three fellowships are supported.

**1129. Indianapolis Water Company,** 113 Monument Circle, Indianapolis 6, Ind.

*President:* H. S. Schutt.

*Laboratory:* 951 West 20th St., Indianapolis, Ind.

*Research staff:* C. K. Calvert, Superintendent of purification; E. R. Hupp, Chief Chemist. 3 chemists, 1 biologist, 1 engineer; technical personnel 2; additional personnel 3.

*Research activities:* The improvement of water quality with respect to sterilization, taste and odor control, coagulation, distribution, sanitation, and methods of testing. (Research initiated 1903.)

*Library:* 350 volumes.

**1130. Indium Corporation of America,** 1676 Lincoln Ave., Utica 4, N. Y.

*President:* William S. Murray.

*Research staff:* J. Robert Dyer, Jr., Director. 5 chemists, 3 metallurgists; technical personnel 3; additional personnel 6.

*Research activities:* The investigation of indium metal, salts, plating baths, alloys, etc.; codeposition of alloys; solders; brazing materials; bearing materials; low melting alloys for fire protection devices. (Research initiated 1934.)

*Library:* 500 volumes.

**1131. Industrial By-Products and Research Company,** 800-814 Market St., Philadelphia 5, Pa.

*Partners:* Sol Weinberg, Charles L. Simon, Louis S. Potsdamer, and Leon Weinberg.

*Research staff:* Louis S. Potsdamer, Laboratory Director. 6 chemists, 6 textile technicians, 3 laboratory assistants; additional personnel 3.

*Research activities:* Textile testing and research; the development of new fibers; consultants to hosiery and clothing manufacturers and rayon producers; standards testing for department stores; research in cosmetics and toiletries. (Research initiated 1922.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported.

**1132. Industrial Chemical Laboratories, Ltd.,** 1015 North 14th St., Omaha, Nebr.

*Partners:* L. M. Mattson and P. L. Gilmore.

*Research staff:* P. L. Gilmore, Director. 1 chemist.

*Research activities:* The development of products used in sanitation of schools, public buildings, factories, and office buildings.

**1133. Industrial Chemical Products Company,** 3777 Bellevue Ave., Detroit 7, Mich.

*President:* Clete L. Boyle.

*Research staff:* Martin D. Sclar, Director. 2 chemists; additional personnel 2.

*Research activities:* Cleaning and preparing metal surfaces for painting; specialties. (Research initiated 1924.)

*Library:* A library is maintained.

- 1134. Industrial Research Company, 50 East 41st St., New York 17, N. Y.**  
*President:* Walter J. Baēza.  
*Research staff:* Walter J. Baēza, Director. 1 chemist, 1 physicist, 1 metallurgist; additional personnel 2.  
*Research activities:* Powder metallurgy; the evaluation of patents and processes; production difficulties; sugar and paper problems; the introduction of control systems. (Research initiated 1929.)
- 1135. Industrial Research Laboratories, Wolf Lake, Route 4, Box 572, Muskegon, Mich.**  
*Proprietor:* F. Peter Dengler.  
*Laboratories:* Wolf Lake, Muskegon, Mich.; Chicago, Ill.  
*Research staff:* F. Peter Dengler, Director; Will D. Slagle, candy and sugar research. 2 chemists, 1 physicist, 1 biologist and bacteriologist, 1 metallurgist, 2 engineers; additional personnel 1.  
*Research activities:* Research in occupational and industrial diseases; milk and its products; public health problems; beverages; manufacturing problems related to candy, cement, coal, corn, cottonseed, drugs, dyes, foods, minerals, paints, paving, petroleum, paper, soap, sugar, tobacco, water, and barley; the conservation of waste material; the manufacture of nonalcoholic flavoring extracts including vanilla; alcoholic beverages; wax compositions. (Research initiated 1910.)  
*Library:* 500 volumes.  
*Cooperative research:* One scholarship is supported.
- 1136. Industrial Research Laboratories, Ltd., 215 Market St., San Francisco 5, Calif. (Subsidiary of Honolulu Oil Corporation.)**  
*President:* A. C. Mattei.  
*Laboratory:* 527 East 16th St., Los Angeles 15, Calif.  
*Research staff:* Howard Smith, Vice President in charge of research; Walter F. Hirsch, General Manager. 1 metallurgist; additional personnel 15.  
*Research activities:* Pump liners, plungers, etc. (Research initiated 1930.)
- 1137. Industrial Scientific Company, 34 West 33rd St., New York 1, N. Y.**  
*Research staff:* William S. Tandler, Director. 6 engineers; technical personnel 9; additional personnel 2.  
*Research activities:* Electronics as applied to the design of instruments and machinery. (Research initiated 1940.)  
*Library:* 150 volumes.
- 1138. Industrial Tape Corporation, U. S. Highway No. 1, New Brunswick, N. J. (Subsidiary of Johnson and Johnson.)**  
*President:* George F. Smith.  
*Research staff:* V. N. Morris, Director; W. E. Holland, Research Supervisor. 26 chemists, 5 chemical engineers; technical personnel 22; additional personnel 6.  
*Research activities:* Pressure-sensitive adhesive tapes; industrial adhesive cements; thermoplastic compositions; the development of new polymers. (Research initiated 1940.)  
*Library:* A library is maintained.  
*Cooperative research:* Two fellowships are offered.
- 1139. Industrial Testing Laboratories and National Brewers' Academy and Consulting Bureau, 315 Fourth Ave., New York 10, N. Y.**  
*Treasurer:* Miss M. Schlichting.  
*Research staff:* C. Weaver, Director; M. P. Stemler, Chief Chemist; 4 chemists, 1 biologist; technical personnel 1; additional personnel 3.  
*Research activities:* Brewing and food technology. (Research initiated 1887.)  
*Library:* 500 volumes.  
*Cooperative research:* One scholarship is supported.
- 1140. Industrial Testing Laboratory, 930 Wyandotte, Kansas City 6, Mo.**  
*Research staff:* R. M. Snyder, Director. 2 chemists, 1 chemical engineer; additional personnel 2.  
*Research activities:* Analytical and consulting research; research in fuel, food, and proprietary products. (Research initiated 1924.)  
*Library:* 250 volumes.
- 1141. Ingman Laboratories, C. W., 324 Fourth Ave., South, Minneapolis 15, Minn.**  
*President:* Charles W. Ingman.  
*Research staff:* 2 chemists; technical personnel 2; additional personnel 3.  
*Research activities:* Milling, feed, grain, and foods; cereal chemistry. (Research initiated 1928.)
- Inland Manufacturing Division, General Motors Corporation. See General Motors Corporation.**
- Inland Rubber Company. See Minnesota Mining and Manufacturing Company.**
- 1142. Inland Steel Company, East Chicago, Ind.**  
*President:* W. Sykes.  
*Research staff:* J. H. Nead, Manager, Metallurgical and Inspection Department; E. D. Martin and T. S. Washburn, Assistant Managers;

C. C. Mahlie, Chief Metallurgist; C. O. Geyer, Chief Chemist; R. L. Harbaugh, Assistant Chief Chemist; B. E. Baker, Chief Inspector; N. Eisenberg, Chief Chemist, Coke and By-Products Laboratory; F. R. Porter, Ceramic Engineer. *General Laboratories*: 35 chemists, 1 research chemist, 2 assistant chemists, 3 chemist helpers, 14 metallurgists, 4 research metallurgists, 3 assistant metallurgists, 7 pyrometer technicians, 5 mill representatives. *Control Laboratories*: 14 control chemists, 10 assistant control chemists, 32 open hearth and mill metallurgical inspectors, 49 testers, junior testers, and apprentice testers, 6 mill observers, 3 metallographists; 4 coke and by-products chemists and 7 assistant chemists; miscellaneous control personnel 143; additional personnel 93.

*Research activities*: Developmental research on steel; the development of new products; chemical and metallurgical control of plant operations; investigations of complaints on products. (Research initiated 1894.)

*Library*: 1,200 volumes.

*Cooperative research*: Two grants for research are made.

1143. **Innis Speiden and Company, Isco Chemical Division**, 47th St. and Royal Ave., Niagara Falls, N. Y.

*President*: W. H. Sheffield.

*Research staff*: Edward Thorndike Ladd, Director. 3 chemists, 3 engineers.

*Research activities*: The application of chloropicrin to industrial, agricultural, and other problems. (Research initiated 1916.)

*Scientific periodicals*: Larvacide Log. Irregular.

*Cooperative research*: One fellowship is supported.

1144. **Institute of Gas Technology**, 3300 Federal St., Chicago, Ill.

*President*: Henry T. Heald.

*Research staff*: Elmer S. Pettyjohn, Director; Leon J. Willien, Associate Director; George D. Creelman, Administrative Assistant. 18 chemists, 21 engineers, 2 librarians; technical personnel 8; additional personnel 16.

*Research activities*: Production, purification, and utilization of manufactured and natural gas; continuous production of city gas from oil and coal; appliance and heater development. (Research initiated 1941.)

*Library*: 5,000 volumes.

*Scientific periodicals*: Gas Abstracts. Vol. I, 1945.

*Cooperative research*: Fellowships are maintained.

1145. **Institute of Paint and Varnish Research; Gardner Laboratory, Inc., Henry A.**, 4723 Elm St., Bethesda 14, Md.

*President*: Henry A. Gardner.

*Research staff*: Henry A. Gardner, Director; Paul N. Gardner, Manager of laboratory. 2 chemists, 1 physicist; technical personnel 2.

*Research activities*: Paints, varnishes, lacquers, plastics, etc. (Research initiated 1924.)

*Library*: 200 volumes.

1146. **Institute of Paper Chemistry**, Appleton, Wis.

*Executive Director*: Westbrook Steele.

*Research staff*: Otto Kress, Technical Director; Harry F. Lewis, Dean. 63 in scientific professions; technical personnel 32; additional personnel 39.

*Research activities*: Fundamental and applied work in problems of the paper and pulp industry and related industries. (Research initiated 1929.)

*Library*: 12,000 volumes.

*Scientific periodicals*: Library Notes. Monthly. Vol. I, 1931. Research Bulletin. Quarterly.

**Institute of Product Research.** See Harvey Machine Company, Inc.

1147. **Insulation Products Company**, South St., Willimantic, Conn.

*Laboratory*: North St., Willimantic, Conn.

*Research staff*: R. E. Layman, Jr., Director. 3 chemists, 1 engineer.

*Research activities*: Electrical insulation. (Research initiated 1939.)

1148. **Interchemical Corporation**, 350 Fifth Ave., New York 1, N. Y.

*President*: E. W. Pittman.

*Laboratories*: 432 West 45th St., New York 19, N. Y.

The over-all research activities of the corporation are divided among a number of laboratories. The Research Laboratories of Interchemical Corporation are concerned solely with basic industrial research, and new and improved products are passed on to proper divisions or subsidiaries. Each division or subsidiary company sponsors its own chemical investigations in control, development, and the solution of customer problems.

*Research staff*: A. E. Gessler, Vice President in charge of research. 63 chemists, 11 physicists, 2 biologists, 1 metallurgist, 2 engineers, 3 electronics engineers, 2 colorimetrists; technical personnel 19.

*Research activities*: Problems connected with

chemical coatings and their components, such as: printing inks, intaglio inks, colored carton coatings, tin decorating, industrial finishes on metal or wood, textile printing and dyeing compositions, oil cloth, artificial leather, wall coverings, carbon papers, typewriter ribbons, artists' colors, pigments, intermediates, dyes, varnishes, resins, pharmaceuticals, etc. (Research initiated 1934.)

*Library:* 1,800 volumes.

*Scientific periodicals:* Interchemical Review. Vol. I, 1942.

AULT AND WIBORG CARBON AND RIBBON  
DIVISION

417 East 7th St., Cincinnati 1, Ohio

*President:* L. C. Ball.

*Research staff:* Robert R. Wissinger, Chemist. 3 chemists; additional personnel 1.

*Research activities:* The development of formulae for carbonizing ink used for making typewriter carbon paper, pencil carbon paper, and one-time carbon paper. The development of formulae for typewriter ribbons, adding machine ribbons, accounting machine ribbons, time clock ribbons, etc. (Research initiated 1931.)

BIOCHEMICAL DIVISION

1120 Commerce Ave., Union, N. J.

*President:* E. T. Fritzsching.

*Research staff:* 10 chemists, 3 biologists, 1 physician; technical personnel 15; additional personnel 10.

*Research activities:* Biochemical products. (Research initiated 1945.)

*Library:* 400 volumes.

*Cooperative research:* Several fellowships are supported and several grants for research are made.

FINISHES DIVISION

350 Fifth Ave., New York 1, N. Y.

*President:* Joseph R. Esposito.

*Laboratories:* Cincinnati, Ohio; Newark, N. J.

*Research staff:* A. E. Gessler, Director; Paul O. Blackmore, Director of product development. 22 chemists, 1 physicist; technical personnel 20; additional personnel 6.

*Research activities:* The development of paints, varnishes, lacquers, enamels, synthetics, adhesives, resins, cable and wire coatings; sanitary lining for cans, kits, drums, tanks, etc; metal lithographic coatings; finishes for metal, wood, plastics, fabrics, glass, etc. (Research initiated 1900.)

*Library:* 300 volumes.

IN-TAG DIVISION

350 Fifth Ave., New York 1, N. Y.

*President:* E. H. McLeod.

*Laboratories:* Lodi, N. J.; Chicago, Ill.

*Research staff:* W. W. Mock, Director; E. H. McLeod, Executive Officer in charge of research. 10 chemists; technical personnel 3.

*Research activities:* New raw materials for intaglio inks, new inks, new application of intaglio inks, and problems in rotogravure printing.

INTERCHEMICAL SPECIALTIES, INC.

L-5 Factory Lane, Bound Brook, N. J.

*President:* E. W. Pittman.

*Research staff:* A. Saunders, Vice President in charge of research. 4 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Copolymerization and high polymer work with resins. (Research initiated 1945.)

INTERNATIONAL PRINTING INK DIVISION

350 Fifth Ave., New York 1, N. Y.

*President:* R. W. Smith.

*Laboratories:* 432 West 45th St., New York 19, N. Y.; 2211 Elston Ave., Chicago, Ill. Research is done in some of the plant laboratories.

*Research staff:* Milton Zucker, Research Manager; F. A. Weymouth, Director of Chicago laboratory. 21 chemists, 4 engineers; technical personnel 14; additional personnel 5.

*Research activities:* Printing inks.

*Library:* 1,800 volumes.

R-B-H DISPERSIONS, INC.

L-5 Factory Lane, Bound Brook, N. J.

*President:* Walter S. Edgar.

*Research staff:* 6 chemists; technical personnel 15; additional personnel 5.

*Research activities:* Dispersions designed for the protective coating industry; printing and textile inks. (Research initiated 1929.)

*Library:* 150 volumes.

*Scientific periodicals:* Dispersions Booklet. Vol. I, 1938.

STANDARD COATED PRODUCTS DIVISION

350 Fifth Ave., New York 1, N. Y.

*President:* H. J. Hemingway.

*Laboratory:* Buchanan, N. Y.

*Research staff:* A. M. Heinzelmann, Director. 6 chemists; technical personnel 2.

*Research activities:* Research on coating materials and their application to cotton fabrics. (Research initiated 1914.)

*Library:* 100 volumes.

See also Aridye Corporation, Cotan Corpora-



tion, Murphy Finishes Corporation, and Scriver and Quinn, Inc.

**Interchemical Specialties, Inc.** See Interchemical Corporation.

**1149. Interlake Chemical Corporation, 1900 Union Commerce Bldg., Cleveland 14, Ohio.**

*President:* Leigh Willard.

*Laboratories:* Forest Park, Ill.; Waltham, Mass.

*Research staff:* R. G. Booty, Manager of research; E. E. Kimmel, Chief Research Engineer; R. W. Simpson, Chief Research Chemist. *Forest Park plant:* 9 chemists, 2 engineers. *Waltham plant:* 3 chemists, 1 engineer.

*Research activities:* Synthetic resins, phenol-formaldehyde, liquid resins, molding powders, and liquid adhesives. Coke oven by-products, recovery and processing.

*Library:* 500 volumes.

*Cooperative research:* Two grants for research are made.

**1150. International Business Machines Corporation, Endicott, N. Y.**

*President:* Thomas J. Watson.

*Laboratories:* Endicott and Poughkeepsie, N. Y.

*Research staff:* J. C. McPherson, Director of engineering. 2 chemists, 1 physicist, 30 engineers, 2 metallurgists; technical personnel 150; additional personnel 25.

*Research activities:* Experimental research on chemical, metallurgical, and electrical processes as applied to high-speed electric accounting machines, horological apparatus, weights and measures, etc.; invention and design work on business machinery. (Research initiated 1917.)

*Library:* 2,000 volumes.

**1151. International Chemical Company, Inc., 2628-40 North Mascher St., Philadelphia, Pa.**

*President:* Charles W. Lacey.

*Research staff:* Charles W. Lacey, Director. 1 chemist, 2 chemical engineers.

*Research activities:* The development of special compounds for removing greases and oils from metals in manufacturing processes; special compounds, for stripping of paint, japan, and lacquer in industrial processes; special compounds for industrial cleaning processes (cleaning metals, textiles, fuel oil tanks, creosote tanks, containers, railroad parts, etc.); the development of water-soluble pastes (soaps holding oils in emulsion) and soluble oils for cutting, drawing, stamping, and other machine tool operations; the development of special oils for diaphragms in gas meters, for rustproofing and cutting, etc.; industrial problems with mixtures of alkalis, alkali salts, neutral salts, soaps, oils,

or mixtures of any of these, together with other special chemicals. (Research initiated 1908.)

**1152. International Creosoting and Construction Company, 2205½ Avenue B, Galveston, Tex.**

*President:* J. D. Latimer.

*Laboratories:* Texarkana and Beaumont, Tex.

*Research staff:* P. B. Mayfield, Manager of research and development. 2 chemical engineers.

*Research activities:* Wood preservation. (Research initiated 1907.)

**1153. International Detrola Corporation, 1501 Beard Ave., Detroit 9, Mich.**

*President:* C. Russell Feldmann.

*Research staff:* H. E. Kranz, Director; R. M. Daugherty, Director of engineering. 1 chemist, 3 engineers; additional personnel 3.

*Research activities:* Absorption refrigeration; new type of prime mover; improvements in lead-acid storage batteries. (Research initiated 1942.)

*Library:* A library is maintained.

**1154. International Geophysics, Inc., 1063 Gayley Ave., West Los Angeles, Calif.**

*President:* J. J. Jakosky.

*Research staff:* J. J. Jakosky, Director; C. H. Wilson, Assistant. 1 chemist, 2 physicists, 68 engineers (including field engineers and physicists), 7 instrument makers; technical personnel 3.

*Research activities:* The development of geophysical methods for the petroleum and mining industries, and for locating water supplies; research in instrumentation for geophysical exploration and petroleum production. (Research initiated 1930.)

**1155. International Graphite and Electrode Corporation, St. Marys, Pa. (Subsidiary of Speer Carbon Company.)**

*President:* Andrew Kaul III.

*Laboratories:* Main Laboratory, St. Marys, Pa.; Works Laboratory, Niagara Falls, N. Y.

*Research staff:* Harald W. Abbott, Director of laboratories; John A. Shaw, Technical Supervisor, Niagara Falls. 2 chemists, 3 engineers; technical personnel 7; additional personnel 11.

*Research activities:* The analysis of raw materials; the inspecting and testing of raw and finished electrographite products; plant development of products and processes. (Research initiated 1898.)

**1156. International Harvester Company, 180 North Michigan Ave., Chicago 1, Ill.**

*President:* Fowler McCormick.

*Laboratories:* Tractor Works, 2626 West 31st

Blvd., Chicago 8, Ill.; McCormick Works, Blue Island Ave. and Leavitt St., Chicago 8, Ill.; West Pullman Works, 1015 West 120th St., Chicago 43, Ill.; Wisconsin Steel Works, 2701 East 106th St., Chicago 17, Ill.; Canton Works, Canton, Ill.; East Moline Works, East Moline, Ill.; Farmall Works, 505 Forty-first St., Rock Island, Ill.; Milwaukee Works, 1714 West Bruce St., Milwaukee 1, Wis.; Richmond Works, 520 North 15th St., Richmond, Ind.; Springfield Works, Lagonda Ave., Springfield, Ohio; Fort Wayne Works, Pontiac St. and Bueter Road, Fort Wayne 8, Ind.; Auburn Works, 5 Pulaski St., Auburn, N. Y.; Indianapolis Works, 5565 Brookville Road, Indianapolis 1, Ind.; Rock Falls Works, 201 First St., Rock Falls, Ill.; St. Paul Works, 2572 University Ave., St. Paul 4, Minn.; New Brighton Works, P. O. Box 68, Minneapolis 1, Minn.; Huntington Park Works, Huntington Park, Calif.; Hamilton Works, International Harvester Company of Canada, Ltd., Hamilton, Ont.

*Research staff:* A. W. Scarratt, Vice President in charge of research, engineering, and patents. Division Engineering Managers: D. B. Baker, Industrial Power; W. F. Borgerd, Refrigeration; A. E. W. Johnson, Farm Implement; W. D. Reese, Motor Truck; L. B. Sperry, Farm Tractor. B. F. Courtright, Director at the Wisconsin Steel Mills; K. O. Schreiber, Vice President of manufacturing; J. E. Robinson, Supervisor of metallurgy; M. C. Evans, Supervisor of manufacturing research; H. B. Knowlton, Supervisor of materials and standards. 116 chemists, 54 physicists, 73 metallurgists, 125 engineers, 305 layout men and draftsmen, 922 shop mechanics, 81 road engineers, field mechanics, and testers; additional personnel 340.

*Research activities:* Chemical, physical, electrical, optical, and metallurgical research as related to the industries served and the products manufactured (agricultural implements, power units, industrial and farm tractors, automobile trucks, Diesel and gasoline engines, etc.).

**1157. International Lubricant Corporation, P. O. Box 390, New Orleans, La.**

*President:* W. H. Saunders.

*Research staff:* H. M. Fraser, Director. 6 chemists, 1 engineer; 3 in other scientific professions.

*Research activities:* The development of improved lubricating greases and oils. (Research initiated 1939.)

**1158. International Milling Company, McKnight Bldg., Minneapolis, Minn.**

*President:* Charles Ritz.

*Laboratories:* Main Laboratory, Minneapolis, Minn. Control laboratories: Buffalo, N. Y.;

Baldwinsville, N. Y.; Detroit, Mich.; New Prague, Minn.; Wabasha, Minn.; Davenport, Iowa; Sioux City, Iowa; Greenville, Tex.; Ponca City, Okla.; Humberstone, Ont.; Moose Jaw, Sask.; Saskatoon, Sask.; Calgary, Alta.

*Research staff:* E. L. Dosch, Director; H. R. Wick, Chief Control Chemist; E. N. Frank, Chief Research Chemist. 12 chemists; technical personnel 18; additional personnel 6.

*Research activities:* Milling and baking technology; chemistry of cereals; the development of new products; the utilization of by-products and derivatives. (Research initiated 1929.)

**1159. International Minerals and Chemical Corporation, 20 North Wacker Drive, Chicago 6, Ill.**

*President:* Louis Ware.

*Laboratories:* East Point, Ga.; Rossford, Ohio; Woodland, Calif.; Carlsbad, N. Mex.; Mulberry, Fla.

*Research staff:* Paul D. V. Manning, Vice President in charge of research. Branch Laboratory Directors: H. R. Bates, East Point, Ga.; M. J. Blish, Rossford, Ohio; Lucile Hac, Woodland, Calif.; E. E. Wrege, Carlsbad, N. Mex.; I. M. LeBaron, Mulberry, Fla. 20 chemists, 3 metallurgists, 14 engineers, 1 geologist; technical personnel 2; additional personnel 4.

*Research activities:* Protein and amino acids; beneficiation of nonmetallic ores by flotation; phase rule; hydrous gels; agronomy; animal feed. (Research initiated 1935.)

*Library:* 500 volumes.

*Cooperative research:* Twenty-four fellowships are maintained.

**1160. International Nickel Company, Inc., 67 Wall St., New York 5, N. Y.**

*President:* R. C. Stanley.

*Laboratories:* Research Laboratory, Bayonne, N. J.; Mill Research and Control Laboratory, Huntington, W. Va.

*Research staff:* P. D. Merica, Vice President in charge of research; T. H. Wickenden, Manager of development and research. *Bayonne laboratory:* N. B. Pilling, Director. 13 chemists, 1 physicist, 24 metallurgists, 2 engineers; technical personnel 10; additional personnel 30. *Huntington laboratory:* E. M. Kline, Director. 7 chemists, 2 physicists, 20 metallurgists, 5 engineers; technical personnel 22; additional personnel 13.

*Research activities:* The metallurgy and properties of nickel and its alloys, nickel steels, Monel, Inconel, high temperature and corrosion resisting alloys, nickel cast irons, welding, plating, etc. Metallurgy and properties of the platinum metals, particularly palladium, including alloys for technical applications; also jewelry,

electroplating, spark plugs, and electrical contacts. (Research initiated 1922.)

*Library:* 2,200 volumes.

*Cooperative research:* A variable number of fellowships are supported.

**1161. International Paper Company, 220 East 42nd St., New York 17, N. Y.**

*President:* J. H. Hinman.

*Laboratory:* Glens Falls, N. Y.

*Research staff:* K. A. Taylor, Director. 5 chemists, 7 engineers; technical personnel 8; additional personnel 7.

*Research activities:* The development of new and improved processes and products in the field of pulp and paper; new uses for pulp and paper products; new and improved methods of control in pulp and paper making operations; recovery and utilization of by-products, including development of new uses for by-products. (Research initiated 1898.)

*Library:* 1,500 volumes.

*Cooperative research:* One grant for research is made.

**1162. International Plastic Corporation, 10 Park Place, Morristown, N. J.**

*President:* G. Schieman.

*Laboratory:* Ridgedale Ave., Morristown, N. J.

*Research staff:* C. S. Powell, Director. 5 chemists, 4 engineers; technical personnel 6; additional personnel 4.

*Research activities:* Pressure-sensitive adhesives. (Research initiated 1940.)

*Library:* 100 volumes.

**International Printing Ink Division, Interchemical Corporation. See Interchemical Corporation.**

**1163. International Rare Metals Refinery, Inc., 630 Fifth Ave., New York 20, N. Y.**

*President:* Boris Pregel.

*Laboratory:* 446 West 43rd St., care West Side Hospital, New York, N. Y.

*Research staff:* Marietta Blau, Director; Leandro W. Tomarkin; S. Baudisch; W. R. Horn; N. Thon; Richard Jahiel. 4 chemists, 6 physicists, 3 biologists, 2 physicians, 1 metallurgist, 2 engineers, 1 geologist; technical personnel 4; additional personnel 6.

*Research activities:* The field of radioactivity. (Research initiated 1942.)

*Library:* 250 volumes.

**1164. International Resistance Company, 401 North Broad St., Philadelphia 8, Pa.**

*President:* Ernest Searing.

*Research staff:* Carl C. Chambers, Director; Jesse Marsten, Vice President in charge of en-

gineering. 2 chemists, 1 physicist, 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Electrical resistors. (Research initiated 1925.)

*Library:* 200 volumes.

**1165. International Salt Company, Inc., Adams and Thomas Sts., Scranton, Pa.**

*President:* Edward L. Fuller.

*Laboratories:* Watkins Glen and Ludlowville, N. Y. P. O. address: Box 506, Ithaca, N. Y.

*Research staff:* G. A. Walter, General Manager; C. M. Hopper, Production Manager; C. D. Looker, Director. 3 chemists, 2 engineers; technical personnel 1; additional personnel 2.

*Research activities:* Investigations on the manufacture, purification, uses and sale of common salt and its allied products. (Research initiated 1931.)

**1166. International Shoe Company, 1509 Washington Ave., St. Louis 3, Mo.**

*President:* B. A. Gray.

*Laboratories:* 1820 Cherokee St., St. Louis 18, Mo.; Rubber Laboratory, Hannibal, Mo.

*Research staff:* William Enscoe, Director; G. B. Britton, in charge of rubber research. 8 chemists, 2 engineers; technical personnel 5; additional personnel 9.

*Research activities:* The development of processes for making shoes, leather, rubber heels and soles, and other shoe parts; the study of properties of leather, shoes, and the materials and parts used. (Research initiated 1928.)

**1167. International Silver Company, Meriden, Conn.**

*President:* Evarts C. Stevens.

*Research staff:* B. Egeberg, Director. 2 chemists, 1 metallurgist; technical personnel 5; additional personnel 4.

*Research activities:* Electroplating and non-ferrous metals. (Research initiated 1910.)

*Library:* 500 volumes.

**1168. International Smelting and Refining Company, 420 One Hundred and Fifty-first St., East Chicago, Ind. (Subsidiary of Anaconda Copper Mining Company.)**

*President:* J. R. Hobbins. *Vice President in charge of research:* Frederick Laist.

*Laboratories:* East Chicago, Ind.; Tooele, Utah; Raritan Cooper Works, Perth Amboy, N. J.

East Chicago, Ind.

*Research staff:* W. W. Shropshire, Research Engineer. 7 chemists, 1 paint chemist, 1 rubber chemist, 4 metallurgists, 1 ceramist.

*Research activities:* Process and product development and improvement work on the re-

fining of lead bullion and the manufacture of white lead and zinc oxide; the development of new uses and new grades of white lead and zinc oxide for use in paints, rubber, ceramics, etc. (Research initiated 1920.)

Tooele, Utah  
(2 laboratories)

*Research staff:* E. C. Peterson, Concentration Engineer. 1 chemist, 2 metallurgists. V. E. Christensen, Chief Testing Engineer. 1 chemist, 2 metallurgists.

*Research activities:* The development of new hydrometallurgical methods and application of known methods to a wide variety of lead, zinc, and copper ores. Development of chemical and pyrometallurgical processes and improvements for the treatment of lead, zinc, and copper ores and plant secondaries. (Research initiated 1911.)

RARITAN COPPER WORKS

Perth Amboy, N. J.  
(2 laboratories)

*Research staff:* A. L. Christensen, Metallurgist. 3 technical assistants. S. S. Skowronski, Research Engineer. 1 chemist, 1 physicist, 3 technical assistants.

*Research activities:* Process and product development and improvement work on the refining, casting, and production of refined copper shapes. Physical and chemical testing of refined copper and other end products such as gold, silver, selenium, and tellurium. Laboratory and plant control of electrolytic copper refining and furnace operations as well as precious metals refining.

International Vitamin Division, American Home Products Corporation. See American Home Products Corporation.

1169. Interstate Cotton Oil Refining Company, Sherman, Tex.

*President:* Arthur G. Hopkins.

*Research staff:* Robert R. King, Technical Director. 9 chemists, 1 biologist, 1 engineer; technical personnel 10; additional personnel 8.

*Research activities:* Edible oils and fats; milk products. (Research initiated 1930.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported and two grants for research are made.

1170. Interstate Folding Box Company, Middletown, Ohio.

*President:* S. Bergstein.

*Research staff:* F. Bergstein, Director. 1 chemist, 2 engineers; additional personnel 2.

*Research activities:* Paper coatings, adhesives, and containers. (Research initiated 1929.)

1171. Ironsides Company, 270 West Mound St., Columbus 16, Ohio.

*President:* Hugh M. Bone.

*Research staff:* Robert C. Williams, Director. 2 chemists, 2 engineers.

*Research activities:* Industrial lubricants; weatherproof insulation for electrical conductors; synthetic resins. (Research initiated 1931.)

*Library:* 300 volumes.

*Cooperative research:* One grant is made for research.

1172. Irvington Varnish and Insulator Company, 6 Argyle Terrace, Irvington 11, N. J.

*President:* Arthur E. Jones.

*Research staff:* William F. Hoffmann, Jr., Vice President in charge of research; O. Dale, Director; S. Caplan, Chemist, synthetic resins; H. G. Rotherham, Chemist, thermoplastic products. 11 chemists, 4 engineers; technical personnel 6; additional personnel 6.

*Research activities:* Varnished cotton cloth (electrical insulation); varnished paper; electrical insulating varnishes; varnished cotton sleeving; rubber separator cloth; diaphragm cloth; bottlecap liner papers; slot insulation; thermoplastic compositions for extrusion; synthetic resins for brake lining industry; cold setting cements; products derived from cashew nut shell liquid; furane resins. (Research initiated 1921.)

*Library:* 550 volumes.

*Cooperative research:* Two grants for research are made.

Isco Chemical Division, Innis Speiden and Company. See Innis Speiden and Company.

1173. Ising Corporation, C. E., 133-24-30 Forty-first Ave., Flushing, N. Y.

*President:* A. M. Ising.

*Research staff:* K. W. von Massow, Director. 4 men on call.

*Research activities:* New aromatic products; new masking odors for industries; new odors for food products. (Research initiated 1931.)

*Library:* A library is maintained.

1174. Jacobs Cereal Products Laboratories, Inc., 156 Chambers St., New York 7, N. Y.

*President:* Benjamin R. Jacobs.

*Research staff:* Benjamin R. Jacobs, Director; James J. Winston, Chief Chemist. 3 chemists; technical personnel 1.

*Research activities:* The standardization of cereal products and raw material entering into their composition; methods of control in the purchase of raw materials and containers for cereal products; commercial analyses of cereal and bakery products; the inspection of plants;

vitamins and minerals; enrichment problems. (Research initiated 1920.)

*Library:* A library is maintained.

**1175. James Company, Inc., U. S., 35 East Runyon St., Newark 5, N. J.**

*Research staff:* U. S. James, Jr., Secretary-Treasurer and Director of research. 1 ore separation metallurgist, 1 engineer; additional personnel 5.

*Research activities:* Ore concentration and metal reclamation by means of wet gravity concentration; pulverizing of miscellaneous materials. (Research initiated 1933.)

**1176. James Manufacturing Company, Fort Atkinson, Wis.**

*President:* W. D. James.

*Research staff:* A. E. Waterman, Director. 3 engineers.

*Research activities:* The development of incubation, hatching, poultry, and barn equipment. (Research initiated 1906.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is supported.

**1177. Jamieson and Company, C. E., 1962 Trombly Ave., Detroit 11, Mich.**

*President:* C. E. Jamieson.

*Laboratories:* Detroit, Mich.; 414 Sandwich St., Windsor, Ont.

*Research staff:* Carl Cunov, Chief Chemist; Jason L. Russell, Assistant General Manager. 12 chemists, 1 engineer; technical personnel 3; additional personnel 3.

*Research activities:* The development of pharmaceutical products, cosmetics, insecticides, and fungicides. (Research initiated 1925.)

*Library:* 500 volumes.

**1178. Janes and Geiger, Inc., 817 West Market St., Louisville 2, Ky.**

*President:* William E. Janes.

*Research staff:* Wm. E. Janes, Director; C. E. Geiger, Chief Chemist. 3 chemists, 2 registered engineers.

*Research activities:* Alcoholic fermentation. (Research initiated 1917.)

*Library:* 200 volumes.

**1179. Jansky and Bailey, 970 National Press Bldg., Washington 4, D. C.**

*Partners:* C. M. Jansky, Jr. and Stuart L. Bailey.

*Laboratory:* 1226 Wisconsin Ave., N. W., Washington 7, D. C.

*Research staff:* Stuart L. Bailey, Director. 6 radio engineers; technical personnel 5; additional personnel 6.

*Research activities:* Field intensity measuring equipment; special equipment for the evaluation of radio station effectiveness; radio receiver design; systems studies. (Research initiated 1930.)

*Cooperative research:* One fellowship is supported.

**1180. Jantzen Knitting Mills, Jantzen Center, Portland 14, Oreg.**

*President:* J. A. Zehntbauer.

*Research staff:* Mayer G. Monroe, Director. 3 knitting machine technicians, 5 designers, 2 sewing machine operators.

*Research activities:* The development of new styles, fabrics, constructions, etc., of knitted goods products. (Research initiated 1932.)

**1181. Jarrett and Company, Brooke L., 2212 Oliver Bldg., Pittsburgh 22, Pa.**

*President:* Brooke L. Jarrett.

*Research staff:* J. C. Lang, Vice President and Director. 2 engineers; technical personnel 1; additional personnel 2.

*Research activities:* Metal fasteners; automatic and manual applicators for fasteners. (Research initiated 1937.)

*Library:* 540 volumes.

**1182. Jarvis Laboratory, Kenneth W., 1140 Cherry St., Winnetka, Ill.**

*Research staff:* Kenneth W. Jarvis, Director. 4 engineers; additional personnel 2.

*Research activities:* The use of electromagnetic radiation phenomena in physical applications; high and ultra high frequency applications; the study and use of electronics techniques in industrial applications; special machine developments involving electrical, electromagnetic, and some fields of electrochemical facilities. (Research initiated 1938.)

*Library:* 400 volumes.

**1183. Jayne and Son, Inc., D., Delaware Ave. and Vine St., Philadelphia 6, Pa.**

*President:* Joseph D. McIntyre.

*Research staff:* F. O. Laquer, Director. 2 chemists, 1 biologist, 1 engineer, 1 physician; technical personnel 3; additional personnel 4.

*Research activities:* The study of the isolation and production of various glycosides of *Digitalis purpurea*. The chemical and biological study of old and new anthelmintic drugs. (Research initiated 1924.)

*Library:* Several thousand volumes.

*Cooperative research:* Three fellowships are supported and one grant for research is made.

**1184. Jeffrey Manufacturing Company, East 1st Ave., Columbus, Ohio.**

*President:* R. W. Gillispie.

*Research staff:* Neil E. Salsich, Vice President in charge of research.

*Research activities:* Investigations of problems related to the design and manufacture of mining and material handling equipment; applied research leading to new developments; testing and development of new designs. (Research initiated 1929.)

**1185. Jelenko and Company, Inc., J. F., 136 West 52nd St., New York 19, N. Y.**

*President:* J. F. Jelenko, Sr.

*Research staff:* R. C. Brumfield, Director. 2 chemists, 1 metallurgist, 2 engineers; technical personnel 1; additional personnel 30.

*Research activities:* The development of rare metal alloys for dental uses; the determination of the physical properties of these alloys and the application of methods for their use in dentistry; general metallurgical research in rare metal alloys; precision casting. (Research initiated 1928.)

**1186. Jelliff Manufacturing Corporation, C. O., Southport, Conn.**

*President:* W. F. Wheeler.

*Research staff:* H. H. Rennell, General Manager and Director of research; Percy Ross, Chemical Engineer; J. F. Kavanaugh, Metallurgist; Robert Hackney, Chemist.

*Research activities:* Electrochemical and metallurgical research. (Research initiated 1935.)

**Jell-O Division, General Foods Corporation.**  
*See General Foods Corporation.*

**1187. Jenkins Brothers, 510 Main St., Bridgeport, Conn.**

*President:* Farnham Yardley.

*Research staff:* Herbert Barnsley, Vice President in charge of research; Bernard J. Lee, Director. 1 chemist, 1 metallurgist; technical personnel 2; additional personnel 6.

*Research activities:* Bronze, iron, and steel valves; mechanical rubber goods. (Research initiated 1920.)

*Library:* A library is maintained.

**1188. Jenkins Company, George O., 1045 Plymouth St., Bridgewater, Mass.**

*President:* Robert A. Jenkins.

*Research staff:* Herman W. Richter, Director. 2 chemists; technical personnel 1.

*Research activities:* The development and application of new fiberboard products; the standardization of manufacturing techniques and

products; the reduction of process losses; improvement in quality and assistance in solving production difficulties. (Research initiated 1929.)

**1189. Jensen Radio Manufacturing Company, 6601 South Laramie Ave., Chicago, Ill.**

*President:* T. A. White.

*Research staff:* Hugh S. Knowles, Vice President and Chief Engineer. 2 physicists, 6 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Electroacoustics, principally loudspeakers and accessories. (Research initiated 1930.)

*Library:* 1,500 volumes.

*Scientific periodicals:* Jensen Technical Monographs. Volume 1, 1944.

*Cooperative research:* Two grants for research are made.

**1190. Jensen Salsbury Laboratories, Inc., Kansas City, Mo.**

*President:* G. G. Graham.

*Laboratories:* Kansas City, Mo.; Kansas City, Kans.

*Research staff:* G. G. Graham, Director; J. A. Austin; E. M. Sanders; S. J. Schilling. 4 chemists, 6 bacteriologists, 4 veterinarians; technical personnel 4; additional personnel 168.

*Research activities:* Animal disease control problems. (Research initiated 1915.)

*Library:* 100 volumes.

*Cooperative research:* Two grants for research are made.

**1191. Jergens Company, Andrew, Spring Grove and Alfred St., Cincinnati 22, Ohio.**

*President:* Andrew Jergens.

*Research staff:* Philip D. Adams, Director. 4 chemists; technical personnel 1; additional personnel 2.

*Research activities:* The effects of cosmetics and their ingredients on the skin; physiology and biochemistry of the skin; vitamins; studies of soaps, lotions, cosmetic creams, etc. (Research initiated 1935.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported.

**1192. Jewel Tea Company, Inc., Barrington, Ill.**

*President:* F. J. Lunding.

*Research staff:* Joseph Radov, Director. 3 chemists, 2 home economists; technical personnel 2.

*Research activities:* Food; cosmetics; sanitary products and detergents. (Research initiated 1919.)

*Library:* 250 volumes.

- 1193. Jewelers Technical Advice Company, 123 William St., New York 7, N. Y.**  
*President:* C. M. Hoke.  
*Laboratory:* 1070 Anderson Ave., Palisade, N. J.  
*Research staff:* C. M. Hoke, Director. 1 chemist and metallurgist, 1 engineer.  
*Research activities:* The recovery of precious metal wastes. (Research initiated 1913.)  
*Library:* 200 volumes.
- 1194. Johns-Manville Corporation, 22 East 40th St., New York, N. Y.**  
*President:* Lewis H. Brown.  
*Laboratory:* Manville, N. J.  
*Research staff:* C. F. Rassweiler; Vice President in charge of research and development; E. R. Williams, Director of research laboratories. The following are in charge of projects as indicated: D. T. Colton, transite pipe and shingles; H. T. Coss, thermal insulations; H. B. Cummins, celite products and inorganic research; G. B. Brown, paper and board products; H. T. Halstead, friction materials and packings; G. W. Clarvoe, asphalt products; A. Jenssen, mechanical service. 29 chemists, 8 physicists, 1 metallurgist, 53 engineers; technical personnel 84; additional personnel 88.  
*Research activities:* Asbestos products; textiles; insulation; building materials; papers; acoustical products; friction materials; packings; asbestos-cement products; transite pipe; celite products (fillers, filter aids, etc.); asphalt products; mineral fibers. (Research initiated 1928.)  
*Library:* 1,500 volumes.  
*Cooperative research:* One fellowship is supported and four grants for research are made.
- 1195. Johnson and Company, Charles Eneu, 10th and Lombard Sts., Philadelphia 47, Pa.**  
*President:* L. C. Herkness.  
*Research staff:* R. W. Wilhelm, Director. 4 chemists; additional personnel 6.  
*Research activities:* Printing inks, colors, and varnishes. (Research initiated 1901.)
- 1196. Johnson and Johnson, New Brunswick, N. J.**  
*President:* George F. Smith.  
*Research staff:* David F. Smith, Director. 33 chemists, 1 physicist, 6 engineers, 1 physician, 2 bacteriologists, 20 technicians; additional personnel 8.  
*Research activities:* Medical, surgical, and hospital supplies; incidental drugs and druggists' commodities. (Research initiated 1890.)  
*Library:* A library is maintained.
- JOHNSON AND JOHNSON SURGICAL DRESSINGS**  
4949 West 65th St., Chicago 38, Ill.  
*Research staff:* E. H. Robinson, Technical Director. 8 chemists, 1 biologist, 16 technicians; additional personnel 2.  
*Research activities:* Cotton and gauze processing.  
*Library:* 150 volumes.
- FILTER PRODUCTS RESEARCH AND TECHNICAL SERVICE LABORATORY**  
4949 West 65th St., Chicago 38, Ill.  
*Research staff:* B. E. Anderson, in charge of laboratory. 1 chemist; technical personnel 3; additional personnel 1.  
*Research activities:* Filtration through cotton media; bonding of carded cotton fleeces; substances filtered include milk, viscose, cellulose acetate, and air.  
*See also* Chicopee Manufacturing Corporation; Ethicon Suture Corporation; Industrial Tape Corporation; Ortho Pharmaceutical Corporation; and Personal Products Corporation.
- 1197. Johnson and Son, Inc., S. C., Racine, Wis.**  
*President:* H. F. Johnson, Jr.  
*Laboratories:* Racine, Wis.; West Drayton, Middlesex, England; Brantford, Ont.; Fortaleza, Ceara, Brazil.  
*Research staff:* J. Vernon Steinle, Research and Development Director. 20 chemists, 1 engineer; technical personnel 12; additional personnel 5.  
*Research activities:* The chemistry of natural waxes; uses of wax; preparation of polishes and finishing materials from wax; synthesis of waxes; the preparation of finishing materials, including varnishes, enamels, stains, lacquers, paints, etc. (Research initiated 1925.)  
*Library:* 600 volumes.  
*Cooperative research:* Six fellowships are supported and one grant for research is made.
- 1198. Johnson Fare Box Company, 4619 Ravenswood Ave., Chicago 40, Ill. (Subsidiary of Bowser, Inc.)**  
*President:* R. Hosken Damon.  
*Research staff:* Charles F. Rogier, Director. 4 engineers; additional personnel 2.  
*Research activities:* Coin handling equipment.
- 1199. Jones and Laughlin Steel Corporation, 3rd Ave. and Ross St., Pittsburgh, Pa.**  
*President:* H. E. Lewis.  
*Laboratory:* 40 Longworth St., Pittsburgh 7, Pa.  
*Research staff:* H. W. Graham, Director of metallurgy and research; H. K. Work, Manager of research and development. 9 chemists, 1 phys-

icist, 11 metallurgists, 5 engineers, 1 patent attorney; technical personnel 8; additional personnel 16.

*Research activities:* Investigation of the methods of manufacture of iron and steel and their influence on the physical properties of steel and steel products. (Research initiated 1930.)

*Library:* 2,500 volumes.

*Cooperative research:* Two grants for research are made.

**1200. Jones Dabney Company, 1481 South 11th St., Louisville, Ky.** (Subsidiary of Devco and Reynolds Company, Inc.)

*President:* William C. Dabney.

*Research staff:* L. K. Scott, Director of product development; H. R. Beckwith, Assistant Director of product development. 20 chemists; additional personnel 22.

*Research activities:* The study of the development and application of synthetic resins to industrial protective coatings.

**1201. Joss Laboratories, Goodwin, 718 Washington Ave., North, Minneapolis 1, Minn.**

*President and Owner:* Goodwin Joss.

*Research staff:* 2 chemists; additional personnel 1.

*Research activities:* Food, water, and toxicology. (Research initiated 1936.)

**1202. Joy Manufacturing Company, Franklin, Pa.**

*President:* J. D. A. Morrow.

*Research staff:* Charles F. Ball, Director of engineering; John D. Russell, Assistant Chief Engineer in charge of development. 5 engineers; additional personnel 4.

*Research activities:* The development of machinery and equipment suitable for the mechanical production of coal, limestone, gypsum, potash, etc. (Research initiated 1938.)

**1203. Julep Company, 353 West Grand Ave., Chicago 10, Ill.**

*General Manager:* J. S. Boswell.

*Research staff:* J. S. Boswell, Director; P. W. Stokesberry. 2 chemists, 1 biologist.

*Research activities:* Food products, including flavoring syrups, home drink preparations, carbonated beverages, and food specialties. (Research initiated 1936.)

*Library:* A library is maintained.

**1204. K and K Engineering Company, Bolton, N. Y.**

*President:* Berthold Antonio Knauth.

*Research staff:* Berthold A. Knauth, Direc-

tor; Pao Hsiung Chin, Associate Director. 3 engineers, 1 geologist; additional personnel 6.

*Research activities:* Electronics; high vacuum; motor control; mechanical adaptability. (Research initiated 1945.)

*Library:* A library is maintained.

**1205. K. C. Bacteriological Laboratories, 1318 Harrison St., Kansas City, Mo.**

*President:* R. A. Posch.

*Research staff:* R. A. Posch, Director. 1 chemist, 1 biologist and bacteriologist; additional personnel 1.

*Research activities:* Miscellaneous research problems undertaken for clients. (Research initiated 1922.)

**1206. Kahlenberg Laboratories, Sarasota, Fla.**

*Research staff:* Herman H. Kahlenberg, Director. 2 chemists, technical personnel 3; additional personnel 8.

*Research activities:* Preparation and testing of new drugs; anticorrosive and antifouling ship's bottom paints. (Research initiated 1925.)

*Library:* 700 volumes.

**1207. Kalamazoo Vegetable Parchment Company, Parchment, Kalamazoo 99, Mich.**

*President:* R. A. Hayward.

*Research staff:* G. F. DesAutels, Director. 5 chemists, 1 biologist, 2 engineers; additional personnel 4.

*Research activities:* The determination of the most suitable papers or combinations of papers for use in the packaging of foodstuffs and other products requiring protective packaging under different climatic conditions; the development of special papers for particular uses; the establishment and maintenance of high and uniform quality in papers manufactured. (Research initiated 1915.)

*Library:* 225 volumes.

**1208. Kalunite, Inc., 600 West 33rd South St., Salt Lake City 8, Utah.**

*President:* John M. Olin.

*Laboratories:* 81 Navajo St.; 600 West 33rd South St., Salt Lake City, Utah.

*Research staff:* Arthur Fleischer, Technical Director. 8 chemists, 2 engineers; additional personnel 8.

*Research activities:* The manufacture of alumina and potassium sulfate from alunite ores; the manufacture of aluminum from alumina. (Research initiated 1929.)

**1209. Kamlet Laboratory, 250 East 43rd St., New York 17, N. Y.**

*Laboratories:* New York and Brooklyn, N. Y.

*Research staff:* Jonas Kamlet, Director. 3 chemists, 2 bacteriologists.



*Research activities:* Industrial organic chemistry; pharmaceutical and medicinal chemistry; biochemistry; industrial microbiology; textile and dyestuff chemistry. (Research initiated 1935.)

*Library:* 500 volumes.

**1210. Kannenstine Laboratories, 1922 West Gray Ave., Houston 6, Tex.**

*Research staff:* F. M. Kannenstine, Director. 1 physicist, 4 engineers; technical personnel 40.

*Research activities:* Geophysical instrument development; manufacture of radar test equipment and precision optical plane and parallel surfaces. (Research initiated 1937.)

**1211. Kansas Research and Management Company, Emporia, Kans.**

*President:* Ted W. Lord.

*Research staff:* John R. Clopton, Chief Research Chemist. 2 chemists; technical personnel 2; additional personnel 1.

*Research activities:* Vegetable oil products; oil seed meal products; promotion of new agricultural crops. (Research initiated 1943.)

*Library:* 500 volumes.

**1212. Karpen and Brothers, S., 636 West Cermak Road, Chicago, Ill.**

*President:* Leo Karpen.

*Research staff:* Robert E. Williams, Transportation Seating Department; H. E. S. Craig, Furniture Department. 11 engineers, designers, and draftsmen.

*Research activities:* Mechanical research in the improvement of upholstered furniture, mattresses, and transportation seating; the testing of materials used in the construction of the products of the company.

**1213. Kaumagraph Company, Wilmington, Del.**

*President:* Trowbridge Marston.

*Research staff:* W. S. Lawrence, Director. 1 chemist, 1 assistant.

*Research activities:* The testing of raw materials and the devising of new methods and improved formulas for use in the manufacture of dry transfers and in the lithographic department. (Research initiated 1922.)

**1214. Kay and Ess Company, 820 Kiser St., Dayton 1, Ohio.**

*President:* H. G. Kittredge.

*Research staff:* H. G. Kittredge, Director. 3 chemists; technical personnel 3.

*Research activities:* Surface coatings and plastics. (Research initiated 1900.)

*Library:* 2,000 volumes.

**1215. Kay-Fries Chemicals, Inc.,  $\frac{1}{2}$  mile east of Highway 9W, West Haverstraw, N. Y.**

*President:* J. T. Ames.

*Research staff:* Leonard Nicholl, Director; Wm. P. Bitler, Technical Director. 5 chemists, 2 engineers; technical personnel 3; additional personnel 1.

*Research activities:* Denaturants, insecticides, fumigants, principles of vapor phase oxidation of oil in the presence of a catalyst, aromatic chemicals, solvent chemicals, plasticizers, plastics, formaldehyde manufacture and uses, pharmaceutical intermediates, and pharmaceuticals. (Research initiated 1930.)

*Library:* 250 volumes.

*Cooperative research:* One fellowship is supported.

**1216. Kearney and Trecker Corporation, 6784 West National Ave., West Allis, Wis.**

*President:* Theodore Trecker.

*Research staff:* J. B. Armitage, Vice President in charge of engineering; Orrin W. Barker, Assistant Chief Engineer; A. O. Schmidt, Director of metal cutting research; Theodore A. Wetzel, Director of electronic and electrical research; Michael Maletz, Technical Engineer; T. A. Stoner, Physicist. 1 chemist, 1 physicist, 1 metallurgist, 4 engineers; other technical personnel are drawn from the engineering department and shop as required.

*Research activities:* Metal cutting: comparisons of up and down milling; hydraulics as applied to milling machines; materials for feed screws and nuts; methods of surface hardening steel and cast iron; vibration and chatter in milling machinery; noise in milling machines, etc. (Research initiated 1920.)

**1217. Kearsbey and Mattison Company, Ambler, Pa.**

*President:* Ernest Muehleck.

*Research staff:* Clyde R. Hutchcroft, Technical Manager; Ralph L. Lanz, Assistant Technical Director. 5 chemists, 11 engineers; technical personnel 12; additional personnel 2.

*Research activities:* The investigation and development of magnesia, asbestos, and asbestos-cement products. (Research initiated 1900.)

*Library:* 500 volumes.

**1218. Keenan Soil Laboratory, Frostproof, Fla.**

*Research staff:* Edward T. Keenan, Director. 1 chemist; additional personnel 3.

*Research activities:* Soil chemistry and plant nutrition. (Research initiated 1929.)

**1219. Keever Starch Company, 538 East Town St., Columbus 15, Ohio.**

*President:* C. J. Kurtz, Sr.

*Research staff:* L. M. Thomas, Director. 3 chemists, 4 chemical technicians.

*Research activities:* Starch modifications; protein derivatives. (Research initiated 1927.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported.

**1220. Kelley-Koett Manufacturing Company, 212 West 4th St., Covington, Ky.**

*President:* A. H. Feibel.

*Research staff:* D. Sussin, Chief of research; Scott W. Smith, 1 physicist, 5 engineers; technical personnel 4; additional personnel 2.

*Research activities:* X-ray apparatus and applications in the medical and industrial fields. (Research initiated 1905.)

*Library:* 200 volumes.

**1221. Kellogg and Sons, Inc., Spencer, 98 Delaware Ave., Buffalo, N. Y.**

*President:* Howard Kellogg.

*Laboratories:* Buffalo, N. Y.; Edgewater, N. J.; Minneapolis, Minn.; Chicago, Ill.; Des Moines, Iowa; Decatur, Ill.; Long Beach, Calif.

*Research staff:* Alexander Schwarcman, Director; laboratory personnel 30.

*Research activities:* Improvement of the drying, refining, and bleaching processes of linseed oil; refining, deodorizing, and hydrogenating of soybean oil and coconut oil; refining castor oil, etc. (Research initiated 1904.)

**1222. Kellogg Company, Porter and Stiles Sts., Battle Creek, Mich.**

*President:* W. H. Vanderploeg.

*Research staff:* C. W. Lindow, Director of fundamental research; J. J. Thompson, Director of production research. 6 chemists, 1 physicist, 1 biologist and bacteriologist, 1 metallurgist, 1 chemical engineer, 6 laboratory technicians; technical personnel 4; additional personnel 6.

*Research activities:* Biological research in food; the improvement of cereal products, processes, and equipment. (Research initiated 1906.)

*Library:* 2,000 volumes.

*Cooperative research:* Three grants for research are made.

**1223. Kellogg Company, M. W., 225 Broadway, New York 7, N. Y.**

*President:* M. W. Kellogg.

*Laboratory:* Foot of Danforth Ave., Jersey City 5, N. J.

*Research staff:* Louis C. Rubin, Director of petroleum research; R. K. Hopkins, Director of metallurgical research and development. 22 chemists, 4 metallurgists, 95 engineers; additional personnel 168.

*Research activities:* The development of proc-

esses in petroleum refining; studies of physical and thermodynamic properties of hydrocarbons; investigations covering the properties of ferrous alloys; the development of mechanical and electrical devices for use in the manufacture of high pressure containers and forgings for the oil industry. (Research initiated 1920.)

*Library:* 2,000 volumes.

*Cooperative research:* One fellowship is supported and three grants for research are made.

**1224. Kellogg Switchboard and Supply Company, 6650 South Cicero Ave., Chicago 38, Ill.**

*President:* James G. Kellogg.

*Research staff:* Robert M. Kalb, Chief Engineer; George H. Brodie, Development Engineer. 2 chemists, 3 physicists, 2 metallurgists, 14 engineers; technical personnel 10; additional personnel 5.

*Research activities:* Telephone and radio communication; telephone systems; manufacturing processes; metals and alloys; finishes, plastics, and new products. (Research initiated 1900.)

*Library:* 160 volumes.

**Kelly Company, E. J. See Sun Chemical Corporation.**

**1225. Kelly-Springfield Tire Company, Cumberland, Md.**

*President:* E. S. Burke.

*Research staff:* R. T. Bete, Development Manager; E. T. Duke, Assistant Development Manager; C. F. Slemmer, Chief Chemist; A. N. Billings, Tire Design Engineer. 11 chemists, 6 engineers; technical personnel 19; additional personnel 8.

*Research activities:* The development of compounds of crude and synthetic rubber; study of the processing of rubber compounds; methods of physical and chemical testing of raw materials and finished products; study of the design and fabrication of tires and tubes; improvement of quality and performance of tires and tubes. (Research initiated 1909.)

*Library:* 100 volumes.

**1226. Kem Products Company, Inc., 227-229 High St., Newark 2, N. J.**

*President:* Edgar S. Genstein.

*Research staff:* Edgar S. Genstein, Director. 2 chemists; additional personnel 1.

*Research activities:* The development of new and improved commercial products; problems of technical sales service; emulsifying agents for industry; oils, gums, colloids, adhesives; preparations for softening and finishing; rayon sizing; chemical specialties. (Research initiated 1923.)

**Kemet Laboratories Company, Inc.** See Union Carbide and Carbon Corporation.

**1227. Kendall Company, 140 Federal St., Boston 10, Mass.**

*President:* Henry P. Kendall.

*Laboratories:* Kendall Mills, Finishing Division, Walpole, Mass.; Kendall Mills, Grey Goods Division, Paw Creek, N. C.; Kendall Mills, Grey Goods Division, Walpole, Mass.; Bauer and Black, 2500 South Dearborn St., Chicago 16, Ill.

*Research Staff:* Warner Eustis, Director of research; Horace A. Secrist, Director, Finishing Division, Walpole, Mass.; John P. Elting, Director of process research, Grey Goods Division, Paw Creek, N. C.; Ross C. Whitman, Director of product development, Grey Goods Division, Walpole, Mass.; Paul F. Ziegler, Director of research, Bauer and Black.

*Research activities:* Textile and associated surgical products.

**Kendall Mills, Division of Kendall Company.**  
See Kendall Company.

**1228. Kendall Refining Company, 77 North Kendall Ave., Bradford, Pa.**

*Chairman of the Board:* Otto Koch.

*President:* J. B. Fisher.

*Research staff:* F. I. L. Lawrence, Director. 5 chemists, 5 engineers; technical personnel 1; additional personnel 16.

*Research activities:* Lubricants research and development, including engine testing of lubricants; petroleum research, particularly petroleum specialties. (Research initiated 1931.)

*Library:* 230 volumes.

*Cooperative research:* Grants are made for research.

**1229. Kennametal, Inc., Latrobe, Pa.**

*President:* Philip M. McKenna.

*Research staff:* Philip M. McKenna, Director; John Redmond, Chief Analytical Chemist and Research Engineer. 6 chemists, 1 physicist, 2 metallurgists, 4 engineers, 1 X-ray spectroscopist, 1 optical spectroscopist, 1 microscopist; additional personnel 2.

*Research activities:* Cemented hard carbide compositions for use as tools, dies, and wear resisting parts; X-ray crystallography. (Research initiated 1938.)

*Library:* 2,000 volumes.

*Cooperative research:* One grant for research is made.

**1230. Kentucky Color and Chemical Company, 600 North 34th St., Louisville 12, Ky.**

*President:* Sevier Bonnie.

*Research staff:* Lawrence Harbury, Director

of research; Henry L. Beakes, Director of physical research. 8 chemists, 1 engineer; technical personnel 3; additional personnel 6.

*Research activities:* Organic and inorganic colors and pigments; coal tar products such as roof coatings, coal tar paints, etc.; asphalt products including roof coatings, paints, etc.; dry powder insecticides. (Research initiated 1920.)

*Library:* 100 volumes.

**1231. Kern Coal Conversion Company, 1096 Arcade Bldg., St. Louis 1, Mo.**

*President:* Victor Packman.

*Laboratory:* 51st and St. Clair, East St. Louis, Ill.

*Research staff:* Ludwig Kern, Director. 2 chemists, 2 engineers; technical personnel 2; additional personnel 3.

*Research activities:* Coal conversion into smokeless fuels, insulating materials, oil derivatives; investigation of plasticity and reactivity of carbonaceous materials, combined with organic and inorganic substances. (Research initiated 1944.)

*Library:* 600 volumes.

**1232. Kessler Chemical Company, Inc., State Road and Cottman Ave., Philadelphia 35, Pa.**

*President:* Fred E. Loud.

*Research staff:* L. W. Wasum, Director. 4 chemists; additional personnel 3.

*Research activities:* Cosmetic raw materials, plasticizers, and synthetic chemicals. (Research initiated 1925.)

*Library:* 800 volumes.

**1233. Keto Chemical Company, Inc., 40-33 Twenty-third St., Long Island City 1, N. Y.**

*President:* Curtis O. Baer.

*Research staff:* Ernest R. Schulz, Vice President and Director; Harold R. Frost, Chief Chemist. 3 chemists; additional personnel 3.

*Research activities:* Basic pharmaceutical chemicals. (Research initiated 1939.)

**1234. Keto Laboratories, 4603 South State St., Chicago 9, Ill.**

*President:* Frederick D. Johnson.

*Research staff:* Clyde R. Dillard, Director; Harold B. Evans and Jasper B. Jeffries, Associate Directors. 3 chemists, 1 physicist; technical personnel 3; additional personnel 2.

*Research activities:* Industrial research: advisory research services in food products, lubricants, insecticides and fungicides, cosmetics, and corrosion testing, and in the development of special analytical methods for plant control. Special chemicals: development and laboratory-scale manufacture of new or rare chemicals for industrial and academic research. (Research initiated 1944.)

**1235. Keuffel and Esser Company, 300 Adams St., Hoboken, N. J.**

*President:* Carl M. Bernegau.

*Research staff:* Carl W. Keuffel, Director. 5 chemists, 3 physicists, 5 engineers; technical personnel 10; additional personnel 6.

*Research activities:* Photo-copying processes; optical instruments and the calculation of optical systems. (Research initiated 1914.)

**1236. Kewanee Boiler Corporation, Kewanee, Ill.** (Subsidiary of American Radiator and Standard Sanitary Corporation.)

*President:* R. B. Dickson.

*Research staff:* John M. Hartman, Director. 4 engineers.

*Research activities:* The study of the performance of steam and hot water heating boilers when fired with various fuels; product development. (Research initiated 1921.)

**1237. Keystone Color Works, Inc., 151 West Gay Ave., York, Pa.**

*President:* H. E. Bruce.

*Research staff:* H. E. Bruce, General Manager. 4 chemists; technical personnel 2.

*Research activities:* Improving the nonfading properties of colors; increasing the resistance of colors to chemicals; originating new types of colors. (Research initiated 1919.)

*Library:* 113 volumes.

**1238. Keystone Manufacturing Company, 151 Hallet St., Boston 24, Mass.**

*President:* I. Marks.

*Research staff:* I. Marks, Director; E. M. Swartz. 1 physicist, 10 engineers.

*Research activities:* The development of sound and silent motion picture cameras and projectors, 8 and 16 mm., for the home. (Research initiated 1934.)

**1239. Keystone Steel and Wire Company, Peoria 7, Ill.**

*President:* R. E. Sommer.

*Research staff:* R. S. Simmons, Director. 8 chemists, 54 physicists, 8 metallurgists; technical personnel 2.

*Research activities:* Control and research work necessary to maintain and evaluate the quality of basic open-hearth steel and products made from it, such as billets, rods, and wire. The operations consist of hot rolling, cold-drawing, heat-treating, galvanizing, galvan-nealing, tinning, and copper coating. (Research initiated 1915.)

**1240. Keystone Tanning and Glue Company, Ridgway, Pa.** (Subsidiary of United States Leather Company.)

*President:* H. H. McAdoo.

*Research staff:* Frank F. Marshall, Chief Chemist. 4 chemists; technical personnel 6; additional personnel 3.

*Research activities:* Problems pertinent to the manufacture of heavy leather. (Research initiated 1893.)

*Library:* 500 volumes.

#### KEYSTONE GLUE DIVISION

Williamsport, Pa.

*Research staff:* Charles R. Harer, Director. 2 chemists; additional personnel 1.

*Research activities:* The determination of physical differences in the same grades of glue; the investigation of the chemical structure of glue; factory procedure; the development of liquid and flexible glues. (Research initiated 1907.)

**1241. Kidde and Company, Inc., Walter, 675 Main St., Belleville 9, N. J.**

*President:* John Kidde.

*Research staff:* Daniel Mapes, Vice President in charge of engineering and development; 8 chemists, 1 research chemist, 1 physicist, 3 metallurgists, 26 engineers; technical personnel 27; additional personnel 8.

*Research activities:* Fire detection and extinguishing, particularly special hazards; the use of water and carbon dioxide as a fire extinguishing medium; smoke, heat, mechanical, and electrical devices for fire detection; compressed gas high pressure cylinders, aviation specialties, instruments, smoke density meters, compressors, high pressure quick release valves, textile machinery, construction fastening devices, deep drawn metal products. (Research initiated 1923.)

*Library:* 400 volumes.

**1242. Kieckhefer Container Company, Camden 2, N. J. and North Carolina Pulp Company, Plymouth, N. C.**

*President:* J. W. Kieckhefer.

*Laboratory:* Plymouth, N. C.

*Research staff:* E. H. Hill, Chief Chemist. 6 chemists, 1 engineer; additional personnel 36.

*Research activities:* Stream pollution; pulp quality control; paper quality control; control of losses. (Research initiated 1937.)

*Cooperative research:* One grant for research is made.

**1243. Kienle and Company, 33 Nassau Ave., Brooklyn 22, N. Y.**

*President:* Eugene Carl Kienle.

*Research staff:* Herbert J. Wolfe, Vice President in charge of research. 3 chemists, 1 engineer; technical personnel 4; additional personnel 2.

*Research activities:* Metal lithographing inks and coatings. (Research initiated 1904.)

*Library:* 150 volumes.

*Cooperative research:* Two grants for research are made.

**1244. Kilgore Development Corporation, 1050 Thirtieth St., N. W., Washington 7, D. C.**

*President:* Edmund D. Campbell.

*Research staff:* Lowell B. Kilgore, Director. 3 chemists, 1 entomologist; technical personnel 1; additional personnel 1.

*Research activities:* Synthetic organic insecticides and insectifuges, antioxidants, and preservatives; organic chemical light screens. (Research initiated 1935.)

*Library:* 426 volumes.

**1245. Killark Electric Manufacturing Company, 3940 Easton Ave., St. Louis, Mo.**

*President:* Joseph Desloge.

*Research staff:* Marcel Desloge, Secretary in charge of research; Quentin Kaysing, Director; Ernest Kaysing, Superintendent; B. E. White, Vice President; Roland Tegeler, Engineer.

*Research activities:* The investigation of the use of electrical conduit fittings, including fittings for hazardous locations. (Research initiated 1913.)

**1246. Killian Research Laboratories, Inc., 49 West 45th St., New York 19, N. Y.**

*President:* John A. Killian.

*Research staff:* John A. Killian, Director; M. Elizabeth Marsh, Assistant Director; Trinita Rivera; Mary G. Knapp; Ramon F. Hanzal; Helen Haff. 6 chemists, 6 biological chemists, 2 bacteriologists, 2 physiologists, 2 histologists, 1 nutritionist, 1 nurse; additional personnel 6.

*Research activities:* The development of new products, particularly food, drug, and cosmetic products; improvements in products now on the market; the development of by-products from wastes in manufacture. (Research initiated 1933.)

*Library:* A library is maintained.

*Cooperative research:* Three fellowships are supported and three grants for research are made.

**1247. Kimberly-Clark Corporation, Neenah, Wis.**

*President:* Cola G. Parker.

*Laboratories:* Kimberly, Wis.; Neenah, Wis.  
*Research staff:* H. A. Rothchild, Technical Director; K. R. Wink, Superintendent of chemical research; M. N. Davis, Superintendent of physics research. 24 chemists, 5 physicists, 12 chemical engineers, 4 statisticians; technical personnel 51; additional personnel 12.

*Research activities:* The development of

products in the paper mill. (Research initiated 1921.)

*Library:* 3,800 volumes.

*Cooperative research:* Nine grants for research are made.

**1248. Kimble Glass Company, Vineland, N. J.**

*President:* Herman K. Kimble.

*Research staff:* Joseph F. Greene, Director; Kenneth M. Henry, Chief Engineer. 11 chemists, 12 engineers; technical personnel 5; additional personnel 6.

*Research activities:* Glass products and manufacturing methods. (Research initiated 1919.)

*Library:* 1,500 volumes.

**1249. Kind and Knox Gelatine Company, Head North 5th St., Camden, N. J. (Subsidiary of Charles B. Knox Gelatine Company.)**

*President:* Ludwig A. Kind.

*Research staff:* Thomas B. Downey, Vice President in charge of production and research. 5 chemists, 1 biologist, 1 bacteriologist; technical personnel 4; additional personnel 1.

*Research activities:* Problems relative to the manufacture and expansion of the uses of high grade gelatins in food, pharmaceutical, and photographic industries. (Research initiated 1925.)

*Library:* 400 volumes.

*Cooperative research:* The Charles B. Knox Gelatine Company supports four fellowships.

**1250. Kindt-Collins Company, 12651 Elmwood Ave., Cleveland 11, Ohio.**

*President:* Ernest T. Kindt.

*Research staff:* O. Lee Spurlin, Director. 1 chemist, 1 consulting chemist, 1 engineer, 1 assistant to engineer.

*Research activities:* The development and production of new and useful items of pattern shop supplies and equipment: wax products, pattern making machinery, pattern shop equipment, etc. (Research initiated 1927.)

**1251. King-Seeley Corporation, Ann Arbor, Mich.**

*President:* John Airey.

*Research staff:* A. N. Gustine, Vice President; R. C. Darnell, Chief Engineer; L. Boddy, Consulting Engineer; R. B. Bell, Director of engineering laboratory. 2 chemists, 1 physicist, 2 metallurgists, 5 engineers; technical personnel 3.

*Research activities:* Applied research in the field of instrumentation and control; mechanical and electrical devices. (Research initiated 1928.)

*Library:* 100 volumes.

1252. Kinney Manufacturing Company, 3529 Washington St., Boston 30, Mass.

*President:* Harold B. Neal.

*Research staff:* C. M. Van Atta, Director; H. I. Stoltz, Chief Engineer; H. G. Bowering, Assistant Chief Engineer; Nathaniel Heard. 2 physicists; technical personnel 1; additional personnel 2.

*Research activities:* High vacuums and allied subjects. (Research initiated 1935.)

1253. Kirk Company, C. F., 521-523 West 23rd St., New York 11, N. Y.

*President:* Harry Eliot Gross.

*Research staff:* A. Lincoln Konwiser, Director. 4 chemists, 1 biologist, 1 consulting physician, 1 pharmacist, 3 consulting pharmacists; additional personnel 2.

*Research activities:* The development of injection products (intravenous and intramuscular); vaccines and pollens. (Research initiated 1930.)

*Cooperative research:* One grant for research is made.

1254. Knapp-Monarch Company, St. Louis, Mo.

*President:* A. S. Knapp.

*Research staff:* C. W. Clemons, Director. 8 engineers.

*Research activities:* Engineering research on the development of electrical household appliances, small motors for household appliances, heating devices, etc. (Research initiated 1932.)

1255. Knight, B. H., 50 East 41st St., New York, N. Y.

*Research activities:* Shellac testing and research for clients and for the research control board of the U. S. Shellac Importers Association. (Research initiated 1923.)

1256. Knowles China Company, Edwin M., Newell, W. Va.

*President:* F. B. Lawrence.

*Research staff:* M. H. King, Plant Engineer; J. W. Hepplewhite, Ceramist. 1 chemist; technical personnel 1.

*Research activities:* Routine factory control of raw materials, kiln firing, etc.; research on new materials, new body and glaze compositions, new colors for decorating processes, and investigations in ceramic science; practical plant problems. (Research initiated 1922.)

1257. Kobbé Laboratories, Inc., 114 East 32nd St., New York 16, N. Y.

*President:* William H. Kobbé.

*Research staff:* 1 chemist; additional personnel 2 to 4.

*Research activities:* Investigations on the utilization of sulfur with particular reference to the development of new commercial uses, and the application of sulfur as an impregnant for pulp and fiberboard products, concrete, wood, and other porous materials; the development of sulfur base compositions for pipe jointing compounds, cast pottery, and other purposes, with incidental work on sulfur-containing metal-cutting oils and pharmaceutical products; and the development of oil soluble sulfur compounds. (Research initiated 1924.)

1258. Kobe, Inc., 3040 East Slauson Ave., Huntington Park, Calif.

*President:* C. J. Coberly.

*Research staff:* Ralph F. McArthur, Chief Engineer in charge of research; C. J. Coberly, Director. 1 metallurgist, 4 engineers, 3 draftsmen, 2 field men; additional personnel 2.

*Research activities:* Problems relating to sand control and perforated pipe and casing utilization in the production of oil; gravel packing; hydraulic oil well pump and the manufacture of its parts; the development of a cathode ray oscillograph; research on special hard and corrosion resistant materials; methods of inhibiting wear and corrosion; special metallurgical problems; the investigation of various problems in hydraulic design; high pressure lubricants; dampening of hydraulic pressure waves; control of wax deposits; separation of gas, water, and solids from oils. (Research initiated 1923.)

1259. Kohler Company, Kohler, Wis.

*President:* Herbert V. Kohler.

*Research staff:* Carl J. Kohler, Director. 1 chemist, 1 metallurgist, 4 engineers; technical personnel 4; additional personnel 5.

*Research activities:* Ceramics, cast iron, brass, chromium plating, heating, internal combustion engines. (Research initiated 1920.)

*Library:* 500 volumes.

1260. Kohnstamm and Company, Inc., 87 Park Place, New York, N. Y.

*President:* Lothair S. Kohnstamm.

*Laboratories:* Color Department: Brooklyn, N. Y.; Camden, N. J. Laundry Supplies Department: New York, N. Y.

*Research staff:* William C. Bainbridge, Director, Color Department; R. A. Phair, Director, Laundry Supplies Department; Fred Hope, Color Department; John G. Lukash, Laundry Supplies Department. 19 chemists; additional personnel 6.

*Research activities:* Laundry supplies: bluing, starches, soaps, etc.; dry colors; flavors; food, drug, and cosmetic colors. (Research initiated 1905.)

**1261. Kohorn and Company, Ltd.,** 501 Fifth Ave., New York, N. Y.

*President:* Oscar von Kohorn.

*Research staff:* Joseph L. Costa, Vice President and Director. 4 chemists, 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Cellulose, rayon, and related products. (Research initiated 1939.)

*Library:* 500 volumes.

**1262. Kolar Laboratories, Inc.,** 6 South Seeley Ave., Chicago 12, Ill.

*President:* Gustav S. Kolar.

*Research staff:* George G. Kolar, Director; Peter Parker; H. R. Kolar; Joseph Kiefer. 3 chemists; technical personnel 1; additional personnel 3.

*Research activities:* Cosmetic chemistry; industrial hygiene. (Research initiated 1910.)

*Library:* A library is maintained.

*Cooperative research:* One grant for research is made.

**1263. Kolker Chemical Works,** 786 Broad St., Newark, N. J.

*President:* L. A. Kolker.

*Laboratory:* Pittstown, N. J.

*Research staff:* Albert Bloom, Director. 2 chemists, 2 engineers.

*Research activities:* Synthetic organic chemicals; synthetic waxes; resins and plasticizers. (Research initiated 1937.)

*Library:* 450 volumes.

**1264. Koppers Company, Inc.,** Koppers Bldg., Pittsburgh 19, Pa.

*President:* J. P. Williams, Jr.

*Laboratories:* Kearny, N. J.

*Research staff:* Fred Denig, Vice President and Director. 46 chemists, 2 physicists, 2 biologists, 1 metallurgist, 39 engineers; 30 trained laboratory assistants; additional personnel 30.

*Research activities:* Coal carbonization; recovery and utilization of coal products; preparation of chemicals and other products from coal-tar, light-oil and coal-gas constituents; coke utilization; gas production and purification; preparation of butadiene and styrene for synthetic rubber manufacture; bonding and impregnation of wood; development of plastics for piston rings. (Research initiated 1915.)

*Library:* 2,000 volumes.

*Cooperative research:* Twelve fellowships are supported and five grants for research are made.

#### AMERICAN HAMMERED PISTON RING DIVISION

P. O. Box 626, Baltimore 3, Md.

*Vice President and General Manager:* Allen W. Morton.

*Research staff:* Tracy C. Jarrett, Chief Metal-

lurgist. 3 chemists, 1 physicist, 4 metallurgists, 1 engineer; technical personnel 3; additional personnel 5.

*Research activities:* The investigation of improved materials for piston rings; centrifugal casting; chromium plating. (Research initiated 1942.)

*Library:* 334 volumes.

*Cooperative research:* Two fellowships are supported.

#### BUTADIENE DIVISION

P. O. Box 92, Monaca, Pa.

*Vice President:* D. M. Rugg.

*Laboratory:* Kobuta, Pa.

*Research staff:* C. F. Winans, Chief Chemist and Director. 18 chemists, 1 physicist; technical personnel 22; additional personnel 3.

*Research activities:* Butadiene and styrene process—studies for improvement of yield and efficiency; by-product identification and separation; new process development including waste disposal. (Research initiated 1943.)

*Library:* 288 volumes.

#### TAR AND CHEMICAL DIVISION

##### DEVELOPMENT DEPARTMENT

Koppers Bldg., Pittsburgh 19, Pa.

*Vice President:* J. N. Forker.

*Laboratories:* -Chicago, Ill., and field work at various plants.

*Research staff:* E. O. Rhodes, Manager of development. 2 chemists, 6 engineers; additional personnel 3.

*Research activities:* The development of new processes for the recovery and refining of coal tar components; improvement of existing processes.

*Cooperative research:* One fellowship is supported.

#### WOOD PRESERVING DIVISION

Koppers Bldg., Pittsburgh 19, Pa.

*Vice President:* W. F. Munnikhuysen.

*Laboratory:* Orrville, Ohio.

*Research staff:* W. P. Arnold, Director. 3 chemists, 1 forester; technical personnel 4; additional personnel 3.

*Research activities:* Treatment of wood and development of treated wood products. (Research initiated 1925.)

**1265. Kramer and Company, H.,** 1345 West 21st St., Chicago 8, Ill.

*President:* Lazarus Chapman.

*Research staff:* George P. Halliwell, Director; William Romanoff, Vice President in charge of research; Carl O. Thieme, Vice President and Works Manager in charge of

process metallurgy. 6 chemists, 1 physicist, 3 metallurgists; technical personnel 6.

*Research activities:* Research for new alloys; the investigation of the physical and mechanical properties of existing alloys, particularly red and yellow casting brasses, bronzes, nickel silvers, aluminum and manganese bronzes, special brass and bronze; the development and checking of test bar types; age hardening and heat-treating studies; improvement in smelting and refining processes; separation and classification of nonferrous scrap; utilization of secondary nonferrous scraps; use of alloy cast iron; refractories for nonferrous smelting or melting; spectrographic research on methods for spectrographic analysis of all copper base alloys. (Research initiated 1928.)

*Library:* 500 volumes.

*Scientific periodicals:* Kramer Alloy News. Irregular.

*Cooperative research:* Three grants are made for research.

**1266. Krause Milling Company, Charles A.,** South 43rd and West Burnham Sts., Milwaukee, Wis.

*President:* Charles A. Krause.

*Research staff:* C. E. Norton, Director. 3 chemists.

*Research activities:* Development work in the production and use of the following types of products: pearl hominy, hominy flakes, grits, meal, and flour; special flours for bakeries; sausage flours; gelatinized flakes for bakers, confectioners, and for cereal beverages; corn oil and corn germ meal; gelatinized dry adhesives from both wheat and corn which swell or disperse in either cold or warm water; core binders for foundry cores, facings, and gypsum products; flakes for motion picture snow scenes. (Research initiated 1930.)

**1267. Kroger Grocery and Baking Company, 35** East 7th St., Cincinnati 2, Ohio.

*President:* Charles M. Robertson.

*Laboratory:* Kroger Food Foundation, 1212 State Ave., Cincinnati 4, Ohio.

*Research staff:* George Garnatz, Director; J. A. Dalve, Chief Chemist. 15 chemists, 1 physicist, 2 biologists, 3 chemical engineers, 2 bacteriologists, 3 home economists, 4 technicians; additional personnel 8.

*Research activities:* The development of new food products and processes; quality control; development in cereal and baking technology; research in the food field to improve quality, reduce spoilage, and discover new methods of processing and preservation. (Research initiated 1930.)

*Library:* 375 volumes.

**1268. Kugler Laboratory, L. T., 48 South Union** St., Lambertville, N. J.

*Research staff:* L. T. Kugler, Director. 2 chemists, 1 assistant.

*Research activities:* Research on insulating paper; analytical methods. (Research initiated 1926.)

**1269. Laboratory Construction Company, 1115** Holmes St., Kansas City, Mo.

*President:* R. D. Callaway.

*Research staff:* 1 engineer.

*Research activities:* Improvement of the scientific apparatus manufactured by the company. (Research initiated 1937.)

**1270. Laboratory of Industrial Hygiene, Inc., 76** Madison Ave., New York 16, N. Y.

*President:* George B. Wallace.

*Research staff:* K. George Falk, Director; Grace McGuire. 6 chemists, 3 bacteriologists; additional personnel 10.

*Research activities:* Methods of testing vitamins A, B<sub>1</sub>, B<sub>2</sub>, C, D, etc.; pyrogens, purification and properties; immunization studies (typhoid, etc.); testing of sulfa drugs and of penicillin. (Research initiated 1938.)

**1271. Laboratory of Microchemistry, 366 Fifth** Ave., New York 1, N. Y.

*Research staff:* Carl Tiedcke, Director. 3 chemists; additional personnel 1.

*Research activities:* Organic and inorganic microchemical procedures including physical methods and spot test analyses; toxicological research; the study of methods for crime detection; investigations in halogen metabolism; nutritional studies. (Research initiated 1931.)

**1272. Laboratory of Vitamin Technology, 1411** East 60th St., Chicago, Ill.

*Research staff:* Howard J. Cannon, Director. 2 chemists, 1 biologist and bacteriologist, 3 technicians; additional personnel 3.

*Research activities:* The development of biological methods of assay for the analysis of vitamin-containing products. (Research initiated 1932.)

**1273. Laclede-Christy Clay Products Company,** 1711 Ambassador Bldg., St. Louis 1, Mo.

*President:* W. P. Hemphill.

*Laboratories:* St. Louis, Mo.; Toledo, Ohio.

*Research staff:* L. C. Hewitt, Vice President; A. J. Paul; K. A. Aderholt; C. W. Berry; L. E. Puntney. 5 engineers; additional personnel 4.

*Research activities:* The development of general utility refractories; special refractories; compositions for vitrified ware; plant control refinements. (Research initiated 1904.)



*Cooperative research:* Two grants for research are made.

**1274. Laclede Steel Company, 1317 Arcade Bldg., St. Louis, Mo.**

*President:* Thomas R. Akin.

*Laboratories:* Alton and Madison, Ill.

*Research staff:* A. C. Weber, Director; A. H. Lamack, Assistant; W. M. Baldrige; Wilbur Peters. 5 chemists, 3 metallurgists, 6 engineers; additional personnel 12.

*Research activities:* Concrete reinforcing; steel joists; welding; galvanizing; open-hearth problems; the heating and treating of steel bars, strip, wire, and tubular products. (Research initiated 1922.)

*Cooperative research:* Several grants for research are made and fellowships are supported.

**1275. Lacquer and Chemical Corporation, 214 Fortieth St., Brooklyn 32, N. Y.**

*President:* Irving Flaumenhaft.

*Research staff:* M. Thau, Director. 4 chemists; additional personnel 1.

*Research activities:* The investigation of new materials and the determination of new uses of established materials for the manufacture of lacquer and synthetics. (Research initiated 1924.)

*Library:* 250 volumes.

**1276. Lady Esther, Ltd., 7171 West 65th St., Chicago 38, Ill.**

*President:* Syma Busiel.

*Research staff:* Melvin A. Goldberg, Chief Chemist. 4 chemists; additional personnel 1.

*Research activities:* Cosmetics.

*Library:* 500 volumes.

**1277. Lakeside Laboratories, Inc., Milwaukee 1, Wis.**

*President:* Evan P. Helfaer.

*Laboratory:* Brown Deer Road, Granville, Wis.

*Research staff:* C. O. Miller, Vice President; E. Leon Foreman, Director. 6 chemists, 3 biologists; technical personnel 3; additional personnel 1.

*Research activities:* The development of new medicinal agents; the improvement of old medicinal agents and of manufacturing processes. (Research initiated 1940.)

*Library:* 400 volumes.

*Cooperative research:* Five grants for research are made.

**1278. Lakeside Steel Improvement Company, 5418 Lakeside Ave., Cleveland 14, Ohio.**

*President:* C. W. Derhammer.

*Research staff:* M. Tomko. 2 metallurgists,

2 engineers; technical personnel 5; additional personnel 10.

*Research activities:* Steel treating. (Research initiated 1924.)

**1279. Lambert Pharmacal Company, 2117 Franklin Ave., St. Louis 6, Mo.**

*Executive Vice President:* J. S. Norton.

*Research staff:* R. R. Read, Chief Chemist; G. F. Reddish, Chief Bacteriologist. 17 chemists, 4 engineers, 1 physician, 5 bacteriologists; additional personnel 9.

*Research activities:* Bacteriological and clinical therapeutic studies of oral antiseptics, including standardization of test cultures, methods of testing, clinical studies of therapeutic agents for colds, dandruff, and halitosis; the study of the use of fungicides in treating epidermophytosis; the production of extremely potent chemical germicides and their practical applications; the relationships between surface active chemicals and phenolic germicides; fungicidal chemicals and their practical application; natural and synthetic gums and froth builders; synthetic detergents and soaps; pharmaceuticals; compositions and their influence on enamel polishes; quantitative evaluation of odors. (Research initiated 1915.)

*Library:* 1,000 volumes.

*Cooperative research:* Twenty grants for research are made.

*See also* Pro-phy-lac-tic Brush Company.

**1280. Lammert and Mann Company, 215 North Wood St., Chicago 12, Ill.**

*President:* R. F. Lammert.

*Research staff:* R. F. Lammert, Director. 2 engineers; technical personnel 8; additional personnel 3.

*Research activities:* The improvement of vacuum pumps, compressors, gas compressing equipment, and domestic and industrial oil burning equipment. (Research initiated 1892.)

**1281. LaMotte Chemical Products Company, Towson, Baltimore 4, Md.**

*President:* F. L. LaMotte.

*Research staff:* W. R. Kenny, Director. 4 chemists, 1 engineer, 3 assistant chemists; additional personnel 1.

*Research activities:* The development of methods and apparatus for pH control of industrial and scientific processes. The studies involve inorganic, organic, and physical chemistry. Work is also carried on in the development of methods and apparatus for simplifying such control problems as boiler water, refrigerating brines, chlorine treatment of water and sewage, and soil fertilization investigations; the development of simplified methods for blood and urine

analysis; investigations in soil chemistry. (Research initiated 1919.)

*Library:* A library is maintained.

*Cooperative research:* One fellowship is supported.

**1282. Lampkin Laboratories, Bradenton, Fla.**

*Research staff:* G. F. Lampkin.

*Research activities:* Improved frequency-measuring apparatus for radio stations and laboratories. (Research initiated 1932.)

**1283. Lamson and Sessions Company, 1971 West 85th St., Cleveland 2, Ohio.**

*President:* Roy H. Smith.

*Research staff:* C. L. Harvey, Director. 1 chemist, 2 metallurgists, 4 engineers.

*Research activities:* Metallurgical, chemical, and mechanical engineering problems related to the manufacture of bolts, nuts, and allied fastening devices. (Research initiated 1921.)

*Library:* 100 volumes.

**1284. Landers Corporation, Box 911, Toledo 1, Ohio.**

*President:* R. G. Landers.

*Research staff:* F. W. Baker, Vice President in charge of research; C. J. Chaban, Director; H. A. Lamlein, Technical Controller; D. R. Marsh, Chemist; E. B. Pursel, Chemist. 5 chemists; technical personnel 2; additional personnel 1.

*Research activities:* Natural and synthetic rubbers; synthetic rubberlike elastomers; the processing of cotton and synthetic fibers; coating and combining of fabrics. (Research initiated 1927.)

*Library:* 300 volumes.

**1285. Lane-Wells Company, 5610 South Soto St., Los Angeles 11, Calif.**

*President:* Rodney S. Durkee.

*Research staff:* Russell M. Otis, Manager of Research and Patent Department. 1 physicist, 6 engineers; technical personnel 1; additional personnel 2.

*Research activities:* Oil field technical services; aircraft and industrial instruments.

**1286. Lapp Insulator Company, Inc., Le Roy, N. Y.**

*President:* J. S. Lapp.

*Research staff:* G. W. Lapp, Consulting Engineer; R. S. Lapp, Test Engineer; R. L. Jenner, Chief Engineer; K. E. Stettinius, Ceramic Engineer. 2 electrical engineers, 2 mechanical engineers, 2 ceramic engineers.

*Research activities:* The investigation of clays, porcelains, and glazes; studies in factory processes for making electrical and chemical

porcelain; testing materials and structures for electrical and mechanical properties to improve the designs for high voltage, radio, and chemical applications. Radio insulator design (broadcasting); radar insulator design wave guides; ceramic laboratory research; heavy mechanical design laboratory testing—tension to 1,500,000 pounds and compression to 5,000,000 pounds. (Research initiated 1916.)

*Cooperative research:* One grant for research is made.

**1287. Larkin Products Inc., 191 Van Rensselaer St., Buffalo 10, N. Y.**

*President:* Harry H. Larkin.

*Research staff:* Earl L. Booth, Director. 1 chemist; technical personnel 2; additional personnel 4.

*Research activities:* Cosmetics, foods, detergents, insecticides. (Research initiated 1941.)

**Larro Research Farm. See General Mills, Inc.**

**1288. Larsen Company, 314 North Broadway, Green Bay, Wis.**

*President:* M. W. Larsen.

*Research staff:* R. H. Winters, Director. 2 chemists, 1 biologist, 1 engineer; technical personnel 4; additional personnel 2.

*Research activities:* Research in connection with the canning industry and related food problems. (Research initiated 1935.)

**1289. Larus and Brother Company, Inc., Richmond 17, Va.**

*President:* W. T. Reed, Jr.

*Research staff:* Charles L. Reed, Vice President and Director; Thomas T. Garber, Assistant Director; Clinton W. Baber, Chemical Engineer; Charles D. Larus III, Control Engineer. 2 chemists, 1 biologist and bacteriologist, 1 engineer; additional personnel 3.

*Research activities:* The investigation of manufacturing processes and raw materials; the development of new products; control testing of manufactured tobacco products, cigarettes, smoking tobacco, and chewing tobacco; research on Burley, Flue, and Turkish tobaccos according to grade, crop, seasonal variations, and use. (Research initiated 1935.)

**1290. Latrobe Electric Steel Company, 2626 Ligonier St., Latrobe, Pa.**

*President:* M. W. Saxman, Jr.

*Research staff:* D. J. Giles, Vice President and Director. 4 chemists, 6 metallurgists; technical personnel 10; additional personnel 3.

*Research activities:* High speed steel; stainless steels; die steels and various tool steels. (Research initiated 1921.)

*Library:* 200 volumes.

*Cooperative research:* One grant for research is made.

**1291. Laucks, Inc., I. F.,** 314 Maritime Bldg., Seattle 4, Wash.

*President:* H. P. Banks.

*Laboratories:* Seattle, Wash.; 120 South Niagara St., Lockport, N. Y.

*Research staff:* H. P. Banks, in charge of research. 10 chemists, 1 biologist, 3 chemical engineers, 3 mechanical engineers, 1 entomologist, 1 wood technologist; technical personnel 7; additional personnel 6.

*Research activities:* Wood glues, preservative coatings, wood preservatives, insecticides, synthetic resins. (Research initiated 1915.)

*Library:* 1,200 volumes.

**1292. Laughlin China Company, Homer,** Newell, W. Va.

*President:* M. L. Aaron.

*Research staff:* A. V. Bleininger, Director; W. H. Emerson, Chief Mechanical Engineer. 2 chemists, 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* The study of raw materials, the fundamentals of ceramic processes, the properties of the finished ware, and the development of new products. (Research initiated 1920.)

*Cooperative research:* One fellowship is supported.

**1293. Lavino and Company, E. J.,** 1528 Walnut St., Philadelphia 2, Pa.

*President:* E. M. Lavino.

*Laboratory:* Plymouth Meeting, Pa.

*Research staff:* H. A. Heiligman, Head, Technical Department. 4 chemists, 1 physicist, 1 metallurgist, 3 engineers; technical personnel 23; additional personnel 3.

*Research activities:* Refractories, combustion, kilns and furnaces, ore dressing, dry batteries, gas purifying materials, metallurgy, ceramics, minerals and ores, temperature control and measurement, plant equipment, abrasives, electric furnaces, insulating materials, and pigments. (Research initiated 1926.)

*Library:* 1,000 volumes.

**1294. Law and Company, P. O. Box 1558,** Atlanta 1, Ga.

*President:* Thomas C. Law.

*Laboratories:* Atlanta, Ga.; Macon, Ga.; Wilmington, N. C.

*Research staff:* L. B. Lockhart, Director; T. C. Law; J. D. Evans. 8 chemists, 1 physicist, 1 biologist and bacteriologist, 1 metallurgist; additional personnel 7.

*Research activities:* Problems in the vegetable

oil, fertilizer, textile, and cellulose industries. (Research initiated 1903.)

*Library:* 500 volumes.

**1295. La Wall and Harrison,** 1921 Walnut St., Philadelphia 3, Pa.

*Research staff:* Joseph W. E. Harrison, Director; George W. Perkins, Assistant Director of organic research. 5 chemists, 3 biologists, 1 consulting medical associate, 2 bacteriologists; technical personnel 10; additional personnel 5.

*Research activities:* Food; pharmaceuticals; public health; insecticides; fungicides; organic synthesis; toxicology; pharmacologic and clinical investigations. (Research initiated 1875.)

*Library:* A library is maintained.

*Cooperative research:* Three grants for research are made.

**1296. Lawrence Leather Company, A. C.,** 10-18 Sawyer St., Peabody 1, Mass.

*President:* H. N. Goodspeed.

*Laboratories:* Peabody, Mass.(3); Winchester, N. H.; Newport, Tenn.

*Research staff:* Kenneth E. Bell, Vice President and Technical Director; R. Sutherland, Assistant Technical Director; R. L. Griffin, Mechanical Development. 15 chemists, 5 chemical engineers; technical personnel 5; additional personnel 5.

*Research activities:* Improvements in the efficiency of tanning and finishing processes; new agents, products, and chemical ingredients; the development of control methods and testing devices; the design and development of machines and handling methods; patent leather and finishing materials; drying; waste disposal and utilization. (Research initiated 1923.)

*Library:* 500 volumes.

*Cooperative research:* Two grants for research are made.

**1297. Lea Manufacturing Company,** 16 Cherry Ave., Waterbury 86, Conn.

*President:* R. S. Leather.

*Research staff:* L. V. Verzier, Director; H. L. Kellner, Technical Director. 2 chemists, 2 engineers, 1 metallurgist; technical personnel 2; additional personnel 3.

*Research activities:* Abrasive products for buffing and polishing; electroplating. (Research initiated 1925.)

*Library:* 400 volumes.

**1298. Lear, Inc.,** 110 Ionia Ave., N. W., Grand Rapids 2, Mich.

*President:* William P. Lear.

*Laboratory:* Radio Research and Development Laboratory, 1860 Broadway, New York 23, N. Y.

*Research staff:* Garrard Mountjoy, Director of research and development. 2 physicists, 26 engineers; technical personnel 14; additional personnel 16.

*Research activities:* Television; household radios; FM television receivers and transmitters; aeronautical radio receivers, transmitters, synchronizers, and control devices. (Research initiated 1944.)

*Library:* 225 volumes.

**1299. Leas and McVitty, Inc., Salem, Va.**

*President:* S. H. McVitty.

*Research staff:* G. V. Downing, Chief Chemist; S. S. Sherrard, Chemist. 3 chemists, 1 engineer; additional personnel 2.

*Research activities:* Problems in connection with the manufacture of leather and chestnut extract. (Research initiated 1912.)

*Library:* 200 volumes.

**1300. Lebanon Steel Foundry, Lebanon, Pa.**

*President:* W. H. Worrilow.

*Research staff:* John W. Juppenlatz, Chief Metallurgist; Gordon H. Gingrich, General Laboratory Supervisor. 5 chemists, 4 metallurgists.

*Research activities:* Routine quality control; the development of new ferrous alloys for structural, corrosion resistance, and heat resistance purposes; nondestructive methods of inspection; the solution of technical difficulties which may arise either in the manufacture or application of carbon and alloy cast steels. (Research initiated 1920.)

**Lederle Laboratories, Inc. See American Cyanamid Company.**

**1301. Ledoux and Company, Inc., 155 Sixth Ave., New York 13, N. Y.**

*President:* Louis V. Ledoux.

*Research staff:* William H. Buckhout, Technical Director; William C. Bowden, Jr., Chief Chemist. 35 chemists, 3 metallurgists, 2 engineers, 2 mineralogists; technical personnel 4; additional personnel 6.

*Research activities:* Experimental work and consultation on ore and mineral treatment methods; research analyses and tests of refined metals and alloys; corrosion problems; research analyses and investigations in connection with patents; the development of analytical methods for the closer control of raw materials and products. (Research initiated 1898.)

*Library:* 1,000 volumes.

**1302. Lee, Inc., Alan Porter, 136 Liberty St., New York 6, N. Y.**

*Research staff:* Alan Porter Lee, Director. 3 engineers; additional personnel 2.

*Research activities:* Engineering development of processes for the treatment of glycerides and their products; fatty acid technology; soap manufacture; hydrogenation of glyceride oils. (Research initiated 1928.)

*Library:* 1,000 volumes.

**1303. Lee Broadcasting System, Don, 5515 Melrose Ave., Hollywood 38, Calif.**

*President:* Thomas S. Lee.

**RADIO LABORATORY**

*Research staff:* Frank M. Kennedy, Chief Engineer. 2 physicists, 5 engineers.

*Research activities:* Radio AM and FM broadcasting. (Research initiated 1930.)

*Library:* 100 volumes.

**TELEVISION LABORATORY**

3800 Mt. Lee Drive, Hollywood 28, Calif.

*Research staff:* Harry R. Lubcke, Director of television; Harold W. Jury, Assistant Director. 8 engineers; technical personnel 3; additional personnel 3;

*Research activities:* Television. (Research initiated 1930.)

*Library:* 100 volumes.

**1304. Lee Rubber and Tire Corporation, Conshohocken, Pa.**

*President:* A. A. Garthwaite.

*Laboratories:* Conshohocken, Pa; Youngstown, Ohio.

*Research staff:* A. H. Neller, Vice President in charge of development and research; W. B. Dunlap, Jr., Chief Chemist; A. K. Brill, Technical Manager, Youngstown, Ohio. 12 chemists, 4 physicists, 7 laboratory assistants.

*Research activities:* Rubber products; fabric-compounding materials; rubber chemicals. (Research initiated 1909.)

**1305. Leece-Neville Company, 5363 Hamilton Ave., Cleveland 14, Ohio.**

*President:* B. M. Leece.

*Research staff:* S. Floyd Stewart, Chief Engineer; A. D. Gilchrist, Assistant Chief Engineer. 1 metallurgist, 5 engineers; technical personnel 6.

*Research activities:* Motors, generators, regulators, and transforming devices. (Research initiated 1909.)

**1306. Leeds and Northrup Company, 4901 Stenton Ave., Philadelphia 44, Pa.**

*President:* Charles S. Redding.

*Research staff:* I. Melville Stein, Vice President and Director; P. H. Dike, Assistant Director. 6 chemists, 6 physicists, 4 metallurgists, 17 engineers; additional personnel 14.

*Research activities:* The development of apparatus, primarily electrical, for precise measurement, recording, and control; heat, electricity, magnetism, heat-treatment of metals, composition of gases, chemical analysis, and fluid flow. (Research initiated 1911.)

*Library:* 4,125 volumes.

**1307. Leffingwell Company; Westwell Chemical Company, P.O. Box 191, Whittier, Calif.**

*President:* I. G. McBeth.

*Laboratory:* 1234 Santa Gertrudes Ave., Whittier, Calif.

*Research staff:* J. R. Allison, Chief Chemist and Director. 4 chemists, 2 entomologists; technical personnel 2; additional personnel 15.

*Research activities:* Insecticides, fungicides, fertilization, spreaders, and wetting agents; metallic soaps. (Research initiated 1916.)

**1308. Lehigh Foundries, Easton, Pa.**

*President:* Frank E. Shumann.

*Research staff:* Roy D. Haworth, Jr., Metallurgist. 1 chemist, 1 metallurgist; technical personnel 5; additional personnel 2.

*Research activities:* Control, improvement, and development in the fields of grey iron and malleable castings. (Research initiated 1927.)

**1309. Lehigh Navigation Coal Company, Inc., Lansford, Pa.**

*President:* J. B. Warriner.

*Research staff:* D. C. Helms, Mining Engineer; C. D. Rubert, Superintendent of preparation; C. E. Cooper, Chemist. 1 chemist, 2 engineers, 2 chemical analysts; additional personnel 3.

*Research activities:* The routine testing of the company's product, testing of materials used in production, testing and research on new products and devices, the development of new devices and processes incidental to coal production and preparation, and the development of by-products from waste materials. (Research initiated 1913.)

**1310. Lehigh Portland Cement Company, 718 Hamilton St., Allentown, Pa.**

*President:* Joseph S. Young.

*Laboratory:* Ormrod, Pa.

*Research staff:* Raymond R. Bear, Vice President and General Manager; Roy N. Young, Assistant Vice President and Operating Manager; B. L. Pake, Manager of plant laboratories; J. C. Pearson, Director of laboratory; W. J. McCoy, Research Chemist. 2 chemists, 1 physicist, 1 chemical engineer; technical personnel 3; additional personnel 2.

*Research activities:* The properties and uses

of cement, concrete, and allied materials. (Research initiated 1926.)

*Library:* 1,000 volumes.

**1311. Lehn and Fink Products Corporation, 192 Bloomfield Ave., Bloomfield, N. J.**

*President:* Edward Plaut.

*Research staff:* Emil G. Klarmann, Director. 7 chemists, 2 bacteriologists; technical personnel 3; additional personnel 3.

*Research activities:* Bacteriological, organic, and pharmaceutical problems. (Research initiated 1920.)

*Library:* 4,000 volumes.

*Cooperative research:* Three grants for research are made.

**1312. Lehon Company, 4425 South Oakley Ave., Chicago, Ill.**

*President:* A. G. Leonard, Sr.

*Laboratory:* Wilmington, Ill.

*Research staff:* Cecil G. Metzger, Chief Chemist. 2 chemists.

*Research activities:* Asphalt roofing products. (Research initiated 1935.)

**1313. Leibiger Research Laboratories, Inc., O. W., Petersburg, N. Y.**

*Research staff:* O. W. Leibiger, Director; I. Leibiger. 2 chemists, 1 physicist; technical personnel 2.

*Research activities:* Synthetic resins; polydimensional polymerization and polycondensation; plastics and molding materials for compression molding, injection molding and casting; special purpose coating materials for paper and textiles; elastomers and supersize polymers; depolymerization; dry distillation (cracking) of polymers. Consulting research is done frequently at the customers' laboratories. (Research initiated 1933.)

*Library:* 600 volumes.

**1314. Leland Electric Company, 1501 Webster St., Dayton 1, Ohio.**

*President:* William F. Lisman.

*Research staff:* E. B. George, Vice President in charge of engineering; Thomas W. Moore, Director; 1 physicist, 8 engineers; technical personnel 3; additional personnel 9.

*Research activities:* The improvement of design and production methods in the manufacture of electric motors; the development of voltage regulators, high intensity lighting, high frequency motors and alternators, electronic equipment, etc. (Research initiated 1939.)

*Library:* 150 volumes.

**1315. Lo Roi Company, 1706 South 68th St., West Allis 14, Wis.**

*President:* C. W. Pendock.

*Research staff:* P. W. Eells, Vice President in charge of engineering; Wayne B. Grieve, Technical Engineer. 4 engineers; additional personnel 10.

*Research activities:* The development of internal combustion engines, air compressors, and special equipment for industrial use which involves internal combustion engines as the prime source of power. (Research initiated 1929.)

**1316. LeRoy's International Research Laboratories, 1190 Third Ave., New York 21, N. Y.**

*Owners:* Adrian E. LeRoy and G. E. LeRoy.

*Research staff:* Adrian LeRoy, Director. 4 chemists, 3 physicists, 2 engineers; technical personnel 11; additional personnel 3.

*Research activities:* Spectrophotometric research on color as applied to color photography; the replacement of gelatin colloids with recently discovered polymerized plastics capable of colloidization; research on a process for raising photographic aerial maps in relief and reproducing them in color, which includes the subtraction of the visible spectrum colors from uranium nitrate and the application of color photography. (Research initiated 1924.)

*Library:* 1,000 volumes.

*Scientific periodicals:* New Discoveries in Photography. Vol. I, 1927.

**1317. Leslie Laboratories, 1831 Traver Road, Ann Arbor, Mich.**

*Owner:* E. H. Leslie.

*Research staff:* E. H. Leslie, Director. 5 chemical engineers.

*Research activities:* Petroleum, vegetable oils, foods, solvents, distillation, heat transfer, and solvent extraction and recovery. (Research initiated 1923.)

*Library:* 1,200 volumes.

**1318. Lever Brothers Company, 164 Broadway, Cambridge 39, Mass.**

*President:* F. A. Countway.

*Research staff:* J. W. Bodman, Director. 54 chemists, 2 physicists, 24 engineers; technical personnel 15; additional personnel 38.

*Research activities:* Soap, glycerin, shortening, and edible oils. (Research initiated 1925.)

*Library:* 2,000 volumes.

*Cooperative research:* Three fellowships are supported and two grants for research are made.

PEPSODENT DIVISION

141 West Jackson, Chicago 4, Ill.

*President:* Charles Luckman.

*Laboratory:* 6901 West 65th St., Chicago, Ill.

*Research staff:* T. H. Rider, Technical Director; Homer D. Long, Chief Chemist. 15 chemists, 1 bacteriologist, 1 dentist; technical personnel 3; additional personnel 5.

*Research activities:* Oral hygiene products, antiseptics, pharmaceuticals. (Research initiated 1915.)

*Library:* 1,000 volumes.

*Cooperative research:* Three fellowships are supported.

**Lever Company, Inc., C. See Burns Company, W. H.**

**1319. Lever Motors Corporation, P. O. Box 606, Wheaton Ill. (Subsidiary Research Department of A. L. Powell Power Company, Inc.)**

*President:* R. P. Rainey.

*Research staff:* C. F. Rainey, Director; C. A. Shaffer, Assistant for Chemistry; R. S. Rainey and C. Chronic, engineering and chemistry.

*Research activities:* The adaptation of the lever to various types of engines, with special stress upon oil burning engines. (Research initiated 1939.)

**1320. Levey Company, Inc., Frederick H., 41 East 42nd St., New York 17, N. Y. (Subsidiary of Columbian Carbon Company.)**

*President:* Robert M. Hillas.

*Laboratories:* Brooklyn, N. Y.; Philadelphia, Pa.; Monmouth Junction, N. J.; Chicago, Ill.

*Research staff:* Edwin L. Duhring, Director; Charles J. Hammer; Mitchell Gordon; Charles H. Oberdorf; H. W. Pearsall. 32 chemists, 2 physicists, 2 engineers, 1 instrument maker; technical personnel 5; additional personnel 4.

*Research activities:* Dyestuff research as related to pigments; intermediate products for dyestuffs; resin research; vehicle research; ink fabrication; printing ink application; study of materials allied to printing ink, paper, and the application methods of printing.

*Library:* 400 volumes.

**1321. Levey Laboratories, Harold A., 8127-33 Oleander St., New Orleans 18, La.**

*Research staff:* Harold A. Levey, Director. 3 chemists, 1 physicist, 1 biologist and bacteriologist, 1 engineer; 3 in other scientific professions; additional personnel 3.

*Research activities:* Cellulose technology; plastics; coating compositions; starch processing; sizing; adhesives; alcohol and organic solvent production; pulp and paper engineering and research; petroleum lubricant compounding; greases and special lubricants. (Research initiated 1927.)

**1322. Levitt, Benjamin, Consulting Chemist,**  
4834 North Franklin St., Philadelphia 20, Pa.

*Research staff:* Benjamin Levitt, Director.  
1 chemist; additional personnel 2.

*Research activities:* Soaps and detergents;  
cosmetics and toilet preparations; lacquers. (Re-  
search initiated 1944.)

*Research activities:* Fundamental and applied  
research in the field of plastics and synthetic  
resins; specifically, molding compositions, adhe-  
sives, and resins for the coating, laminating,  
foundry, textile, and paper industries. (Re-  
search initiated 1933.)

*Library:* 2,800 volumes.

**1323. Lewis and Company, J. P., Beaver Falls,**  
N. Y.

*President:* H. S. Lewis.

*Research staff:* 1 chemist; technical person-  
nel 2.

*Research activities:* The development of new  
products and new processes for the pulp, paper,  
and allied industries. (Research initiated 1930.)

*Cooperative research:* One grant for research  
is made.

**1326. Librascope, Inc., 133 East Santa Anita**  
Ave., Burbank, Calif.

*President:* H. Griffin.

*Research staff:* R. I. Case, Chief Research  
Engineer; Benton Hall Schaub, Physicist. 2  
physicists, 8 engineers; additional personnel 2.

*Research activities:* The design of comput-  
ing mechanisms and automatic controlling de-  
vices; precision manufacture. (Research initi-  
ated 1939.)

**1324. Lewis Company, 232 Canal St., New**  
York, N. Y.

*Proprietor:* Charles H. Lewis.

*Laboratory:* 798 Ocean Parkway, Brooklyn,  
N. Y.

*Research staff:* Charles H. Lewis, Director.  
2 chemists; technical personnel 2; additional  
personnel 2.

*Research activities:* Plastics, ceramics, or-  
ganic chemicals, and synthetic aromatic chem-  
icals. (Research initiated 1910.)

*Library:* 200 volumes.

**1327. Liddell, Donald M., 33 Rector St., New**  
York, N. Y.

*Laboratory:* 961 Frelinghuysen Ave., New-  
ark, N. J.

*Research staff:* Donald M. Liddell, Director.

*Research activities:* Pressure and steam dis-  
tillations of oil shales or any bituminous or oily  
products; the study of petroleum products and  
cements and stucco. (Research initiated 1919.)

**Lewis Foundry and Machine Division, Blaw-**  
Knox Company. See Blaw-Knox Company.

**1325. Libbey-Owens-Ford Glass Company, Ni-**  
cholas Bldg., Toledo 3, Ohio.

*President:* John D. Biggers.

*Laboratory:* 1701 East Broadway, Toledo  
5, Ohio.

*Research staff:* David H. Goodwillie, Execu-  
tive Vice President in charge of research;  
George B. Watkins, Director; Joseph D. Ryan,  
Donald E. Sharp, Roy W. Wampler, Assistant  
Directors. 17 chemists, 4 physicists, 1 metallur-  
gist, 39 engineers; technical personnel 11; addi-  
tional personnel 20.

*Research activities:* Glass technology; plastics  
and engineering research in connection with  
glass manufacture. (Research initiated 1919.)

*Library:* 3,500 volumes.

*Cooperative research:* Two grants for re-  
search are made.

**1328. Lilly and Company, Eli, Indianapolis, Ind.**

*President:* Eli Lilly.

*Research staff:* A. H. Fiske, Vice President  
in charge of research and control; H. W. Rhode-  
hamel, Director, research development; J. P.  
Scott, Director, research contacts; W. A.  
Jamieson, Director, Biological Division; R. M.  
Rice, Director, Medical Division; W. J. Rice,  
Director, Control Division. 89 chemists, 14  
biologists and bacteriologists, 6 chemical engi-  
neers, 13 physicians, 13 pharmacologists, 2  
mycologists; technical personnel 72.

*Research activities:* The development of new  
therapeutic agents; the study of the mode of  
action of drugs from the physical, chemical,  
and physiological aspects. (Research initiated  
1910.)

**Lima Woolen Mills Company. See North Star**  
Woolen Mill Company.

**1329. Limoges China Company, Sebring, Ohio.**

*President:* J. Harrison Keller.

*Research staff:* Melvin S. Lund, Director. 1  
ceramic engineer; technical personnel 1.

*Research activities:* New body and glaze de-  
velopments; the investigation of new materials  
and methods in the manufacture of china. (Re-  
search initiated 1922.)

**PLASKON DIVISION**

2112 Sylvan Ave., Toledo 6, Ohio

*Research staff:* Arthur M. Howald, Tech-  
nical Director; William C. Dearing, Associate  
Director. 22 chemists, 1 physicist, 2 engineers;  
technical personnel 5; additional personnel 12.

- 1330. Limoneira Company, Santa Paula, Calif.**  
*President:* C. C. Teague.  
*Research staff:* Fred J. Foote, Chemist. 1 chemist; additional personnel 7.  
*Research activities:* Fertilization, irrigation, and general cultural practices in citriculture. (Research initiated 1923.)
- 1331. Lincoln, E. S., 501 Fifth Ave., New York 17, N. Y.**  
*Laboratory:* Scarsdale, N. Y.  
*Research staff:* 1 engineer.  
*Research activities:* General electricity and electrical equipment, appliances, and instruments. (Research initiated 1906.)
- 1332. Lincoln Electric Company, Coit and Kirby Aves., Cleveland, Ohio.**  
*President:* J. F. Lincoln.  
*Research staff:* J. F. Lincoln, Director; G. G. Landis, welding equipment and automatic welding; T. E. Jerabek, electrodes. 3 chemists, 5 metallurgists, 10 engineers; technical personnel 8; additional personnel 6.  
*Research activities:* The development of arc welding processes, equipment, and supplies.
- Linde Air Products Company. See Union Carbide and Carbon Corporation.**
- 1333. Lindsay Light and Chemical Company, 258 Ann St., West Chicago, Ill.**  
*President:* C. W. Lindsay III.  
*Research staff:* M. W. Eichelberger, General Manager; R. P. Hammond, Chief Chemist. 5 chemists, 2 engineers; technical personnel 4; additional personnel 2.  
*Research activities:* Rare earths.  
*Library:* 500 volumes.
- 1334. Line Material Company, South Milwaukee, Wis.**  
*President:* W. D. Kyle.  
*Research staff:* R. H. Earle, Chief Research Engineer. 1 chemist, 10 engineers, 1 metallurgist; technical personnel 3.  
*Research activities:* Equipment for electric power distribution, for voltages of 2400 and above; street lighting equipment; carrier current communication equipment. (Research initiated 1929.)  
*Cooperative research:* Four grants for research are made.
- 1335. Link Aviation Devices, Inc., Nowlan Road, Binghamton, N. Y.**  
*President:* E. A. Link, Jr.  
*Research staff:* E. A. Link, Jr., Director; Gunne Lowkrantz, Vice President; J. P. Poth, Manager, Development Engineering Division.  
8 engineers; technical personnel 25; additional personnel 6.  
*Research activities:* Aviation devices, particularly those concerned with blind flying and navigational training. (Research initiated 1936.)  
*Library:* 300 volumes.
- 1336. Lion Oil Refining Company, El Dorado, Ark.**  
*President:* T. H. Barton.  
*Research staff:* W. M. Carney, Chief Chemist. 8 chemists, 4 engineers; technical personnel 7; additional personnel 4.  
*Research activities:* Lubricating oils, asphalts, motor fuels, and lighter hydrocarbons. (Research initiated 1930.)  
*Library:* 250 volumes.  
*Cooperative research:* One grant for research is made.
- 1337. Lipton, Inc., Thomas J.; Continental Foods, Inc., 1500 Hudson St., Hoboken, N. J.**  
*President:* Robert B. Smallwood.  
*Research staff:* Stephen L. Galvin, Director; John H. Nair, Assistant Director; M. L. Anson, Director, chemical research. 9 chemists, 1 physicist, 2 biologists, 4 engineers, 5 home economists; technical personnel 8; additional personnel 6.  
*Research activities:* Dehydrated foods—methods and products; vegetable proteins and protein hydrolyzates; analytical methods for food; food packaging; carotenoids; vitamin estimation. (Research initiated 1941.)  
*Library:* 300 volumes.  
*Cooperative research:* One grant for research is made.
- 1338. Lithgow Company, James, 4657 East Sheila St., Los Angeles 22, Calif.**  
*President:* James Lithgow.  
*Research staff:* Doris Granicher, Director. 2 chemists, 1 metallurgist, 2 engineers, 1 physician; additional personnel 19.  
*Research activities:* Corrosion of metals; prevention of metallic contamination of critical products in the process of manufacturing. (Research initiated 1941.)
- 1339. Lithographic Technical Foundation, Inc., 131 East 39th St., New York 16, N. Y.**  
*President:* E. H. Wadewitz. *Executive Director:* W. E. Griswold.  
*Laboratory:* Glessner House, 1800 South Prairie Ave., Chicago 16, Ill.  
*Research staff:* Robert F. Reed, Director of research. 4 chemists, 1 metallurgist, 1 engineer; technical personnel 1; additional personnel 4.  
*Research activities:* Chemical, physical, and engineering research for the improvement of



materials, methods, and equipment for the lithographic industry. (Research initiated 1925.)

*Library:* 1,000 volumes.

*Cooperative research:* Two grants for research are made.

**1340. Littelfuse, Inc.,** 4757 Ravenswood Ave., Chicago 40, Ill.

*President:* E. V. Sundt.

*Research staff:* Frank A. Barta, Director. 1 physicist, 3 engineers.

*Research activities:* Circuit protection devices; indicating devices for electrical circuits; gaseous discharge tube products; measuring and testing devices for ultra-high radio frequency. (Research initiated 1928.)

*Library:* 250 volumes.

**1341. Litter Company, Inc.,** D. H., 242 West 55th St., New York 19, N. Y.

*President:* D. H. Litter.

*Research staff:* Chandler Withington III, and Elias Singer, Directors. 5 chemists, 3 assistant chemists; additional personnel 3.

*Research activities:* Developing and improving raw materials for protective coatings industry, i.e., resins, oils, emulsifiers, driers, processed calcium carbonate, etc. (Research initiated 1921.)

*Library:* 100 volumes.

**1342. Little, Inc.,** Arthur D., 30 Memorial Drive, Cambridge 42, Mass.

*President:* Earl P. Stevenson.

*Research staff:* Raymond Stevens, Thorne L. Wheeler, Roger C. Griffin, Vice Presidents in charge of research. 33 chemists, 7 physicists, 3 biologists, 2 metallurgists, 22 chemical engineers, 9 mechanical engineers, 1 physician, 2 pharmacologists, 3 patent technologists; technical personnel 13; additional personnel 44.

*Research activities:* Consulting industrial research, especially product and process development, based on chemistry, biochemistry, physics, and mechanical engineering. Direction of research is determined by the client's requirements and includes developmental opportunities in fields such as special foods, plastics, odor and flavor problems, pharmacology, ceramics, chemical syntheses, electronic design, and surface protection. Engineering work includes development and design of new types of equipment and apparatus. Pilot plant research and cooperation in initial production operations. Industrial surveys and technical counsel on financial and managerial problems. Technical assistance on patent matters. (Research initiated 1886.)

*Library:* 6,500 volumes.

*Cooperative research:* Several fellowships are supported.

*Scientific periodicals:* Industrial Bulletin. Vol. I, 1927.

**1343. Litton Engineering Laboratories,** P. O. Box 749, Redwood City, Calif.

*President:* Charles V. Litton.

*Research staff:* Charles V. Litton, Director; W. G. Wagener, Chief Engineer, vacuum tube development. 4 engineers; technical personnel 24; additional personnel 18.

*Research activities:* Vacuum tubes; high vacuum research; vacuum tube processing methods. (Research initiated 1932.)

*Library:* 500 volumes.

**1344. Loek Insulator Corporation,** P. O. Box 57, Baltimore 3, Md. (Subsidiary of General Electric Company.)

*President:* R. G. Bellezza.

*Laboratory:* South Charles and Cromwell Sts., Baltimore, Md.

*Research staff:* R. L. McCoy, Chief Design Engineer; C. G. Harman, Ceramic Research Engineer; H. A. Frey, Research and Development Engineer. 3 ceramic engineers; 1 electrical engineer, 1 mechanical engineer; technical personnel 3.

*Research activities:* The development and improvement of ceramic materials for insulators for power and radio work and for mechanical and chemical applications. Ceramic materials are developed to meet a variety of needs by the ceramic laboratory. Their properties and characteristics as applied to specific products are investigated in the high voltage and mechanical laboratories. (Research initiated 1920.)

**1345. Lockheed Aircraft Corporation,** Burbank, Calif.

*President:* Robert E. Gross.

*Research staff:* Hall L. Hibbard, Vice President and Chief Engineer; C. L. Johnson, Chief Research Engineer. *Engineering Research Division:* F. R. Shanley, Engineer; J. M. Gerschler, Director; Maurice Nelles, Staff Assistant; E. Simon, Chemical Engineer; B. A. Rose, Mechanical Engineer; F. W. Bowden, Electrical Engineer; E. H. Burkart, Metallurgical Engineer; V. B. Koriagin, Structural Engineer; H. Rempt, Special Electrical Engineer. *Aeronautical Research Division:* W. W. Beman, Engineer; P. A. Colman, Aerodynamics Engineer; E. O. Richter, Wind Tunnel Engineer; J. C. Duffendack, Engine Test Laboratory Manager; R. L. Thoren, Flight Test Division Engineer; N. C. Price, Engine Development Division Engineer. 12 chemists, 5 physicists, 3 biologists, 5 metallurgists, 289 engineers; technical personnel 230; additional personnel 108.

*Research activities:* Engineering, aerodynamic, engine, and manufacturing research. (Research initiated 1940.)

*Library:* 8,000 volumes.

**1346. Lockport Cotton Batting Company, Lockport, N. Y.**

*President:* Thomas D. Cole.

*Research staff:* R. R. Oliver, Director. 1 chemist, 1 engineer.

*Research activities:* The development of bleaching and fireproofing processes for cotton fibers; treatments to inhibit mold, mildew, and bacteria growths; heat resistance and transfer tests. (Research initiated 1931.)

*Library:* 200 volumes.

**1347. Lone Star Cement Corporation, 342 Madison Ave., New York, N. Y.**

*President:* R. A. Hummel.

*Laboratory:* Hudson, N. Y.

*Research staff:* Th. Avnsoe, Vice President in charge of research; M. A. Swayze, Director. 2 chemists, 1 engineer, 1 petrographer; additional personnel 3.

*Research activities:* Fundamental research on the constitution of portland cement; the manufacture of cement and its use in concrete.

**1348. Long Company, W. E., 155 North Clark St., Chicago 1, Ill.**

*President:* Lloyd R. Wolfe.

*Chairman of Board:* W. E. Long.

*Research staff:* L. W. Haas, Director. 10 chemists, 5 engineers; technical personnel 10; additional personnel 5.

*Research activities:* Baking; milk, sugar, and other foods, including flour and cereals. (Research initiated 1917.)

*Library:* 1,000 volumes.

**1349. Loomis Talc Corporation, W. H., 223 East Main St., Gouverneur, N. Y.**

*President:* A. P. Loomis.

Gouverneur, N. Y.

*Research staff:* Orton Smalley, Director. 1 chemist, 2 assistants.

*Research activities:* The testing of talc for fineness, color, and oil absorption; chemical analyses for shipments to the ceramic industry. (Research initiated 1921.)

Zanesville, Ohio

*Research staff:* Donald Hagar, Director. 1 ceramist.

*Research activities:* Ceramics. (Research initiated 1932.)

**1350. Los Angeles Chemical Company, 1960 Santa Fe Ave., Los Angeles, Calif.**

*President:* A. P. Hall.

*Laboratory:* 4525 Ardine St., South Gate, Calif.

*Research staff:* James J. Haprov, Vice President and Sales Manager; C. D. Wood, Secretary and Production Manager; F. C. Yokel, Director; M. H. Yardley, chemical research; J. E. Carisoza, entomological research. 6 chemists, 1 engineer, 4 entomologists.

*Research activities:* The methods of manufacture of various heavy chemicals from crude materials obtained in the West; research in new insecticides, detergents, and industrial chemicals. (Research initiated 1923.)

**1351. Los Angeles Soap Company, 617 East 1st St., Los Angeles, Calif.**

*President:* F. H. Merrill.

*Research staff:* F. H. Merrill, President and General Manager; P. C. Merrill, Assistant to President; H. C. Bennett, Chief Chemist. 4 chemists, 3 chemical engineers; 1 in another scientific profession; additional personnel 3.

*Research activities:* The development and improvement of soaps, alkaline detergents, perfumes, and fatty raw materials. (Research initiated 1898.)

**1352. Louisville Cement Company, 315 Guthrie St., Louisville 2, Ky.**

*President:* E. D. Hill.

*Laboratory:* Speed, Ind.

*Research staff:* Eugene J. Wechter, Director. 4 chemists.

*Research activities:* Improvements in the quality of cements, limes, and mortar materials; the development of new cements and materials for special purposes. (Research initiated 1915.)

*Library:* A library is maintained.

**1353. Lowe Brothers Company, 424 East 3rd St., Dayton 2, Ohio. (Affiliated with Sherwin-Williams Company.)**

*President:* D. A. Kohr.

*Research staff:* E. W. Fasig, General Superintendent and Technical Director; J. M. Purdy, Director. 6 chemists; technical personnel 6; additional personnel 11.

*Research activities:* The development of paints, varnishes, and lacquers for industrial, automotive, architectural, building, and decorative purposes; the study and development of synthetic resins; new methods for the modification and utilization of semidrying and drying oils; the consistency, flow, and leveling properties of paint products; the absorption and wetting properties of pigments. (Research initiated 1901.)

*Library:* 1,300 volumes.

**1354. Lowe Corporation, Joe, 601 West 26th St., New York 1, N. Y.**

*President:* Joe Lowe.

*Laboratories:* New York, N. Y.; Los Angeles, Calif.; San Antonio, Tex.

*Research staff:* Aaron Friedman, Director. 8 chemists, 2 bacteriologists; additional personnel 5.

*Research activities:* Bakery products; ice cream products; dehydration of eggs. (Research initiated 1925.)

*Library:* 150 volumes.

*Cooperative research:* Five grants for research are made.

**1355. Lowe Paper Company, Ridgefield, N. J.**

*President:* D. V. Lowe.

*Research staff:* R. M. Karapetoff Cobb, Director. 3 chemists, 1 engineer; additional personnel 2.

*Research activities:* Problems connected with the manufacture of clay-coated board, printing, moistureproof and greaseproof stock. (Research initiated 1926.)

**1356. Lubri-Zol Corporation, Cleveland 17, Ohio.**

*President:* Kent Smith.

*Research staff:* C. F. Prutton, Director; Kelvin Smith, Vice President in charge of research and development; T. W. Mastin, Director of chemical laboratory. 33 chemists; technical personnel 3; additional personnel 8.

*Research activities:* Lubricant addition agents. (Research initiated 1928.)

*Library:* 470 volumes.

**1357. Lucidol Corporation, 1740 Military Road, Buffalo 5, N. Y.**

*President:* M. F. Tiernan.

*Research staff:* F. Visser't Hooft, Vice President in charge of research. 6 chemists; technical personnel 5.

*Research activities:* Organic chemistry, especially organic peroxides and peroxide compounds, cereal chemistry, baking, bacteriology, and the bleaching and improving of flour, oils, and fats. (Research initiated 1926.)

**1358. Luft Company, Inc., George W., 34-12 Thirty-sixth Ave., Long Island City 1, N. Y.**

*President:* Constance Luft Huhn.

*Research staff:* Paul G. I. Lauffer, Director. 3 chemists; technical personnel 1.

*Research activities:* Problems related to the manufacture of cosmetics: emulsions, coloring materials, waxes in oils, essential oils, and aromatic chemicals. (Research initiated 1920.)

**1359. Lumen Bearing Company, 197 Lathrop St., Buffalo 12, N. Y.**

*President:* Noah F. Young.

*Research staff:* Christopher H. Bierbaum, Vice President and Consulting Engineer; H. Harold McKay, Chemist and Metallurgist in charge of physical testing laboratory; Joseph

J. Mayer, General Superintendent in charge of general specifications of alloys; Albert Teska, Laboratory Assistant. 2 chemists, 2 metallurgists, 1 engineer.

*Research activities:* The adaptation of alloys for specific and technical purposes; micro-character studies and the adapting of alloys to specific bearing purposes; corrosion effects of lubricants on bearing metals; foundry and furnace methods for economy and quality production. (Research initiated 1916.)

**1360. Lummus Company, 420 Lexington Ave., New York 17, N. Y.**

*President:* C. S. Reed.

*Laboratory:* East 3rd St. and Hobart Ave., Bayonne, N. J.

*Research staff:* W. J. Bloomer, Laboratory Manager; W. W. Kraft, Chief Process Engineer. 5 engineers; technical personnel 5; additional personnel 15.

*Research activities:* Petroleum refining process research and development. (Research initiated 1931.)

*Library:* 150 volumes.

**1361. Lund Laboratories, 415 Lexington Ave., New York 17, N. Y.**

*Proprietor:* A. A. Lund.

*Laboratory:* Kinderhook, N. Y.

*Research staff:* A. A. Lund, Director. 1 physico-chemist; additional personnel as needed.

*Research activities:* Syrup sugars and substitutes; seaplant extractives (manufacture and use); sharp freezing of fruits, etc.; nutritional enrichment of foods; colloidal disintegration; patent development. (Research initiated 1928.)

*Library:* 3,000 volumes.

**1362. Lunkenheimer Company, P. O. Box 360, Annex Station, Cincinnati 14, Ohio.**

*President:* Frank P. Rhame.

*Research staff:* John W. Bolton, Director. 2 chemists, 4 metallurgists, 2 engineers; additional personnel 9.

*Research activities:* The development of alloys for high temperature, high pressure, and corrosive service; studies of elevated temperature properties; methods for development of improved castings, etc. (Research initiated 1902.)

*Library:* 520 volumes.

**1363. Lyon Metal Products, Inc., Aurora, Ill.**

*President:* E. D. Power.

*Research staff:* Frederick Z. Pearson, Manager of Plastics Division. 1 chemist, 2 engineers; technical personnel 2.

*Research activities:* Structural plastics for large moldings. (Research initiated 1944.)

1364. M and R Dietetic Laboratories, Inc., 585 Cleveland Ave., Columbus 16, Ohio.

*President:* S. M. Ross.

*Research staff:* O. F. Garrett, Supervisor of research; R. M. Ross, Chairman of Research Committee. 9 chemists; technical personnel 1; additional personnel 3.

*Research activities:* Infant food; dehydrated and concentrated dairy products; other specialized dairy foods. (Research initiated 1925.)

*Library:* 1,975 volumes.

*Cooperative research:* Two grants for research are made.

1365. Maas and Waldstein Company, 438 Riverside Ave., Newark 4, N. J.

*President:* M. A. Maas.

*Research staff:* G. Klinkenstein, Director. 9 chemists, 2 engineers; technical personnel 8.

*Research activities:* The development of finishing materials for application to metal, wood, composition and leather; research in synthetic resins, plasticizers, and other film-forming materials; new methods and finishes. (Research initiated 1876.)

*Library:* 250 volumes.

1366. Maas Chemical Company, A. R., 4570 Ardine St., South Gate, Calif.

*President:* Arthur R. Maas.

*Research staff:* F. C. Bowman, Director; W. M. Ramsey, Chief Chemist. 4 chemists, 2 engineers, 1 pharmacist; technical personnel 2; additional personnel 2.

*Research activities:* Inorganic phosphorus and sulfur compounds; photographic chemicals; market and raw material development studies. (Research initiated 1929.)

*Library:* 2,500 volumes.

1367. MacAllister Laboratory, 9213 Wade Park Ave., Cleveland 6, Ohio.

*President:* Wallace K. MacAllister.

*Research staff:* Wallace K. MacAllister and John D. MacAllister, Directors; Irene B. MacAllister. 2 chemists, 1 physician; additional personnel 3.

*Research activities:* Pharmaceutical and bacteriological research. (Research initiated 1934.)

1368. MacAndrews and Forbes Company, 3rd and Jefferson Sts., Camden, N. J.

*President:* W. E. Ransom.

*Research staff:* Percy A. Houseman, Chief Chemist; Clement K. Swift; Bertrand Schneeberg; Albert M. Spiegel. 4 chemists; technical personnel 4; additional personnel 1.

*Research activities:* Constituents of licorice root and extract; fire extinguishing compounds; insulating board and insulation. (Research initiated 1902.)

1369. McCloskey Varnish Company, 7600 State Road, Philadelphia 36, Pa.

*President:* William H. Jarden, Jr.

*Laboratories:* Philadelphia, Pa.; 5501 East Slauson Ave., Los Angeles, Calif.

*Research staff:* Joseph O. Olson, Director; M. J. Bonham, Assistant Technical Director. 7 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Alkyd resins; varnishes and other protective coatings. (Research initiated 1921.)

1370. McCormick and Company, Inc., Light and Barre Sts., Baltimore 2, Md.

*President:* Charles P. McCormick.

*Research staff:* Walter Kuhl, Director. 5 chemists.

*Research activities:* Spices; flavoring extracts; mayonnaise salad dressing; other food and drug products.

#### ENTOMOLOGICAL AND BACTERIOLOGICAL RESEARCH LABORATORY

*Research staff:* A. E. Badertscher, Director. 4 assistants.

*Research activities:* Insecticides; pyrethrum; rotenone and derris derivatives; dichlorodiphenyl trichlorethane (DDT).

*Cooperative research:* Fellowships are maintained and grants for research are made.

McDonald and Company Works, D., American Meter Company. See American Meter Company, Inc.

1371. McFarland Company, J. Horace, Crescent and Mulberry Sts., Harrisburg, Pa.

*President:* J. Horace McFarland.

*Laboratory:* Breeze Hill Gardens, 2101 Bellevue Road, Harrisburg, Pa.

*Research staff:* J. Horace McFarland, Director; Margaret Ruth Snyder, Horticulturist; Kenneth Drayer, Photographer. 3 garden workers; additional personnel 2.

*Research activities:* Seeds and plants from various parts of the world are tested for adaptability in horticultural commerce and landscape value at Breeze Hill Gardens; extended testing of roses, perennials, annuals, biennials, and shrubs. (Research initiated 1915.)

*Scientific periodicals:* Breeze Hill News. Irregular.

1372. McGean Chemical Company, 1106 Republic Bldg., Cleveland 15, Ohio.

*President:* J. A. McGean.

*Laboratory:* 2910 Harvard Ave., Cleveland, Ohio.

- Research staff:* V. H. Waite, Director. 11 in scientific professions; additional personnel 2.
- Research activities:* The commercial application of chemicals manufactured by the company, and the development of new chemicals. (Research initiated 1930.)
1373. McGraw Colorgraph Company, 175 West Verdugo Ave., Burbank, Calif.
- Research staff:* R. F. McGraw, Manager. 2 chemists, 1 chemical engineer; technical personnel 2; additional personnel 5.
- Research activities:* Research in perfecting the tri-color carbonyl process.
1374. Machlett Laboratories, Inc., 1063 Hope St., Springfield, Conn.
- President:* R. R. Machlett.
- Research staff:* T. H. Rogers, Manager of engineering. 1 chemist, 2 physicists, 2 metallurgists, 10 engineers; technical personnel 30; additional personnel 30.
- Research activities:* Electronic tubes; electronics; X-ray tubes; X-ray physics. (Research initiated 1934.)
- Library:* 2,000 volumes.
- Scientific periodicals:* Cathode Press. Vol. I, 1943.
1375. Mack Manufacturing Corporation, Empire State Building, New York 1, N. Y.
- President:* C. T. Ruhf.
- Laboratories:* Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.
- Research staff:* W. M. Walworth, Acting Chief Engineer in charge of research; L. E. Burgess, Director; C. A. Scharfenberg, Allentown; K. D. Bull, New Brunswick; A. T. Stahl, Plainfield. 5 chemists, 1 physicist, 3 metallurgists, 29 engineers; technical personnel 35; additional personnel 8.
- Research activities:* Improvement in automotive truck design, production, and operation. Facilities include provision for study in fields of metallurgy, chemistry, electricity, physics, and mechanics. (Research initiated 1916.)
1376. Mackay, A. D., 198 Broadway, New York 7, N. Y.
- Owner:* A. D. Mackay.
- Laboratories:* Durham, N. H.; Lansdale, Pa.; Woodbridge, N. J.; Wilmington, Del.; Cleveland, Ohio.
- Research staff:* 7 chemists, 3 metallurgists; technical personnel 3; additional personnel 4.
- Research activities:* The extraction of rare elements from their raw sources, for example: beryllium, boron, cesium, columbium, gadolinium, gallium, germanium, hafnium, indium, rhenium, rubidium, scandium, tantalum, uranium, ytterbium, and zirconium; rare earth metals and salts, organic acids, sugars, vitamins, azides, borides, carbides, and silicides; luminescent and fluorescent materials; optical and radio crystals. (Research initiated 1915.)
1377. McKesson and Robbins, Inc., Grasmere Ave., Bridgeport 9, Conn.
- President:* W. J. Murray, Jr.
- Research staff:* A. L. Omohundro, Vice President and Director of plant and laboratories; F. Neumeier, Director. 12 chemists, 1 biologist and bacteriologist, 1 physician, 1 pharmacologist; additional personnel 5.
- Research activities:* Pharmaceutical and medicinal compounds including research in organic chemistry, physiology, bacteriology, pharmacology, nutrition (vitamins), and general chemistry. (Research initiated 1928.)
1378. Mackintosh Hemphill Company, 901 Bingham St., Pittsburgh, Pa.
- President:* J. S. Ervin.
- Laboratories:* Midland and Pittsburgh, Pa.
- Research staff:* Fred C. T. Daniels, Director. T. A. Pattison, Pittsburgh; L. R. Brown, Midland. 6 chemists, 4 metallurgists, 10 engineers.
- Research activities:* The manufacture of iron and steel and their alloys; heat-treatments; casting processes; sand control. (Research initiated 1898.)
1379. Macklin Company, Jackson, Mich.
- President:* T. J. McIntyre.
- Research staff:* W. V. Blake, Director; R. O. Lane, Ceramic Engineer. 2 chemists, 2 engineers.
- Research activities:* The development of high tensile strength glasses and resins for use in the manufacture of grinding wheels. (Research initiated 1931.)
1380. McLaughlin Gormley King Company, 1715 Fifth St., S. E., Minneapolis, Minn.
- President:* C. B. Gnadinger.
- Research staff:* C. B. Gnadinger, Director. 8 chemists; technical personnel 1.
- Research activities:* Foods and insecticides, including the development of the source of supply of pyrethrum flowers in the United States. (Research initiated 1923.)
- McMullen Experimental Station, Richard Cann.  
*See* Allied Kid Company.
1381. McNeil Laboratories, Inc., 2900 North 17th St., Philadelphia 32, Pa.
- President:* Robert Lincoln McNeil.
- Research staff:* Robert L. McNeil, Jr., Director. 10 chemists, 2 physicians, 2 bacteriolo-

gists; technical personnel 1; additional personnel 2.

*Research activities:* The development of new and improved pharmaceuticals and medicinal chemicals. (Research initiated 1921.)

*Scientific periodicals:* McNeil-O-Gram. Vol. I, 1927.

*Cooperative research:* One fellowship is supported and six grants for research are made.

**1382. Macwhyte Company, Kenosha, Wis.**

*President:* Jessel S. Whyte.

*Research staff:* W. R. Bloxdorf, Director. 1 chemist, 1 physicist, 2 metallurgists, 3 engineers; additional personnel 2.

*Research activities:* Metallurgical research on the fatigue of wire and wire rope; heat-treatment of airplane tie rod terminals; application of cold-drawn metals and alloys. (Research initiated 1928.)

**1383. Macy and Company, Inc., R. H., Herald Square, New York 1, N. Y.**

*President:* Jack I. Straus.

*Laboratories:* Drug and Cosmetic and Food Manufacturing Development and Control Laboratories, Long Island Warehouse, 47-44 Thirty-first St., Long Island City, N. Y.; Macy's Bureau of Standards, Herald Square, New York, N. Y.

*Research staff:* Ephraim Freedman, Director; A. M. Moos, Chief Chemist, Development and Control Laboratories. 18 chemists, 4 engineers, 5 textile technologists; technical personnel 11; additional personnel 6.

*Research activities:* Adaptability, performance, durability, and care of consumer goods, e.g., textiles, home furnishings, drugs, cosmetics, foods, and plastics. (Research initiated 1902.)

*Library:* 900 volumes.

**1384. Magnaflux Corporation, 5900 Northwest Highway, Chicago 31, Ill.**

*President:* F. B. Doane.

*Research staff:* C. E. Betz, First Vice President and Technical Director; J. E. Clarke, Second Vice President and Director of research; Taber deForest, in charge of new development research; R. J. Kerr, Chief Chemist. 10 chemists and metallurgists, 30 engineers.

*Research activities:* Magnetic particle inspection; brittle coatings as strain indicators; improved magnetic pastes and powders; electronic locators. (Research initiated 1931.)

**1385. Magnavox Company, 2131 Bueter Road, Fort Wayne 4, Ind.**

*President:* R. A. O'Connor.

*Research staff:* J. West, Jr., capacitor research; C. E. Hoekstra, loudspeaker research; J. C. Koonz, special devices research; R. H.

Dreisbach, radio research. 7 chemists, 2 physicists, 15 engineers; technical personnel 17; additional personnel 26.

*Research activities:* Electrolytic capacitors; the development of improved capacitors; loudspeaker performance and the improvement of design. (Research initiated 1935.)

*Library:* 500 volumes.

**1386. Magnetic Analysis Corporation, 42-44 Twelfth St., Long Island City 1, N. Y.**

*President:* William S. Gould, Jr.

*Research staff:* Theodore Zuschlag, Director. 4 electrical engineers, 5 field engineers.

*Research activities:* The development of magnetic analysis equipment for the inspection of steel; equipment for demagnetizing steel; magnetic analysis comparators for sorting ferrous products. (Research initiated 1927.)

*Library:* A library is maintained.

**1387. Magnolia Petroleum Company, Box 900, Dallas 1, Tex. (Subsidiary of Socony Vacuum Oil Company, Inc.)**

*President:* D. A. Little.

*Laboratory:* Field Research Department, Old Duncanville Road, Dallas County, Tex.

*Research staff:* Armand J. Abrams, Director; H. D. Sims, Assistant Manager and Chief of Service Section; Section Chiefs: M. H. Gorin, Chemical Research; S. A. Johnson, Patent; G. E. Kidd, Design; J. P. Minton, Physics Research; W. Swerdloff, (acting chief) Development. H. A. W. Kidd and C. S. Kuhn, Jr., Assistants to the Director. 89 chemists, 15 physicists, 1 metallurgist, 37 engineers, 4 patent attorneys and agents; additional personnel 152.

*Research activities:* The utilization of natural gas and other raw materials available in the petroleum industry; petroleum prospecting methods; production research. (Research initiated 1938.)

*Library:* 6,000 volumes.

**1388. Magnus Chemical Company, Garwood, N. J.**

*President:* W. M. Campbell.

*Research staff:* R. W. Mitchell, Director. 2 chemists, 1 biologist and bacteriologist.

*Research activities:* Soap, industrial cleaning, lubrication for metal forming, drawing, burnishing, and wetting agents. (Research initiated 1928.)

**1389. Makalot Corporation, 262 Washington St., Boston, Mass.**

*President:* M. M. Makeever.

*Laboratory:* Waltham, Mass.

*Research staff:* V. B. Palmgren, Director; Wm. D. Cochrane; E. B. Funke. 7 chemists, 1 physicist, 2 engineers.

*Research activities:* Phenolformaldehyde resins, oil soluble alkyd, modified alkyd, and oil soluble resins and urea varnishes. (Research initiated 1933.)

**1390. Mallinckrodt Chemical Works, 3600 North 2nd St., St. Louis 7, Mo.**

*President:* A. C. Boylston.

*Research staff:* H. V. Farr, Vice President in charge of research; V. H. Wallingford, Director of organic research. 65 chemists, 15 engineers; technical personnel 47; additional personnel 10.

*Research activities:* The development of new articles and new uses of present articles of manufacture; improvement in the efficiency and the control of processes in the manufacture of fine chemicals for medicinal, photographic, analytical reagent, and industrial purposes. (Research initiated 1867.)

*Library:* 4,500 volumes.

**1391. Mallory and Company, Inc., P. R., 3029 East Washington St., Indianapolis 6, Ind.**

*President:* P. R. Mallory.

*Research staff:* Leon Robbin, Vice President in charge of engineering; G. W. Carpenter, Administrative Engineer; F. R. Hensel, Chief Metallurgical Engineer; E. E. Schwarzenbach, Chief Electrical Engineer; H. R. Mallory, Manager of new products engineering; H. R. Rhodes, Chief Engineer of Battery Division; Carl Sleight, Chief Bearing Engineer. 16 chemists, 4 physicists, 9 metallurgists, 36 engineers; technical personnel 46; additional personnel 45.

*Research activities:* The development of the products of the company, including the study of problems in metallurgy, electrical equipment, electrical welding, electrical contacts, resistance materials, electrolytic condensers, radio parts, dry batteries, and bearings. (Research initiated 1929.)

*Library:* Several thousand volumes.

**1392. Maltine Company, 745 Fifth Ave., New York 22, N. Y.**

*President:* James C. Chilcott.

*Laboratory:* 436 Eighteenth St., Brooklyn 15, N. Y.

*Research staff:* E. R. Janes, Vice President in charge of research; R. S. Overman, Assistant Director. 9 chemists, 5 biologists, 1 engineer; technical personnel 9; additional personnel 3.

*Research activities:* Vitamins, endocrinology, general pharmacology, and organic synthesis. (Research initiated 1930.)

*Library:* 1,000 volumes.

**1393. Mann and Company, Leo; Rose-Derry Company, 15 Kingston St., Boston 11, Mass.**

*President* (Rose-Derry Company): Edward Rose.

*Research staff:* Leo Mann, Director of Chemical Division. 2 chemists.

*Research activities:* Textile fibers and fabrics combined with other materials; chemical heat reaction mixtures; odorants and deodorants. (Research initiated 1936.)

**1394. Manning Paper Company, Inc., John A., Troy, N. Y.**

*President:* James F. Adams.

*Laboratories:* Green Island and Troy, N. Y.

*Research staff:* Charles E. Lanyon, Director. 5 chemists, 2 engineers; technical personnel 3; additional personnel 2.

*Research activities:* The investigation of the nature and process reactions of papermaking raw material; process procedure looking toward the improvement of the product; development of types of rope manila and other specialty papers for new uses; improvement of the electrical properties of insulating papers and boards; investigation of new fibrous materials, both organic and inorganic, for papermaking possibilities; development of treated specialty papers. (Research initiated 1915.)

*Library:* 500 volumes.

**1395. Mantell, C. L., 601 West 26th St., New York 1, N. Y.**

*Research staff:* C. L. Mantell, Director. 2 chemists, 1 physicist, 3 metallurgists, 3 chemical engineers, 3 engineers; additional personnel 3.

*Research activities:* Industrial research in nonferrous metallurgy, electrochemical engineering, corrosion, activated carbon, and adsorbents. No testing work is carried on. (Research initiated 1924.)

*Library:* 3,000 volumes.

**1396. Manufacturers Research Laboratories, Inc., Room 905, 507 Fifth Ave., New York 17, N. Y.**

*President:* James E. Prescott.

*Laboratory:* 322 Fifth St., Jersey City 2, N. J.

*Research staff:* J. J. Press, Director of textile research; I. Nadel, Director of food, cosmetic, and aromatic chemicals research; James E. Prescott, Engineer. 4 chemists, 2 engineers; technical personnel 10; additional personnel 4.

*Research activities:* Textiles; synthetic fibers; foods; cosmetics; aromatic chemicals. (Research initiated 1945.)

*Library:* 200 volumes.

**1397. Marathon Corporation, Rothschild, Wis.**

*President:* D. C. Everest.

*Laboratories:* Rothschild and Menasha, Wis.

*Research staff:* Allen Abrams, Vice President in charge of research and development; *Rothschild, Wis.:* G. J. Brabender, Director of

pulp and paper laboratory; J. R. Salvesen, Director of chemical division laboratory; *Menasha, Wis.*: D. W. Davis, Director of converted products laboratory; W. H. Graebner, Director of technical service laboratory. 22 chemists and chemical engineers, 1 bacteriologist, 30 assistants, 18 control testers; additional personnel 13.

*Research activities*: The development of new packaging materials, methods, and types of packages; experimental laminating, coating and printing; thermoplastic compositions; lignin products from waste sulfite liquor; experimental sulfate and sulfite pulping and multistage bleaching. (Research initiated 1926.)

*Library*: Rothschild: 1,450 volumes. *Menasha*: 500 volumes.

*Cooperative research*: One fellowship is supported.

1398. **Marlette Corporation**, 37-21 Thirtieth St., Long Island City 1, N. Y.

*President*: Herbert C. Kranzer.

*Research staff*: Max Hilrich, Director. 1 chemist, 1 engineer; technical personnel 1; additional personnel 1.

*Research activities*: Phenolic resins. (Research initiated 1929.)

*Library*: 125 volumes.

1399. **Marbon Corporation**, 1926 West 10th Ave, Gary, Ind. (Subsidiary of Borg-Warner Corporation.)

*President*: G. P. F. Smith.

*Research staff*: W. C. Calvert, Director; A. G. Susie, Chief Chemist. 8 chemists, 2 engineers; technical personnel 8; additional personnel 3.

*Research activities*: Thermoplastic resins; rubber-to-metal adhesives; copolymers. (Research initiated 1934.)

*Library*: 300 volumes.

**Marietta-Harmon Chemicals, Inc.**, Marietta Branch Division. See American Home Products.

1400. **Marine Magnesium Products Corporation**, East Grand Ave., South San Francisco, Calif.

*President*: R. E. Clarke.

*Research staff*: G. H. Gloss, Director. 3 chemists; technical personnel 2.

*Research activities*: Recovery of pure grades of magnesia from dolomite, magnesite, and sea water; the development of new magnesium products. (Research initiated 1928.)

*Library*: 120 volumes.

*Cooperative research*: One fellowship is supported.

1401. **Marlin-Rockwell Corporation**, 402 Chandler St., Jamestown, N. Y.

*President*: A. C. Davis.

*Research staff*: W. B. Haag, Chief Metallurgist. 2 chemists, 2 metallurgists, 1 engineer; technical personnel 4; additional personnel 13.

*Research activities*: Metallurgical research problems of alloy steels; mechanical testing for load rating investigations; research into lubrication problems. (Research initiated 1926.)

1402. **Marschall Dairy Laboratory, Inc.**, 14 Proudfit St., Madison 3, Wis.

*President*: Arthur T. Benner.

*Research staff*: B. A. Stein, Director; Philip Koch. 3 chemists; technical personnel 1.

*Research activities*: Rennet and annatto products. (Research initiated 1907.)

*Library*: 150 volumes.

*Cooperative research*: Occasional fellowships are supported.

**Marshall-Eclipse Division**, Bendix Aviation Corporation. See Bendix Aviation Corporation.

**Marshall Field and Company**. See Field and Company, Marshall.

1403. **Marshalltown Manufacturing Company**, Marshalltown, Iowa.

*President*: J. M. Considine.

*Research staff*: C. O. Sloan, Research Engineer. 1 engineer, 1 product technician.

*Research activities*: Metals used and the stresses set up in making Bourdon tubes, and the motion derived from end of tube; bimetal thermometer design and vapor tension; heat transfer in metals and liquids. (Research initiated 1945.)

1404. **Martin Company**, Glenn L., Baltimore 3, Md.

*President*: Glenn L. Martin.

*Laboratory*: Engineering Department, Middle River, Md.

*Research staff*: Guy L. Bryan, Jr., Chief Designer; Roger Ward, Chief of laboratories. 28 chemists, 7 metallurgists, 41 engineers; technical personnel 17; additional personnel 98.

*Research activities*: The development of improved materials and processes for aircraft; synthetics and plastics. (Research initiated 1919.)

*Library*: 750 volumes.

*Cooperative research*: One grant for research is made.



**PLASTICS RESEARCH LABORATORY**

Industrial Bldg., Preston and Greenmount Sts.,  
Baltimore 3, Md.

*Research staff:* Clayton F. Ruebensaal, Technical Director; Robert H. Kittner, Manager. 20 chemists, 10 chemical engineers; technical personnel 16; additional personnel 12.

*Research staff:* Basic research in polymerization; development work on thermoplastic resins; special research projects for parent aircraft company. (Research initiated 1942.)

*Library:* 350 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**1405. Martin Laboratories, 110 South Yale, Albuquerque, N. Mex.**

*Owner-director:* Guy V. Martin.

*Research staff:* G. R. Griswold, Director of research. 1 chemist, 2 metallurgists, 1 engineer; technical personnel 2; additional personnel 1.

*Research activities:* The conception, design, and development of precision instruments in the fields of spectroscopy, meteorology, hydrology, and metallurgy. (Research initiated 1933.)

*Library:* 300 volumes.

**1406. Masland and Sons, C. H., Carlisle, Pa.**

*President:* F. E. Masland, Jr.

*Research staff:* C. H. Masland II, Director. 3 chemists, 5 chemical engineers; technical personnel 3; additional personnel 2.

*Research activities:* The influence of scouring, dyeing, and other processes on the strength and resilience of wool; electrodeposition of copper at high-current densities; the use of rubber latex in textiles. (Research initiated 1918.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported.

**1407. Masonite Corporation, Laurel, Miss.**

*President:* M. P. McCullough

*Research staff:* Robert M. Boehm, Director. 10 chemists, 2 physicists, 1 biologist, 5 engineers; technical personnel 12; additional personnel 6.

*Research activities:* Wood chemistry; lignocellulose fiber research; research on structural board products. (Research initiated 1929.)

*Library:* 525 volumes.

*Cooperative research:* One fellowship is supported.

**1408. Master Builders Company, 7016 Euclid Ave., Cleveland 3, Ohio.**

*President:* S. W. Flesheim.

*Laboratory:* 6511 Morgan Ave., Cleveland 4, Ohio.

*Research staff:* E. W. Scripture, Jr., Director.

2 chemists, 2 chemical engineers; additional personnel 2.

*Research activities:* The improvement and maintenance of concrete and allied problems; development of floor hardeners, waterproofing materials, cement plasticizers, etc.; dispersion and wetting agents; lignin chemistry; grinding studies. (Research initiated 1910.)

*Library:* 160 volumes.

*Cooperative research:* One fellowship is supported.

**1409. Mathews Conveyer Company, Ellwood City, Pa.**

*President:* F. E. Moore.

*Research staff:* M. J. Anderson, Chief Engineer. 1 engineer; technical personnel 1.

*Research activities:* The design of new products and the study of new applications; the compilation of information for the engineering and sales departments; standards for the engineering and shop departments; experiments and tests on conveyers, chutes, elevators, etc.

**1410. Mathieson Alkali Works, Inc., 60 East 42nd St., New York 17, N. Y.**

*President:* George W. Dolan.

*Laboratory:* Niagara Falls, N. Y.

*Research staff:* G. P. Vincent, Technical Director; M. C. Taylor, Resident Director of research and development; R. E. Gage, Technical Adviser.

*Research activities:* New chemical products and improved processes of chemical manufacture. (Research initiated 1920.)

*Library:* A library is maintained.

**1411. Matthiessen and Hegeler Zinc Company, La Salle, Ill.**

*President:* Robert McClurkin.

*Research staff:* H. D. Carus, Vice President in charge of research.

*Research activities:* Improvement of the zinc distillation process, the manufacture of rolled zinc alloys, and the recovery of zinc. (Research initiated 1917.)

*Library:* 250 volumes.

**1412. Maxim Silencer Company, 85 Homestead Ave., Hartford 5, Conn.**

*President:* Hiram Hamilton Maxim.

*Research staff:* Roland B. Bourne, Vice President and Director. 1 physicist, 4 engineers; additional personnel 2.

*Research activities:* Industrial noises associated with pipes, conduits, etc.; aircraft noise; general sound research; engine exhaust oscillations. (Research initiated 1922.)

**Maxwell House Division, General Foods Corporation. See General Foods Corporation.**

1413. **May, Inc., Otto B.**, 198 Niagara St., Newark 5, N. J.

*President:* Otto B. May.

*Research staff:* E. M. May, Director. 4 chemists; technical personnel 2.

*Research activities:* Dyestuffs. (Research initiated 1923.)

*Library:* 800 volumes.

1414. **May McEwen Kaiser Company**, Main St., Burlington, N. C.

*President:* J. H. McEwen.

*Laboratories:* Testing Laboratory, Burlington, N. C.; Nylon Size Control Laboratory, Grabur Silk Mills, Graham, N. C.

*Research staff:* M. N. Holmes, Director. 1 textile technician; technical personnel 3; additional personnel 2.

*Research activities:* Improvement in the control of nylon yarns in the various phases of hosiery manufacture, particularly the sizing of yarn; the development of new devices and methods for testing the wear and resiliency of fibers, yarns, and knitted fabrics; the application of electronics to hosiery manufacture.

*Library:* 200 volumes.

*Cooperative research:* Two grants for research are made.

1415. **Maynard, Poole**, 26 Cain St., N. W., Atlanta, Ga.

*Research staff:* Poole Maynard, Geologist and Technologist.

*Research activities:* Research on raw materials and commercial processing; beneficiation of nonmetallic ores; activation of clays; refining of kaolins, bauxites, fuller's earth, bentonites, talcs, feldspars; research in refractories, fillers for textiles, ceramic products, potash, sand, brick products, phosphates, etc. (Research initiated 1912.)

1416. **Maytag Company**, Newton, Iowa.

*President:* Fred L. Maytag II.

*Research staff:* Thomas R. Smith, Director of research and development. 2 chemists, 6 engineers; technical personnel 10; additional personnel 4.

*Research activities:* The development of new products, including washing machines, ironers, driers, refrigerators, and other allied products; chemical research in the utilization of farm products; miscellaneous product development. (Research initiated 1929.)

*Library:* 425 volumes.

1417. **Mead Corporation**, Chillicothe, Ohio.

*President:* Sydney Ferguson.

*Research staff:* Russell H. Savage, Technical Director. 7 chemists, 2 physicists, 2 mechanical

engineers, 5 chemical engineers, 1 colloid chemist, 1 librarian, 1 assistant librarian; junior technical personnel 15; additional personnel 3.

*Research activities:* Problems relating to research and development on pulp and paper; improvement of present processes and products and the development of new products; research and development work on board. (Research initiated 1846.)

*Library:* 1,500 volumes.

#### DILL AND COLLINS DIVISION

Richmond and Tioga Sts., Philadelphia 34, Pa.

*Research staff:* John D. Davis, Technical Director. 1 chemist; technical personnel 2; additional personnel 2.

*Research activities:* Paper and surface coated papers. (Research initiated 1919.)

*Library:* 100 volumes.

1418. **Mead Johnson and Company**, Evansville 21, Ind.

*President:* L. D. Johnson.

*Research staff:* Charles E. Bills, Director; Francis G. McDonald, Assistant Director; Warren M. Cox, Jr., Director of Nutritional Research Laboratory; Nathan F. True, Administrator. 22 chemists, 3 bacteriologists; technical personnel 21; additional-personnel 17.

*Research activities:* Major work of both laboratories is in the field of nutrition, with specialization in vitamins, infant foods, parenteral alimentation; minor activities in organic chemistry, especially sulfonamides, and in analytical and assay technics. (Research initiated 1925.)

*Library:* 9,600 volumes.

*Cooperative research:* Twenty grants for research are made.

1419. **Mead Distilling Company, David**, 240 Race St., Meadville, Pa.

*Partner:* Marshall S. Leff.

*Research staff:* James D. Gregory, Director. 1 chemist; technical personnel 2; additional personnel 1.

*Research activities:* The production of alcohol and its by-products. (Research initiated 1943.)

1420. **Measurements Corporation**, Monroe St., Boonton, N. J.

*President:* Harry W. Houck.

*Laboratory:* Intervale Road, Boonton, N. J.

*Research staff:* John van Beuren, Director. 6 engineers, 1 physicist.

*Research activities:* Physical measurements; electronic measurements (microwaves); dielectrics; conductors. (Research initiated 1939.)

*Library:* 300 volumes.

**1421. Medical Arts Laboratory, Medical Arts Bldg., Jenkintown, Pa.**

*President:* J. Cecil Rhodes.

*Research staff:* J. Cecil Rhodes, Director. 2 chemists, 3 biologists and bacteriologists; additional personnel 4.

*Research activities:* Pharmaceuticals; dispersions and emulsions; detergents; tuberculosis research. (Research initiated 1929.)

**1422. Medusa Portland Cement Company, 1000 Midland Bldg., Cleveland, Ohio.**

*President:* J. B. John.

*Laboratory:* Wampum, Pa.

*Research staff:* Harry L. Vanderwerp, Chief Chemist; G. M. Jarrett, Research Chemist. 2 chemists.

*Research activities:* The development of new products; problems connected with the production of portland cement; problems from the field. (Research initiated 1930.)

**1423. Melbourne Engineering Corporation, Melbourne, Fla.**

*President:* L. R. Culver.

*Research staff:* L. R. Culver, Director. 1 chemist, 2 engineers; technical personnel 2; additional personnel 5.

*Research activities:* General engineering research and development. Basic research; applied research in electrical, mechanical, and chemical fields. Routine testing and control incidental to consulting practice, and assistance on inventions and patent applications. (Research initiated 1944.)

**1424. Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.**

*Executive staff:* Edward R. Weidlein (chemical engineering), Director. 5 Assistant Directors: E. Ward Tillotson (inorganic chemistry), William A. Hamor (chemical technology), Harry S. Coleman (mechanical engineering), George D. Beal (pharmaceutical chemistry), and Leonard H. Cretcher (organic chemistry). Executive Assistant: George H. Young (organic chemistry). 3 analysts, 4 librarians, 2 photographers, and 162 administrative aids, accountants, clerks, and mechanics.

*Research staff:* 5 fellows and 3 assistants in pure research; 242 industrial fellows and 232 fellowship aids, practically all of whom are chemists and chemical engineers.

*Research activities:* The researches of the Institute's industrial fellowships are concerned primarily with new or improved manufacturing processes, minimizing or utilizing wastes, discovering novel materials, extending present uses or finding new applications for products of chemical industry, and standardizing industrial

practice and products, especially in the domain of chemical technology. The current programs are as follows: abrasives, acid recovery, amines, anthracite, bone products, bread, calcite technology, catalysis, cellulosic molding, ceramic chemicals, chain and welding, chemical hygiene, chemical storage, chicle, cigarette technology, coal products analysis, coke-plant constructional materials, coke-plant physical technology, commodity standards, cork, corn products, cotton properties, disinfectants, felt, food varieties, frictional materials, fur, gas by-products, gas purification, industrial hygiene, insecticides, insulation and roofing, lead, life preserver, lignin, magnesium, metalworking, mineral products, nacre, natural gas, nickel, nitrogen compounds, optical elements, organic synthesis, packaging, paper, petrolatum, petroleum refining, phenol chemistry, piston ring, plastic metals, powder metallurgy, pressing machinery, protected metals, protective coatings, rayon chemistry, refractories, rubber, shaving, silk, soybean, special lubricants, stream improvement, structural glass, sulfur, tape technology, tar constituents, tar derivatives, tar distillation, tar properties, tar synthetics, technical glassware, textile finishing, thread, watch technology, and yeast. (Research initiated 1911.)

*Library:* 21,000 volumes.

*Scientific periodicals:* Industrial Hygiene Digest. Nutritional Observatory. Bibliographic Series.

**1425. Menasco Manufacturing Company, 805 South San Fernando Road, Burbank, Calif.**

*President:* John C. Lee.

*Research staff:* 3 chemists, 3 metallurgists, 2 engineers; technical personnel 16; additional personnel 6.

*Research activities:* Metallurgical investigations; mechanical research: power plant, aircraft hydraulic mechanisms; chemical research: ferrous and nonferrous processing and fabrication. (Research initiated 1942.)

*Library:* 350 volumes.

**1426. Mengel Company, 4th and Colorado Sts., Louisville 1, Ky.**

*President:* A. A. Voit.

*Research staff:* R. F. Wilder, Manager of research and quality control. 2 chemists, 1 wood technologist; technical personnel 1; additional personnel 3.

*Research activities:* Finishing materials and adhesives as applied to the furniture industry; other miscellaneous projects concerned with wood stabilization; furniture construction; impregnation of wood with various chemicals, etc. (Research initiated 1938.)

**1427. Mennel Milling Company, Second National Bank Bldg., Toledo, Ohio.**

*President:* Mark Mennel.

*Laboratory:* Fostoria, Ohio.

*Research staff:* C. A. Nelson, Director. 4 chemists; additional personnel 1.

*Research activities:* Development of new and improved products; investigations concerning wheat varieties; research looking toward improvements in laboratory methods of evaluating cereal products. (Research initiated 1934.)

**1428. Mennen Company, 345 Central Ave., Newark, N. J.**

*President:* William G. Mennen.

*Research staff:* L. J. DeCosta, Director of research; J. Heyman, Director of clinical research. 4 chemists, 1 engineer, 1 physician; technical personnel 1; additional personnel 2.

*Research activities:* Improvement and development of toilet products.

*Library:* 150 volumes.

**1429. Merck and Company, Inc., Rahway, N. J.**

*President:* George W. Merck.

*Laboratories:* Rahway, N. J.; Stonewall Plant, Elkton, Va.

*Research staff:* Randolph T. Major, Director of research and development; W. H. Engels, Associate Director. 6 assistant directors, 115 chemists, 26 chemical engineers, 1 entomologist, 20 microbiologists, 1 botanist, 43 laboratory technicians; 115 pilot plant operators; technical personnel 8; library service 4; patent service 3; additional personnel 76.

*Research activities:* Medicinal chemicals including vitamins, antibiotic agents, sulfonamide compounds and alkaloids; chemicals for industrial and laboratory use. (Research initiated 1918.)

Closely associated with the Research and Development Division of Merck and Company, Inc., in pharmacological investigations, is the Merck Institute for Therapeutic Research, Dr. Hans Molitor, Director. His staff includes ten scientifically trained members assisted by thirty persons who have technical educations.

*Library:* 10,000 volumes.

*Scientific periodicals:* Merck Index. Issued about every ten years. 5th edition, 1940. Merck Manual of the Materia Medica. Issued every five years, 7th edition, 1940.

*Cooperative research:* Twenty-three fellowships and grants for research are supported.

**1430. Merco Nordstrom Valve Company, 400 North Lexington Ave., Pittsburgh 8, Pa.**

*President:* W. F. Rockwell.

*Laboratory:* 2431 Peralta St., Oakland 4, Calif.

*Research staff:* In January, 1946, Merco

Nordstrom Valve Company became Nordstrom Valve Division of Rockwell Manufacturing Company, which see.

*Research activities:* Pressure control apparatus; valves. (Research initiated 1925.)

**1431. Mercury Aircraft, Inc., Wheeler Ave., Hammondsport, N. Y.**

*President:* J. F. Meade.

*Research staff:* Arthur M. Cunnings, Director.

*Research activities:* Product development in light metals. (Research initiated 1945.)

*Library:* 100 volumes.

*Cooperative research:* One grant for research is made.

**1432. Meredith Publishing Company, 1716 Locust St., Des Moines 3, Iowa.**

*President:* Fred O. Bohlen.

*Research staff:* Glen Boylan, Vice President in charge of production; Claude V. McBroom, Director of methods; E. R. Duffie, Director of material testing; L. E. Smith, Director of production; J. O. Gleason, Director of purchasing. 2 chemists, 6 engineers; technical personnel 2; additional personnel 3.

*Research activities:* Research on materials, especially inks and paper; the purchase and development of equipment; the development of methods; long-time planning, plant layout, etc.; quality improvement and cost reduction. (Research initiated 1920.)

*Library:* 100 volumes.

*Cooperative research:* Six grants for research are made.

**1433. Mergenthaler Linotype Company, 29 Ryerson St., Brooklyn 5, N. Y.**

*President:* Joseph T. Mackey.

*Laboratory:* 43 Hall St., Brooklyn 5, N. Y.

*Research staff:* R. R. Mead, Director. 20 engineers; additional personnel 11.

*Research activities:* Line composing and slug casting machines.

*Library:* 107 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**1434. Meridian Chemical Laboratories, 4005 Fifth St., Meridian, Miss.**

*Owner:* N. E. Katz.

*Research staff:* N. E. Katz, Director. 1 chemist; technical personnel 1.

*Research activities:* Plastics; water (municipal and industrial); cottonseed, and other seed and seed products; feeds; foods; fertilizers. (Research initiated 1917.)

*Library:* 500 volumes.

**1435. Merrell Company, William S.,** Lockland Station, Cincinnati 15, Ohio. (Subsidiary of Vick Chemical Company.)

*President:* Thurston Merrell.

*Research staff:* Robert S. Shelton, Vice President in charge of research. 30 chemists, 2 biologists, 2 engineers, 2 physicians, 10 bacteriologists, 10 pharmacologists, 7 pharmacists; technical personnel 22; additional personnel 37.

*Research activities:* The development of new medicinal agents, synthetic and derived from natural sources; pharmaceutical and biological research; product improvements. (Research initiated 1828.)

*Library:* 8,000 volumes.

*Cooperative research:* Thirty fellowships are supported.

**1436. Merrill Company, 582 Market St.,** San Francisco 4, Calif.

*President:* Charles W. Merrill.

*Laboratory:* 221 Natoma St., San Francisco 3, Calif.

*Research staff:* Raymond E. Byler, Director, Metallurgical Department. 1 chemist, 2 metallurgists; additional personnel 1.

*Research activities:* Beneficiation of ores; chemical process work. (Research initiated 1910.)

**1437. Metal and Thermit Corporation, 120** Broadway, New York 5, N. Y.

*President:* Frank J. O'Brien.

*Laboratory:* P. O. Box 255, Rahway, N. J.

*Research staff:* Lincoln T. Work, Director of research and development. 10 chemists, 3 metallurgists, 8 engineers, 1 librarian; technical personnel 11; additional personnel 28.

*Research activities:* Tin, tin chemicals, antimony chemicals, vitreous enamels and glazes, titanium oxide (rutile), rail welding (thermit process), carbon free metals and alloys, metallurgy of electric arc welding, and the development of coatings for welding electrodes. (Research initiated 1915.)

*Library:* 3,000 volumes.

**1438. Metal Forming Corporation, Elkhart, Ind.**

*President:* E. M. Sims.

*Research staff:* M. F. Maloney, Chief Metallurgist; A. E. Jones, Vice President. 1 metallurgist; technical personnel 3.

*Research activities:* Control of quality of metal moldings and tubings; development of new processes. (Research initiated 1934.)

**1439. Metal Hydrides, Inc., 12-24 Congress St.,** Beverly, Mass.

*President:* Peter P. Alexander.

*Research staff:* Peter P. Alexander, Direc-

tor. 7 chemists, 1 biologist, 1 metallurgist, 4 engineers; technical personnel 4; additional personnel 2.

*Research activities:* Manufacture and application of semi-rare metals and alloys; development of new metallurgical processes. (Research initiated 1940.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**1440. Metal Textile Corporation, 4 Central Ave.,** Orange, N. J.

*President:* Russell B. Kingman.

*Laboratory:* West Orange, N. J.

*Research staff:* Otto H. York, Director of research; Alfred M. Goodloe, Vice President in charge of Industrial Division. 2 chemists, 2 engineers; technical personnel 6; additional personnel 4.

*Research activities:* The development of various applications of knit metal mesh. These include in the chemical and petroleum field: tower packing for distillation, absorption and extraction, entrainment separators, mixing media, de-emulsification media, flame arrestors, catalysts and catalyst supports, and chemical gaskets and packing; in the mechanical field: liquid filters and strainers, air filtration media, resilient metal padding, vibration dampeners, shock mounts, flexible couplings, and bearings; in the electrical field: resilient metallic shielding gaskets for high frequency plumbing, radar reflection targets, and electrical contacts; various items for industrial equipment and domestic appliances. (Research initiated 1944.)

**1441. Metalloy Corporation, 1320 Rand Tower,** Minneapolis 2, Minn.

*President:* K. M. Leute.

*Research staff:* R. B. Ellestad, Director. 4 chemists.

*Research activities:* Metal salts; ferrous and nonferrous alloys. (Research initiated 1943.)

*Library:* A library is maintained.

**1442. Metals and Controls Corporation, General** Plate Division, 34 Forest St., Attleboro, Mass.

*President:* R. Willard.

*Research staff:* H. W. Boessenkool, Vice President in charge of research and engineering. 1 chemist, 3 metallurgists, 2 engineers; additional personnel 8.

*Research activities:* The bonding of metals to result in clad materials; improvements in thermostatic bimetals; soldering.

*Library:* 500 volumes.

**1443. Metals Disintegrating Company, Inc.,**  
P. O. Box 290, Elizabeth B, N. J.

*President:* H. E. Hall.

*Research staff:* J. F. Sachse, powder metals development; A. F. Knoll, flake metals development. 5 chemists, 2 metallurgists, 1 engineer; technical personnel 14.

*Research activities:* The development of new flake and granular metal powder types and compositions; the investigation of methods of manufacture and industrial uses of metal powders; study of particle size distribution analytical methods. (Research initiated 1929.)

*Library:* 500 volumes.

**Metals Refining Company.** *See* Glidden Company.

**1444. Metasap Chemical Company, 1st and Essex Sts., Harrison, N. J.** (Division of National Oil Products Company, Inc.)

*President:* Charles P. Gulick.

*Laboratories:* Harrison, N. J.; Cedartown, Ga.

*Research staff:* Francis J. Licata, Director. 6 chemists; additional personnel 1.

*Research activities:* The manufacture and application of metallic soaps; paints, varnishes, lacquers, grease; waterproofing. (Research initiated 1930.)

*Scientific periodicals:* Metallic Soaps. Annual.

**1445. Metcalf and Eddy, 1300 Statler Bldg., Boston 16, Mass.**

*Research staff:* E. Sherman Chase, Director; Stuart E. Coburn, Chief Chemist. 1 to 2 chemists, 1 to 2 engineers.

*Research activities:* The treatment of water, sewage, and trade wastes; sanitation; odor elimination; materials of construction; suitability of soils for foundations and construction, etc. (Research initiated 1922.)

*Library:* 500 volumes.

**Metric Metal Works.** *See* American Meter Company, Inc.

**1446. Metrical Laboratories, Inc., P. O. Box 606, Ann Arbor, Mich.**

*President:* Walter Graves.

*Laboratory:* 3686 Jackson Road, Ann Arbor, Mich.

*Research staff:* R. W. Niles, Director. 3 engineers; technical personnel 22; additional personnel 15.

*Research activities:* Measuring methods for industrial and laboratory use covering dimensional characteristics and quality control, utilizing principles of fluid dynamics. Special measuring problems of industrial and research organizations where measurements smaller than

.000100" are significant. The development of measuring instruments for tolerances not covered by commercial gages. The development of measuring methods for measuring dimensional characteristics physically inaccessible to commercially available gages. The development of gaging methods for measuring dimensional characteristics for which no commercial gages are available. (Research initiated 1941.)

**1447. Metron Instrument Company, 432 Lincoln St., Denver 9, Colo.**

*President:* Stewart Becker.

*Research staff:* 3 engineers; technical personnel 2; additional personnel 1.

*Research activities:* Electromechanical measuring instruments. (Research initiated 1942.)

**1448. Metropolitan Life Insurance Company, 1 Madison Ave., New York, N. Y.**

*President:* Leroy A. Lincoln.

*Research staff:* Donald B. Armstrong, Second Vice President in charge of research; Earl C. Bonnett, Medical Director; J. William Fehnel, Chemist and Director, Industrial Hygiene Laboratory; Norman R. Blatherwick, Director, Biochemical Laboratory; Harold H. Fellows, Director, Home Office Medical Division.

*Research activities: Industrial hygiene laboratory:* Continued studies into new methods for the determination of free silica in industrial dusts; methods for the determination of oxides of nitrogen; methods of sampling and determining the presence of a number of substances incidental to new war production activities, including acrolein, aniline, cashew nut oil, and other toxic materials; the development of an apparatus for the more efficient sampling of dust by electrostatic methods, etc.

*Biochemical laboratory:* Experimental nephritis produced by feeding diets high in protein content; the dietary production of fatty livers; the metabolism of carbohydrates; investigation of the conditions of pentosuria and fructosuria. Experimental diabetes produced by alloxan, particularly the effects of high carbohydrate diets fed to rats which have apparently recovered from the diabetes produced by alloxan.

*Home office medical division:* Numerous tuberculosis studies among employes, including the value of the fluoroscope in case finding, fluoroscopy versus physical findings, etc.; a study of dysmenorrhea and absenteeism and the value of corrective measures; a study of serological examination methods for the detection of syphilis; electrocardiographic and roentgenographic studies of the heart at five year intervals, of employes age 40 and over, to determine preclinical and incipient signs of early and progressive myocardial disease. (Research initiated 1909.)

- 1449. Mexico Refractories Company, P. O. Box 267, Mexico, Mo.**  
*President:* J. B. Arthur.  
*Research staff:* R. C. Weigel, Director. 2 ceramic engineers; technical personnel 1; additional personnel 3.  
*Research activities:* Refractories: fire clay, diaspore, silica, chrome, insulating refractories, plastic refractory materials, high temperature cements, refractory castables. (Research initiated 1931.)  
*Library:* Several hundred volumes.  
*Cooperative research:* Two fellowships are supported.
- 1450. Meyer Manufacturing Company, George J., Cudahy, Wis.**  
*President:* G. L. N. Meyer.  
*Research staff:* W. C. Cooper, Director. 1 chemist; technical personnel 1.  
*Research activities:* Bottling industry problems. (Research initiated 1939.)
- 1451. Michigan Steel Casting Company, 1986 Guoin St., Detroit, Mich.**  
*President:* E. D. Flintermann.  
*Research staff:* R. J. Wilcox, Engineer in charge. 1 chemist, 1 engineer.  
*Research activities:* Ferrous metallurgy; corrosion-resisting chrome, chrome nickel, and special alloys; foundry sands and materials.
- 1452. Michigan Tool Company, 7171 East Mc-Nichols Road, Detroit 12, Mich.**  
*President:* O. L. Bard.  
*Research staff:* H. Pelphrey, Research Engineer. 2 chemists, 2 metallurgists; technical personnel 2.  
*Research activities:* Control of high speed steel received for making precision cutting tools (mostly for gear cutting); investigations in the control of heat-treating high speed steel such as drawing, freezing, etc. (Research initiated 1943.)
- Micro Switch Division, First Industrial Corporation. See First Industrial Corporation.**
- 1453. Mid-Continent Petroleum Corporation, Tulsa 2, Okla.**  
*President:* Jacob France.  
*Research staff:* H. T. Bennett, Technical Director. 24 chemists, 1 physicist, 1 engineer; technical personnel 38; additional personnel 13.  
*Research activities:* The improvement of petroleum products; refinery methods; testing methods. (Research initiated 1917.)  
*Library:* 600 volumes.
- Middlesex Manufacturing Company. See No. 2435 in Addenda.**
- Mid-States Gummed Paper Company. See Minnesota Mining and Manufacturing Company.**
- 1454. Midvale Company, Nicetown, Philadelphia 40, Pa. (Subsidiary of Baldwin Locomotive Works.)**  
*President:* Francis Bradley.  
*Research staff:* Francis B. Foley, Director. 1 chemist, 1 metallurgist, 1 engineer, 1 geologist; technical personnel 4; additional personnel 2.  
*Research activities:* Chemical and physical properties of steels and ferrous alloys. (Research initiated 1901.)  
*Library:* 1,000 volumes.
- 1455. Mid-West Abrasive Company, 500 South Washington St., Owosso, Mich.**  
*President:* James T. Jackson.  
*Laboratories:* Rochester, Pa.; Owosso, Mich.  
*Research staff:* 2 chemists; technical personnel 1.  
*Research activities:* Abrasives.
- 1456. Midwest Research Institute, 4049 Pennsylvania, Kansas City 2, Mo.**  
*President and Director:* Harold Vagtborg.  
*Research staff:* George E. Ziegler, Executive Scientist and Director of research; Carl M. Marberg, Chairman, organic chemistry research; Charles L. Shrewsbury, Chairman, agricultural chemistry research; Frank H. Trimble, Chairman, applied physics research; George W. Ward, Chairman, inorganic chemistry research. 24 chemists, 6 physicists, 4 biologists, 2 metallurgists, 10 engineers, 1 geologist, 2 ceramists, 1 entomologist; technical personnel 11; additional personnel 14.  
*Research activities:* The Institute has two primary objectives: (1) to operate as an industrial research institute working in the interest of industry throughout the country with priority given to industry in the midwest section of the country; and (2) to operate as a privately supported regional research laboratory investigating the mineral, agricultural, and forest resources of the entire midwest area with the view of developing industrial uses of these materials as a means of raising the standard of living in the region. In addition to these research services, the Institute actively participates in other services to the area and the research profession, and sponsors seminars on scientific subjects to which are invited representatives of industry and education throughout the area. Research service to industry includes biochemistry, physical chemistry, organic chemistry, agricultural

chemistry, pure and applied physics, metallurgy, and engineering mechanics. (Research initiated 1945.)

*Library:* 10,000 volumes.

*Scientific periodicals:* Midwest Research Institute Bulletin. Volume 1, 1945.

*Cooperative research:* Two fellowships are supported and two grants for research are made.

**1457. Midwest Rubber Reclaiming Company,** East St. Louis, Ill.

*President:* William Welch.

*Laboratories:* East St. Louis, Ill.; Barberton, Ohio.

*Research staff:* S. G. Luther, Vice President in charge of research; D. S. leBeau, Director; Robert Randall, Chief Chemist. 5 chemists; technical personnel 6.

*Research activities:* The development of new processes and grades of reclaimed rubber based on synthetic rubber compounds; the study of compounding value of new synthetic rubber reclaims; the investigation of new materials and processes; rubber compounding problems. (Research initiated 1929.)

*Library:* 140 volumes.

**1458. Miessner Inventions, Inc.,** 18 Main St., Millburn, N. J.

*President:* Benjamin F. Miessner.

*Research staff:* 1 physicist, 1 engineer, 1 patent attorney.

*Research activities:* The development and patenting of electronic musical instruments. (Research initiated 1930.)

**1459. Mifflin Chemical Corporation,** Delaware Ave. and Mifflin Sts., Philadelphia 48, Pa.

*President:* Leonard Brown.

*Research staff:* H. B. Brown, Chief Chemist. 3 chemists, 1 engineer; technical personnel 1.

*Research activities:* Industrial uses of alcohols; antiseptics; methods of analysis; pharmaceutical products; cosmetics. (Research initiated 1922.)

**1460. Miles Laboratories, Inc.,** Myrtle and McNaughton Sts., Elkhart, Ind.

*President:* Charles S. Beardsley.

*Research staff:* Walter A. Compton, Director, Vice President in charge of research; Raymond L. Conklin, Medical and Research Director. 3 chemists, 1 engineer, 3 physicians, 3 bacteriologists, 1 hematologist; technical personnel 2; additional personnel 5.

*Research activities:* Pharmacology, biology, pathology, bacteriology, blood bank, chemistry, hematology. (Research initiated 1939.)

*Library:* 2,500 volumes.

*Cooperative research:* Fifteen fellowships are supported and nine grants for research are made.

**1461. Miller Laboratories, Inc.,** E. S., 743 Maple Ave., Los Angeles 26, Calif.

*President:* Mrs. Ruth D. Miller.

*Research staff:* Ralph L. Tracy, Director. 4 chemists, 3 biologists, 1 engineer; technical personnel 1; additional personnel 37.

*Research activities:* General pharmaceutical problems. (Research initiated 1926.)

*Library:* 400 volumes.

**1462. Milligan and Higgins Corporation,** 222-224 Front St., New York 7, N. Y.

*President:* Henry E. Tyler.

*Laboratories:* Johnstown and New York, N. Y.

*Research staff:* George W. Easley, Chief Chemist. 3 chemists; technical personnel 1.

*Research activities:* Improvements in hide glue and gelatin manufacture and the extension of their commercial uses. (Research initiated 1868.)

*Library:* 150 volumes.

*Cooperative research:* Two fellowships are supported.

**1463. Milwaukee Gas Specialty Company,** 722 North Jackson, Milwaukee, Wis.

*President:* H. E. Toelle.

*Research staff:* Philip R. Marvin, Director of research and development. 2 chemists, 1 physicist, 1 metallurgist, 4 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Magnetic research; thermionic emission research; surface chemistry; applied mechanics. (Research initiated 1930.)

*Library:* 800 volumes.

**1464. Mine Safety Appliances Company,** Braddock, Thomas, and Meade Sts., Pittsburgh 8, Pa.

*President:* George H. Deike.

*Laboratory:* 327 Craft Ave., Pittsburgh 13, Pa.

*Research staff:* William P. Yant, Director of research and development; E. W. Gilliland, Chief Chemist. 21 chemists, 6 physicists, 11 engineers; technical personnel 9; additional personnel 17.

*Research activities:* Research and development pertaining to procedures, materials, and appliances for the control of harmful environment and protection of life and property. These include products such as instruments for determining explosive or poisonous gases, dusts, and mists; personal protective devices such as gas masks, respirators, mine rescue apparatus, aviators' oxygen supply, submarine escape lungs, protective hats and helmets, protective goggles; noise protection; safety clothing; first aid and resuscitation equipment; electric cap lamps for underground and other industrial use; fume and



dust collectors; ventilation control equipment; specialized emergency tools. (Research initiated 1919.)

*Library:* 2,500 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**1465. Miner Laboratories, 9 South Clinton St., Chicago 6, Ill.**

*Owner:* Carl S. Miner.

*Research staff:* Carl S. Miner, Director; O. C. Stanger, Associate Director; R. N. Dupuis and C. S. Miner, Jr., Assistant Directors. 20 chemists; additional personnel 5.

*Research activities:* Cereal industries; agricultural by-products; glycerin and glycerin derivatives; furfural; surface coating resins; foods; fats; organic silicon compounds; cosmetics; dentifrices; synthetic stone; pen inks; wood chemicals; detergents; soy products; general consultation on industrial research. (Research initiated 1906.)

*Library:* 1,000 volumes.

**1466. Minerals Separation North American Corporation, 11 Broadway, New York 4, N. Y.**

*President:* S. Gregory.

*Laboratories:* 320 West Main St., Lakeland, Fla.; 1907 Seventh Ave., East, Hibbing, Minn.

*Research staff:* W. Trotter, Director. 5 chemists, 7 metallurgists, 4 engineers; technical personnel 7; additional personnel 9.

*Research activities:* The development of processes for the concentration of ores and other materials; research on special problems.

*Library:* A library is maintained.

**1467. Minneapolis Moline Power Implement Company, Minneapolis 1, Minn.**

*President:* W. C. MacFarlane.

*Research staff:* B. G. Van Zee, Director. 2 chemists, 2 metallurgists, 10 engineers; technical personnel 8; additional personnel 20.

*Research activities:* Internal combustion engines for burning gasoline, distillate, natural gas, and butane; tractors for farm and industrial use. (Research initiated 1926.)

**1468. Minnesota and Ontario Paper Company, 500 Baker Arcade, Minneapolis 2, Minn.**

*President:* Donald D. Davis.

*Laboratory:* International Falls, Minn.

*Research staff:* M. S. Wunderlich, Director, Minneapolis; J. O. Burton, Research Manager, International Falls. 7 chemists, 10 engineers; technical personnel 7; additional personnel 3.

*Research activities:* The production of wood fiber products, paper, and insulation materials; the utilization of sawmill waste and forest by-products. (Research initiated 1936.)

**1469. Minnesota Mining and Manufacturing Company, 900 Fauquier Ave., St. Paul 6, Minn.**

*President:* W. L. McKnight.

*Laboratories:* St. Paul, Minn.; Detroit, Mich.; Chicago, Ill.

*Research staff:* Central Laboratory, St. Paul: H. N. Stephens, Director; N. W. Taylor, Assistant to the Director. Coated Abrasives Division, St. Paul, Minn.: C. E. March, Products Manufacturing Manager. Roofing Granules Division, St. Paul, Minn.: G. W. Swenson, Manufacturing Manager. Tape Division, St. Paul, Minn.: H. J. Tierney, Products Manufacturing Manager. Adhesives and Coatings Division, Detroit, Mich.: F. J. Wehmer, Technical Director. Scotchlite Division, St. Paul, Minn.: E. P. Davis, Technical Director. Inland Rubber Company, Chicago, Ill.: W. R. Westman, Chief Chemist; 7 chemists, 2 technicians. Mid-States Gunned Paper Company, Chicago, Ill.: 1 chemist. Total: 91 chemists, 5 physicists, 53 engineers, 1 geologist; technical personnel 54; additional personnel 158.

*Research activities:* Adhesives and adhesion; coating and impregnation of cloth and paper; synthetic resins; abrasives and abrasion; ceramic coatings; rubber compounding and testing; inorganic pigments. (Research initiated 1919.)

*Library:* 2,000 volumes.

*Cooperative research:* Seventeen scholarships are supported.

**1470. Minnesota Testing Laboratories, Inc., 318 Glencoe Bldg., Duluth 2, Minn.**

*President:* C. A. Graves.

*Laboratory:* 618 Lyceum Bldg., Duluth, Minn.

*Research staff:* 1 chemist, 1 metallurgist, 1 engineer.

*Research activities:* A comparison of the air conditioning in various types of refrigerators; the preparation of chromates and bichromates from chromite ores; the uses of vermiculite; the recovery of fine gold in placer deposits; the effect of fine particles in concrete mixes; calibration and tests of industrial equipment. (Research initiated 1909.)

**1471. Minnesota Valley Canning Company, 1200 Commerce St., Le Sueur, Minn.**

*President:* E. B. Cosgrove.

*Research staff:* G. C. Scott, Director; J. D. Barnard, agricultural research; G. R. Muhr, soils; Marshall Evans, Geneticist; R. O. Belkengren, Chemist; E. C. Ritchell, Chemical Engineer. 5 chemists, 2 biologists, 1 engineer, 2 geneticists; 30 to 40 seasonal chemists, bacteriologists, and technicians; technical personnel 3.

*Research activities:* Sweet corn and pea seed breeding; soils and fertilizers; agricultural methods; canning technology; the testing of raw produce and of canned products; equipment adaptation; bacteriological tests for sterility of product; chemical analysis of food values. (Research initiated 1926.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**Minute Tapioca Company, See General Foods Corporation.**

**1472. Mirein, Unlimited, 51 Halsey St., Newark 2, N. J.**

*President:* James J. W. Middleton.

*Research staff:* James J. W. Middleton, Director. 3 chemists, 1 physicist, 1 biologist, 1 metallurgist, 2 engineers; additional personnel 3.

*Research activities:* Biochemical research: chemical process development, organic synthesis, chemical and biological effects of radiations. (Research initiated 1937.)

*Library:* 125 volumes.

**1473. Mississippi Valley Research Laboratories, Inc., 901 South 18th St., St. Louis 3, Mo.**

*President:* A. L. Duval d'Adrian.

*Research staff:* George L. Doelling, Chief Chemist. 4 chemists, 1 physicist, 1 engineer; additional personnel 2.

*Research activities:* Applied and analytical chemistry; mechanical and electrical engineering; metallurgy and metallography; cast iron, steel, and nonferrous metals; mineralogy; fuel combustion; bacteriology; the testing of materials, including paints and varnishes; glass and ceramics; oils and lubricants; paper and fabrics; microscopy and microphotography. (Research initiated 1930.)

*Library:* 1,000 volumes.

**1474. Missouri Paint and Varnish Company, 5125 North 2nd St., St. Louis 7, Mo.**

*President:* J. P. Frank.

*Research staff:* C. A. Schraudenbach, Director. 2 chemists.

*Research activities:* The development of new products in paints, varnishes, and roof coatings, together with the improvement of the present products. (Research initiated 1924.)

**1475. Mohawk Carpet Mills, Inc., Amsterdam, N. Y.**

*President:* Howard L. Shuttleworth.

*Research staff:* L. R. Jones, Technical Director; E. D. Friderici, Chief Chemist. 5 chemists, 1 physicist, 3 engineers; technical personnel 13; additional personnel 5.

*Research activities:* The improvement and

control of materials and processes used in the manufacture of rugs and carpets. Evaluation of new materials, processes, and methods. Development of new products and methods of manufacture. (Research initiated 1914.)

*Library:* 250 volumes.

*Cooperative research:* Three grants for research are made.

**1476. Mohawk Paper Mills, Inc., 465 Saratoga St., Cohoes, N. Y.**

*President:* George E. O'Connor.

*Laboratories:* Cohoes, N. Y.; Kings Canal, Waterford, N. Y.

*Research staff:* Michael L. Harrigan, Technical Director. 2 chemists; technical personnel 6; additional personnel 1.

*Research activities:* Pulp, paper and paper making materials, processes, and equipment; paper defects; the identification of dirt in pulp and paper. (Research initiated 1939.)

*Library:* 140 volumes.

**1477. Molnar Laboratories, 211 East 19th St., New York 3, N. Y.**

*Owner:* Nicholas M. Molnar.

*Laboratories:* New York 3, N. Y.; 201 Main St., Lodi, N. J.

*Research staff:* Nicholas M. Molnar, Director; E. Segessemann; A. S. Richer; Alice Gelfand; Carl Krafft; Julius Molnar. 4 chemists, 2 biologists, 1 physician; technical personnel 3; additional personnel 4.

*Research activities:* Medicinal preparations; organic chemistry; the investigation of water treatments and boiler compounds; corrosion problems; biochemical and clinical investigations; industrial, pathological, and bacteriological research. (Research initiated 1927.)

*Library:* 300 volumes.

**Monarch Chemical Company. See Westvaco Chlorine Products Corporation.**

**1478. Monarch Manufacturing Company, P. O. Box 2208, Atlanta 1, Ga.**

*President:* Mrs. M. H. Lowenstein.

*Research staff:* F. E. Lowenstein, Vice President and Manager; C. E. Stegall, Director. 2 chemists.

*Research activities:* Flavors and flavoring materials; essential oils; confectionery research for Norris, Inc. (Research initiated 1899.)

**1479. Monite Waterproof Glue Company, 1628 North 2nd St., Minneapolis, Minn.**

*President:* Henry L. Prestholdt.

*Research staff:* Henry L. Prestholdt, Director; Arthur R. Weber. 2 chemists; technical personnel 1; additional personnel 1.

*Research activities:* Animal protein solvents and fixed alkalis. (Research initiated 1916.)

**1480. Monsanto Chemical Company**, 1700 South 2nd St., St. Louis 4, Mo.

*President:* William McNear Rand.

*Laboratories:* St. Louis, Mo.; Everett, Mass.; Nitro, W. Va.; Springfield, Mass.; Laucks, Seattle, Wash.; Dayton, Ohio; Anniston, Ala.

*Research staff:* C. A. Thomas, Vice President in charge of research and development; J. R. Mares, Development Director; C. A. Hochwalt, Director of central research; L. P. Kyrides, Director, organic chemicals; R. L. Sibley, Director, Rubber Service Department; N. N. T. Samaras, Director of research, Plastics Division; W. S. Wilson, Director of research, Everett, Mass.; R. L. Jenkins, Director of research, Phosphate Division. 6 research directors, 5 assistant research directors, 335 chemists and chemical engineers, 9 physicists, 1 metallurgist, 2 mechanical engineers.

*Research activities:* *St. Louis:* Pharmaceuticals, fine chemicals and intermediates, including catalytic research, plasticizers, and phosphorus products. *Everett:* Organic and inorganic research on processes; application research in the fields of textiles, paper, surface coatings, leather, and lacquers. *Nitro:* Rubber chemicals, oil additives, and organic intermediates. *Springfield:* Thermoplastic and thermo-setting resins and molding compositions, specialty resins, and plasticizers. *Laucks, Seattle:* Synthetic resin and protein, plywood glues and adhesives, wood preservatives and sealers, surface coatings. *Dayton:* Special research projects for various divisions of the company. Long term research in newer fields of company activities or in allied fields. *Anniston:* Process and new product development in the fields of phosphates, aluminous abrasives, calcium carbide and acetylene derivatives, biphenyl and chlorinated biphenyl. (Research initiated 1904.)

*Libraries:* St. Louis, 5,200 volumes. Everett, 2,500 volumes. Nitro, 1,600 volumes. Springfield, 2,390 volumes. Laucks, Seattle, 1,400 volumes. Dayton, 4,800 volumes. Anniston, 2,000 volumes.

*Cooperative research:* Six fellowships are supported and five grants for research are made.

#### CLINTON LABORATORIES

(of the Monsanto Chemical Company)

Oak Ridge, Tenn.

*Research staff:* M. D. Whitaker, Director of laboratories; R. L. Doan, Associate Director. 275 chemists, physicists, engineers, etc.; technical personnel 50; additional personnel 900.

*Research activities:* Atomic energy under government contract. (Research initiated 1943.)

See also Shawinigan Resins Corporation.

**1481. Montclair Research Corporation**, 4 Cherry St., Montclair, N. J.

*President:* Frederick A. Hessel.

*Research staff:* John B. Rust, Director. 7 chemists.

*Research activities:* Synthetic resins and plastics; synthetic elastomers; textile finishing compounds; organosilicon compounds. (Research initiated 1941.)

*Library:* A library is maintained.

**1482. Montgomery Ward and Company**, 618 West Chicago Ave., Chicago, Ill.

*President:* C. D. Ryan.

*Laboratories:* Chicago, Ill.; New York, N. Y.

*Research staff:* H. C. Anderson, Assistant General Merchandise Manager; Gerald C. MacDonald, Manager Quality Control; Logan M. Schilb, Manager, Chicago Laboratories; H. H. Scott, Manager, New York Laboratory. 4 chemists, 4 engineers, 7 textile analysts, 4 laboratory assistants; additional personnel 5.

*Research activities:* The evaluation of new merchandise in textile, engineering, and chemical fields. (Research initiated 1912.)

#### WARDWAY PAINT WORKS DIVISION

10th and Washington, Chicago Heights, Ill.

*Research staff:* A. L. Smith, Manager in charge of research; E. Schmeckpeper, Director. 5 chemists; technical personnel 3; additional personnel 2.

*Research activities:* Surface coatings, paints, enamels, varnishes, and raw materials used in their manufacture. (Research initiated 1920.)

**1483. Moore Laboratory**, 64 South Division St., Buffalo 3, N. Y.

*Owner:* Raymond L. Moore.

*Research staff:* Raymond L. Moore, Director. 2 chemists; technical personnel 1; additional personnel 2.

*Research activities:* Vegetable tanning of heavy leather; sole, harness, belting, and mechanical devices; development of new leathers; soil; plant tissue; fertilizer; nutrient solution control. (Research initiated 1934.)

*Library:* 300 volumes.

**1484. Moore, Warren**, Consulting Entomologist, Bon Air, Va.

*Research staff:* Warren Moore, Director. 1 biologist; technical personnel 1.

*Research activities:* Insecticides; nutrition of insects. (Research initiated 1936.)

*Library:* 500 volumes.

**1485. Moorman Manufacturing Company,** Quincy, Ill.

*President:* C. A. Moorman.

*Research staff:* W. P. Elmslie, Director. 4 chemists; technical personnel 8; additional personnel 1.

*Research activities:* The study of mineral supplements to rations of livestock and poultry; the utilization by animals of various mineral elements, including trace elements, in various forms; protein supplements for livestock; vitamin needs of livestock and poultry; parasitology of farm animals; methods of analysis of mineral mixtures and of assay of vitamins. (Research initiated 1920.)

*Library:* 800 volumes.

*Cooperative research:* One fellowship is supported.

**Moraine Products Division, General Motors Corporation.** See General Motors Corporation.

**1486. Morehead Fleming Drug Company,** 100 South 2nd St., San Jose, Calif.

*Owner:* W. M. Moody.

*Research staff:* Harry A. Duffy, Director. 1 chemist, 1 bacteriologist, 4 in other scientific professions; additional personnel 5.

*Research activities:* The investigation of new medicinal products; synthesis of organic medicinal; investigations in chemotherapy. (Research initiated 1936.)

*Library:* 792 volumes.

**1487. Morgan Construction Company,** 15 Belmont St., Worcester 5, Mass.

*President:* Philip M. Morgan.

*Research staff:* J. W. Sheperdson, Executive Vice President in charge of research; John H. Hitchcock, Director. 10 to 12 engineers and technicians.

*Research activities:* The development and improvement of machinery used in rolling, handling, and shearing of metals, particularly steel; wire-drawing machinery; mechanical gas producers; equipment for control of combustion in heating and melting furnaces. (Research initiated 1916.)

*Cooperative research:* Five scholarships are supported.

**1488. Morrell and Company,** John, Ottumwa, Iowa.

*President:* G. M. Foster.

*Research staff:* C. E. Gross, Director. 4 chemists, 1 engineer, 4 bacteriologists; technical personnel 3; additional personnel 3.

*Research activities:* Foods, with special reference to the curing and canning of meat products, and other problems in connection with the

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operation of a meat-packing plant. (Research initiated 1930.)

*Library:* 210 volumes.

**Morrill Company, George H.** See Sun Chemical Corporation.

**1489. Morris and Company, Ltd., Inc., Philip,** 119 Fifth Ave., New York 3, N. Y.

*President:* A. E. Lyon.

*Laboratory:* Richmond, Va.

*Research staff:* W. F. Greenwald, Director. 9 chemists, 1 engineer.

*Research activities:* The study of tobacco, its physiological effects; the pharmacology of smoke; routine control. (Research initiated 1934.)

*Cooperative research:* Two fellowships are supported.

**1490. Morse Twist Drill and Machine Company,** 163 Pleasant St., New Bedford, Mass.

*President:* William T. Read.

*Research staff:* 1 chemist, 1 metallurgist, 1 to 3 helpers and machine operators.

*Research activities:* Economic study and analysis of steel; photomicrographical study of steel; testing of finished tools manufactured by this company and others; research on the shape, form, heat-treatment, etc., of tools, and new designs; wearing qualities, torsional strain, power required of tools, etc. (Research initiated 1915.)

**1491. Mosinee Paper Mills Company,** Mosinee, Wis.

*President:* Aytch P. Woodson, Wausau, Wis.

*Research staff:* G. F. Enderlein, Director; N. S. Stone, General Manager. 2 chemists, 2 engineers; technical personnel 12.

*Research activities:* The development of new paper products and improvement of process and control. (Research initiated 1911.)

**Moto Meter Gange and Equipment Division, Electric Auto-Lite Company.** See Electric Auto-Lite Company.

**1492. Mueller Company,** Decatur, Ill.

*President:* W. E. Mueller.

*Research staff:* Lucien W. Mueller, Vice President in charge of administrative and sales engineering; Frank H. Mueller, Director. 2 chemists, 1 metallurgist, 6 engineers; technical personnel 4; additional personnel 28.

*Research activities:* Ferrous and nonferrous alloyed valves, fire hydrants, sewage disposal equipment, safety relief valves, and pressure control valves for water, air, gas, and oil industries. (Research initiated 1930.)

- 1493. Mulford Colloid Laboratories, 9-11 South 38th St., Philadelphia 4, Pa.**  
*President:* L. W. Mulford.  
*Research staff:* H. H. Fehr, Director. 2 chemists, 1 part time physician; technical personnel 2; additional personnel 1.  
*Research activities:* Pharmaceutical products; medicinal colloids. (Research initiated 1920.)  
*Library:* 200 volumes.
- 1494. Mullin, Charles E., 111 Fourth St., Huntingdon, Pa.**  
*Research staff:* Charles E. Mullin, Director; Robert S. Withers, Chief Chemist. 3 chemists; technical personnel 2; additional personnel 7.  
*Research activities:* Textile chemistry; rayon and dyeing; specialties for the textile and related industries, including paper, leather, detergents, etc. (Research initiated 1914.)  
*Library:* 3,000 volumes.
- 1495. Munch Research Laboratories, 306 South 69th St., Upper Darby, Pa.**  
*Owner:* James C. Munch.  
*Laboratories:* Upper Darby, Pa.; Route 3, West Chester, Pa.  
*Research staff:* James C. Munch, Director; Rose P. Marriott; Mikhail Plungian. 1 chemist, 1 biologist, 30 physicians, 4 pharmacologists and toxicologists; technical personnel 3; additional personnel 3.  
*Research activities:* Pharmacology and toxicology, and clinical applications of new and old drugs; insecticides and fungicides; chemical and bacteriological investigations; antidotes for poisons; consultation with manufacturers and government agencies. (Research initiated 1938.)  
*Library:* 2,500 volumes.  
*Cooperative research:* Twelve fellowships are supported.
- 1496. Mundet Cork Corporation, 501 Bloy St., Hillside 5, N. J.**  
*President:* J. J. Mundet, Jr.  
*Research staff:* B. Wager, Plant Chemist. 3 chemists.  
*Research activities:* Cork products. (Research initiated 1938.)  
*Library:* 150 volumes.
- 1497. Munn, W. Faitoute, 75 Walker Road, West Orange, N. J.**  
*Research staff:* W. Faitoute Munn, Director.  
*Research activities:* Perfumes, photomicrography, electrochemistry, and miscellaneous industrial research. (Research initiated 1920.)
- 1498. Munsell Color Company, Inc., 10 East Franklin St., Baltimore, Md.**  
*President:* Paul G. Gravenhorst.  
*Research staff:* Blanche R. Bellamy, Manager. 1 assistant.  
*Research activities:* The study of color measurement, both theoretical and applied.
- 1499. Muralo Company, Inc., 570 Richmond Terrace, Staten Island 1, N. Y.**  
*President:* Alfred F. King.  
*Research staff:* C. R. Davison, Chief Chemist; W. M. Clark, Vice President and General Manager. 2 chemists; technical personnel 4.  
*Research activities:* Water paints. (Research initiated 1932.)
- 1500. Murphy Finishes Corporation, 224 McWhorter St., Newark 1, N. J. (Subsidiary of Interchemical Corporation.)**  
*President:* Charles J. Roh.  
*Research staff:* A. M. Taylor, Technical Director. 9 chemists; technical personnel 8; additional personnel 2.  
*Research activities:* The development of synthetic resins, i.e., phenolics and alkyds; special resistant coatings for specific purposes. (Research initiated 1923.)
- 1501. Murray Corporation of America, 7700 Russell St., Detroit 11, Mich.**  
*President:* C. W. Avery.  
*Research staff:* Alfred H. Haberstump, Director. 7 engineers, technical personnel 11; additional personnel 2.  
*Research activities:* The development and improvement of products for automobile bodies, parts, and accessories; the testing of sheet metal stampings, and automobile chassis frames. (Research initiated 1937.)  
*Library:* 100 volumes.
- 1502. Murray, Inc., William S., 805 Watson Place, Utica, N. Y.**  
*Research staff:* William S. Murray, Director. 1 chemist; technical personnel 1.  
*Research activities:* Textile products and processes; rare elements. (Research initiated 1915.)  
*Library:* 500 volumes.
- 1503. Muskegon Piston Ring Company, 6th and Alpha Sts., Muskegon, Mich.**  
*President:* T. E. McFall.  
*Laboratories:* Muskegon and Sparta, Mich.  
*Research staff:* Paul S. Lane, Director; J. L. Brooks, Chief Metallurgist. 3 metallurgists, 8 engineers; additional personnel 4.  
*Research activities:* Metallurgy (gray cast

iron); automotive development; wear resistance (surface finishes); ferrous alloy materials. (Research initiated 1920.)

**1504. Muter Company, 1255 South Michigan Ave., Chicago, Ill.**

*President:* Leslie F. Muter.

*Research staff:* Karl E. Rollefson, Director. 1 physicist, 5 engineers.

*Research activities:* Switches, condensers, resistors, coils, and other component parts which are used in radio receivers; electronic equipment. (Research initiated 1932.)

**1505. Mutual Boiler Insurance Company of Boston, 60 Batterymarch St., Boston, Mass.**

*President:* M. B. Dalton.

*Research staff:* Clair L. Keene, Engineering Manager in charge of research; E. R. Doherty, Chief Inspector; A. B. Kane, Chief Engineer; H. M. Spring, Assistant Chief Inspector; C. W. R. Johnson, Assistant Chief Engineer. Technical personnel 58.

*Research activities:* The promotion of engineering and inspection methods in reference to boilers, pressure vessels, and power plant machinery.

**1506. Mutual Chemical Company of America, 1348 Block St., Baltimore 31, Md.**

*President:* G. A. Benington.

*Laboratories:* Baltimore, Md.; Jersey City, N. J.

*Research staff:* O. F. Tarr, Director, and Marc Darrin, Chief Research Chemist, both at Baltimore. 10 chemists, 7 chemical engineers, 1 mining engineer, 1 librarian; additional personnel 2.

*Research activities:* Production, industrial applications, and properties of chromium compounds; corrosion prevention and chromic acid anodizing. (Research initiated 1919.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**1507. Mycoloid Laboratories, Inc., 47 Center Ave., Little Falls, N. J.**

*President:* A. C. Montell, Jr.

*Research staff:* Walter R. Russ, Director. 4 chemists, 1 physician; additional personnel 6.

*Research activities:* Pharmacologic and clinical investigations of antimycotic agents; colloids as applied to therapeutics; general pharmacology. (Research initiated 1936.)

*Library:* 250 volumes.

*Cooperative research:* Five grants for research are made.

**1508. Narragansett Electric Company, 49 Westminster St., Providence 1, R. I.**

*President:* Samuel C. Moore.

**SOUTH STREET GENERATING PLANT  
LABORATORY**

*Research staff:* Ernest F. Walsh, Assistant to Superintendent of power plants. 8 chemists, 5 testers and assistants.

*Research activities:* Fuels, feed water treatment, ferrous and nonferrous metals, liquid and solid electrical insulation. (Research initiated 1920.)

**MELROSE STREET SERVICE BUILDING  
LABORATORY**

*Research staff:* Harry C. Rankin, Laboratory Engineer. 1 engineer, 2 assistants; additional personnel 1.

*Research activities:* The development of new electrical devices; proof testing apparatus; electrical instrument standardization. (Research initiated 1929.)

**1509. Nashua Gummed and Coated Paper Company, 44 Franklin St., Nashua, N. H.**

*President:* Vasco E. Nunez.

*Research staff:* Lloyd M. Perry, Chief Chemist. 7 chemists, 5 engineers; technical personnel 7; additional personnel 2.

*Research activities:* Adhesive compositions; protective coatings; paper and other laminations; paper impregnating; specialty papers. (Research initiated 1919.)

*Library:* 200 volumes.

**1510. Nassau Laboratories, Hackensack, N. J.**

*President:* James W. Maples.

*Research staff:* James W. Maples, Director; George Ulrich. 3 chemists, 1 physicist, 2 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Achievement of particle size of minerals so small that molecular adhesion between diverse materials is accomplished through electrolytic attraction. (Research initiated 1921.)

*Library:* A library is maintained.

**1511. Nassau Smelting and Refining Company, Inc., 170 Fulton St., New York 7, N. Y. (Subsidiary of Western Electric Company, Inc.)**

*President:* F. W. Willard.

*Laboratory:* Tottenville, Staten Island, N. Y.

*Research staff:* L. S. Deitz, Jr., Chief Metallurgist. 3 chemists, 2 metallurgists, 3 engineers; additional personnel 3.

*Research activities:* The development of metallurgical methods. (Research initiated 1931.)

1512. National Acme Company, 170 East 131st St., Cleveland, Ohio.

*President:* F. H. Chapin.

*Research staff:* A. E. Drissner, Vice President in charge of engineering; Robert Southworth, Metallurgist; Howard Thompson, Chemist. Additional personnel 1.

*Research activities:* The development of materials and heat-treatment in automatic screw machine construction; machinability of ferrous metals; cutting lubricants for screw machine work; general metallurgy of brass and steel; tool steel and dies. (Research initiated 1915.)

National Alloy Steel Division, Blaw-Knox Company. See Blaw-Knox Company.

1513. National Aluminate Corporation, 6216 West 66th Place, Chicago 38, Ill.

*President:* H. A. Kern.

*Research staff:* P. G. Bird, Director. 13 chemists, 5 chemical engineers, 1 bacteriologist; technical personnel 20; additional personnel 2.

*Research activities:* The manufacture and use of water-treating chemicals, with special reference to aluminates, and various problems connected with water, waste, and sewage treatment; the manufacture and use of chemicals for papermaking, printing ink, dyeing, ceramic, and refractory industries. (Research initiated 1928.)

The research activities of the Paige-Jones Chemical Company are conducted in the laboratory of the National Aluminate Corporation.

*Library:* 750 volumes.

National Aniline Division, Allied Chemical and Dye Corporation. See Allied Chemical and Dye Corporation.

1514. National Association of Dyers and Cleaners, 8001 Georgia Ave., Silver Spring, Md.

*President:* Leo Soukup.

*Research staff:* George P. Fulton, Director. 5 chemists; technical personnel 1; additional personnel 5.

*Research activities:* Detergency in nonaqueous solvents; reclamation of drycleaning solvents; efficiency and costs; methods of handling new fabrics; causes of fabric damage. (Research initiated 1927.)

*Library:* 300 volumes.

1515. National Atlantic Research Corporation, 40 Glen Ave., Newton Centre 59, Mass.

*President:* F. C. Atwood.

*Research staff:* Henry A. Hill, Director. 7

chemists, 1 physicist, 1 biologist, 3 engineers; technical personnel 7; additional personnel 24.

*Research activities:* The development of new products, synthetic resins, surface coatings, adhesives, textile and leather finishes, elastomers, process equipment, textile fibers, pigments, proteins, and protein derivatives. (Research initiated 1930.)

*Library:* 3,000 volumes.

1516. National Automotive Fibres, Inc., 19925 Hoover Ave., Detroit 5, Mich.

*President:* J. R. Millar.

*Laboratories:* Detroit, Mich.; 1851 East State St., Trenton, N. J.

*Research staff:* Detroit: Karl E. Buff, Executive Chemist. 1 chemist; technical personnel 2; additional personnel 1. Trenton: G. W. Parkin, Division Manager; Raymond D. Coldwell, Director. 1 chemist; technical personnel 2.

*Research activities:* Detroit: Materials used in car interior trim and insulation such as sound insulating and deadening materials, adhesives, fibrous board materials, coated fabrics, plastic trim materials, vulcanizing extruded and sheet materials, etc. (Research initiated 1935.) Trenton: Automobile carpet; synthetic suede; synthetic sponge; vinyl film; miscellaneous coating and proofing of fabrics. (Research initiated 1940.)

*Library:* 100 volumes at Detroit.

National Bearing Division, American Brake Shoe Company. See American Brake Shoe Company.

1517. National Biscuit Company, 449 West 14th St., New York 11, N. Y.

*President:* R. E. Tomlinson.

*Laboratories:* New York, N. Y.; Toledo, Ohio; Carthage, Mo.; Cheney, Wash.

*Research staff:* D. J. Maveety, Director. 12 chemists, 1 engineer; additional personnel 6.

*Research activities:* Food products, especially bakery and cereal products. (Research initiated 1914.)

*Library:* 1,000 volumes.

1518. National Blank Book Company, Holyoke, Mass.

*Research staff:* R. P. Towne, in charge of research; F. S. Schade, Director. 1 chemist, 2 research engineers; technical personnel 2; additional personnel 1.

*Research activities:* The design and development of office record keeping equipment and loose leaf devices; the study of adhesives, plastics, and paper; other products and materials for the manufacture of loose leaf equipment.

**National Brewers' Academy and Consulting Bureau.** See Industrial Testing Laboratories.

**1519. National Broadcasting Company, Inc., 30 Rockefeller Plaza, New York 20, N. Y.** (Subsidiary of Radio Corporation of America.)

*President:* Niles Trammell. *Vice President and Chief Engineer:* O B. Hanson.

*Research staff:* R. E. Shelby, Development Engineer; G. M. Nixon, Assistant Development Engineer. 10 engineers; technical personnel 8; additional personnel 2. 44 engineers engaged in design and construction engineering work on audio, video, and radio facilities; 469 technical personnel engaged in the broadcast operating activities of the company.

*Research activities:* The development of equipment and techniques for use in the operational activities of the company in the fields of aural, television, FM broadcasting, and transcription recording; the engineering design of broadcasting studios from the standpoint of acoustical characteristics and sound isolation; the solution of special technical problems which arise in the course of the company's various operational activities; the experimental development of new activities in the field of broadcasting, such as FM broadcasting; television and facsimile; liaison work between NBC and the RCA research laboratories to bring to the attention of the laboratories the problems encountered in broadcasting and to adapt the results obtained by the research laboratories to the needs of the company's operational activities. Fundamental research for the company is done in RCA Laboratories, a division of the Radio Corporation of America. (Research initiated 1927.)

*Library:* 15,000 volumes in NBC general library and 100 volumes in laboratory technical library.

**1520. National Bureau of Standards, Washington 25, D. C.**

*Director:* E. U. Condon. *Assistant Director:* E. C. Crittenden.

*Research staff:* 215 chemists, 320 physicists, 3 biologists, 40 metallurgists, 165 engineers, 30 mathematicians, 65 technologists; technical personnel 585; additional personnel 810.

*Research activities:* The National Bureau of Standards aids American industry by supplying the standards of measurement, quality, performance, and practice, and the standard physical constants needed in scientific and technical work. This is accomplished through the testing of instruments, apparatus, and materials; through cooperative research on problems of mutual interest to the industry and the Bureau; and through agreements between manufacturers, distributors, and consumers on standard sizes and

varieties of articles, and on acceptable minimum specifications. The Bureau likewise prepares safety and other codes which serve as the basis for uniform governmental regulations, thus promoting uniformity of requirements in different jurisdictions. (Research initiated 1901.)

*Library:* 52,500 volumes; 900 journals.

*Scientific periodicals:* Journal of Research. Vol. I, 1928.

*Cooperative research:* 54 research associates representing scientific and technical societies and trade associations are stationed at the Bureau to work on problems of mutual interest.

**1521. National Canners Association, 1739 H St., N. W., Washington, D. C.**

*President:* F. A. Stare.

*Laboratories:* Washington, D. C.; Western Branch, San Francisco, Calif.; Northwest Branch, Seattle, Wash.

*Research staff:* Directors: E. J. Cameron, Washington Laboratory; J. R. Esty, Western Branch Laboratory; E. D. Clark, Northwest Branch Laboratory. 11 chemists, 7 biologists and bacteriologists, 1 microscopist, 8 technical assistants; additional personnel 8.

*Research activities:* Research activities are chemical, bacteriological, and technological in nature. Special attention is given to technological activities and to the development of appropriate sterilizing processes for both acid and nonacid foods. These studies include, among other things, fundamental heat penetration and heat resistance studies, and bacterial surveys of canning plants to determine sources of significant microorganisms which are responsible for the spoilage of canned foods. (Research initiated 1913.)

**National Carbon Company, Inc.,** See Union Carbide and Carbon Corporation.

**1522. National Cash Register Company, Main and K Sts., Dayton 9, Ohio.**

*President:* S. C. Allyn.

*Research staff:* H. M. Williams, Vice President in charge of engineering and research. 16 chemists, 1 physicist, 5 metallurgists, 48 engineers; technical personnel 78; additional personnel 28.

*Research activities:* Chemical, metallurgical, and mechanical research in the field of office equipment. (Research initiated 1905.)

*Library:* A library is maintained.

**1523. National Cooperative Refinery Association, McPherson 1, Kans.**

*President:* J. L. Nolan.

*Research staff:* C. W. Berger, Manager of



research and development. 6 chemists; technical personnel 9; additional personnel 2.

*Research activities:* Petroleum refining; petroleum products and specialties; agricultural chemicals. (Research initiated 1938.)

*Library:* 100 volumes.

*Cooperative research:* One grant for research is made.

1524. National Crushed Stone Association, 1735 Fourteenth St., Washington 9, D. C.

*President:* F. O. Earnshaw.

*Research staff:* A. T. Goldbeck, Engineering Director; J. E. Gray, Testing Engineer. 2 engineers; additional personnel 3.

*Research activities:* Aggregates as used in concrete, bituminous pavements, ballast, etc.; concrete and asphaltic concrete; flexible pavement design. (Research initiated 1928.)

*Library:* 750 volumes.

*Scientific periodicals:* Crushed Stone Journal. Vol. I, 1925. Stone Briefs. Vol I, 1944.

1525. National Cylinder Gas Company, 205 West Wacker Drive, Chicago 6, Ill.

*President:* C. J. Haines.

*Laboratory:* 1520 North Fremont St., Chicago 22, Ill.

*Research staff:* A. F. Chouinard, Manager of research and development. 2 chemists, 5 engineers; technical personnel 9; additional personnel 3.

*Research activities:* Industrial gases and their manufacture; equipment and apparatus employing these gases. (Research initiated 1937.)

*Library:* 200 volumes.

HOLLUP CORPORATION LABORATORY

4700 West 19th St., Chicago 50, Ill.

*Research staff:* R. E. Long, Chief Engineer. 1 chemist, 2 metallurgists, 1 engineer; additional personnel 8.

*Research activities:* Research on electrodes and arc welding processes. (Research initiated 1933.)

*Library:* 150 volumes.

1526. National Dairy Products Corporation, 230 Park Ave., New York 17, N. Y.

*President:* L. A. Van Bomel.

SEALTEST, INC.

1403 Eutaw Place, Baltimore. 17, Md.

*President:* E. V. McCollum.

*Research staff:* E. V. McCollum; Arnold H. Johnson; J. J. Johnson; Robert P. Myers; H. A. Trebler; S. M. Weisberg; R. Whitaker. 12 chemists, 3 chemical engineers, 4 bacteriologists, 3 dairy technologists, 10 technicians, 2 librarians; additional personnel 21.

*Research activities:* The utilization of milk and its by-products for food and industrial purposes; dairy plant materials; dairy plant technology; dairy waste disposal; new products investigation. The manufacture of lactic acid and its derivatives from whey. (Research initiated 1929.)

*Library:* 1,221 volumes.

SHEFFIELD FARMS COMPANY, INC.

524 West 57th St., New York 19, N. Y.

*President:* F. J. Andre.

*Research staff:* David B. Hand, Technical Director. 9 chemists, 2 biologists, 4 engineers; additional personnel 4.

*Research activities:* Foods, pharmaceuticals, and industrial chemicals derived from milk. (Research initiated 1944.)

*Library:* 125 volumes.

1527. National Distillers Products Corporation, 120 Broadway, New York, N. Y.

*President:* Seton Porter.

*Laboratory:* Cincinnati, Ohio.

*Research staff:* E. C. Pattee, Director. 6 chemists, 3 engineers; additional personnel 2.

*Research activities:* Investigations on fundamental and process development problems connected with the manufacture of alcohol and whiskey from grains, the production of grape wines, and the recovery of by-products from the above processes. (Research initiated 1936.)

*Library:* 450 volumes.

1528. National Drug Company, 4663 Stenton Ave., Philadelphia 44, Pa.

*President:* Albert B. Collins.

*Laboratory:* Philadelphia, Pa.; Biological Branch, Swiftwater, Pa.

*Research staff:* Gustav J. Martin, Director; Leo Tolman, Harold Urist, and Souren Avakian, Organic Chemists; James Lewis, Bacteriologist; Sanford Byers, Biochemist; Wallace Donaghy, Pharmaceutical Chemist; John Wilkinson, Physical Chemist; Sidney Alpert, Analytical Chemist; Robert Brendel, Pharmacologist; Vinton Swayne, Histopathologist. 7 chemists; technical personnel 4; additional personnel 6.

*Research activities:* Displacement compounds; relationship of structure to pharmacological action. (Research initiated 1906.)

*Library:* 500 volumes.

*Cooperative research:* Twelve grants for research are made.

1529. National Foam System, West Chester, Pa.

*President:* Fisher L. Boyd.

*Research staff:* H. Hart Fleming, Vice President and Director. 3 chemists, 1 biologist, 2 engineers; technical personnel 5.

*Research activities:* Foaming agents and surface active substances; pharmaceuticals. (Research initiated 1941.)

*Cooperative research:* One fellowship is supported.

1530. National Fruit Product Company, Inc., Winchester, Va.

*President:* Frank Armstrong.

*Laboratories:* Winchester, Va.; Martinsburg, W. Va.; Peach Glen, Pa.

*Research staff:* Wm. A. Rooker, Director. 4 chemists; technical personnel 4; additional personnel 1.

*Research activities:* Food products, particularly apple products; new products and processes; quality control methods; product applications. (Research initiated 1934.)

1531. National Grain Yeast Corporation, 810 Mill St., Belleville 9, N. J.

*President:* Frank J. Hale.

*Research staff:* Morris W. Mead, Director. 4 chemists, 1 biologist; technical personnel 4; additional personnel 1.

*Research activities:* Improvements in yeast manufacturing processes; fermentation studies, especially in bread doughs; new products investigations, such as dried yeasts; improvement in analytical and testing methods. (Research initiated 1931.)

1532. National Gypsum Company, 325 Delaware Ave., Buffalo 2, N. Y.

*President:* Melvin H. Baker.

*Research staff:* Dean DeForest Crandell, Vice President in charge of research; Frank L. Marsh, Director. 10 chemists, 2 engineers; technical personnel 20; additional personnel 5.

*Research activities:* Building products research, and the industrial uses of gypsum, lime, insulation paint, and acoustical materials. (Research initiated 1926.)

*Library:* 500 volumes.

1533. National Lead Company, 111 Broadway, New York 6, N. Y.

*President:* Fletcher W. Rockwell.

*Laboratory:* 105 York St., Brooklyn 1, N. Y.

*Research staff:* C. A. Geatty, Vice President and Chairman of research and development committee; Alex. Stewart, Director of research. 46 chemists, 5 physicists, 2 biologists and bacteriologists, 6 metallurgists, 4 engineers, 2 electrochemists; additional personnel 32.

*Research activities:* The manufacture and utilization of lead products, including white lead, lead oxides, sheet lead, pipe, alloys, etc.; also pigments, linseed, castor oils, and other paint vehicles; paint technology; the metallurgy of

lead, tin, and white metal alloys, including magnesium; corrosion studies of lead on steel; microscopy, spectrography; ceramics; petroleum and oil well drilling; storage battery materials. (Research initiated 1892.)

*Library:* 3,200 volumes.

*Cooperative research:* Four scholarships are supported and two grants for research are made.

BAROID SALES DIVISION, NATIONAL LEAD COMPANY

830 Ducommun St., Los Angeles 12, Calif.

*General Manager:* George L. Ratcliffe.

*Research staff:* D. H. Larsen, Manager of research and development. 9 chemists, 1 geologist; technical personnel 2; additional personnel 3.

*Research activities:* Colloidal chemistry of clays. (Research initiated 1929.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is supported.

See also Titanium Pigment Corporation.

1534. National Lock Washer Company, 40 Hermon St., Newark 5, N. J.

*President:* Esty Foster.

*Research and Development Committee:* Esty Foster, Chairman; Samuel Frothingham, Superintendent of Manufacturing; Gilbert E. Webster and Arthur W. Preikschat, Vice Presidents; Alfred W. Mellows, President of the National Lock Washer Company of Wisconsin.

*Research staff:* Dominic J. Holleran, Plant Engineer; Rolf G. Sartorius, Metallurgical Engineer and Engineer of Tests; Joseph Schunk, Product Research Engineer.

*Research activities:* The improvement of present products and development of new products, i.e., spring washers, retaining rings, drop forgings, car window equipment, railway and bus windows, electrical resistors and rheostats.

NATIONAL LOCK WASHER COMPANY OF WISCONSIN

Milwaukee 2, Wis.

*President:* Alfred W. Mellows.

*Research staff:* Joseph F. Barthlemess, Assistant to the President.

*Research activities:* The improvement of present products.

HARDWICK, HINDLE, INC.

40 Hermon St., Newark 5, N. J.

*President:* A. W. Preikschat.

*Research staff:* Donald F. Hastings, Director. 1 metallurgist, 2 engineers.

*Research activities:* The investigation of the properties of ceramic materials, alloys, enamels,

etc., in relation to their use in the construction of electrical resistors, and in the application of resistors to the various branches of the electrical industry; vitreous enameled resistors, rheostats, and electrical apparatus. (Research initiated 1929.)

**1535. National Malleable and Steel Castings Company, 10600 Quincy Ave., Cleveland, Ohio.**

*President:* Charles McCrea.

*Laboratories:* Research Laboratory, Cleveland, Ohio. Works Control Laboratories: Cleveland Ohio; Indianapolis, Ind.; Cicero, Ill.; Melrose Park, Ill.; Sharon, Pa.

*Research staff:* H. A. Schwartz, Manager, Research Laboratory. 2 chemists, 1 engineer, 1 metallographer; additional personnel 4.

*Research activities:* Foundry process metallurgy; properties of cast iron and cast steels; the effect of hydrogen and nitrogen on cast metals; graphitization; castings for magnetic purposes. (Research initiated 1920.)

*Library:* 1,500 volumes.

**National Meter Division, Rockwell Manufacturing Company. See Rockwell Manufacturing Company.**

**1536. National Oil Products Company, Inc., 1st and Essex Sts., Harrison, N. J.**

*President:* Charles P. Gulick.

*Laboratories:* Nopco Industrial Laboratories; Nopco Vitamin Laboratories; Packaged Products Research Laboratory. (Research initiated 1907.)

*Library:* 4,000 volumes and 10,000 pamphlets.

*Scientific periodicals:* Bulletin of Chemistry and Industry. Vol. I, 1936. Bulletin of Biochemistry and Nutrition. Vol. I, 1936.

*Cooperative research:* Five grants for research are made.

#### NOPCO SALES AND DEVELOPMENT LABORATORY

*Vice President in charge:* Thomas A. Printon.

*Research staff:* Edwin A. Robinson, Technical Director. 13 chemists; technical personnel 1; additional personnel 4.

*Research activities:* The development and evaluation of products for use in the processing of textiles, leather, paper, rubber, metals, and the preparation of such industrial articles as adhesives, paints, greases, etc.

#### NOPCO INDUSTRIAL RESEARCH LABORATORY

*Vice President in charge:* Thomas A. Printon.

*Research staff:* Francis J. Sprules, Technical Director. 10 chemists; technical personnel 2; additional personnel 2.

*Research activities:* The development of synthetic organics for application to textiles, leather, and paper; the development of lower molecular weight organics from naturally occurring fats, oils, and waxes.

#### NOPCO VITAMIN LABORATORIES

*Vice President in charge:* Perc S. Brown.

*Research staff:* A. E. Briod, Executive Head of laboratories; K. Morgareidge, Director of research and control laboratories. 17 chemists, 2 physicists, 7 biologists, 5 engineers; technical personnel 4; additional personnel 7.

*Research activities:* Production and use of vitamin products from natural and synthetic sources.

#### PACKAGED PRODUCTS RESEARCH LABORATORY

*Vice President in charge:* G. Daniel Davis.

*Research staff:* John J. Miskel, Technical Director. 4 chemists, 2 biochemists, 1 physician, 1 pharmacologist, 2 bacteriologists, 2 pharmacists; additional personnel 8.

*Research activities:* Pharmaceuticals: hormones, salicylates, anesthetics, digitalis principles, hematinics, vitamins, antiseptics, skin detergents, and sedatives. Cosmetics: shampoos, hair lacquers, creams, skin cleansers, hair dressings, hair rinses. (Research initiated 1944.)

*See also* Metasap Chemical Company, Nopco Chemical Company, Inc., and Rare Chemicals, Inc.

**National Printing Ink Research Institute. See No. 2436 in Addenda.**

**1537. National Radiator Company, 221 Central Ave., Johnstown, Pa.**

*President:* Robert S. Waters.

*Laboratory:* Bridge St., Johnstown, Pa.

*Research staff:* L. N. Hunter, Vice President in charge of research. 2 chemists, 2 metallurgists, 5 engineers, 6 draftsmen and testers, 3 mechanics.

*Research activities:* The development of cast iron and steel low pressure coal-burning, oil-burning, and gas-burning boilers; direct and indirect radiators and convectors; blast heaters; heat transfer equipment for use in oil refineries; heating equipment for use in oil fields; humidifiers and general air conditioning equipment; automatic controls for boilers and heating systems; corrosion-resisting alloys; the investigation of air and gas flow problems; combustion problems; the treating of oil emulsions; heat transfer problems; insulation; refractories; corrosion; metal powders, sponge and electrolytic iron. (Research initiated 1929.)

*Cooperative research:* One fellowship is supported and two grants for research are made.

**1538. National Research Corporation, 100 Brookline Ave., Boston 15, Mass.**

*President:* Richard S. Morse.

*Laboratories:* Boston, Mass.; Plymouth, Fla.

*Research staff:* Richard S. Morse, Director of research. Department Directors: Norman V. Hayes, Dehydration; Frank C. Benner, Chemistry; Robert A. Stauffer, Metals. 15 chemists, 4 physicists, 3 metallurgists, 26 engineers; technical personnel 24; additional personnel 49.

*Research activities:* High vacuum processes and equipment: high vacuum dehydration; high vacuum distillation; vacuum metallurgy; pumps, gages, flow of gases; thin films. (Research initiated 1940.)

*Library:* 1,000 volumes.

*Cooperative research:* One fellowship is maintained and one grant for research is made.

**1539. National Sand and Gravel Association, Inc., 951 Munsey Bldg., Washington 4, D.C.**

*President:* Robert Mitchell.

*Laboratory:* National Sand and Gravel Association Research Foundation is located at the University of Maryland, College Park, Md.

*Research staff:* Stanton Walker, Director. Two research associates, a laboratory assistant, and part-time undergraduate student assistants.

*Research activities:* Studies of the physical characteristics of sand and gravel, and other mineral aggregates, principally with respect to their use in the construction field. (Research initiated 1928.)

*Scientific publications:* Bulletin. Irregular. Circular. Irregular.

*Cooperative research:* One fellowship is supported.

**1540. National Slag Association, 644 Earle Bldg., Washington 4, D. C.**

*President:* W. W. Lavers.

*Laboratory:* Youngstown, Ohio.

*Research staff:* Fred Hubbard, Director; H. T. Williams, Materials Engineer. 2 engineers; technical personnel 2; additional personnel 1.

*Research activities:* Investigations of the production, quality, and use of blast furnace slag aggregate. (Research initiated 1928.)

*Cooperative research:* Three fellowships are supported.

**National Southern Products Corporation. See No. 2437 in Addenda.**

**1541. National Starch Products, Inc., 270 Madison Ave., New York 16, N. Y.**

*President:* Frank Greenwall.

*Laboratories:* New York, N. Y.; Dunellen, N. J.

*Research staff:* Alfred A. Halden, Director. 20 chemists, 10 chemical engineers; additional personnel 10.

*Research activities:* Starches, dextrans, corn, corn oil, lacquers, and proteins. (Research initiated 1934.)

*Library:* A library is maintained.

*Cooperative research:* One grant for research is made.

**1542. National Steel Corporation, 2800 Grant Bldg., Pittsburgh 19, Pa.**

*Chairman:* E. T. Weir.

*Laboratories:* Weirton Steel Division, Weirton, W. Va.

*Research staff:* J. J. Munns, Vice President in charge of quality control; J. D. Gold, Assistant Vice President; S. M. Newbrander, Chief Metallurgist; J. A. Sample, Chief Chemist; G. C. Jenison, in charge of chemical development and research. *General laboratories:* 5 chemists, 1 physicist, 20 metallurgists, 2 bacteriologists, 70 technicians, 31 testers. *Chemical development:* 3 chemists, 3 research chemists, 1 research chemical engineer, 4 technicians; additional personnel 14.

*Research activities:* Research and development in the manufacture, fabrication, and finishing of steel, electrocoated strip and hot dipped coatings, together with investigations in the utilization of finished products. Chemical and metallurgical control of mill operation, customer's service, and special investigations. (Research initiated 1903.)

*Library:* 1,500 volumes.

**1543. National Sugar Refining Company, 129 Front St., New York, N. Y.**

*President:* E. Bunker.

*Laboratory:* 1037 North Delaware Ave., Philadelphia, Pa.

*Research staff:* W. H. Hoodless, Vice President and Director of research, design, and development. 4 chemists; additional personnel 6.

*Research activities:* Sugar and its by-products, alcohol, dry ice, yeast, and chemicals. (Research initiated 1927.)

*Library:* 800 volumes.

*Cooperative research:* Grants for research are made.

**1544. National Technical Laboratories, 820 Mission St., South Pasadena, Calif.**

*President:* A. O. Beckman.

*Research staff:* Howard H. Cary, Vice President in charge of research and development. 6 chemists, 4 physicists, 2 engineers; technical personnel 12; additional personnel 2.

*Research activities:* Scientific instruments, particularly glass electrodes and pH meters, ultraviolet and infrared spectrophotometers, precision potentiometers and instruments for chemical analysis and chemical process control. (Research initiated 1933.)

*Library:* 500 volumes.

**1545. National Tube Company, Frick Bldg., Pittsburgh, Pa.** (Subsidiary of United States Steel Corporation of Delaware.)

*President:* C. R. Cox.

*Laboratories:* Central Research Laboratory, 4910 Forbes St., Pittsburgh, Pa. Mill laboratories: McKeesport, Pa.; Lorain, Ohio; Ellwood City, Pa.

*Research staff:* E. N. Sanders, Vice President in charge of operation; J. J. Dunn, Assistant to Vice President; E. C. Wright, Assistant to President. About 30 men are engaged in technical development.

*Research activities:* Metallurgical, chemical, and physical research as it applies to mill operations, new products, and various uses of tubular goods by consumers; corrosion; protection of steel; welding, etc. (Research initiated 1920.)

**1546. National Twist Drill and Tool Company, Rochester, Mich.**

*President:* H. L. McGregor.

*Research staff:* J. A. Cook, Director. 1 chemist, 2 metallurgists, 2 engineers; additional personnel 6.

*Research activities:* The design of tools and their performance; cutting tool materials. (Research initiated 1916.)

**1547. National Union Radio Corporation, 15 Washington St., Newark 2, N. J.**

*President:* S. W. Muldowny.

*Laboratory:* 251 Plane St., Newark, N. J.

*Research staff:* A. M. Skellett, Director of research; L. Grant Hector, Director of engineering. 2 chemists, 5 physicists, 13 engineers; technical personnel 35; additional personnel 8.

*Research activities:* Vacuum tube research: Mechanics—having to do with the structure of tubes; physics—vacuum technique, electrical measurements, circuit research gas discharges, high voltage phenomena, etc.; chemistry—electron emitters, secondary emissive surfaces, phosphors for cathode ray tubes, and X-ray and electron diffraction. Research work is done also for Philco Corporation and various other companies. (Research initiated 1943.)

*Library:* 300 volumes.

**1548. National Vulcanized Fibre Company, Wilmington, Del.**

*President:* J. W. Marshall.

*Laboratories:* Yorklyn, Del.; Newark, Del.; Kennett Square, Pa.

*Research staff:* G. A. Albert, Director. 6 chemists, 3 engineers; additional personnel 7.

*Research activities:* Improvement of the conversion of cotton cellulose, and the development of chemically-treated papers with varying degrees of dielectric strength, power factor loss, and mechanical strength.

**1549. National Warm Air Heating and Air Conditioning Association, 145 Public Square, Cleveland 14, Ohio.**

*President:* H. P. Mueller.

*Laboratory:* 1108 West Stoughton St., Urbana, Ill.

*Research staff:* A. P. Kratz, Director; S. Konzo, Chief Engineer. 3 engineers.

*Research activities:* The investigation of the design, efficiency, and improvement of warm air furnaces and their appurtenances for heating and other phases of air conditioning. (Research initiated 1918.)

*Cooperative research:* One grant for research is made.

**Naugatuck Chemical Division, United States Rubber Company.** See United States Rubber Company.

**1550. Nazareth Cement Company, Nazareth, Pa.**

*President:* H. B. Robeson.

*Research staff:* J. Clifford Evans, Director. 3 chemists, 1 physicist; technical personnel 3; additional personnel 1.

*Research activities:* Problems of production and operation of a cement mill; the use of portland cement in concrete and concrete products; the materials used in the manufacture of cement. (Research initiated 1926.)

**1551. Nekoosa-Edwards Paper Company, Port Edwards, Wis.**

*President:* J. E. Alexander.

*Research staff:* T. A. Pascoe, Technical Director; R. C. Crain, Research Director; J. H. Smart, in charge of mill research. 6 chemists; technical personnel 27; additional personnel 2.

*Research activities:* The development of new papers and of new pulps with special characteristics; improvement in pulping and bleaching; pulp washing and pulp purification; chemical recovery; pulp refining and wood evaluation. (Research initiated 1908.)

*Cooperative research:* One grant for research is made.

**Nelio Resin Processing Corporation.** See Glidden Company.

**1552. Neptune Meter Company, 50 West 50th St., New York 20, N. Y.**

*President:* John H. Ballantine.

*Laboratories:* 228 East 45th St., New York, N. Y.; Danbury, Conn.

*Research staff:* Henry F. Soper, Vice President in charge of research; Charles S. Hazard, Chief Engineer. 2 chemists, 1 physicist, 10 engineers, 8 model makers; additional personnel 1.

*Research activities:* Liquid meters. (Research initiated 1900.)

*Library:* A library is maintained.

**1553. Nestlé's Milk Products, Inc., 155 East 44th St., New York 17, N. Y.**

*President:* Daniel F. Norton.

*Laboratory:* Marysville, Ohio.

*Research staff:* R. W. Titus, Director. 6 chemists, 1 biologist; technical personnel 4; additional personnel 1.

*Research activities:* Research in the chemistry, bacteriology, and nutrition of milk and other food products, including sweetened, condensed and evaporated milk, powdered milk, malted milk, infant foods, processed cheese, and coffee; miscellaneous food research involving methods of manufacture and quality control. (Research initiated 1918.)

**1554. Neumann-Buslee and Wolfe, Inc., 224-230 West Huron St., Chicago, Ill.**

*President:* John Buslee.

*Research staff:* C. E. Larrabee, Director. 3 chemists; technical personnel 4.

*Research activities:* The chemistry of essential oils, perfumes, and flavors. (Research initiated 1922.)

**1555. Neville Company, Neville Island, Pittsburgh 25, Pa.**

*President:* Edwin Hodge, Jr.

*Research staff:* L. M. Geiger, Director. 3 chemists, 5 engineers; technical personnel 8; additional personnel 2.

*Research activities:* Synthetic resins; organic chemicals. (Research initiated 1926.)

*Library:* 600 volumes.

*Cooperative research:* One fellowship is supported.

**New Departure Division, General Motors Corporation. See General Motors Corporation.**

**1556. New England Box Company, Greenfield, Mass.**

*President:* L. F. Dickinson.

*Research staff:* Nathan Tufts, Vice President and General Manager. 1 physicist; technical personnel 1; additional personnel 1.

*Research activities:* The testing and designing of improved types of wooden containers. (Research initiated 1929.)

*Cooperative research:* Two fellowships are supported and one grant for research is made.

**1557. New England Confectionery Company, 254 Massachusetts Ave., Cambridge, Mass.**

*President:* Horace S. Ridley.

*Research staff:* Ernest C. Peakes, Chief Chemist. 2 chemists; technical personnel 2.

*Research activities:* Confectionery problems. (Research initiated 1916.)

*Library:* 100 volumes.

**1558. New England Spectrochemical Laboratories, 21 Winthrop St., West Medway, Mass.**

*Research staff:* Daniel P. Norman, Director. 1 chemist, 1 physicist, 1 engineer; technical personnel 3; additional personnel 1.

*Research activities:* Optical methods of chemical analysis, particularly ultraviolet and infrared absorption spectrophotometry and emission spectrography. A long-range research program is under way to develop satisfactory spectrographic methods of detecting and determining nonmetallic elements of the fifth, sixth, and seventh groups of the periodic table. Applications of physical methods of chemical analysis to industrial problems. (Research initiated 1939.)

*Library:* 1,000 volumes.

**1559. New Jersey Dairy Laboratories, 222-226 Easton Ave., New Brunswick, N. J.**

*Research staff:* David Levowitz, Director. 2 chemists, 2 biologists; technical personnel 3; additional personnel 5.

*Research activities:* Standardization of analytical methods for dairy chemistry and dairy bacteriology; development of equipment for continuous conversion of cream to butter; investigations into factors relating to sperm life for artificial insemination work; investigation into behavior of various antiseptics, with relation to flora of dairy products. (Research initiated 1935.)

*Library:* 600 volumes.

**1560. New Jersey Silica Sand Company, Millville, N. J.**

*President-Treasurer:* Clarence R. Wolf.

*Research staff:* Stewart A. Wick, Director. 1 metallurgist; technical personnel 2.

*Research activities:* The purification of silica sand for glass purposes, and the determination of clay values in molding sands. (Research initiated 1926.)

**1561. New Jersey Zinc Company, 160 Front St., New York 7, N. Y.**

*President:* Henry Hardenbergh.

*Laboratory:* Palmerton, Pa.

*Research staff:* Marshall L. Havey, Executive Vice President in charge of research; E. H. Bunce, General Manager, Technical Department; W. M. Peirce, Chief, Research Division; G. F. A. Stutz, Chief, Development Engineering Division. 24 chemists, 9 physicists, 20 metallurgists, 8 engineers, 34 technicians, 104 laboratory and development workers; additional personnel 87.

*Research activities:* Fundamental research on metals and pigments; metallurgical, mechanical, physical, and chemical investigations on the manufacture of zinc oxide, zinc sulfide, lithopone, luminescent pigments, and other pigments, and

their use in the rubber, paint, paper, plastics, and ceramic industries; also on the manufacture and utilization of spiegel iron, slab zinc, worked metallic zinc in shapes, strip, and sheets, zinc alloys for rolling and casting, metal powders, and other metals. The study of zinc coatings and of finishes for zinc surfaces, and zinc base alloy die casting development. (Research initiated 1906.)

*Library:* 9,000 volumes.

*Scientific periodicals:* Alloy Pot. Vol. I, 1933. Paint Progress. Vol. I, 1939. Activator. Vol. I, 1935.

**1562. New Products Laboratories, 1020 West 94th St., Chicago 20, Ill.**

*President:* W. Wilhelm.

*Laboratories:* 9145 South Leavitt St., and 1020 West 94th St., Chicago, Ill.

*Research staff:* 3 chemists, 1 physicist, 1 biologist, 1 metallurgist, 2 engineers, 1 psychologist, 1 physician, 1 geologist, 1 bacteriologist; technical personnel 4; additional personnel 6.

*Research activities:* The development of commercial products in many fields; general research in pharmaceuticals, including germicides and antiseptics; tablets; galenicals; specialties; dental supplies; packaging; electronic devices; plastics; new products made of metal; entomology. (Research initiated 1927.)

*Library:* 500 volumes.

**1563. New York Produce Exchange, 2 Broadway, New York, N. Y.**

*President:* Charles B. Crofton.

*Research staff:* M. F. Lauro, Chief Chemist. 2 chemists; additional personnel 4.

*Research activities:* Fats and oils, cereals, foods, canned goods. (Research initiated 1908.)

**1564. New York Quinine and Chemical Works, Inc., 99 North 11th St., Brooklyn 11, N. Y.**

*President:* Irving McKesson.

*Research staff:* J. W. H. Randall, Technical Director. 12 chemists; technical personnel 4; additional personnel 3.

*Research activities:* The development of improved methods for the production of narcotics and cinchona alkaloids. (Research initiated 1920.)

*Library:* 1,000 volumes.

**1565. New York Sugar Trade Laboratory, Inc., 70 Pine St., New York 5, N. Y.**

*President:* C. H. A. Mott.

*Laboratory:* 113 Pearl St., New York 4, N. Y.

*Research staff:* F. W. Zerban, Director; Louis Sattler, Research Chemist. 8 chemists; additional personnel 2.

*Research activities:* The determination of

sucrose, dextrose, and levulose in cane sugar products; methods of clarification prior to the determination of sugars; the determination of color and turbidity in cane sugar products; the determination of ash in sugar products by electrical conductivity measurements; the analysis of sugar mixtures containing sucrose, dextrose, levulose, maltose, and lactose; the nature and determination of unfermentable reducing substances in cane molasses; analysis of mixed cane and corn products; use of Karl Fischer reagent for determination of water in sugar products. (Research initiated 1907.)

*Library:* 400 volumes.

**1566. New York Testing Laboratories, Inc., 74-80 Washington St., New York 6, N. Y.**

*President:* G. Brinton Jack, Jr.

*Research staff:* Gerald J. Horvitz, Technical Director; Louis Sherman, inorganic research; Arthur H. Wilson, organic research; Walter R. Knapp, Engineer of physical tests; Angelo Boscia, Physicist; Albert Selinger, Metallurgist; Alfred H. Rudrauff, Metallurgist and X-ray Technician. 45 chemists, 2 physicists, 4 metallurgists, 9 engineers, 2 bacteriologists; additional personnel 18.

*Research activities:* Ores and metals, microphotography, chemical processes, and patent investigation; the development of new products, such as coating materials, fuels, papers, petroleum products, rubber, leather, etc.; mechanical and electrical devices; model design and building; synthetic resins, radiography, etc. (Research initiated 1919.)

*Library:* 5,000 volumes.

**1567. Newlands Sanitary Laboratory, 11 Laurel St., Hartford, Conn.**

*President:* James A. Newlands.

*Research staff:* James A. Newlands, Director; F. P. Gilligan, Secretary and Treasurer; I. L. Newell, Chief Chemist. 2 chemists, 2 biologists and bacteriologists, 1 engineer; additional personnel 2.

*Research activities:* Water, milk, and foods. (Research initiated 1912.)

**1568. Newport Industries, Inc., P. O. Box 911, Pensacola, Fla.**

*President:* J. H. McCormack.

*Laboratories:* Principal laboratory, Pensacola, Fla.; branch laboratories, DeQuincy, La.; Bay Minette, Ala.

*Research staff:* Vice Presidents: R. C. Palmer, Chemical Director; C. H. Bibb, research; H. L. Marter, production; E. F. Sisson, engineering; J. L. Boyer, Director of technical sales. 15 chemists, 10 engineers; technical personnel 8.

*Research activities:* Rosin, turpentine, pine oil, terpenes, terpene chemicals, synthetic resins,

plastics, paints, varnishes, and fibers. (Research initiated 1916.)

*Library:* 2,000 volumes.

**1569. Ney Company, J. M., 71 Elm St., Hartford, Conn.**

*President:* H. C. Ney.

*Research staff:* Richard L. Coleman, Director. 2 technical assistants.

*Research activities:* The development of new products and alloys in the field of precious metals; improved methods of manufacture and use; the development of new uses; the investigation of inventions and problems submitted by outside sources. (Research initiated 1928.)

**Niacet Chemicals Division, United States Vanadium Corporation.** See Union Carbide and Carbon Corporation.

**1570. Niagara Alkali Company, Niagara Falls, N. Y.**

*President:* J. C. Cassidy.

*Research staff:* H. P. Wells, Technical Director; Axel Heilborn, Director of research. 7 chemists, 2 engineers; technical personnel 3; additional personnel 3.

*Research activities:* Potash, chlorine, and sodium products; pulp bleaching. (Research initiated 1930.)

*Library:* A library is maintained.

**Niagara Frontier Division, Bell Aircraft Corporation.** See Bell Aircraft Corporation.

**1571. Niagara Machine and Tool Works, 683 Northland Ave., Buffalo 11, N. Y.**

*President:* Frederick E. Munschauer.

*Research staff:* F. E. Munschauer, Director; G. E. Munschauer and J. P. Wadleck, Professional Engineers. 5 engineers.

*Research activities:* The development of presses, shears, and other sheet metal equipment; the development and testing of new products.

**1572. Niagara Smelting Corporation, P. O. Box 616, Niagara Falls, N. Y. (Subsidiary of Stauffer Chemical Company.)**

*President:* Hans Stauffer.

*Research staff:* Paul S. Brallier, Plant Manager. 3 chemists, 1 engineer; technical personnel 4; additional personnel 1.

*Research activities:* Process improvement; development of new products; sales service. (Research initiated 1916.)

**1573. Niagara Sprayer and Chemical Company, Inc., Middleport, N. Y. (Subsidiary of Food Machinery Corporation.)**

*President:* J. B. Cary.

*Research staff:* C. O. Eddy, Director. 6 chemists, 3 entomologists, 3 pathologists, 2 parasitologists; technical personnel 4; additional personnel 8.

*Research activities:* Research in insecticides, fungicides, and seed treatments. (Research initiated 1925.)

*Library:* 700 volumes.

*Cooperative research:* Six fellowships are supported.

**1574. Nichols Engineering and Research Corporation, 60 Wall Tower, New York 5, N. Y.**

*President:* C. W. Nichols, Jr.

*Laboratory:* Care of Phelps Dodge Refining Company, 43-09 Fifty-fifth Drive, Laurel Hill, Long Island, N. Y.

*Research staff:* Richard N. Hill, Director; George E. Connolly, Vice President. 1 chemist, 1 metallurgist, 1 engineer; additional personnel 1.

*Research activities:* Pyrometallurgical processes; ore treatment; waste disposal; industrial chemicals.

*Library:* 100 volumes.

**1575. Niloak Company, 1709 East 9th St., Little Rock, Ark.**

*President:* H. L. Winburn.

*Research staff:* Sinclair Whitlow Winburn, Director. 1 chemist, 2 engineers; technical personnel 1.

*Research activities:* Ceramics and nonmetallic minerals. (Research initiated 1938.)

*Library:* 100 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**1576. Niles-Bement-Pond Company, Pratt and Whitney Division, Charter Oak Blvd., West Hartford 1, Conn.**

*President:* Charles W. Deeds.

*Research staff:* Charles M. Pond, Vice President in charge of research; A. H. d'Arcambal, Consulting Metallurgist; W. E. Bancroft, Chief Metallurgist. 5 chemists, 5 metallurgists; technical personnel 5; additional personnel 2.

*Research activities:* The testing of various types of steel for tools, gages, and machine tool parts; the study of the effect of various heat-treatments on different types of steel and kinds of tools; cutting oils, slushing oils, etc. (Research initiated 1915.)



1577. **Ninol Laboratories, 1719 South Clinton St., Chicago 16, Ill.**

*Research staff:* William Colburn, Director. 4 chemists; additional personnel 2.

*Research activities:* Wetting agents, detergents, emulsifying agents, and organic syntheses. (Research initiated 1938.)

*Library:* 600 volumes.

1578. **Nixon Nitration Works, Nixon, N. J.**

*President:* C. A. Schuster.

*Research staff:* Gordon Schmelter, Director. 3 chemists, 1 biologist, 2 engineers; technical personnel 5; additional personnel 3.

*Research activities:* The development of plastics, cellulose derivatives, and related products. (Research initiated 1917.)

1579. **Noble and Wood Machine Company, 1st St., Hoosick Falls, N. Y.**

*President:* C. W. Noble.

*Research staff:* George W. Dodge, Director. 1 chemist, 3 engineers; technical personnel 2; additional personnel 2.

*Research activities:* The development of new ideas of stuff-preparation machines or novel uses of such machines, or of standard machines in various kinds of stock. (Research initiated 1926.)

*Library:* A library is maintained.

1580. **Nopeo Chemical Company, Inc., 1st and Essex Sts., Harrison, N. J. (Subsidiary of National Oil Products Company, Inc.)**

*President:* C. P. Gulick.

*Research staff:* Roland Kapp, Director of research; Ralph Wechsler, Treasurer and Officer in charge. 5 chemists, 1 engineer; technical personnel 2.

*Research activities:* Pharmaceuticals and fine chemicals. (Research initiated 1938.)

**Nordstrom Valve Division, Rockwell Manufacturing Company. See Rockwell Manufacturing Company.**

1581. **Norfolk Testing Laboratories, 288 Bank St., Norfolk, Va.**

*Partners:* John H. Parkins and Harvey L. Hunt.

*Research staff:* 3 chemists.

*Research activities:* Studies by fuel experts and marine chemists in factory problems; process and product improvement; formulas, foods, feeds, fertilizers, and soil improvement; coal and coke inspection; spontaneous combustion investigations; fire hazards; court testimony. (Research initiated 1914.)

1582. **Norma-Hoffmann Bearings Corporation, Stamford, Conn.**

*President:* O. P. Wilson.

*Research staff:* F. L. Wright, Director. 1 chemist, 1 metallurgist, 2 engineers; additional personnel 6.

*Research activities:* Fundamental studies of noise and vibration as applied to ball bearings and applications of ball bearings; grease lubrication for antifriction bearings operating under conditions of unusual low and high temperatures and for extended periods without relubrication; preservation and packaging for tropical exposure and for long storage periods; development of bearing seals against fluids under pressure and against dirt ingress; improvement of the quality of the product through use of better materials, heat-treatment, and manufacturing procedure. (Research initiated 1934.)

*Library:* 300 volumes.

**Norman Laboratories. See Weisselberg, Arnold.**

**Norris, Inc. See Monarch Manufacturing Company.**

1583. **North American Aviation, Inc., 5701 Imperial Highway, Inglewood, Calif.**

*President:* J. H. Kindelberger.

*Research staff:* L. P. Spalding, Chief Research Engineer; H. E. Harris, Laboratory Director. 7 chemists, 2 physicists, 4 metallurgists, 16 engineers; technical personnel 4; additional personnel 15.

*Research activities:* The development and application of materials and manufacturing processes used in aircraft construction; functional and environmental testing of aircraft components and accessories; study and correction of operational and service troubles; special instrumentation for aircraft structural and performance testing. (Research initiated 1936.)

1584. **North American Cement Corporation, 41 East 42nd St., New York 17, N. Y.**

*President:* T. J. Harte.

*Laboratories:* Catskill and Alfred, N. Y.

*Research staff:* J. J. Porter, Chairman of Research Committee; H. F. Kichline, Chief Chemist in charge of research; F. W. Kelley, Jr., Research Assistant, Catskill, N. Y.; J. O. Reid, Research Fellowship, Alfred, N. Y.; A. W. Cox, Experimental Engineer, Catskill, N. Y. 2 chemists, 4 engineers; additional personnel 4.

*Research activities:* The development of various products for use in the cement field and the improvement of manufacturing processes. (Research initiated 1925.)

*Cooperative research:* One fellowship is supported.

- 1585. North American Rayon Corporation, Elizabethton, Tenn.**  
*President:* S. R. Fuller, Jr.  
*Research staff:* J. L. Bitter, Director. 4 chemists, 2 mechanical engineers, 1 textile engineer; technical personnel 13; additional personnel 6.  
*Research activities:* Research on raw materials, rayon yarn production, and the use of rayon yarn in the textile industry. (Research initiated 1929.)  
*Library:* 3,400 volumes.  
*Cooperative research:* Two grants for research are made.
- 1586. North American Research Laboratories, Inc., 530 Somerset St., North Plainfield, N. J.**  
*President:* Robert S. Goodyear.  
*Research staff:* Alfred N. Rogers, Chief Chemist; Robert S. Goodyear, Chief Engineer. 1 chemist, 1 physicist; additional personnel 3.  
*Research activities:* Electroplating; zirconium refinement; electronics; temperature controls. (Research initiated 1944.)  
*Library:* 600 volumes.
- North Carolina Pulp Company. See Kieckhefer Container Company.**
- 1587. North Star Woolen Mill Company, 218 Second St., South, Minneapolis 1, Minn.**  
*President:* W. G. Northup.  
*Laboratories:* 109 Sixth Ave., South, Minneapolis, Minn.; Lima Woolen Mills Company, Lima, Ohio.  
*Research staff:* Raymond K. Flege, Director. 4 chemists, 2 engineers; technical personnel 3; additional personnel 3.  
*Research activities:* Process methods for the manufacture of woolen fabrics; new product development; fundamental research in the effect of process method on fiber properties. (Research initiated 1914.)  
*Library:* 200 volumes.  
*Cooperative research:* One grant for research is made.
- 1588. Northeastern Engineering, Inc., Canal St., Manchester, N. H.**  
*President:* Donald W. Brous.  
*Research staff:* 3 engineers; technical personnel 2; additional personnel 3.  
*Research activities:* Audio and radio frequency systems. (Research initiated 1945.)
- 1589. Northern Equipment Company, 1945 Grove Drive, Erie, Pa.**  
*President:* E. W. Nick.  
*Research staff:* H. H. Weining, Director. 2 engineers; technical personnel 2.  
*Research activities:* Fluid flow, pressure and level controls. (Research initiated 1927.)
- 1590. Northern Paper Mills, Green Bay, Wis.**  
*President:* A. B. Hansen.  
*Research staff:* N. L. Malcove, Director. 2 chemists, 1 engineer; technical personnel 11.  
*Research activities:* Improvement of the quality and reduction of the manufacturing costs of toilet paper, paper towels, and napkins; studies of wood pulping and bleaching; the development of paper specialties. (Research initiated 1931.)  
*Library:* 500 volumes.  
*Cooperative research:* One grant for research is made.
- 1591. Northern States Power Company, 15 South 5th St., Minneapolis, Minn.**  
*President:* T. D. Crocker.  
*Laboratory:* 1600 Chestnut Ave., North, Minneapolis, Minn.  
*Research staff:* J. J. Brennan, Manager of supplies and testing. 2 chemists, 2 engineers; additional personnel 2.  
*Research activities:* Fuel, corrosion, and water treatment. (Research initiated 1919.)  
*Library:* 400 volumes.
- Northland Dairy Division, General Foods Corporation. See General Foods Corporation.**
- Northrop Aircraft, Inc. See Northrop Hendy Company.**
- 1592. Northrop Hendy Company, Northrop Field, Hawthorn, Calif.**  
*President:* Thomas Quayle.  
*Research staff:* A. J. Phelan, Chief Engineer of Northrop Hendy and Chief of power plant research of Northrop Aircraft, Inc. 5 chemists, 3 physicists, 2 metallurgists, 35 engineers, 4 aerodynamicists; technical personnel 10; additional personnel 12.  
*Research activities:* Aerodynamics; thermodynamics; combustion research; power plant research; axial flow compressor research. (Research initiated 1944.)  
*Library:* 150 volumes.
- 1593. Northwest Paper Company, Cloquet, Minn.**  
*President:* Stuart B. Copeland.  
*Research staff:* R. E. Noreus, Manager of Technical Service Department; W. W. Marteny, Assistant Manager. 3 chemists, 2 engineers; technical personnel 12; additional personnel 1.  
*Research activities:* Pulp and paper; general problems dealing with the manufacture of papers for special purposes; the utilization of wood waste and by-product recovery; the chemistry of wood cooking processes; investigations of new wood-pulp producing processes; a physical and

chemical study of pulp wood; new sources of raw materials. (Research initiated 1926.)

*Library:* 125 volumes.

1594. Norton, Arthur J., 2919 First Ave., South, Seattle 4, Wash.

*President:* Arthur J. Norton.

*Research staff:* Arthur J. Norton, Director. 2 chemists; additional personnel 2.

*Research activities:* Synthetic resins, plastics, organic chemicals, paints and varnishes, rubber, textiles, paper, and adhesives. (Research initiated 1938.)

*Library:* 200 volumes.

1595. Norton Company, New Bond St., Worcester 6, Mass.

*President:* George N. Jeppson.

*Laboratories:* Worcester, Mass.; Chippawa, Ont.

*Research staff:* M. F. Beecher, Director; S. S. Kistler, Associate Director (Worcester); R. R. Ridgway, Associate Director (Chippawa). 11 chemists, 4 metallurgists, 5 electrical engineers, 9 chemical engineers, 7 mechanical engineers, 4 ceramic engineers, 3 petrographers; technical personnel 58; additional personnel 22.

*Research activities:* Bonded abrasives, special and pure oxide refractories, surface finish, synthetic resins, electric furnaces, and electric furnace products. (Research initiated 1908.)

*Library:* 5,550 volumes.

*Cooperative research:* Two grants for research are made.

1596. Norwich Pharmacal Company, Inc., 17 Eaton Ave., Norwich, N. Y.

*President:* Frank L. McCartney.

*Research staff:* A. B. Scott, Director of organic research. 21 chemists, 1 engineer; technical personnel 5; additional personnel 11.

*Research activities:* Burn treatment products, antiseptics, and vitamins. (Research initiated 1900.)

*Library:* 1,900 volumes.

*Cooperative research:* Two grants for research are made.

*See also* Eaton Laboratories, Inc.

1597. Novocol Chemical Manufacturing Company, Inc., 2923 Atlantic Ave., Brooklyn 7, N. Y.

*President:* Mendel Nevin.

*Research staff:* Elias Epstein, Director. 5 chemists, 2 bacteriologists; additional personnel 2.

*Research activities:* Local anesthetics; antiseptics; sedatives. (Research initiated 1922.)

*Library:* 1,500 volumes.

*Cooperative research:* One grant for research is made.

1598. Nowak Optical Company, Inc., 1105 Broadway, Buffalo, N. Y.

*President:* John J. Nowak.

*Research staff:* Victor V. Nowak, Director. 1 chemist, 1 physicist.

*Research activities:* Audio apparatus pertaining to deafness of human ears. (Research initiated 1932.)

1599. Nox-Rust Chemical Corporation, 2429 South Halsted St., Chicago 8, Ill.

*President:* G. A. Daubert.

*Research staff:* Eugene Lieber, Technical Director. 5 chemists; technical personnel 7; additional personnel 6.

*Research activities:* Corrosion prevention by protective coatings; petroleum additives. (Research initiated 1936.)

*Library:* 200 volumes.

Nubian Paint and Varnish Company. *See* Glidden Company.

1600. Nuodex Products Company, Inc., Elizabeth F, N. J.

*President:* Leo Roon.

*Laboratories:* 830 Magnolia Ave., and 1075 Magnolia Ave., Elizabeth F, N. J.

*Research staff:* Arthur Minich, Director. 8 chemists, 3 biologists; technical personnel 4; additional personnel 3.

*Research activities:* Heavy metal soaps and esters of organic acids; fungicides and insecticides; wetting agents; paint and varnish driers; miscellaneous chemicals. (Research initiated 1932.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

1601. Nutritional Research Associates, Inc., Box 205, South Whitley, Ind.

*President:* Albert F. O. Germann.

*Research staff:* Albert F. O. Germann, Director. 3 chemists, 2 biologists, 2 engineers.

*Research activities:* Plant pigments: carotene, chlorophyll, and xanthophyll; vitamins in nutrition; utilization of by-products. (Research initiated 1935.)

*Library:* 300 volumes.

1602. Nutrition Research Laboratories, 4210 Peterson, Chicago 30, Ill.

*Managing Director:* Leo C. Hoffman.

*Research staff:* Nelson W. Bolyard, Medical Director; Clifford D. Bauer, Chief Chemist. 6 chemists, 1 biologist, 2 physicians; technical personnel 6.

*Research activities:* Vitamins; steroids; miscellaneous biochemical and pharmaceutical projects. (Research initiated 1935.)

*Library:* 2,000 volumes.

*Cooperative research:* Sixty-two grants for research are made.

**1603. Nyanza Color and Chemical Company, Inc.,** 215 Water St., New York, N. Y.

*President:* O. F. Muller.

*Laboratories:* New York, N. Y.; Newark, N. J.; Ashland, Mass.

*Research staff:* Julius Flaks, Director. 12 chemists.

*Research activities:* The processing of textiles, leather, furs, etc. (Research initiated 1916.)

**1604. Nye-Wait Company, Inc.,** 11-17 North Division St., Auburn, N. Y.

*President:* G. E. Schulz.

*Research staff:* C. L. Shelton, Textile Director; L. E. Bryant, Mechanical Director. 2 chemists, 3 engineers; technical personnel 7; additional personnel 12.

*Research activities:* Wool fiber; yarn; construction of carpet; the development of special machinery to cope with textile research. (Research initiated 1936.)

*Library:* A library is maintained.

**1605. Oakite Products, Inc.,** 22 Thames St., New York 6, N. Y.

*President:* D. C. Ball.

*Research staff:* H. Liggett Gray, Vice President in charge of research; Donald Price, Technical Director; A. Lloyd Taylor, Director of chemical research. 10 chemists, 3 engineers, 2 bacteriologists, 4 technicians; additional personnel 8.

*Research activities:* Chemical research on industrial and household cleaning materials and surface treatment of metals. Mechanical research on industrial cleaning methods, such as cleaning prior to electroplating, cleaning locomotives and parts, metal cleaning in the production of automobile chassis and body parts, cleaning operations and sanitation in food plants, process cleaning in the manufacture of war equipment, cleaning oil refinery and power plant equipment, textile and laundry operations, air conditioning and recirculating water supply; the mechanical laboratory is equipped for such experiments on a semi-plant scale. (Research initiated 1909.)

*Library:* 1,000 volumes.

**1606. O'Brien Varnish Company,** South Bend 21, Ind.

*President:* Floyd M. Reece.

*Research staff:* Matthew F. Taggart, Direc-

tor. 7 chemists; technical personnel 3; additional personnel 4.

*Research activities:* Paint, varnish, enamels, and lacquers. (Research initiated 1922.)

*Library:* 200 volumes.

**1607. Oceanographic and Meteorological Instrument Company,** 50 West 3rd St., New York 12, N. Y. (Subsidiary of G. M. Manufacturing Company.)

*President:* Joseph Kahl.

*Research staff:* Joseph Kahl, Director; technical personnel 2; additional personnel 2.

*Research activities:* The development and manufacture of oceanographic and meteorological instruments. (Research initiated 1945.)

**1608. O'Connor and Company, John T.,** 168 South Valley Road, West Orange, N. J.

*President:* John T. O'Connor.

*Research staff:* John T. O'Connor, Director. 1 chemist, 3 physicists, 1 metallurgist, 5 engineers, 1 psychologist; technical personnel 3; additional personnel 4.

*Research activities:* Industrial electronic controls and machines; electromedical apparatus; electromechanical amusement devices. (Research initiated 1930.)

*Library:* 1,500 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**1609. Ohio-Apex, Inc.,** P. O. Box 98, Nitro, W. Va.

*President:* Andrew A. Payne.

*Research staff:* C. A. Heiberger, Director; B. H. Jacobson, Manager. 4 chemists, 2 engineers; additional personnel 3.

*Research activities:* Organic esters and general chemical syntheses. (Research initiated 1929.)

*Library:* 2,000 volumes.

*Cooperative research:* Two fellowships are supported.

**1610. Ohio Brass Company,** Mansfield, Ohio.

*President:* C. K. King.

*Laboratories:* Barberton and Mansfield, Ohio.

*Research staff:* J. J. Taylor, Director, Barberton; W. C. Becker, Director, Mansfield. 3 chemists, 3 metallurgists, 15 engineers, 3 ceramists; additional personnel 14.

*Research activities:* The study of materials and design in the development of current collection equipment for electric transportation systems and high voltage insulation equipment for electric power companies. (Research initiated 1911.)

**1611. Ohio Chemical and Manufacturing Company**, 60 East 42nd St., New York 17, N. Y. (Subsidiary of Air Reduction Company, Inc.)

*President:* L. A. Hull.

*Cooperative research:* Several grants for research are made.

**HEIDBRINK DIVISION LABORATORY**  
Minneapolis, Minn.

*Research staff:* J. A. Heidbrink, Research Director. 3 engineers; additional personnel 7.

*Research activities:* Anesthetic, resuscitation, gas therapy, and aviation oxygen equipment.

**MEDICAL GAS DIVISION LABORATORY**  
Cleveland, Ohio

*Research staff:* J. F. Vitcha, Chief Chemist. 2 chemists; additional personnel 4.

*Research activities:* Anesthetics, rare and common gases, organic synthesis, and nonconductive rubber products.

**SCANLAN-MORRIS DIVISION LABORATORY**  
East Johnson St., Madison 4, Wis.

*Research staff:* R. H. Schneider, Manager of research and engineering. 1 chemist, 2 engineers; additional personnel 3.

*Research activities:* Sterilizers, operating tables and lights, hospital and surgical equipment, and sutures.

**1612. Ohio Ferro-Alloys Corporation**, Canton 2, Ohio.

*President:* L. G. Pritz.

*Laboratories:* Philo, Ohio; Tacoma, Wash.

*Research staff:* James C. Vignos, Director. 2 chemists, 1 metallurgist.

*Research activities:* Fundamental and practical research in the manufacture and use of ferroalloys which are used in the steel and iron industry. (Research initiated 1935.)

**1613. Ohio Grease Company**, Loudonville, Ohio.

*President:* W. A. Wanders.

*Research staff:* G. V. Beardsley, Director. 2 chemists.

*Research activities:* Analysis of oils, fats, and greases as required in a grease factory; petroleum and its products; lubricants; boiler feedwater; deposits of foreign matter removed from steam engine cylinders. (Research initiated 1916.)

**1614. Ohio Hydrate and Supply Company**, Woodville, Ohio.

*President and General Manager:* Fred Witmer.

*Research staff:* A. H. Nieman, Chemist. 2 chemists, 3 engineers.

*Research activities:* The hydration of lime; field observations on line plaster and lime mortar; research on lime mortar and lime in concrete. (Research initiated 1918.)

**1615. Ohio Rubber Company**, Willoughby, Ohio.

*President:* Franklin G. Smith.

*Research staff:* John H. Winchester, Administrative Director; George L. Meyers, Technical Director; John F. McWhorter, Special Compound Research Engineer; M. Achterhof, Chief Chemist. 9 chemists, 1 engineer; technical personnel 8; additional personnel 2.

*Research activities:* The development of new products using rubber and synthetic rubber. (Research initiated 1926.)

*Library:* A library is maintained.

**1616. Ohio Steel Foundry Company**, Lima, Ohio.

*President:* John E. Galvin.

*Research staff:* H. R. McCoy, Chief Metallurgist. 4 chemists, 5 metallurgists, 24 chemical analysts, 5 metallurgical assistants, 3 pyrometer checkers and repairmen; additional personnel 3.

*Research activities:* Investigation of the composition, melting practice, heat-treatment, and certain other properties of alloy steels used in the manufacture of the company's products; development of new products and improvements in the manufacturing processes. (Research initiated 1930.)

**1617. Ohmite Manufacturing Company**, 4835 West Flournoy St., Chicago 44, Ill.

*President:* D. T. Siegel.

*Research staff:* D. T. Siegel, Director. 8 engineers; technical personnel 10; additional personnel 7.

*Research activities:* Applied research in the company's products: resistors, rheostats, switches, and electrical controls; new projects.

**1618. Oil Field Research Laboratories**, 1028 South Santa Fe, Chanute, Kans.

*Partners:* Carl L. Pate and John R. Lavens, Jr.

*Research staff:* Carl L. Pate, Director. 1 chemist, 1 engineer, 2 laboratory technicians; additional personnel 1.

*Research activities:* Increasing the recovery of crude oil by water repressuring. (Research initiated 1941.)

**1619. Oil Well Supply Company**, Dallas, Tex. (Subsidiary of United States Steel Corporation of Delaware.)

*President:* Fred F. Murray.

*Laboratories:* Oil City, Pa.; Kansas City, Mo.

*Research staff:* A. R. Zelt, Vice President in charge of research. 2 chemists, 2 metallurgists, 10 engineers.

*Research activities:* Research associated with the manufacture of equipment for the petroleum industry; metallurgy and metallography; the physical properties of metals; foundry methods and materials.

1620. Oilgear Company, 1403 West Bruce St., Milwaukee, Wis.

*President:* H. M. Swigart.

*Research staff:* Walter Ferris, Vice President and Director of engineering; James K. Douglas, Development Engineer. 4 engineers, 1 machinist, 1 laboratory assistant.

*Research activities:* Research on the hydraulic transmission of power by positive displacement mechanisms; pumping and motor mechanisms; the behavior of oil as a medium for power transmission, etc.; speed control devices; other types of control. (Research initiated 1924.)

1621. Okonite-Callender Cable Company, Inc., 730 Twenty-first Ave., Paterson 3, N. J. (Associated with Okonite Company.)

*President:* F. C. Jones.

*Research staff:* H. L. Beede, Technical Manager. 5 chemists, 10 engineers; technical personnel 6; additional personnel 3.

*Research activities:* The manufacture of electric power cable and transmission systems. (Research initiated 1925.)

*Library:* A general reference library is maintained.

Oldsmobile Division, General Motors Corporation. See General Motors Corporation.

1622. Olin Industries, Inc., East Alton, Ill.

*President:* J. M. Olin.

#### WESTERN CARTRIDGE COMPANY

East Alton, Ill.

*Research staff:* R. S. Perry, Executive Officer in charge of research; Fred Olsen, Director; E. Hartshorne, Assistant Director. 24 chemists, 9 physicists, 15 metallurgists, 12 chemical engineers, 3 mechanical engineers; technical personnel 75; additional personnel 52.

*Research activities:* Explosives, smokeless powder, ballistics, ammunition, brass and non-ferrous alloys, electrical equipment, and special test apparatus. Research problems of Egyptian Powder Company, East Alton, Ill., and Equitable Powder Company, East Alton, Ill., are handled by the laboratories of Western Cartridge Company. (Research initiated 1929.)

*Library:* 1,000 volumes.

WINCHESTER REPEATING ARMS COMPANY  
275 Winchester Ave., New Haven, Conn.

*Research staff:* E. Pugsley. 3 chemists, 1 physicist, 1 mathematical physicist, 1 metallurgist, 1 chemical engineer, 1 electrical engineer, 1 electronics engineer, 4 ballisticians, 1 chief gun designer, 4 assistant gun designers, 1 chief model maker; additional personnel 32.

*Research activities:* The development of fundamental knowledge of Winchester products and of materials, processes, and new products involved in the manufacture of rifles, shotguns, ammunition, flashlights, batteries, and roller skates. (Research initiated 1904.)

*Library:* 1,500 volumes.

1623. Oliver, Graydon, 215 West 7th St., Los Angeles 14, Calif.

*President:* Graydon Oliver.

*Laboratories:* Ventura and Los Angeles, Calif.

*Research staff:* 3 chemists, 3 physicists, 3 engineers, 2 geologists.

*Research activities:* Core analysis and soil analysis; reservoir engineering; formation characteristics; productivity factors; flow of homogeneous fluids through porous media; electrical characteristics of formation waters; formation characteristics by application of electronics and gamma ray investigations; allied problems. (Research initiated 1932.)

*Library:* 375 volumes; clipping file of more than 30,000 references.

1624. Oliver Corporation, 400 West Madison St., Chicago 6, Ill.

*President:* Alva Phelps.

*Laboratories:* South Bend, Ind.; Charles City, Iowa; Battle Creek, Mich.; Cletrac Division, Cleveland, Ohio; Springfield, Ohio.

*Research staff:* O. E. Eggen, Director of engineering; R. J. Altgelt, South Bend; L. A. Gilmer, Charles City; C. Nyberg, Battle Creek; L. C. Daniels, Cleveland; G. D. Kreuzkamp, Springfield.

*Research activities:* Agricultural equipment and engineering; internal combustion motors; general agricultural sales research.

1625. Oliver Machinery Company, Grand Rapids 2, Mich.

*Research staff:* H. B. Tuthill, Director. 7 engineers; technical personnel 4.

*Research activities:* Machinery development: woodworking, packaging, labeling. (Research initiated 1910.)

1626. **Oliver United Filters, Inc.**, 33 West 42nd St., New York 18, N. Y.

*President:* Edwin Letts Oliver.

*Laboratories:* 2900 Glascock St., Oakland, Calif.; Hazleton, Pa.

*Research staff:* W. J. Riker, in charge of Hazleton laboratory and field development; F. W. Brittain, in charge of Oakland laboratory, 2 chemists, 1 metallurgist, 2 engineers, 2 in other scientific professions; additional personnel 3.

*Research activities:* Methods for increasing efficiency and reducing costs of filtration of chemical and metallurgical products; simultaneous filtration and drying of crystalline products and granular materials; continuous precoat filtration as distinguished from batch filtration with a precoat of filter-aid. (Research initiated 1910.)

1627. **Omaha Testing Laboratories**, 511 South 20th St., Omaha 2, Nebr.

*President:* W. H. Campen.

*Research staff:* W. H. Campen and J. R. Smith, Directors. 3 chemists, 2 physicists, 2 engineers; additional personnel 2.

*Research activities:* Design of flexible pavements for stability and load carrying capacity; design of concrete and bituminous pavements. (Research initiated 1920.)

*Library:* 200 volumes.

1628. **Omar, Inc.**, 1910 Harney St., Omaha 2, Nebr.

*President:* W. J. Coad, Sr.

*Laboratory:* 29th and C Sts., Omaha, Nebr.

*Research staff:* Harry Obermeyer, Director. 8 assistants.

*Research activities:* The study of wheats used for milling; the processes of milling and new mill products; new products for bakeries and improvement of the company's baking products. (Research initiated 1936.)

1629. **Oneida, Ltd.**, Oneida, N. Y.

*President:* P. B. Noyes.

*Laboratory:* Sherrill, N. Y.

*Research staff:* Hamilton Allen, Administrator of Works Laboratory. 7 chemists, 2 metallurgists, 1 engineer; technical personnel 1; additional personnel 2.

*Research activities:* Ferrous and nonferrous metals; electroplating of silver, copper, and nickel; material engineering. (Research initiated 1914.)

*Library:* 500 volumes.

1630. **Onondaga Pottery Company**, 1858 West Fayette St., Syracuse 4, N. Y.

*President:* Richard H. Pass.

*Research staff:* Edward Schramm, Director. 2 chemists, 1 engineer; additional personnel 1.

*Research activities:* White ware bodies and glazes; ceramic colors; decorating processes. (Research initiated 1921.)

*Library:* 400 volumes.

1631. **Onyx Oil and Chemical Company**, 15 Exchange Place, Jersey City 2, N. J.

*President:* Charles D. Ehrengart.

*Laboratory:* Warren and Morris Sts., Jersey City 2, N. J.

*Research staff:* Reginald L. Wakeman, Coordinator of research; Hugh H. Mosher, Director of textile research and development; Emeric I. Valko, Director of new products research and development. 16 chemists, 1 biologist, 5 engineers, 4 textile technologists; technical personnel 10; additional personnel 12.

*Research activities:* Textile processing and finishing agents; surface active agents; organic germicides and fungicides; resins and other film-formers; lubricants; specialty chemicals. (Research initiated 1910.)

*Library:* 800 volumes.

*Cooperative research:* Five fellowships are supported and six grants for research are made.

1632. **Orefraction Incorporated**, 7505 Meade St., Pittsburgh 8, Pa.

*President:* Norbert F. Stanny.

*Research staff:* Norman R. Thielke, Director. 1 chemist; technical personnel 2.

*Research activities:* Methods of mineral beneficiation; utility of products and by-products; consumer service and development. (Research initiated 1938.)

*Library:* 100 volumes.

1633. **Organic Products, Inc.**, 303 Main St., Stamford, Conn.

*President:* Arthur W. Mudge.

*Laboratory:* 18 Elmcroft Road, Stamford, Conn.

*Research staff:* E. J. Cardarelli, Vice President in charge of research. 4 chemists; technical personnel 2; additional personnel 2.

*Research activities:* The development of synthetic organic chemicals, principally in the aromatic chemical field. (Research initiated 1933.)

*Library:* 100 volumes.

**1634. Orthmann Laboratories, Inc.,** 647 West Virginia St., Milwaukee 4, Wis.

*President:* August C. Orthmann.

*Research staff:* August C. Orthmann, Director. 3 chemists, 1 biologist and bacteriologist, 1 engineer; additional personnel 5.

*Research activities:* Tanning materials and processes; finishing materials for leather; adhesives; insecticides; enzymes; microorganisms; compounded oils, fats, and waxes; food products. (Research initiated 1929.)

**1635. Ortho Pharmaceutical Corporation,** Somerville, N. J. (Subsidiary of Johnson and Johnson.)

*President:* Philip B. Hofmann.

*Laboratory:* Ortho Research Foundation, Somerville, N. J.

*Research staff:* Clair E. Folsome, Executive Director. 12 chemists, 12 physicists, 6 biologists, 6 engineers, 3 physicians; additional personnel 12.

*Research activities:* The prevention and correction of conditions or diseases of the human and animal reproductive systems and their cognate physiological functions; specific androgynic pharmaceuticals. (Research initiated 1940.)

*Library:* 3,000 volumes.

*Cooperative research:* Four fellowships are supported and seven grants for research are made.

**1636. Orton Ceramic Foundation,** Edward, Jr., 1445 Summit St., Columbus 1, Ohio.

*President, Board of Trustees:* H. L. Bevis.

*Research staff:* J. L. Carruthers, Manager; E. G. Constans and H. C. CoVan, Engineers. 3 engineers; additional personnel 1.

*Research activities:* Pyrometric cones; ceramics; combustion. (Research initiated 1932.)

*Library:* 100 volumes.

*Cooperative research:* Five fellowships are supported.

**1637. Osborn Company, C. J.,** 132 Nassau St., New York 7, N. Y.

*President:* Michael Flaumenhaft.

*Laboratories:* Research laboratory: 245 Water St., New York 7, N. Y.; Plant laboratory: 1301 West Blancke St., Linden, N. J.

*Research staff:* Clarence F. Silleck, Technical Director. 2 chemists; technical personnel 2.

*Research activities:* Synthetic resins, and applied research on their use in the coating industry; pigment dispersion. (Research initiated 1932.)

*Library:* 250 volumes.

**1638. Oshkosh Industrial Laboratory,** 57 West New York Ave., Oshkosh, Wis.

*Owner:* John O. Frank.

*Research staff:* John O. Frank, Director. 2 chemists; additional personnel 2.

*Research activities:* Plastics and wood preservatives. (Research initiated 1937.)

**1639. Overly Biochemical Research Foundation,** Inc., 254 West 31st St., New York 1, N. Y.

*President:* James S. Wallerstein.

*Research staff:* James S. Wallerstein, Director; Arthur L. Schade, Chief Biochemist. 2 chemists, 2 biologists; technical personnel 5; additional personnel 1.

*Research activities:* Enzyme studies, antibiotics, recovery of feed substances from industrial wastes, and food concentrates. (Research initiated 1942.)

*Library:* 100 volumes.

**Owen-Dyneto Corporation.** See Electric Auto-Lite Company.

**1640. Owens-Corning Fiberglas Corporation,** Toledo 1, Ohio.

*President:* Harold Boeschstein.

*Laboratory:* Newark, Ohio.

*Research staff:* Games Slayter, Vice President in charge of research and development; A. W. Davison, Scientific Director; H. W. Collins, Director of research; Dale Kleist, Manager, Engineering Laboratories; R. B. Crepps, Director, Testing Division; A. L. Simison, Laboratory Coordinator; F. W. Atkinson, Chief Products Technologist. 37 chemists, 15 physicists, 6 metallurgists, 29 engineers; 1 psychologist; 30 in other scientific professions; technical personnel 180; additional personnel 327.

*Research activities:* Glass technology specifically applied to the formation, fabrication, properties, and utilization of glass fibers. (Research initiated 1932.)

*Library:* 1,600 volumes.

*Cooperative research:* Eight fellowships are supported and eight grants for research are made.

**1641. Owens-Illinois Glass Company,** Ohio Bldg., Toledo 1, Ohio.

*President:* J. Preston Levis.

*Laboratories:* Toledo, Ohio; Alton, Ill.

*Research staff:* Urban E. Bowes, Director. 20 chemists, 3 physicists, 1 biologist, 1 metallurgist, 32 engineers, 27 laboratory assistants; additional personnel 34.

*Research activities:* Physical and chemical properties of glass and allied subjects; studies of products, processes, and materials for packaging in glass; problems related to the preparation,



sealing, sterilization, etc. of fruit and other products. (Research initiated 1931.)

*Library:* 2,200 volumes.

**1642. Oxford Paper Company, 230 Park Ave., New York, N. Y.**

*President:* Hugh J. Chisholm.

*Laboratory:* Rumford, Maine.

*Research staff:* A. D. Wooley, Director; E. L. Lamb, Assistant Director. 10 chemists, 1 engineer; additional personnel 6.

*Research activities:* The development, improvement, and control of the major and associated processes and products of pulping, bleaching, stock refining, papermaking, and coating; the uses and requirements of raw materials, materials-in-process, and finished products. (Research initiated 1923.)

*Library:* 623 volumes.

**Ozalid Products Division, General Aniline and Film Corporation. See General Aniline and Film Corporation.**

**1643. Ozark Chemical Company, 402 Mid-Continent Bldg., Tulsa 1, Okla.**

*President:* W. N. Smith.

*Research staff:* C. O. Anderson, Vice President in charge of research; R. J. Stengl, Chief Development Engineer. 5 chemists, 2 metallurgists, 4 engineers, 3 geologists.

*Research activities:* Plant and field processes, flotation, submerged combustion, fluorophosphoric compounds. (Research initiated 1929.)

*Library:* 500 volumes.

*Cooperative research:* Two fellowships are supported.

**1644. Ozone Processes, Inc., 1500 Walnut St., Philadelphia 2, Pa.**

*President:* Morse DellPlain.

*Laboratory:* 2409 West Westmoreland St., Philadelphia 29, Pa.

*Research staff:* Victor Hann, Director. 1 chemist, 1 engineer; additional personnel 2.

*Research activities:* Design and development of ozone generating machines; development of processes and applications in which ozone is used. (Research initiated 1939.)

*Library:* 100 volumes.

**1645. Ozo-Ray Process Corporation, 154 East Erie St., Chicago 11, Ill.**

*President:* Albert B. Fridaker.

*Laboratory:* 230 East Ohio St., Chicago 11, Ill. (In conjunction with Allied Research.)

*Research staff:* Clark E. Thorp, Director. 1 chemist, 1 physicist, 3 engineers; additional personnel 3.

*Research activities:* The development and licensing of processes involving air and water

purification, bleaching, etc.; the use of electrochemical principles of ionic discharge and ultraviolet radiation; the manufacturing of equipment for the production of ionized gases. (Research initiated 1933.)

**1646. P. O. M. Company, 60 East 42nd St., New York 17, N. Y.**

*Partners:* Herbert L. Werner and Rudolph M. Ashner.

*Research staff:* Rudolph M. Ashner and Herbert L. Werner, Directors; Winston B. McGuire, Chief Engineer. 1 engineer, 1 in another scientific profession, 5 industrial consultants; additional personnel 8.

*Research activities:* The development of new control methods in manufacturing plants for machinery, supplies, production, and quality of products, and the setting up of new materials-handling methods and research on new materials and equipment. (Research initiated 1944.)

*Library:* 150 volumes.

**1647. Pabst Brewing Company, 917 West Juneau Ave., Milwaukee 3, Wis.**

*President:* Harris Perlstein.

*Research staff:* James G. Shakman, Vice President and Chairman of research committee. 4 chemists, 1 physicist, 1 biologist, 2 engineers; technical personnel 7.

*Research activities:* The study of enzymes, vitamins, raw materials and processes, malt extracts, and syrups. (Research initiated 1900.)

**1648. Pacific Car and Foundry Company, 4th and Factory Sts., Renton, Wash.**

*President:* Paul Pigott.

*Research staff:* Alexander Finlayson, Director; Thor Henrikson, Mechanical Engineering. 2 chemists, 1 physicist, 2 metallurgists, 6 engineers; technical personnel 2.

*Research activities:* Ferrous alloys and metallurgical research; mechanical devices for logging and railway equipment. (Research initiated 1925.)

*Library:* A library is maintained.

**1649. Pacific Chemical and Fertilizer Company, 311 Pacific St., Honolulu 37, T. H.**

*President:* James Tice Phillips.

*Research staff:* John H. Payne, Director. 5 chemists; additional personnel 5.

*Research activities:* Sugar; agricultural by-products. (Research initiated 1925.)

*Library:* 1,500 volumes.

**1650. Pacific Chemical Laboratories, 617 Montgomery St., San Francisco 11, Calif.**

*Owner:* Benno Lowy.

*Research staff:* Benno Lowy, Chief Chemist;

**P. K. Wong; Jack Grillo; Hilde David; Emil Lowy.** 4 chemists, 1 physician; technical personnel 3; additional personnel 3.

*Research activities:* Foods and beverages. (Research initiated 1916.)

*Library:* 750 volumes.

**1651. Pacific Electric Manufacturing Corporation,** 5815 Third St., San Francisco, Calif.

*President:* J. S. Thompson.

*Research staff:* W. G. Hoover, Director of research. 2 physicists, 3 engineers; technical personnel 2.

*Research activities:* Development and testing of high voltage oil circuit breakers, air switches and controlling equipment, high accuracy current transformers, and high tension fuses; the investigation of mechanical and electrical properties of insulating materials. (Research initiated 1926.)

*Cooperative research:* One grant for research is made.

**1652. Pacific Gas and Electric Company,** 245 Market St., San Francisco 6, Calif.

*President:* J. B. Black.

*Laboratory:* Bureau of Tests and Inspection, 4245 Hollis St., Emeryville 8, Calif.

*Research staff:* I. C. Steele, Chief Engineer; W. N. Lindblad, Chief of Bureau of Tests and Inspection. 1 chemist, 12 engineers; technical personnel 6; additional personnel 2.

*Research activities:* Standardization of measuring instruments; utilization of gas and electricity; properties of engineering materials; study and prevention of corrosion. (Research initiated 1903.)

**1653. Pacific Hydrologic Laboratory,** 58 Sutter St., San Francisco, Calif.

*Research staff:* Charles H. Lee, Consulting Engineer, Director. 1 engineer, 1 geologist; technical personnel 1; additional personnel 1.

*Research activities:* The physical properties of earth consisting of natural mixtures of gravel, sand, silt, clay, colloidal and organic matter, etc., under varying conditions of moisture and compactness; standardizing tests for permeability, liquid, plastic and shrinkage limits, shrinkage ratio, plastic index, cohesion, consolidation, compressive and shearing strength, mechanical analysis of fines, etc., as related to the design of engineering structures, including highways, foundations, earth dams, levees, fills, reservoirs, and canals, and the development and control of underground water; soil drainage and leaching; special studies as consultant on the engineering construction of foundations, earth dams, etc., and on land reclamation and ship salvage. (Research initiated 1929.)

**1654. Pacific Mills,** 140 Federal St., Boston 10, Mass.

*President:* H. M. Bliss.

*Cooperative research:* Several grants for research are made.

#### COTTON AND RAYON DIVISION

East Newark, N. J.

*Research staff:* W. O. Jelleme, Director of development. 14 chemists, 2 physicists, 4 engineers; technical personnel 16; additional personnel 13.

*Research activities:* Improvement of the serviceability of rayon and cotton fabrics, fastness to light and washing, wear resistance, waterproofness, and resistance to fire, mildew, and shrinkage; development of new finishes that resist changes due to cleaning procedures, etc. (Research initiated 1880.)

*Library:* 300 volumes.

#### WORSTED DIVISION

Lawrence, Mass.

*Research staff:* H. W. Leitch, General Superintendent in charge of research. 7 chemists, 1 physicist, 3 engineers, 1 bacteriologist, 1 fiber technologist, 1 textile technologist, 1 textile colorist; technical personnel 26; additional personnel 6.

*Research activities:* Work with woolen and worsted fabrics similar to that of the Cotton Division; engineering and process development in woolen and worsted manufacturing. (Research initiated 1880.)

*Library:* 1,000 volumes.

**Pacific Steel Boiler Division, United States Radiator Corporation.** See United States Radiator Corporation.

**1655. Package Research Laboratory,** Rockaway, N. J. (Division of Stapling Machines Company.)

*President:* E. A. Srill.

*Research staff:* Earl R. Stivers, Director; E. H. Hewson, Assistant Director. 4 engineers; technical personnel 5; additional personnel 3.

*Research activities:* The investigation of box structure; woods and metal parts used in boxes; package design and performance; packing methods; the development of packages for specific commodities; general package testing service. (Research initiated 1908.)

**Packard Electric Division, General Motors Corporation.** See General Motors Corporation.

**Paige-Jones Chemical Company.** See National Aluminate Corporation.

**1656. Pan American Engineering Company, 820 Parker St., Berkeley, Calif.**

*Manager:* M. W. Kirk.

*Research staff:* D. N. Vedensky, Chief Metallurgist. 1 chemist, 3 metallurgists, 1 engineer; additional personnel 1.

*Research activities:* The development of processes for ore treatment; general ore testing. (Research initiated 1928.)

**1657. Pan American Refining Corporation, 122 East 42nd St., New York 17, N. Y. (Subsidiary of Pan American Petroleum and Transport Company.)**

*President:* D. J. Smith.

*Laboratory:* Texas City, Tex.

*Research staff:* L. W. Moore, General Manager of research and development; R. H. Price, Director of research; P. L. Brandt and F. J. Smith, Assistant Directors. 33 chemists, 30 engineers; additional personnel 167.

*Research activities:* Refining of petroleum (thermal and catalytic cracking, hydroforming, alkylation, polymerization, isomerization, etc.), finishing of oil products, special chemicals, water treating, corrosion, distillation, etc. (Research initiated 1933.)

*Library:* 1,300 volumes; 6,500 technical reports.

*Cooperative research:* One fellowship is supported.

**Panelyte Division, St. Regis Paper Company.**  
*See St. Regis Paper Company.*

**1658. Papec Machine Company, Shortsville, N. Y.**

*President:* W. H. Preston.

*Research staff:* Directors: W. H. Preston and F. H. Hamlin; K. Van Sickle, Head, Department of research. Technical personnel 4; additional personnel 1.

*Research activities:* Harvesting, transporting, processing, and storing of grain and forage crops. (Research initiated 1909.)

**1659. Paraffine Companies, Inc., 475 Brannan St., San Francisco 19, Calif.**

*President:* W. H. Lowe.

*Laboratory:* Emeryville, Alameda County, Calif.

*Research staff:* R. H. Shainwald, Executive Vice President in charge of research; A. M. Erskine, Director of research and development; S. A. Cohen, Manager, new products development; R. L. Newman, Manager, manufacturing research; R. Lewon, Manager, plant rubber and asbestos division; J. H. Cooper, Manager, asphalt and pitch research; L. F. Andrews, Manager, paint research; L. Rosenstein, Gen-

eral Consultant. 30 chemists, 1 engineer; technical personnel 10; additional personnel 4.

*Research activities:* The development of new products and improvements in current products: asphalts, felts, roofings, asphalt shingles, linoleums, printed and bituminous felt base floor coverings, paints and varnishes, and products for underground pipe protection; fibrous packings, pipe and boiler coverings, and insulations. (Research initiated 1920.)

*Library:* 500 volumes.

*See also Vitrefrax Corporation.*

**1660. Paragon Paint and Varnish Corporation, 5-49 Forty-sixth Ave., Long Island City 1, N. Y.**

*President:* Israel Silberman.

*Research staff:* LeRoy D. Soff, Chief Chemist. 2 chemists, 2 engineers; technical personnel 1.

*Research activities:* Paint. (Research initiated 1924.)

*Library:* 200 volumes.

**1661. Pardee and Associates, Harvey S., 549 West Washington St., Chicago 6, Ill.**

*Owner:* Harvey S. Pardee.

*Research staff:* Harvey S. Pardee, Director. 1 metallurgist, 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Special machine design; mechanical, electrical, electronic, hydraulic, and pneumatic mathematical investigations; metallurgical studies; statistical control of quality in production. (Research initiated 1912.)

*Library:* 750 volumes.

**1662. Park Chemical Company, 8074 Military, Detroit 4, Mich.**

*President:* F. Lloyd Woodside.

*Research staff:* Paul H. Kramer, Technical Director. 2 chemists, 2 metallurgists.

*Research activities:* Heat-treating materials; chemical specialties. (Research initiated 1927.)

*Cooperative research:* One grant for research is made.

**1663. Parke, Davis and Company, Detroit 32, Mich.**

*President:* A. W. Leschier.

*Research staff:* W. F. Holcomb, Business Manager; Oliver Kamm, Scientific Director; L. A. Sweet, Director of chemical and biochemical research; A. C. Bratton, Director of pharmacological research; F. D. Stimpert, Director of microbiological and virus research. 100 in scientific professions; additional personnel 100.

*Research activities:* Vitamins, hormones, synthetic drugs, chemotherapeutic agents, biolog-

icals (including virus products), and pharmaceuticals. (Research initiated 1896.)

*Library:* 22,000 volumes.

*Cooperative research:* Several fellowships are supported.

**1664. Parker-Kalon Corporation**, 200 Varick St., New York 14, N. Y.

*President:* L. Goldberg.

*Research staff:* Walter A. Toepel, in charge of laboratory; H. Rosenberg, Director of research; L. Lovisek, Chief Engineer; L. Oest, Master Mechanic. 1 chemist, 2 physicists, 2 metallurgists, 2 engineers; technical personnel 15; additional personnel 3.

*Research activities:* The improvement of self-tapping screws and other fastening devices, and of manufacturing processes. (Research initiated 1928.)

**1665. Parker Laboratory**, Charleston 3, S. C.

*Partners:* William Schirmer and Harry H. Wyman.

*Research staff:* William Schirmer and Harry H. Wyman, Directors. 4 chemists, 2 engineers; technical personnel 2 to 8; additional personnel 8 to 20.

*Research activities:* Fertilizer and water problems; stream pollution; structural engineering problems. (Research initiated 1904.)

**1666. Parker Pen Company**, Janesville, Wis.

*President:* Kenneth Parker.

*Research staff:* P. C. Hull, Design and Development Manager; Galen Saylor, Chief Chemist; M. R. Pickus, Chief Metallurgist; M. S. Baker, Chief Designer; James Mustard, Development Department Superintendent. 4 chemists, 1 physicist, 2 metallurgists, 5 engineers, 2 chemical assistants, 3 metallurgical assistants; technical personnel 7; additional personnel 2.

*Research activities:* Fountain pens, mechanical pencils, desk bases and other desk accessories, writing inks, adhesives, metallurgical development, material testing, and process proving. (Research initiated 1928.)

*Library:* 1,200 volumes.

*Cooperative research:* Five fellowships are supported and eighteen grants are made for research.

**1667. Parker Rust-Proof Company**, 2177 East Milwaukee Ave., Detroit 11, Mich.

*President:* Van M. Darsey.

*Research staff:* R. C. Gibson, Director of research; H. J. Lodeesen, Assistant Director. 14 chemists; technical personnel 5; additional personnel 2. M. B. Roosa, Director of Service Department. 10 chemists, 2 engineers; technical personnel 12; additional personnel 2.

*Research activities:* The development of new

processes which, when applied to metals retard corrosion, decrease wear on bearing surfaces, and are an aid to drawing; research on the manufacture of chemicals for use in such processes. (Research initiated 1929.)

*Library:* 125 volumes.

*Cooperative research:* One fellowship is supported.

**1668. Parks-Cramer Company**, Rose St., Fitchburg, Mass.

*President:* H. M. Parks.

*Laboratory:* Charlotte, N. C.

*Research staff:* William B. Hodge, Director. 1 engineer, 2 assistants.

*Research activities:* General improvement and refinement of air conditioning equipment and traveling cleaner equipment for textile machinery; tests on the performance of apparatus; field investigation and study of performance of apparatus as installed under actual working conditions; general practical problems and problems connected with air conditioning and textile machinery cleaning; the collection of practical data and their dissemination to the staff of engineers and salesmen.

**1669. Pass and Seymour, Inc.**, Syracuse 9, N. Y.

*President:* R. H. Pass.

*Research staff:* Engineering laboratory: Victor Despard, Vice President in charge of engineering; Mark N. Russell, Chief Engineer. 3 engineers, 4 draftsmen, 3 model makers. Ceramic laboratory: F. P. Hall, Director. 1 chemist, 3 engineers; additional personnel 1.

*Research activities:* Dielectrics for low and high frequency applications. (Research initiated 1931.)

*Library:* 1,000 volumes.

**1670. Passaic Analytical Laboratories, Inc.**, 228 Aycrigg Ave., Passaic, N. J.

*President:* Richard G. England.

*Research staff:* Richard G. England, Director. 1 chemist; technical personnel 3.

*Research activities:* Fractional distillations; solvents and equipment for cleaning precision parts and instruments. (Research initiated 1933.)

*Library:* 500 volumes.

**1671. Patch Company**, E. L., 38 Montvale Ave., Stoneham 80, Mass.

*President:* Ralph R. Patch.

*Research staff:* Robert A. Walsh, Director. 6 chemists, 1 engineer, 2 physicians; additional personnel 2.

*Research activities:* Pharmaceuticals. (Research initiated 1888.)

*Library:* A library is maintained.

*Cooperative research:* One fellowship is supported and two grants are made for research.

**1672. Patent Button Company, 41 Brown St., Waterbury 88, Conn.**

*President:* Lewis J. Hart.

*Research staff:* Lewis J. Hart, Director. 1 chemist, 1 metallurgist, 1 engineer; technical personnel 1; additional personnel 3.

*Research activities:* Electroplating; corrosion; paints, clear and pigmented enamels; thermosetting molding compounds; automatic machinery. (Research initiated 1932.)

*Library:* 500 volumes.

**1673. Patent Chemicals, Inc., 335 McLean Blvd., Paterson 3, N. J.**

*President:* J. W. Orelup.

*Research staff:* J. W. Orelup, Director. 4 chemists.

*Research activities:* Dyestuffs for the petroleum industry; markers for gasolines; lubrication oil stabilizers and inhibitors; ingredients for high pressure lubricants. (Research initiated 1929.)

*Library:* A library is maintained.

**1674. Patterson Company, C. J., 4722 Broadway, Kansas City 2, Mo.**

*Managing Partner:* C. J. Patterson.

*Research staff:* R. W. Selman, Director of technical activities; R. J. Sumner, Director of research. 6 chemists, 2 baking technologists; additional personnel 4.

*Research activities:* Baking technology; fermentation; foods. (Research initiated 1945.)

*Library:* 200 volumes.

**1675. Patzig Testing Laboratories, 2215 Ingersoll Ave., Des Moines 12, Iowa.**

*Senior Partner:* Monroe L. Patzig.

*Research staff:* Monroe L. Patzig, Jr., Director. 1 chemist, 1 physicist, 1 metallurgist, 2 engineers.

*Research activities:* Engineering and construction materials; asphalts, oils, and paints; metallurgy; cleaners and inks. (Research initiated 1912.)

*Library:* 1,500 volumes.

**1676. Paul-Lewis Laboratories, Inc., 918-22 North 4th St., Milwaukee 3, Wis.**

*President:* P. L. Bajus.

*Research staff:* R. B. Oesting, Director. Variable number on scientific staff.

*Research activities:* Enzymes, their manufacture and industrial application; problems of manufacturing fine chemicals. (Research initiated 1937.)

**1677. Paulboro Manufacturing Company, Paulboro, N. J.**

*President:* John S. Clement.

*Research staff:* Ralph G. Jackson and J. Russell Jones, Development Engineers. 3 chemists, 2 engineers; technical personnel 2; additional personnel 1.

*Research activities:* The application of synthetic resins in paper saturation, coating, etc., particularly for hard surface floor covering manufacture; adhesives, varnishes, drying oils, inks, and paints. (Research initiated 1925.)

*Library:* 100 volumes.

**1678. Payne Company, F. S., 75 Richdale Ave., Cambridge 40, Mass.**

*President:* F. A. Smith.

*Research staff:* 1 metallurgist, 2 engineers; additional personnel 1.

*Research activities:* Electrical apparatus and control systems for elevators; gray iron castings. (Research initiated 1940.)

**1679. Pease Laboratories, Inc., 39 West 38th St., New York 18, N. Y.**

*President:* Herbert D. Pease.

*Research staff:* Herbert D. Pease, Director. 4 chemists, 4 biologists and bacteriologists, 1 engineer, 1 physician, 1 pathologist; additional personnel 8.

*Research activities:* General consultation, research, and testing in the fields of foods, drugs, cosmetics, proprietaries, beverages, and tobacco; technical reviews of advertising and labeling under existing regulations; Food and Drug Administration tests of antiseptic and germicidal efficacies by official and supplementary methods; the determination of toxic substances chemically and by animal experimentation; advisory and testimonial service in litigation; general investigations in chemistry, bacteriology, physiology, sanitation, water supplies, sewage disposal plants, and hotel hygiene. (Research initiated 1904.)

**1680. Pellissier, Jonas and Rivet, Inc., P. O. Drawer No. 33, Walden, N. Y.**

*President:* George E. Jonas.

*Research staff:* Michael P. Mulqueen, Director; James A. Jonas, Vice President. 2 chemists; additional personnel 3.

*Research activities:* The development of methods of felting animal and vegetable fibers for hatting; development of improved methods of preparing animal, vegetable, and mineral fibers for spinning. (Research initiated 1933.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported.

1681. Pemco Corporation, 5601 Eastern Ave., Baltimore 24, Md.

*President:* Karl Turk, Sr.

*Research staff:* G. H. Spencer-Strong, Director. 4 chemists, 1 metallurgist, 6 engineers, 1 ceramist; technical personnel 7; additional personnel 3.

*Research activities:* Glasses suitable for application to sheet iron, cast iron, and ceramic bodies; problems involved in the fusing of glass to iron, producing porcelain enamel; development of ceramic glazes, colorants, ceramic bodies, and vitreous bonding agents. (Research initiated 1910.)

*Library:* A library is maintained.

*Cooperative research:* One fellowship is supported and grants for research are made.

1682. Penick and Company, S. B., 50 Church St., New York 7, N. Y.

*President:* S. B. Penick, Jr.

*Laboratories:* 999 West Side Ave., Jersey City, N. J.; Brunswick St., Jersey City, N. J.

*Research staff:* Thomas Lewis, Technical Director; W. G. Bywater, Director of research. 7 chemists, 1 biochemist, 1 bacteriologist, 1 microbiologist, 1 research librarian, 1 pharmacognosist; technical personnel 4; additional personnel 8.

*Research activities:* The classification and standardization of botanical materials used in the practice of medicine, with particular reference to cascara, digitalis, and ergot; chemical examination of the extractives of crude drugs, the isolation of rare alkaloids, glucosides, and related chemicals in chemically pure form for medical and chemical research; the exploration and provision of nonpoisonous plant and animal insecticides of botanical origin; the chemistry of the watersoluble gums, arabic, carob, karaya, and tragacanth; antibiotics, isolation and identification of essential oils, synthesis of organic chemicals for pharmaceutical or technical use. A pilot farm is maintained for the study of factors influencing the growth of medicinal plants. (Research initiated 1930.)

*Library:* 4,000 volumes.

1683. Penick and Ford, Ltd., Inc., 420 Lexington Ave., New York, N. Y.

*President:* F. T. Bedford.

*Laboratories:* Cedar Rapids, Iowa; Harvey, La.; Brooklyn, N. Y.; Atlanta, Ga.

*Research staff:* J. M. Widmer, Vice President in charge of research; C. C. Kesler, Director. 21 chemists; technical personnel 14.

*Research activities:* Corn products and related fields; cane products; maple products; foodstuffs in general. (Research initiated 1913.)

*Library:* 1,250 volumes.

*Cooperative research:* Fourteen fellowships are supported.

1684. Penn Rivet Corporation, 3rd and Huntingdon Sts., Philadelphia 33, Pa.

*President:* T. M. Searles.

*Research staff:* Raphael Stein, Director; Robert Gordon. 1 chemist, 1 metallurgist, 2 engineers; additional personnel 2.

*Research activities:* Basic investigations relating to problems encountered in the design and manufacture of rivets, rivet-making machines, and rivet-setting machines; applied research leading to new developments; testing and developing new designs. (Research initiated 1938.)

*Library:* 320 volumes.

1685. Penn Tobacco Company, 454 South Main St., Wilkes-Barre, Pa.

*President:* T. F. Flanagan.

*Research staff:* John H. Uhl, Vice President and Director; Jason E. Matthews. 2 chemists; additional personnel 3.

*Research activities:* The chemistry of leaf tobacco; production controls; product improvement; packaging. (Research initiated 1939.)

*Library:* 200 volumes.

1686. Penney Company, Inc., J. C., 330 West 34th St., New York 1, N. Y.

*President:* E. C. Sams.

*Research staff:* Charles W. Dorn, Director. 3 chemists, 1 biologist; additional personnel 1.

*Research activities:* Fabrics, leather goods, rubber goods, cosmetics, shoe dressings, etc. (Research initiated 1930.)

*Library:* 200 volumes.

1687. Pennsylvania Coal Products Company, Petrolia, Pa.

*President:* C. F. Hosford, Jr.

*Research staff:* W. M. Lofton, Jr., Chief Chemist; W. J. Cotton, Chief of special research; Philip H. Rhodes, Chief of resin and adhesive research. 8 chemists, 1 engineer; additional personnel 14.

*Research activities:* The development of organic intermediate specialties and pharmaceuticals; also synthetic resins and adhesives. (Research initiated 1916.)

*Library:* 1,800 volumes.

1688. Pennsylvania Industrial Chemical Corporation, 120 State St., Clairton, Pa.

*President:* R. W. Ostermayer.

*Research staff:* Ralph H. Bailey, Vice President and Director. 5 chemists, 1 engineer; technical personnel 1; additional personnel 2.

*Research activities:* The investigation of the nature, production, and uses of distillates and resins from coke oven by-products, terpenes, and other polymerizable material. (Research initiated 1931.)

*Library:* A library is maintained.

**1689. Pennsylvania Railroad Company, Philadelphia, Pa.**

*President:* M. W. Clement.

*Laboratory:* Altoona, Pa.

*Research staff:* L. B. Jones, Engineer of tests. 21 chemists, 1 biologist and bacteriologist, 2 metallurgists, 9 engineers, 6 foresters, 6 inspectors, 2 observers; technical personnel 55; additional personnel 10.

*Research activities:* General investigation and tests of materials and supplies used by railroads.

**1690. Pennsylvania Refining Company, Butler, Pa.**

*President:* Paul R. Beck.

*Laboratory:* Karns City, Pa.

*Research staff:* John A. Beck, Jr., Director; George M. Kirkwood. 2 chemists.

*Research activities:* Petroleum derivatives. (Research initiated 1935.)

*Library:* A library is maintained.

**1691. Pennsylvania Rubber Company, Chambers Ave., Jeannette, Pa.**

*President:* H. W. Jordan.

*Research staff:* C. E. Carlson, Research Director; William F. Hoelzer, Development Director; E. A. Peden, Chief Chemist. 6 chemists, 4 engineers; technical personnel 10.

*Research activities:* Materials for rubber articles such as pneumatic truck, passenger car, and motor cycle tires and tubes; the development and design of tennis balls, play balls, mechanical goods, and shuttlecocks for badminton play. (Research initiated 1913.)

*Cooperative research:* Several grants for research are made.

**1692. Pennsylvania Salt Manufacturing Company, 1000 Widener Bldg., Philadelphia 7, Pa.**

*President:* Leonard T. Beale.

*Laboratories:* Central research and development laboratories: Whitmarsh Research Laboratories, Wyndmoor, Pa. Plant development laboratories: Wyandotte, Mich.; Tacoma, Wash.; Natrona, Philadelphia, Easton, and Cornwells Heights, Pa.; Portland, Oreg.; Bryan, Tex.; and at locations of subsidiary companies.

*Research staff:* S. C. Ogburn, Jr., Manager, Research and Development Department; W. A. LaLande, Jr., Director of research; F. E. Murphy, Director of development; E. A. Georgi,

Director of special products; A. E. Lyden, Director of patents; A. E. Gibbs, Advisory Technical Director; W. S. Riggs, Director of buildings and services. 45 chemists, 1 metallurgist, 10 chemical engineers, 2 bacteriologists, 2 entomologists, 1 horticulturist, 4 in other scientific professions; additional personnel 40.

*Research activities:* Fundamental and applied research and development activities covering inorganic, organic, and electrochemical fields; application and evaluation studies of new and improved products in agricultural chemicals, pulp and paper, textiles, laundry and dry cleaning chemicals, detergents, electroplating operations, ceramics, bactericides, sanitary chemicals, and special chemical products. (Research initiated 1908.)

*Library:* 4,500 volumes.

*Cooperative research:* Two fellowships are supported and several grants for research are made.

**1693. Pennsylvania Water and Power Company, 1611 Lexington Bldg., Baltimore 1, Md.**

*President:* J. A. Walls.

*Laboratories:* Hydraulic Laboratory, and Electrical Laboratory, Holtwood, Pa.; Standardizing Laboratory, Baltimore, Md.; Electrical Laboratory, Safe Harbor Water Power Corporation, Safe Harbor, Pa.

*Research staff:* J. E. Allen, Chief of tests. 9 engineers, 2 hydraulic engineers; additional personnel 1.

*Research activities:* Operating and engineering investigations; improvements in method of reclaiming river bottom anthracite coal; studies of dielectric properties of insulation of electrical machinery; improvements in high voltage transmission; efficiency and cavitation characteristics of model turbines and pumps; metallurgical and welding investigations; measuring and recording instruments. (Research initiated 1911.)

**1694. Peoples and Affiliated Natural Gas Companies, 545 William Penn Place, Pittsburgh 19, Pa.**

*President:* E. M. Borger.

*Research staff:* R. W. Miller, Director. 2 chemists, 4 assistant chemists, 1 chemical engineer; additional personnel 2.

*Research activities:* The processing of natural gas to effect recovery of by-products; new uses of liquefied petroleum gases; thermal decomposition of natural gas and its constituents; processes for increasing oil and gas production from oil fields; dehydration of natural gas; storage of natural gas; transportation problems; super-expansibility of gases; natural gasoline. (Research initiated 1915.)

*Cooperative research:* One fellowship is supported.

**1695. Peoples Gas Light and Coke Company,** 122 South Michigan Ave., Chicago 3, Ill.

*President:* George F. Mitchell.

*Laboratories:* 122 South Michigan Ave. and 3921 South Wabash Ave., Chicago, Ill.

*Research staff:* Matthew E. Benesh, Chief Research Engineer; Edward F. Pohlmann, Chief Testing Engineer. 5 department heads, 17 chemists, 30 engineers; additional personnel 17.

*Research activities:* The manufacture, transmission, distribution, storage, metering, and utilization of gas. (Research initiated 1900.)

**Pepsodent Division, Lever Brothers Company.**  
*See* Lever Brothers Company.

**1696. Pequanoc Rubber Company,** Butler, N. J.

*President:* J. F. McLean.

*Research staff:* F. E. Traflet, Vice President and Director; J. G. Augenstein, Chief Chemist. 6 chemists; technical personnel 5; additional personnel 3.

*Research activities:* Development of new methods of reclaiming rubber, new uses for crude and reclaimed rubber, and improvements in methods for manufacturing rubber goods. (Research initiated 1923.)

*Library:* 300 volumes.

**1697. Perfect Circle Company,** 552 South Washington St., Hagerstown, Ind.

*President:* Lothair Teetor.

*Laboratories:* Research Laboratory, Hagerstown, Ind.; Metallurgical Laboratory, New Castle, Ind.

*Research staff:* Ralph R. Teetor, Vice President in charge of engineering. 2 chemists, 2 metallurgists, 15 engineers; technical personnel 14; additional personnel 60.

*Research activities:* Piston rings and directly related parts; internal combustion engine operation as affected by piston rings. (Research initiated 1928.)

**1698. Perfection Biscuit Company,** 250-350 Pearl St., Fort Wayne 1, Ind.

*President:* H. L. Popp.

*Research staff:* Pearl Brown, Chemist. 1 chemist.

*Research activities:* The study of cracker fermentation; the effect of various ingredients in cake mixes; the study of flours. (Research initiated 1921.)

**1699. Perfection Paint and Color Company,** 715 East Maryland St., Indianapolis 2, Ind.

*President:* Edwin H. Gable.

*Research staff:* Hans Coucheron Aamot, Director; Walter C. Zoller. 1 chemist; technical personnel 1; additional personnel 2.

*Research activities:* Paint and varnish development. (Research initiated 1936.)

**1700. Perfection Stove Company,** 7609 Platt Ave., Cleveland, Ohio.

*President:* L. S. Chadwick. *Vice President of Manufacturing:* G. L. Harrison.

*Research staff:* Marc Resek, Chief Engineer. 3 chemists, 1 metallurgist, 15 engineers; technical personnel 40; additional personnel 20.

*Research activities:* Heating, air conditioning, combustion, liquid and gaseous fuels and burners, refrigeration, materials, and finishes. (Research initiated 1912.)

**1701. Perfex Corporation,** 500 West Oklahoma Ave., Milwaukee 7, Wis.

*President:* J. K. Luthé.

*Research staff:* C. E. Lewis, Vice President, Controls Division; A. E. Elo, Chief Physicist. 2 chemists, 1 physicist, 4 engineers; technical personnel 4; additional personnel 3.

*Research activities:* The development of automatic temperature control and automatic combustion control instruments and devices. (Research initiated 1934.)

*Library:* 250 volumes.

**1702. Perfumers Manufacturing Corporation,** 220 East 21st St., New York 10, N. Y.

*President:* Henri Coutinho.

*Research staff:* Henri Coutinho, Director. 1 chemist, 1 engineer; technical personnel 3; additional personnel 5.

*Research activities:* Scientific compounding of toilet products and related products; development of new uses for known cosmetic raw materials; exploring of newly developed raw materials for their use in the cosmetic field; improvement of present products to increase their effectiveness. (Research initiated 1918.)

*Library:* 200 volumes.

**1703. Perkins Glue Company,** Lansdale, Pa.

*President:* J. B. B. Stryker.

*Research staff:* E. F. Gould, Vice President in charge of research. 4 chemists, 2 engineers; technical personnel 5; additional personnel 2.

*Research activities:* Development of the following types of products or their method of manufacture: synthetic resins and catalysts, casein glues, and vegetable glues. (Research initiated 1910.)

*Library:* 240 volumes.

**1704. Permanente Metals Corporation,** 1522 Latham Square Bldg., Oakland 12, Calif.

*President:* Henry J. Kaiser.

*Laboratory:* Permanente, Calif.

*Research staff:* A. C. Byrns, Director. 11



chemists, 1 physicist, 2 metallurgists, 10 engineers; additional personnel 21.

*Research activities:* Improvement in production methods and the development of new uses for magnesium and magnesia; studies of ferrous and nonferrous alloys, and utilization of by-products. (Research initiated 1941.)

*Library:* 900 volumes.

1705. **Permutit Company**, 330 West 42nd St., New York 18, N. Y.

*President:* Henry W. Foulds.

*Laboratories:* New York, N. Y.; Birmingham, N. J.

*Research staff:* Howard L. Tiger, Vice President in charge of research; Sidney Sussman, in charge of chemical research laboratory; Albert W. Kingsbury, Chemical Engineer in charge of pilot plant laboratory. 8 chemists, 9 engineers; technical personnel 14; additional personnel 8.

*Research activities:* New and improved cation and anion exchange materials and processes for their use in water conditioning; special applications of ion exchangers in nonwater treatment fields, such as the recovery and purification of pectin, various alkaloids such as scopolamine, quinine, and nicotine; chemical solutions such as sorbitol, sugar syrups, corn syrups, and metal solutions; automatic devices and special valves for control and operation of water conditioning equipment and chemical feeds. (Research initiated 1933.)

*Library:* 800 volumes.

*Cooperative research:* Three grants for research are made.

1706. **Perolin Company of New York**, 1112 West 37th St., Chicago, Ill.

*President:* M. A. Solmssen.

*Research staff:* E. L. Gross, Director.

*Research activities:* The protection of metal surfaces against corrosion and pitting; boiler scale removal and prevention; fuel oil treatment; coagulants and clarifiers for municipal and industrial waters. (Research initiated 1913.)

1707. **Personal Products Corporation**, Milltown, N. J. (Subsidiary of Johnson and Johnson.)

*President:* John A. Underwood.

*Research staff:* Frederick W. Schreiber, Director. 5 chemists; technical personnel 6; additional personnel 12.

*Research activities:* Products for menstrual hygiene; facial tissues. (Research initiated 1940.)

*Library:* 250 volumes.

*Cooperative research:* Two grants for research are made.

1708. **Pet Milk Company**, 1401 Arcade Bldg., St. Louis 1, Mo.

*President:* J. A. Latzer.

*Laboratory:* Greenville, Ill.

*Research staff:* E. A. Louder, Technical Director. 4 chemists, 1 metallurgist, 1 engineer, 1 biochemist, 1 bacteriologist; technical personnel 2; additional personnel 15.

*Research activities:* Nutrition, metallurgy, food technology, bacteriology. (Research initiated 1929.)

*Library:* 500 volumes.

1709. **Peter Cailler Kohler Swiss Chocolates Company, Inc.**, 555 South 4th St., Fulton, N. Y.

*President:* Clive C. Day.

*Research staff:* R. F. Korfhage, Chief Chemist; K. E. McCloskey, Chemist in charge of research. 4 chemists; technical personnel 5; additional personnel 2.

*Research activities:* Improvement and development of products and processes in connection with the chocolate industry. (Research initiated 1926.)

*Library:* 150 volumes.

**Peterman, Inc., William.** See No. 2438 in *Addenda*.

**Petroleum Rectifying Company of California.** See *Petrolite Corporation, Ltd.*

1710. **Petrolite Corporation, Ltd.**, 29 Broadway, New York, N. Y.

*President:* J. S. Lehmann.

#### WAX DIVISION

Box 390, Kilgore, Tex.

*Research staff:* Charles M. Blair, Director; A. W. Marshall, Chief Chemist and Resident Research Supervisor. 2 chemists; technical personnel 4; additional personnel 2.

*Research activities:* Development work on wax production from mineral oil sources; production of synthetics from paraffin wax as a raw material. (Research initiated 1943.)

#### TRETOLITE COMPANY DIVISION

937 East Pacific Ave., St. Louis 19, Mo.

*Research staff:* Melvin DeGroote, Vice President in charge of research and development; Charles M. Blair, Director; Arthur F. Wirtel, Chief Chemist. 10 chemists, 3 engineers; technical personnel 9; additional personnel 7.

*Research activities:* The development of chemical demulsifiers for use in the dehydration and desalting of petroleum; the study of combination physical-chemical dehydration and de-

salting processes; work on mechanisms of emulsification and demulsification; synthesis of special chemicals for use in the petroleum and other industries; synthesis of emulsifying agents for specialized industrial uses. (Research initiated 1915.)

*Library:* 1,200 volumes; 15,000 patents in selected fields.

*Cooperative research:* Occasional fellowships are supported and two grants for research are made.

TRETOLITE COMPANY OF CALIFORNIA DIVISION  
5515 Telegraph Road, Los Angeles 22, Calif.

*Vice President and General Manager:* G. W. Camblin.

*Research staff:* Louis T. Monson, Chief Research Chemist. 4 chemists; technical personnel 2; additional personnel 3.

*Research activities:* The development of demulsifiers for water-in-oil emulsions and for oil in water emulsions; wax removers; oil well drilling mud removers; antifoamers; corrosion inhibitors; and reagents for desalting crude petroleum. (Research initiated 1930.)

*Library:* 150 volumes.

PETROLEUM RECTIFYING COMPANY OF CALIFORNIA

530 West 6th St., Los Angeles 14, Calif.

*Vice President and General Manager:* H. C. Eddy.

*Laboratories:* 1390 East Burnett St., Long Beach 6, Calif.; Houston, Tex.

*Research staff:* C. H. M. Roberts, Director (on leave of absence serving the United States Government); R. W. Stenzel, Acting Director, Long Beach; W. E. Eberz, Chief Chemist, Long Beach. 7 chemists, 1 engineer; technical personnel 5; additional personnel 3.

*Research activities:* Electrical, chemical, and physical research, particularly in connection with the company's processes for the dehydration and desalting of petroleum known as the "Petreco" processes; the application of electricity to emulsion problems. (Research initiated 1920.)

*Library:* 2,000 volumes.

*Cooperative research:* One grant for research is made.

Pettinos, Inc., George F. See No. 2439 in *Addenda*.

1711. Pfaudler Company, 89 East Ave., Rochester, N. Y.

*President:* W. D. Pheteplice.

*Laboratories:* Rochester, N. Y.; Elyria, Ohio.

*Research staff:* O. I. Chormann, Director. 3 chemists, 1 metallurgist, 3 engineers, 3 ceramic engineers; technical personnel 4.

*Research activities:* Enamels for steel; resistivity of enamels, etc.; designing of equip-

ment for special processing; new applications of enameled equipment; plant layouts; problems relating to the chemical and food industries. (Research initiated 1908.)

1712. Pfizer and Company, Inc., Charles, 81 Maiden Lane, New York 7, N. Y.

*President:* John L. Smith.

*Laboratory:* 11 Bartlett St., Brooklyn 6, N. Y.

*Research staff:* Richard Pasternack, Director of chemical research; Jasper H. Kane, Director of biochemical research and production. 19 chemists, 18 biologists, 6 engineers; additional personnel 28.

*Research activities:* Fine chemicals, including vitamins and antibiotics, organic acids, and industrial fermentation. (Research initiated 1849.)

*Library:* 2,500 volumes.

*Cooperative research:* Some grants for research are made.

1713. Pharis Tire and Rubber Company, 265 West Main St., Newark, Ohio.

*President:* F. Marshall.

*Research staff:* Ralph Reel, Vice President in charge of research and development; E. E. Laughlin, Chief Chemist. 4 chemists, 1 physicist, 2 engineers; technical personnel 2; additional personnel 12.

*Research activities:* Rubber compounding and product development of automobile and bicycle tires and tubes; the application of plastic and synthetic rubbers to tires, tubes, and brake-linings. (Research initiated 1925.)

*Library:* 500 volumes.

See also Carlisle Tire and Rubber Company.

1714. Pharma Chemical Corporation, 169 West 52nd St., Bayonne, N. J.

*President:* Charles M. Richter.

*Research staff:* Eugene A. Markush, Vice President and Technical Director; Mark S. Mayzner, Julius Miller, and M. Gootner, Chief Chemists. 25 chemists; technical personnel 16; additional personnel 10.

*Research activities:* Dyes, intermediates, and pharmaceuticals, especially antimalarial drugs and other organic compounds. (Research initiated 1919.)

*Library:* 1,100 volumes.

1715. Phelps Dodge Corporation, 40 Wall St., New York 5, N. Y.

*President:* L. S. Cates.

*Laboratory:* Laurel Hill, Long Island, N. Y.

*Research staff:* William H. Osborn, Director, Department of Development and Research. 4 chemists, 5 metallurgists, 1 engineer; additional personnel 5.

*Research activities:* Process and product

metallurgy in the nonferrous field. (Research initiated 1935.)

*Library:* 500 volumes.

**1716. Philadelphia Electric Company, 1000 Chestnut St., Philadelphia 5, Pa.**

*President:* H. P. Liversidge.

*Laboratories:* Engineering and Chemical Laboratories, 2301 Market St., Philadelphia 3, Pa. Other laboratories at Gas Plants, at Chester and West Conshohocken, Pa.

*Research staff:* Howard S. Phelps, Engineer, Special Investigation and Testing Division; Harold Farmer, Chief Chemist, Station Operating Department. 19 engineers; technical personnel 33; additional personnel 12.

*Research activities:* Effects of lightning on electric distribution and transmission circuits, and protective devices therefor; determination of mechanical strength characteristics of lead cable sheathing; studies of corrosion of underground facilities for electric, gas, and steam transmission and distribution, and development of methods for its prevention or control; investigation of pole timbers and preservative treatments for them; testing of service reliability of electric and gas appliances; causes of furnace wall tube corrosion in high-temperature high-capacity power boilers, and methods for its control; investigation of graphitization of electric arc welded carbon molybdenum steel high-pressure high-temperature steam piping; investigation of reliability of the acid cleaning process in high-pressure boilers and heat exchangers with reference to removal of scale and deposits and effect on the life of the boiler metal; investigation of interfacial tension measurements as a means for determining changing characteristics of inhibited turbine oils in service; methods for increasing the operating flexibility of the coke oven battery method of manufacturing gas; development of refinements in the manufacture of reformed refinery oil gas for satisfactory combination with varying amounts of coke; the reforming and mixing of numerous combinations of hydrocarbon gases with which satisfactory operation of appliances can be maintained. (Research initiated 1929.)

**1717. Philadelphia Quartz Company, 121 South 3rd St., Philadelphia 6, Pa.**

*President:* T. W. Elkinton.

*Laboratories:* Philadelphia, Pa.; foot of Lamokin St., Chester, Pa.

*Research staff:* Chester L. Baker, Chemical Director. 9 chemists, 6 engineers; technical personnel 1; additional personnel 1.

*Research activities:* Problems connected with soluble silicates: their preparation, properties, and adaptation to industrial uses such as detergents, adhesives, cements, etc. (Research initiated 1905.)

*Library:* 500 volumes.

*Cooperative research:* One grant for research is made.

*Scientific periodicals:* Silicate P's and Q's. Vol. I, 1921.

**1718. Philadelphia Quartz Company of California, Ltd., 6th and Grayson Sts., Berkeley 2, Calif.**

*President:* A. W. Elkinton.

*Research staff:* T. K. Cleveland, Chemical Director. 5 chemists; additional personnel 2.

*Research activities:* Detergents, properties of sodium silicates, synthetic magnesium silicates, and magnesium borates. (Research initiated 1928.)

*Library:* 250 volumes.

**1719. Philco Corporation, C and Tioga Sts., Philadelphia 34, Pa.**

*President:* John Ballantyne.

*Laboratories:* Philco Products Incorporated, Philadelphia, Pa.

*Research staff:* William Balderston, Vice President in charge of operations; David B. Smith, Director of research, Research Division; Palmer M. Craig, Chief Engineer, Radio Engineering Division; Frank D. Peltier, Chief Engineer, Refrigeration Division; H. N. Stover, Chief Engineer, Storage Battery Division; Frank J. Bingley, Chief Engineer, Television Department. 274 additional professional personnel; 400 laboratory assistants and nontechnical personnel.

*Research activities:* Domestic radio-phonographs, television, commercial and military electronic devices, commercial and television transmission, refrigeration, air conditioning, frozen food, and storage batteries. (Research initiated 1927.)

*Library:* A library is maintained.

*Cooperative research:* Eighteen fellowships are supported.

*See also* National Union Radio Corporation.

**Philco Products Incorporated. See** Philco Corporation.

**1720. Philips Laboratories, Inc., Irvington on Hudson, N. Y.**

*President:* O. S. Duffendack.

*Research staff:* O. S. Duffendack, Director of research and engineering. 1 chemist, 11 physicists, 1 engineer; technical personnel 11; additional personnel 20.

*Research activities:* Microwave investigations; semiconductors; X-ray; crystal oscillators; Geiger Mueller counter; electroacoustics. (Research initiated 1944.)

*Library:* 760 volumes.

*Cooperative research:* One grant for research is made.

**1721. Phillips Aviation Company, South Pasadena, Calif.**

*President:* James A. Phillips, Jr.

*Research staff:* James A. Phillips III, Research Engineer. 1 physicist, 3 engineers; technical personnel 5; additional personnel 21.

*Research activities:* Aeronautics. (Research initiated 1935.)

*Library:* 275 volumes.

**1722. Phillips Petroleum Company, Bartlesville, Okla.**

*President:* K. S. Adams.

*Laboratories:* Bartlesville, Okla.; Phillips, Tex.

*Research staff:* G. G. Oberfell, Vice President in charge of research and development; R. C. Alden, Director of research; T. W. Legatski, Assistant Director; G. H. Short, Resident Director at Phillips, Tex.; W. A. Schulze, F. E. Frey, Karl H. Hachmuth, H. M. Trimble, W. N. Axe, Associate Directors. 129 chemists, 10 physicists, 2 biologists, 81 engineers; technical personnel 18; additional personnel 179.

*Research activities:* Problems allied with the production of aviation gasoline and ingredients for synthetic rubber; exploration methods for crude oil; production and petroleum reservoir studies; natural gas, liquefied petroleum gases, natural gasoline, and by-product investigations; refinery processing; fuels and lubricants; chemicals from petroleum; transportation, marketing, and utilization of petroleum products. (Research initiated 1925.)

*Library:* 1,700 volumes.

*Cooperative research:* Four fellowships are supported.

*See also* Hycar Chemical Company.

**1723. Phipps and Bird, Inc., 303 South 6th St., Richmond 5, Va.**

*President:* Lloyd C. Bird.

*Research staff:* Harry A. Cowardin, Director. 1 chemist, 1 physicist, 1 metallurgist, 2 engineers; technical personnel 6; additional personnel 3.

*Research activities:* The development of new apparatus and instruments, including the building of special recorders; the improvement of devices now on the market in the fields of psychology and physiology. (Research initiated 1927.)

**1724. Phoenix Chemical Laboratory, Inc., 3953 Shakespeare Ave., Chicago 47, Ill.**

*President:* John Krawetz.

*Research staff:* John Krawetz, Director;

G. A. Krawetz; S. F. Graham. 4 chemists; technical personnel 3

*Research activities:* Petroleum and petroleum products. (Research initiated 1924.)

*Library:* 250 volumes.

**1725. Physicists Research Company, 343 South Main St., Ann Arbor, Mich.**

*President:* Ernest J. Abbott.

*Research staff:* Ernest J. Abbott, Director. 2 physicists, 3 engineers; technical personnel 4; additional personnel 6.

*Research activities:* Development of electronic instrumentation for production gaging and similar industrial problems. (Research initiated 1935.)

**1726. Pierce Testing Laboratories, 730-34 Nineteenth St., Denver 2, Colo.**

*President:* George Pierce.

*Research staff:* George Pierce, Director. 1 chemist, 2 physicists, 1 engineer, 2 assistants.

*Research activities:* Road and building materials. (Research initiated 1908.)

**1727. Pillsbury Mills, Inc., Minneapolis 2, Minn.**

*President:* Philip W. Pillsbury.

*Laboratories:* *Flour and Cereal Division:* Minneapolis, Minn.; Buffalo, N. Y.; Astoria, Oreg. *Feed Division:* Centerville and Clinton, Iowa; Colton and Los Angeles, Calif. *Oil and Soybean Division:* Clinton and Centerville, Iowa. Other laboratories at Springfield, Ill.; Atchison, Kans.; Enid, Okla.; Ogden, Utah; Sacramento and San Francisco, Calif.

*Research staff:* Frank L. Gunderson, Vice President in charge of research and development; C. G. Harrel, Director of research laboratory, Minneapolis. 27 chemists, 7 physicists, 5 biologists, 3 engineers, 1 psychologist, 1 veterinarian; technical personnel 22; additional personnel 15.

*Research activities:* Milling of flour; grain by-products; cereal products; commercial feeds; soybean fats and oils; soups. (Research initiated 1908.)

*Library:* A library is maintained.

*Cooperative research:* Seven grants for research are made.

**1728. Pioneer Electric Company, 3700 East Olympic Blvd., Los Angeles 23, Calif.**

*Research staff:* W. H. Bucknell, Chief Electrical Engineer; M. W. Brainard, Electrical Engineer. 4 engineers; technical personnel 4; additional personnel 2.

*Research activities:* Permanent magnet synchronous generators, 60 and 400 cycles; conventional type synchronous generators, 50 and 60 cycles; fractional horsepower motors; elec-

tronic spot welding equipment. (Research initiated 1941.)

**1729. Pioneer Parachute Company, Inc.,** Forest St., Manchester, Conn.

*President:* Henry R. Mallory.

*Research staff:* Conrad Kowalski, Chief Engineer; Norris W. Goldsmith, Physicist. 1 physicist, 1 engineer; technical personnel 8; additional personnel 1.

*Research activities:* Parachute testing, including materials testing on specially designed high speed test towers for life-saving parachutes, cargo parachutes, bomb parachutes, airplane spin check parachutes, etc. (Research initiated 1938.)

*Library:* 100 volumes.

**1730. Pitkin, Inc.,** Lucius, 47 Fulton St., New York 7, N. Y.

*President:* Erskine B. Mayo.

*Research staff:* Robert H. Bell, Technical Director; John Jicha, Chemical Director. 5 chemists, 1 physicist, 1 metallurgist, 1 geologist, 1 spectrographer, 1 assayer; technical personnel 15; additional personnel 10.

*Research activities:* Problems related to or arising from the valuation, sources, use, and application of metals, metal and mineral products, and products containing or contaminated by metals. (Research initiated 1885.)

*Library:* 500 volumes.

**Pitman-Moore Division, Allied Laboratories, Inc.** See Allied Laboratories.

**1731. Pitney-Bowes, Inc.,** Stamford, Conn.

*President:* W. H. Wheeler, Jr.

*Research staff:* W. F. Bernart, Jr., economic and market research; F. J. Rouan, development and experimental engineering. Technical personnel 25; additional personnel 5.

*Research activities:* The design and development of mailing machines and meters and allied products; improvement of methods of production; analysis of markets.

**1732. Pittsburg Chemical Company,** 3100 East 26th St., Los Angeles 23, Calif.

*General Partner:* G. S. Wheaton.

*Research staff:* R. S. Sunderlin, Director. 3 chemists, 2 engineers; technical personnel 2.

*Research activities:* Organic chemicals. (Research initiated 1938.)

*Library:* 150 volumes.

**1733. Pittsburgh Coke and Chemical Company,** Grant Bldg., Pittsburgh 19, Pa.

*President:* J. H. Hillman, Jr.

*Research staff:* A. M. Kennedy, Vice President and Executive Head of research and development.

#### RESEARCH AND DEVELOPMENT LABORATORY

Neville Island, Pittsburgh 25, Pa.

*Research staff:* Norman C. Hill, Director of research and development; William B. Brown, Director of research. 9 chemists, 1 metallurgist, 12 engineers; technical personnel 3; additional personnel 3.

*Research activities:* Organic chemicals; coal tar by-products and their utilization; resins; plastics; coal and gas utilization. (Research initiated 1940.)

*Library:* 1,120 volumes.

#### ACTIVATED CARBON DIVISION

Carnegie, Pa.

*Research staff:* J. William Zabor, Chief Research Associate; Richard A. Glenn, Special Research Associate. 3 chemists, 3 engineers; technical personnel 6; additional personnel 10.

*Research activities:* Activated carbon from coal, both granular and powdered. (Research initiated 1943.)

**1734. Pittsburgh Corning Corporation,** Pittsburgh 22, Pa. (Subsidiary of Pittsburgh Plate Glass Company and Corning Glass Works.)

*President:* H. B. Higgins.

*Laboratory:* Port Allegany, Pa.

*Research staff:* A. H. Baker, Director. 3 chemists, 1 physicist, 5 engineers; technical personnel 2; additional personnel 3.

*Research activities:* Development of new glass products for structural purposes. (Research initiated 1937.)

**1735. Pittsburgh—Des Moines Steel Company,** Neville Island, Pittsburgh 25, Pa.

*President:* John E. Jackson.

*Research staff:* James B. Garner, Director; James O. Jackson, Chief Engineer; Harry E. Lindberg, Assistant Chief Engineer and Designer; Regis Fey, Engineer. 1 chemist, 1 physicist, 1 metallurgist, 4 engineers; technical personnel variable.

*Research activities:* Structural steel containers, tanks, bridges, buildings, sectional dry docks, and wind tunnels; liquefaction of gases, storage at low temperatures, stress-strain, etc. (Research initiated 1940.)

*Cooperative research:* One fellowship is supported and one grant for research is made.

**Pittsburgh Equitable Meter Division, Rockwell Manufacturing Company.** See Rockwell Manufacturing Company.

**1736. Pittsburgh Plate Glass Company,** Grant Bldg., Pittsburgh, Pa.

*President:* H. B. Higgins.

*Research staff:* R. L. Clause, Executive Officer in charge of research.

GLASS DIVISION

Creighton, Pa.

Branch laboratories at all plants

*Research staff:* S. Frank Cox, Director. 60 in scientific professions, 18 laboratory assistants; additional personnel 67.

*Research activities:* Plate, window, structural, laminated, and enameled glass; optical and ophthalmic glasses; glass fabricating techniques; plastics; special glass and plastic products. (Research initiated 1910.)

CHEMICAL DIVISION

Barberton, Ohio.

*Research staff:* F. R. Elmore, Chief Development Engineer; A. Pechukas, Director of research. 50 in scientific professions, 26 laboratory assistants; additional personnel 9.

*Research activities:* Production and development of inorganic chemicals, organic chemicals, and synthetic resins.

PAINT DIVISION

Milwaukee, Wis.

Branch laboratories at all plants

*Research staff:* W. H. Lycan, basic research, Milwaukee, Wis.; W. W. Bauer, technical research, Milwaukee, Wis. 122 in scientific professions, 93 laboratory assistants; additional personnel 26.

*Research activities:* Paint and finishes, lacquers, drying oils, resins, and plastics.

COLUMBIA CHEMICAL DIVISION

Bartlett, Calif.

*Research staff:* A. Pechukas, Director; George D. Dub, Superintendent. 2 chemists.

*Research activities:* Improvement of operations in the manufacture of soda ash and borax from natural brines; process investigation; production difficulties; equipment investigation. (Research initiated 1930.)

See also Pittsburgh Corning Corporation and Thresher Varnish Company.

Pittsburgh Rolls Division, Blaw-Knox Company. See Blaw-Knox Company.

1737. Pittsburgh Testing Laboratory, Stevenson and Locust Sts., Pittsburgh 19, Pa.

*President:* A. R. Ellis.

*Laboratories:* Pittsburgh and Philadelphia, Pa.; New York and Buffalo, N. Y.; Greensboro, N. C.; Jacksonville, Fla.; Birmingham, Ala.; New Orleans, La.; Houston and Dallas, Tex.; St. Louis, Mo.; Indianapolis, Ind.; Chicago, Ill.; Detroit, Mich.; Cleveland, Ohio.

*Research staff:* C. M. Houck, Vice President

in charge of operations; H. H. Craver, Manager, Chemical Department; L. K. Jones, Manager, Research Department; R. B. Lincoln, Manager, Physical Testing. 35 chemists, 4 physicists, 1 biologist, 4 metallurgists, 40 engineers; technical personnel 251; additional personnel 104.

*Research activities:* Investigations in ferrous and nonferrous metallurgy; chemical research; glass and enamel; water purification; air pollution; industrial wastes; concrete and other construction materials; heat insulation and heat losses; air infiltration; heating, ventilating, and air conditioning equipment; noise reduction; household appliances; special investigations. (Research initiated 1881.)

*Library:* 2,000 volumes.

*Scientific periodicals:* PTL News. Vol. I, 1933.

Plaskon Division, Libbey-Owens-Ford Glass Company. See Libbey-Owens-Ford Glass Company.

1738. Plastic Coating Corporation, Holyoke, Mass.

*President:* William J. Warner.

*Laboratory:* 28 Gaylord St., South Hadley Falls, Mass.

*Research staff:* Garrison Householder, Technical Director. 2 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Lacquer formulations for coating paper for photographic, moisture-vapor-proof, greaseproof, heat sealing, and other protective and decorative purposes. (Research initiated 1941.)

*Library:* 100 volumes.

1739. Plastic Film Corporation, Plainfield, Conn.

*President:* William B. Nichols.

*Research staff:* Marc Chavannes, Vice President for research; George T. Howe, Chief Chemist; T. A. Lancaster, Chief Production Chemist. 9 chemists, 2 engineers; technical personnel 1; additional personnel 7.

*Research activities:* Films of plastics; moisture vapor barriers; protective wrappings. Raw materials include plastics solvents, etc., metal foils, fabrics, and papers. (Research initiated 1943.)

1740. Plastic Research Corporation, 91 Hemingway St., Winchester, Mass.

*President:* A. B. Gordee.

*Research staff:* A. B. Gordee, Director. 2 chemists, 1 physicist; additional personnel 2.

*Research activities:* Plastics.

- 1741. Plastics Industries Technical Institute**, 1601 South Western Ave., Los Angeles 6, Calif.  
*President:* Francis Gudger.  
*Research staff:* John Delmonte, Technical Director; W. J. Dewar, Assistant Technical Director; Roy K. Davis; Emmett L. Watkins. 2 chemists, 2 engineers; additional personnel 7.  
*Research activities:* Plastics. (Research initiated 1940.)  
*Scientific periodicals:* Plastics Trends. Vol. I, 1941.
- 1742. Plax Corporation**, 133 Walnut St., Hartford 5, Conn. (Subsidiary of Hartford-Empire Company.)  
*President:* F. Goodwin Smith.  
*Research staff:* James Bailey, Vice President and Director of research; Edward J. Stephens, Chief Physicist; P. K. Horton, Chief Chemist. 4 chemists, 2 physicists, 6 engineers; technical personnel 4; additional personnel 4.  
*Research activities:* Mechanical testing of plastics, testing of chemical properties, investigation of usage, development of new products, and development of methods of fabrication. (Research initiated 1937.)
- 1743. Plough, Inc.**, 121-25 South 2nd St., Memphis 1, Tenn.  
*President:* Abe Plough.  
*Laboratory:* 122 Hernando, Memphis, Tenn.  
*Research staff:* J. Calvin Ozier, Director. 5 chemists, 1 physician; additional personnel 3.  
*Research activities:* Improvement of present proprietaries, cosmetics, solvents, detergents, adhesives, etc., and the development of new products within these fields. (Research initiated 1942.)  
*Library:* 100 volumes.  
*Cooperative research:* Two grants for research are made.
- 1744. Plymouth Cordage Company**, North Plymouth, Mass.  
*President:* Ellis W. Brewster.  
*Research staff:* C. MacKinnon, First Vice President in charge of research; Raymond E. Miskelly, Director. 4 chemists, 1 physicist, 1 biologist, 1 engineer, 5 assistants; additional personnel 4.  
*Research activities:* Problems in rope and twine construction and treatments; manufacturing methods; cordage machinery; test methods; raw materials; new products; cordage fiber. (Research initiated 1924.)  
*Library:* 300 to 400 volumes.
- Plymouth Motor Corporation.** See Chrysler Corporation.
- 1745. Pneumatic Scale Corporation, Ltd.**, 65 Newport Ave., North Quincy 71, Mass.  
*President:* William H. Doble.  
*Research staff:* John Yates, Director. 1 engineer; technical personnel 3.  
*Research activities:* Packaging methods for better product protection, more economical production, and consumer convenience. (Research initiated 1938.)
- 1746. Podbielniak, Inc.**, 8312-44 South Chicago Ave., Chicago 17, Ill.  
*President:* Walter J. Podbielniak.  
*Research staff:* Walter J. Podbielniak, Director; Wladzia G. Podbielniak, Executive Vice President; Alfred Viergutz, Development Engineer; Herbert Kaiser and Richard Schoenberger, Chemical Engineers; Benjamin B. Gajda, Vice President. 4 chemical engineers, 1 mechanical engineer, 10 scientific glass apparatus technicians, 13 junior glass apparatus technicians; technical personnel 20.  
*Research activities:* The development and improvement of precise automatic recording fractional distillation apparatus for research and plant design and control work; the development of centrifugal counter-current contacting apparatus in fractional distilling, gas absorbing, counter-current multi-stage solvent extraction and chemical reaction, air conditioning purification of atmospheric air from war gases and smokes, etc.; the development of ultra-low temperature refrigerating apparatus and processes for laboratory and production purposes; the separation of components of complex gaseous, petroleum, chemical, and other mixtures of distillable or solvent extractable components; special analytical, research, and consulting services to the petroleum, gas, and chemical industries. (Research initiated 1928.)
- 1747. Polamold Research Laboratory**, 240 Ludlow Ave., Springfield, Ohio.  
*Partners:* John F. Dreyer and Russell M. Houghton.  
*Research staff:* John F. Dreyer, Director; Russell M. Houghton. 1 chemist, 1 engineer.  
*Research activities:* The development of plastics materials, with particular emphasis on laminated products. (Research initiated 1945.)  
*Library:* 200 volumes.
- 1748. Polarized Light—Photoelastic Company**, 557 West 124th St., New York 27, N. Y.  
*President:* A. Solakian.  
*Research staff:* 1 engineer.  
*Research activities:* Photoelastic analysis of stress by polarized light and transparent models; the design and manufacture of photoelastic polariscopes and polarizing instruments. (Research initiated 1938.)

**1749. Polaroid Corporation, 211 Massachusetts Ave., Cambridge 39, Mass.**

*President:* Edwin H. Land.

*Laboratory:* 730 Main St., Cambridge 39, Mass.

*Research staff:* Edwin H. Land, Director. 15 chemists, 9 physicists, 17 engineers, 5 mathematicians; technical personnel 60; additional personnel 18.

*Research activities:* Polarized light; plastics, especially optical elements made of plastics; absorption of light; photography, with special reference to three-dimensional and color photography; electronics, organic chemistry, physics, and crystallography, especially as related to phenomena involving radiation. (Research initiated 1937.)

*Library:* 1,805 volumes.

**1750. Polushkin Metallographic Laboratory, E. P., 500 West 111th St., New York, N. Y.**

*Research staff:* E. P. Polushkin, Consulting Metallurgical Engineer.

*Research activities:* The microscopic examination of metals and alloys; research in metallurgy; industrial microscopy. (Research initiated 1935.)

**1751. Polyplastex, 92-35 Horace Harding Blvd., Elmhurst, Long Island, N. Y.**

*President:* H. W. E. Riley.

*Research staff:* Fred Gruenwald, Director. 3 chemists, 1 metallurgist, 1 engineer; technical personnel 2; additional personnel 3.

*Research activities:* Industrial research in the field of low pressure resins; impregnation and coating compounds for porous castings (aluminum, magnesium, brass and iron alloys); impregnation of wood; resins in connection with textile fibers and fabrics; chemical treatments of cotton yarn and textiles; casting resins. (Research initiated 1943.)

**1752. Poor and Company, Promat Division, 851 South Market St., Waukegan Ill.**

*President:* F. A. Poor.

*Research staff:* A. E. Chester, Director of research; D. F. Seymour, Laboratory Director. 2 chemists, 1 engineer; technical personnel 1.

*Research activities:* Metal finishing: electroplating, and ceramic finishes. (Research initiated 1937.)

*Library:* 150 volumes.

**1753. Pope and Gray, Inc., 95 Morton St., New York 14, N. Y.**

*President:* Chester H. Pope.

*Research staff:* Chester H. Pope, Director; J. Howard Houston. 3 chemists, 1 physicist; technical personnel 3; additional personnel 3.

*Research activities:* Synthetic resins and other vehicles for the manufacture of printing and lithographic inks for specialized requirements; overprint varnishes; gloss inks; metallic inks; tin printing inks; heat drying inks. (Research initiated 1926.)

*Library:* 500 volumes.

**1754. Porete Manufacturing Company, Porete Ave., North Arlington, N. J.**

*President:* E. Walter.

*Research staff:* E. Walter, Director; C. Mino. 1 engineer.

*Research activities:* Lightweight concrete products, particularly lightweight cellular concrete for fireproof building construction. (Research initiated 1935.)

**1755. Porro Biological Laboratories, 718 Medical Arts Bldg., Tacoma, Wash.**

*Research staff:* Thomas J. Porro, Director. 2 chemists, 3 biologists and bacteriologists; additional personnel 1.

*Research activities:* Chemical, serological, and bacteriological problems. (Research initiated 1921.)

**1756. Port Huron Sulphite and Paper Company, Port Huron, Mich.**

*President:* E. W. Kiefer.

*Research staff:* L. T. Summers, Director. 2 chemists, 2 engineers.

*Research activities:* Pulp and paper processing and products; sulfite waste disposal.

**1757. Portable Products Corporation, C. J. Tagliabue Division, Park and Nostrand Aves., Brooklyn 5, N. Y.**

*President:* F. R. Marlier.

*Research staff:* C. O. Fairchild, Director. 1 chemist, 2 physicists, 4 engineers; technical personnel 12; additional personnel 1.

*Research activities:* Development of instruments for measuring temperature, flow, pressure, etc., and for testing oil; laboratory thermometers and pyrometers; methods of control of industrial processes. (Research initiated 1912.)

*Library:* 500 volumes.

**1758. Portland Cement Association, 33 West Grand Ave., Chicago 10, Ill.**

*President:* Frank T. Sheets.

*Laboratories:* Chicago, Ill.; Washington, D. C.

*Research staff:* F. R. McMillan, Director; H. F. Gonnerman, Manager of Chicago laboratory; T. C. Powers, Manager of basic research, Chicago; I. L. Tyler, Manager of field research, Chicago; R. H. Bogue, Director of fellowship, Washington; R. P. Scott, Manager, Manufac-



turing Research Bureau, Chicago. 10 chemists, 1 physicist, 6 engineers, 1 chemical engineer, 1 petrographer and geologist, 6 laboratory technicians; additional personnel 6.

*Research activities:* Chicago: Problems relating to cement, concrete, and related materials. Washington: Studies of portland cement. (Research initiated 1916.)

*Library:* 9,000 volumes.

**Post Products Division, General Foods Corporation:** See General Foods Corporation.

**1759. Poste, Emerson P., 309 McCallie Ave., Chattanooga, 3, Tenn.**

*Research staff:* Emerson P. Poste, Chemical Engineer. 1 chemist, 1 engineer; technical personnel 2.

*Research activities:* Clients' problems in ceramics including vitreous enamel; carbonated beverages. (Research initiated 1930.)

**1760. Potash Company of America, Carlsbad, N. Mex.**

*President:* G. F. Coope.

*Research staff:* Parker S. Dunn, Director; E. A. Schoeld, Chief Chemist. 4 chemists, 2 metallurgists, 5 engineers, 1 geologist; technical personnel 8; additional personnel 4.

*Research activities:* The development of processes in the production of potash. (Research initiated 1935.)

*Library:* 400 volumes.

**1761. Poughkeepsie Dyestuff Corporation, 77 North Water St., Poughkeepsie, N. Y.**

*President:* James T. Aspbury.

*Research staff:* James W. Monks, Director. 2 chemists; additional personnel 2.

*Research activities:* Dyes and chemicals. (Research initiated 1931.)

*Library:* 200 volumes.

**1762. Powdered Material Research Laboratories, 11 Windsor St., Cambridge 39, Mass.**

*President:* Alan R. Lukens.

*Research staff:* 2 chemists, 1 technical assistant; additional personnel 1.

*Research activities:* Powdered substances; the measurement of particle size, and the distribution of size and surface areas; investigation of the relationship of particle surfaces to uses in rubber, paint, paper, plastics, food, insecticides, and agricultural arts; surface areas by nitrogen adsorption and other methods. The crystallization of commercial chemicals. Grinding and manufacturing controls of metallic and nonmetallic powders, such as calcium carbonates, clays, barytes, feldspar, mica, talc, cement and cement materials, graphite, silica tinctorial pigments, powdered zinc, nickel, etc. Dust control,

and the relationship of the efficacy of powdered fuels to particle size and surface area. (Research initiated 1944.)

*Library:* 300 volumes.

**1763. Powell Company, William, 2503-31 Spring Grove Ave., Cincinnati 22, Ohio.**

*President:* H. E. Coombe.

*Research staff:* William Heilig, Director; M. G. Bolinger, Chief Metallurgist; George Gohs, Chief Chemist. 3 chemists, 1 physicist, 2 metallurgists, 2 engineers, 1 spectrographer; technical personnel 4; additional personnel 2.

*Research activities:* The development of new ferrous, nonferrous, and austenitic alloy steels to resist chemical corrosion; sizing; galling or wear; erosion at elevated temperatures; impact resistance at low temperatures; stability at elevated temperatures. (Research initiated 1924.)

*Library:* 100 volumes.

**1764. Pratt and Gray Company, Inc., Westport Ave., Norwalk, Conn.**

*President:* V. E. Pratt. *Vice President:* G. Francis Gray.

*Research staff:* V. E. Pratt and G. Francis Gray, Directors. 1 physicist, 4 engineers; technical personnel 4; additional personnel 3.

*Research activities:* Microfilming equipment and processes. (Research initiated 1935.)

*Library:* 1,500 volumes.

**1765. Pratt and Lambert, Inc., 75 Tonawanda St., Buffalo 7, N. Y.**

*President:* H. E. Webster.

*Laboratories:* Buffalo, N. Y.; Dibble Color Company, 1497 East Grand Blvd., Detroit, Mich.; Waggener Paint Company, 10th and Burlington Sts., Kansas City, Mo.; Cleveland Paint and Color Company, 1039-1046 West 11th St., Cleveland, Ohio.

*Research staff:* W. H. Lutz, Technical Director. 13 chemists, 1 engineer; technical personnel 20; additional personnel 7.

*Research activities:* The development of paints, varnishes, enamels, lacquers, and adhesives; the development and utilization of new raw materials. (Research initiated 1893.)

*Library:* 600 volumes.

**Pratt and Whitney Aircraft Division, United Aircraft Corporation.** See United Aircraft Corporation.

**Pratt and Whitney Division, Niles-Bement-Pond Company.** See Niles-Bement-Pond Company.

**1766. Pratt Food Company, 130 Walnut St., Philadelphia, Pa.**

*President:* J. W. Keller.

*Laboratories:* Philadelphia, Pa.; Buffalo, N. Y.

*Research staff:* Arthur H. Teigen, Director. 3 chemists, 2 biologists and bacteriologists; additional personnel 5.

*Research activities:* Animal nutrition and pathology as applied to the development of commercial feeds, disinfectants, insecticides, etc. (Research initiated 1916.)

**1767. Precision Castings Company, Inc.,** Syracuse 2, N. Y.

*President:* F. P. Assmann.

*Laboratories:* Syracuse and Fayetteville, N. Y.; Cleveland, Ohio.

*Research staff:* A. E. Martin, Jr., Chief Metallurgist. 2 chemists, 1 physicist, 1 metallurgist; technical personnel 6; additional personnel 2.

*Research activities:* Spectrographic analysis of metals; heat-treatment and development of hot work steels; radiography of die castings; die design and tool life. (Research initiated 1933).

*Library:* 200 volumes.

**1768. Precision Grinding Wheel Company, Inc.,** 8301 Torresdale Ave., Philadelphia 36, Pa.

*President:* George F. Kohn.

*Research staff:* Roland J. Clark, Technical Director. 3 ceramic engineers; technical personnel 2; additional personnel 4.

*Research activities:* The development and improvement of bonded abrasives, such as vitrified (ceramic) bonds, and resinoid and other plastic bonds. (Research initiated 1925.)

**1769. Precision Scientific Company,** 1750 North Springfield Ave., Chicago 47, Ill.

*President:* Walter W. Pitann.

*Research staff:* L. C. Short, Director. 1 chemist, 1 metallurgist, 1 engineer; technical personnel 3.

*Research activities:* The development, manufacture, and utilization of laboratory appliances and apparatus, including gas calorimetry, gas burners, water stills, constant temperature baths, ovens, incubators, and apparatus for testing cement, lime, gypsum, soils, and petroleum products according to specifications of the American Society for Testing Materials; Kjeldahl equipment for protein determinations; metallurgical testing equipment; rubber and plastics testing equipment. (Research initiated 1920.)

*Library:* A library is maintained.

**1770. Premier Crystal Laboratories, Inc.,** 63 Park Row, New York 7, N. Y.

*President:* Arthur A. Glass.

*Research staff:* Arthur A. Glass, Director; H. M. Bach, Chief Engineer; L. C. Shapiro, General Manager, Radio Division. 2 chemists, 3 physicists, 15 engineers; technical personnel 12; additional personnel 63.

*Research activities:* Frequency control devices; piezo-electric quartz and tourmaline crystals; crystal holders; temperature ovens; frequency meters; reactance meters; capacity meters; radio receivers; photographic printers; photographic enlargers. (Research initiated 1931.)

*Library:* 250 volumes.

**1771. Premo Pharmaceutical Laboratories, Inc.,** 443 Broadway, New York 13, N. Y.

*President:* Theodore A. Blackman.

*Research staff:* Harold Rosenblum, Chief Chemist; A. Taub, Hugo H. Schaefer, Florenz S. Birnbaum, Consultants. 5 chemists, 1 biologist, 2 physicians; technical personnel 2; additional personnel 2.

*Research activities:* Vitamins, amino acids, and other pharmaceuticals. (Research initiated 1926.)

*Library:* 200 volumes.

*Cooperative research:* Four scholarships are supported.

**1772. Pressed Steel Tank Company,** 1445 South 66th St., West Allis 14, Wis.

*President:* H. O. Brumder.

*Research staff:* W. E. Coakley, Vice President in charge of research; H. L. Newton, Works Manager; W. O. Kugler, Chief Metallurgist. 1 chemist, 2 metallurgists, 3 engineers; technical personnel 4; additional personnel 1.

*Research activities:* Improvement of the quality of steel tanks and the processes of their manufacture; the development of new products. (Research initiated 1938.)

*Library:* 300 volumes.

**Prest-O-Lite Battery Corporation.** See Electric Auto-Lite Company.

**Prest-O-Lite Company, Inc.** See Union Carbide and Carbon Corporation.

**1773. Preston Laboratories,** Box 847, Butler, Pa.

*President:* F. W. Preston.

*Research staff:* F. W. Preston, Director. 3 chemists, 2 physicists, 1 biologist, 4 engineers; technical personnel 2; additional personnel 9.

*Research activities:* Glass technology: light weight structures. (Research initiated 1927.)

*Library:* 1,800 volumes.

**1774. Printing Arts Research Laboratories, Inc.,** San Marcos Bldg., Santa Barbara, Calif.

*President:* Albert G. McCaleb.

*Research staff:* Walter S. Marx, Jr., Vice President and Director; Stuart B. Bradley, Secretary. 4 chemists, 1 physicist, 1 engineer; technical personnel 3; additional personnel 5.

*Research activities:* Halftone photography

and photomechanical methods, equipment, and materials for the printing industries; scientific photography. (Research initiated 1938.)

*Library:* 1,400 volumes.

**1775. Process and Instruments**, 60 Greenpoint Ave., Brooklyn 22, N. Y.

*Co-Partners:* Joseph Greenspan and Philip Rosenblatt.

*Research staff:* Joseph Greenspan and Philip Rosenblatt, Directors. 3 chemists, 2 physicists, 1 biologist, 2 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Development of chemical processes; research, design, development of plant instrumentation; development of high vacuum techniques and automatic analytical instruments. (Research initiated 1945.)

*Library:* 750 volumes.

**1776. Procter and Gamble Company**, M. A. and R. Bldg., Ivorydale 17, Ohio.

*President:* R. R. Deupree.

*Research staff:* F. W. Blair, Director, Chemical Division. Laboratory personnel 225.

*Research activities:* Soaps and active detergents, wetting and cleansing agents, cosmetics, glycerin, fats, fatty acids, shortenings, and salad and cooking oils.

*Library:* 10,000 volumes.

*See also* Buckeye Cotton Oil Company.

**1777. Proctor and Schwartz, Inc.**, 7th St. and Tabor Road, Philadelphia 20, Pa.

*President:* Walter M. Schwartz, Sr.

RESEARCH AND DEVELOPMENT LABORATORY

PROCTOR ELECTRIC COMPANY DIVISION

3rd St. and Hunting Park Ave.

Philadelphia 40, Pa.

*Research staff:* Joseph W. Myers, Vice President in charge of research; C. Roger Turner, Assistant Research Director. 4 engineers; additional personnel 6.

*Research activities:* Household electrical appliances, electric heating units, thermostats, and controls. (Research initiated 1930.)

*Library:* 100 volumes.

*Cooperative research:* Two fellowships are supported.

DRYER DIVISION LABORATORY

7th St. and Tabor Road, Philadelphia 20, Pa.

*Research staff:* A. O. Hurxthal and George W. O'Keeffe, Vice Presidents in charge of research. 10 engineers; technical personnel 5; additional personnel 2.

*Research activities:* Problems related to the drying industry involving heating; heat insulation materials; air movement; humidification

and dehumidification; cooling; mechanical developments; developments in search of new lines of business. (Research initiated 1917.)

*Library:* 600 volumes.

*Cooperative research:* Eight fellowships are supported.

TEXTILE MACHINERY LABORATORY

7th St. and Tabor Road, Philadelphia 20, Pa.

*Research staff:* W. F. Bokum, Director. 2 engineers; additional personnel 3.

*Research activities:* Carding and garnetting. (Research initiated 1923.)

*Cooperative research:* Two fellowships are supported.

**Proctor Electric Company.** *See* Proctor and Schwartz, Inc.

**Professional Laboratories, Inc.** *See* U. S. Vitamin Corporation.

**Promat Division, Poor and Company.** *See* Poor and Company.

**1778. Pro-phy-lac-tic Brush Company**, Pine St., Florence, Mass. (Subsidiary of Lambert Pharmacal Company.)

*President:* John L. Johnston.

*Research staff:* William C. Bird, Executive Vice President; Warren E. Hill, Vice President in charge of manufacturing; Gaetano F. D'Alelio, Vice President and Director of research. 11 chemists; technical personnel 2; additional personnel 4.

*Research activities:* Organic and high polymer research and development; toilet goods research, development, and control. (Research initiated 1932.)

*Library:* 2,300 volumes.

**1779. Propper-McCallum Hosiery Company, Inc.**, 136 West St., Northampton, Mass.

*President:* Revell McCallum.

*Research staff:* Carl S. Sandlund, Director. 1 textile engineer; additional personnel 1.

*Research activities:* The control of quality through selection of raw materials and yarn treatments best suited to the manufacture of sheer hosiery; the analysis of yarns and hosiery fabrics; testing; selection of finishes for dyed hose; fashioning and construction of hosiery as related to fit. (Research initiated 1920.)

**1780. Providence Gas Company**, 100 Weybosset St., Providence, R. I.

*President:* F. C. Freeman.

*Research staff:* 5 chemists.

*Research activities:* Problems of gas manufacture and distribution. (Research initiated 1917.)

**1781. Proximity Manufacturing Company,**  
Greensboro, N. C.

*President:* Herman Cone.

*Laboratory:* Cone Mills Laboratory, Fairview St., Greensboro, N. C.

*Research staff:* R. H. Souther, Chief Chemist. 2 chemists, 1 engineer; technical personnel 3.

*Research activities:* The improvement of cotton textiles by chemical means, particularly in the field of bleaching, dyeing, and finishing; the development of better physical testing methods for correlating laboratory and mill conditions; the application of statistical evaluations to test results for better presentation of data and significance. (Research initiated 1944.)

*Library:* 340 volumes.

*Scientific periodicals:* Cone Mills Laboratory Technical Bulletin. Vol. I, 1945.

*Cooperative research:* Six grants for research are made.

**1782. Prudential Insurance Company of America,**  
Newark, N. J.

*President:* Franklin D'Olier.

*Research staff:* Anton R. Rose, Biochemist; Fred Schattner; Samuel Korman; Malcolm K. Smith; Wilbur C. Pace. 3 chemists, 2 physicians, 2 hematologists; additional personnel 9.

*Research activities:* Clinical pathological methods; precision measurements; clinical data. (Research initiated 1914.)

**Public Service Company of Northern Illinois.**  
*See Utilities Research Commission.*

**1783. Public Service Electric and Gas Company,**  
80 Park Place, Newark 2, N. J.

*President:* George H. Blake.

*Laboratory:* 200 Boyden Ave., Maplewood, N. J.

*Research staff:* Hervey S. Vassar, Laboratory Engineer. Engineering and technical personnel 83; additional personnel 32.

*Research activities:* The generation, distribution, and utilization of electricity, including studies of design and performance of electrical and mechanical plant and line equipment; corrosion; the selection and use of materials. (Research initiated 1903.)

**1784. Publicker Industries, Inc.,** 1429 Walnut St., Philadelphia 2, Pa.

*President:* S. S. Neuman.

**CHEMICAL RESEARCH LABORATORY**  
Philadelphia, Pa.

*Research staff:* Karl Kammermeyer, Director; R. S. Wilder, Associate Director; Philip J. Elving, Assistant Director. 26 chemists, 11

engineers; technical personnel 12; additional personnel 35.

*Research activities:* Aliphatic synthetic organic chemistry.

*Library:* 1,000 volumes.

*Cooperative research:* Two fellowships are supported.

**BACTERIOLOGICAL RESEARCH LABORATORY**  
Philadelphia, Pa.

*Research staff:* David A. Legg, Director. 14 biologists; technical personnel 2; additional personnel 9.

*Research activities:* Fermentation, enzymes, and biochemical problems.

**DEVELOPMENT DIVISION**  
Eddington, Pa.

*Research staff:* Virgil D. Drummond, Director; John A. Patterson, Assistant Director; Wendell W. Waterman. 9 chemists; 25 engineers; technical personnel 1; additional personnel 30.

*Research activities:* Aliphatic synthetic organic chemistry; operation and design of pilot plants; chemical engineering studies.

*Cooperative research:* One fellowship is supported.

**1785. Pullman Company, Testing Bureau,** 11001 Cottage Grove Ave., Chicago 28, Ill.

*President:* David C. Crawford.

*Research staff:* A. M. Johnsen, Engineer of tests. 3 chemists, 1 physicist, 2 metallurgists, 1 engineer; additional personnel 15.

*Research activities:* Chemical, metallurgical, and physical investigations of materials for use in the manufacture and maintenance of Pullman cars. (Research initiated 1910.)

*Library:* 125 volumes.

**1786. Pulverizing Machinery Company,** Summit, N. J.

*Proprietor:* Louis Ruprecht.

*Research staff:* W. M. Sheldon, Director; J. H. Foote, Assistant Director. 1 chemist, 1 physicist, 11 engineers; technical personnel 2; additional personnel 3.

*Research activities:* Development of machinery and methods for pulverization to one micron size and finer; coarser milling; dispersion, blending; wet grinding; rubber coagulation; precipitation. (Research initiated 1923.)

*Library:* 100 volumes.

**1787. Purdy Company, Inc.,** W. S., 128 Water St., New York 5, N. Y.

*President:* G. A. Miel.

*Research staff:* Perry G. Vlacos, Director; Walter F. Fuchs, Consultant. 3 chemists, 1

chemical engineer; technical personnel 4; additional personnel 2.

*Research activities:* The stability of oils; the clarification of oils, and knock ratings; emulsions; oil conversion; cosmetic formulations; road construction materials; petroleum products; microcrystalline research; waxes. (Research initiated 1865.)

*Library:* 200 volumes.

1788. Pure Oil Company, 35 East Wacker Drive, Chicago 1, Ill.

*President:* H. M. Dawes.

*Laboratories:* Northfield, Ill.; Cabin Creek, W. Va.; Newark and Toledo, Ohio; Marcus Hook, Pa.; Midland, Mich.; Nederland, Tex.

*Research staff:* W. B. Ross, Manager, Research and Development Department; L. M. Henderson and W. J. Backoff, Supervisors. 62 chemists, 1 physicist, 20 engineers, 7 in other scientific professions; technical personnel 35; additional personnel 24.

*Research activities:* Problems of refining, marketing, production, and transportation of petroleum. (Research initiated 1925.)

*Library:* 1,300 volumes.

1789. Purity Bakeries Corporation, 819 North Michigan Ave., Chicago 11, Ill.

*President:* Lewis A. Cushman.

*Research staff:* R. W. Mitchell, Director. 3 chemists, 2 bakers, 2 home economists.

*Research activities:* Bread and cake baking problems. (Research initiated 1926.)

1790. Purity Drug Company, Inc., 178 River Drive, Passaic, N. J.

*Vice President:* Julius Kesser.

*Research staff:* Samuel L. Silver, Chief Chemist. 2 chemists, 1 pharmacist; technical personnel 1; additional personnel 1.

*Research activities:* The improvement and development of pharmaceutical preparations. (Research initiated 1937.)

1791. Purolator Products, Inc., 744 Broad St.; Newark 2, N. J.

*President:* Ralph R. Layte.

*Laboratories:* 365 Frelinghuysen Ave., Newark 5, N. J.

*Research staff:* Jules P. Kovacs, Chief Engineer. 3 chemists, 8 engineers; technical personnel 5.

*Research activities:* Study of filtration, filtration media, paper conversion and characteristics, fluid flow, internal combustion engine wear characteristics, fluid contaminants, analysis of contaminants, minute particle (micronic) size and dispersion characteristics of contaminants. (Research initiated 1924.)

1792. Pyramid Process Company, Inc., West Commercial St., East Rochester, N. Y.

*President:* E. L. Baker.

*Research staff:* E. L. Baker, Director; Neil A. Stillman, Vice President. 2 chemists, 1 engineer; additional personnel 1.

*Research activities:* Adhesives, pastes, sizes, and cleaners. (Research initiated 1926.)

1793. Pyridium Corporation, Nepera Park, Yonkers 2, N. Y.

*President:* William S. Lasdon.

*Research staff:* E. T. Tisza, Vice President in charge of research. 12 chemists, 4 biologists, 1 engineer; technical personnel 1.

*Research activities:* Chemotherapeutic products; improvement and development of processes for organic preparations. (Research initiated 1926.)

*Library:* 1,000 volumes.

1794. Pyroxylin Products, Inc., 4851 South St. Louis Ave., Chicago 32, Ill.

*President:* P. S. Fawkes.

*Research staff:* W. Courtney Wilson, Vice President in charge of research. 6 chemists, 1 engineer; technical personnel 1.

*Research activities:* The development and application of protective and functional coating materials, finishing processes, and related subjects; moisture-vapor resistant, heat sealing and greaseproof coatings and laminants for food and frozen food packaging; special paper and fabric coatings; hot melts for heat sealing, laminating, and coating; special problems in surface protection; finishes for wood, metal, plastics, cloth, and paper; studies of plasticizers, resins, and other raw materials. (Research initiated 1925.)

*Library:* 500 volumes.

1795. Quaker Chemical Products Corporation, Lime, Elm, and Sandy Sts., Conshohocken, Pa.

*President:* D. J. Benoliel.

*Laboratories:* Conshohocken, Pa.; Detroit, Mich.; Chicago, Ill.

*Research staff:* L. O. Benoliel, Vice President in charge of research; D. M. Gans, Technical Director; W. J. Haring, Director of metal research; H. L. Pfluger, Director of textile research. 19 chemists; technical personnel 6; additional personnel 10.

*Research activities:* Synthetic resins; textile finishes; emulsifiers; solubilizing of materials; treatment of fibers for weaving and knitting; sulfurizing of oils; metal cutting and drawing; corrosion preventives; mechanico-chemical problems that arise in the textile, metal, and related industries. (Research initiated 1931.)

*Library:* 410 volumes.

*Cooperative research:* Five grants for research are made.

**Quaker Maid Company, Inc.** *See* Great Atlantic and Pacific Tea Company.

**1796. Quaker Oats Company, 141 West Jackson Blvd., Chicago 4, Ill.**

*President:* R. Douglas Stuart.

*Laboratories:* 345 East 25th St., Chicago 16, Ill.; Cedar Rapids, Iowa; Akron, Ohio; St. Joseph, Mo.; Tecumseh, Mich.

*Research staff:* E. D. Andrews, Vice President; Fredus N. Peters, Jr., Director of research. 35 chemists, 4 biologists and bacteriologists, 2 engineers; additional personnel 60.

*Research activities:* Cereal research; the development of new products and improvement of old products; nutritional research; chemical research; the development of chemicals from cereal by-products. (Research initiated 1919.)

*Library:* 700 volumes.

*Cooperative research:* Three fellowships are supported.

**1797. Quality Bakers of America Cooperative, Inc., 120 West 42nd St., New York 18, N. Y.**

*General Manager:* G. R. Ludlow.

*Research staff:* Oscar Skovholt, Director of laboratory. 4 chemists; technical personnel 3; additional personnel 1.

*Research activities:* The control and improvement of ingredients; cooperative experimental work with other research agencies on new developments affecting the baking industry; the development of new bakery products and processes; some basic research on dough properties. (Research initiated 1936.)

*Scientific periodicals:* Laboratory Bulletin. Vol. I, 1936.

**1798. Quality Electric Company, Ltd., 1235 East Olympic Blvd., Los Angeles 21, Calif.**

*Vice President and General Manager:* Edward C. Flynn.

*Laboratories:* Los Angeles and Burbank, Calif.

*Research staff:* 1 physicist, 8 engineers; technical personnel 18; additional personnel 12.

*Research activities:* Electronics; aeronautics; radio; electrical conversion. (Research initiated 1932.)

*Library:* 1,000 volumes.

**1799. Quigley Company, Inc., 527 Fifth Ave., New York 17, N. Y.**

*President:* D. F. McMahon.

*Laboratory:* South River, N. J.

*Research staff:* R. J. Demaison, Technical Director; Howard C. Thayer, Chief Engineer;

Edward Waugh, Superintendent. 2 chemists, 1 physicist, 2 engineers, 2 ceramists.

*Research activities:* The investigation and development of refractory materials, heavy refractories, and insulating refractories; studies of factors influencing the behavior of refractories in metallurgical and boiler furnaces; the study of corrosion problems and the development of waterproofings and protective coatings; the investigation of detergent values of various soaps, alkalies, and solvents; the development of acid-proof cements and jointing materials. (Research initiated 1916.)

**1800. R. and M. Industrial Laboratories, 4 Union St., Peabody, Mass.**

*Owner:* Isidor Rabinovitz.

*Research staff:* 2 chemists.

*Research activities:* Leather and oils. (Research initiated 1919.)

*Library:* 400 volumes.

**R-B-H Dispersions, Inc.** *See* Interchemical Corporation.

**1801. RCA Communications, Inc., 66 Broad St., New York 4, N. Y.** (Subsidiary of Radio Corporation of America.)

*President:* David Sarnoff. *Vice President and General Manager:* Thompson H. Mitchell.

*Research staff:* Ralph R. Beal, Vice President in charge of engineering; C. W. Latimer, Vice President and Chief Engineer; H. H. Beverage, Vice President in charge of research and development; 10 engineers; technical personnel 30.

*Research activities:* The development and design of radio communications equipment for use in international radio services and for continental and domestic radio services. (Research initiated 1918.) Fundamental research for the company is done in RCA Laboratories, a division of the Radio Corporation of America.

**RCA Laboratories.** *See* Radio Corporation of America.

**RCA Victor Division, Radio Corporation of America.** *See* Radio Corporation of America.

**1802. Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N. Y.**

*President:* David Sarnoff.

*Libraries:* Research library, RCA Laboratories, Princeton, N. J.; library, Patent Department, New York City; engineering library at each of the following plants: Camden, N. J.; Harrison, N. J.; Lancaster, Pa.; Indianapolis, Ind.

*Scientific periodicals:* RCA Review. Quarterly. Vol. I, 1936. Suspended publication in 1942 for the duration of the war.

*Cooperative research:* Ten to sixty scholarships are supported.

Fundamental research for the companies and divisions of RCA, including RCA Victor Division, RCA Communications, Inc., Radiomarine Corporation of America, and the National Broadcasting Company is done in RCA Laboratories, a division of the Radio Corporation of America.

RCA LABORATORIES  
Princeton, N. J.

C. B. Jolliffe, Vice President in charge; E. W. Engstrom, Research Director; H. H. Beverage, L. P. Smith, V. K. Zworykin, Associate Research Directors.

PRINCETON, N. J. LABORATORY

*Research staff:* 11 chemists, 40 physicists, 90 engineers; technical personnel 108; additional personnel 132.

*Research activities:* Fundamental and applied research in physics and chemistry; engineering research and development in radio, electronics, acoustics, and related fields, including radio transmission and reception; television, facsimile and FM; vacuum tubes and special-purpose electronic devices; radio aids to navigation; industrial application of radio-frequency currents to heating or control; electronic instruments for research or testing.

COMMUNICATION LABORATORIES

66 Broad St., New York, N. Y.; Rocky Point and Riverhead, L. I., N. Y.

*Research staff:* 47 engineers; technical personnel 38; additional personnel 16.

*Research activities:* Research and development in radio communication equipment and methods, including receivers, transmitters, and directive antennas; propagation studies covering all useful radio frequencies to the very highest; radio relays for communication or television; multiplex telegraph printers, photoradio, and central office control equipment.

INDUSTRY SERVICE LABORATORIES

New York City; Chicago, Ill.

*Research staff:* 20 engineers; technical personnel 5; additional personnel 7.

*Research activities:* Technical consulting and information services for the patent licensees of RCA.

In addition to the research group, each of the following organizations has an engineering and technical staff responsible for the development, design, or operation of electronic equipment:

RCA VICTOR DIVISION

Camden, N. J.

(A division of Radio Corporation of America)

F. M. Folsom, Executive Vice President; J. G. Wilson, Operating Vice President; D. F. Schmit, Director of engineering.

*Staff: Engineering Products Division, Camden, N. J.:* Meade Brunet, General Manager; M. C. Batsel, Chief Engineer. 480 engineers, 332 technical personnel; additional personnel 704. *Tube Division, Harrison, N. J.:* L. W. Teegarden, General Manager; G. R. Shaw, Chief Engineer; R. T. Orth, Engineer. *Receiving Tube Engineering, Harrison, N. J.:* D. Ulrey, Engineer. *Power, Cathode Ray and Special Tube Engineering, Lancaster, Pa.:* 16 chemists, 29 physicists, 4 metallurgists, 196 engineers; technical personnel 129; additional personnel 235. *Home Instrument Division, Camden, N. J.:* J. B. Elliott, General Manager; D. D. Cole, Chief Engineer. 11 chemists, 108 engineers; technical personnel 73; additional personnel 41. *Record Division, Camden, N. J.:* J. W. Murray, General Manager; H. I. Reiskind, Chief Engineer. 12 engineers; technical personnel 3; additional personnel 5.

*Engineering activities: Engineering Products Division:* Development and design of transmitters in the fields of communications, broadcasting, and television; of UHF transmitters and receivers, communication receivers, aviation communication and navigation equipment. Development and design of industrial high frequency heating equipment, commercial sound systems, recording and reproducing equipment on both film and discs. Development and design of measuring equipment, oscillographic test apparatus, broadcast audio and television studio equipment, loud speakers, and microphones. *Tube Division:* Development and design of electron tubes for receiving and transmitting and industrial applications, cathode ray tubes for television and special applications. Development and design of tube manufacturing machinery. Development work on electron tube activities involving not only development and design, but investigation of properties of materials such as alloys, ceramic insulation, cathode-coating materials, luminescent materials, and glass. *Home Instrument Division:* Development and design of broadcast receivers both AM and FM, television receivers, and phonographs for home entertainment. Development of associated circuits, mechanical devices, and component parts. *Record Division:* Development of materials, methods, and processes for disc records for home entertainment, broadcast transcription, and other purposes; associated recording methods and studio technique.

See also National Broadcasting Company; RCA Communications, Inc.; Radiomarine Corporation of America.

**1803. Radio Engineering Laboratories, Inc.,** 35-54 Thirty-sixth St., Long Island City 1, N. Y.

*President:* Charles M. Srebroff.

*Research staff:* Frank A. Gunther, Development and Sales Engineer; M. Jennings, Development Engineer. 5 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Frequency modulation broadcast transmitters from 250 watts to 50 kilowatts; portable and semiportable frequency modulation transmitters for police, aircraft, utility, and broadcast pick-up; frequency modulation receivers, especially designed for laboratory use and monitoring work; amplitude transmitters and receivers for aircraft, marine, fire, and police use.

**1804. Radio Frequency Laboratories, Inc.,** Boonton, N. J.

*President:* Richard W. Seabury, Jr.

*Laboratory:* Butler Road, Rockaway Valley, Boonton Township, N. J.

*Research staff:* Richard W. Seabury, Jr., Director; William A. Yonkers, Senior Engineer; L. R. Damon, Electronic Engineer. 4 engineers; technical personnel 3; additional personnel 33.

*Research activities:* Applied industrial electronics; associated electrical and mechanical commercial products. (Research initiated 1938.)

**1805. Radio Patents Corporation,** 10 East 40th St., New York 16, N. Y.

*President:* William Dubilier.

*Research staff:* 1 chemist, 3 physicists, 2 engineers.

*Research activities:* Studies in the electrical field, especially in electronics. (Research initiated 1917.)

*Library:* 200 volumes.

**1806. Radio Receptor Company, Inc.,** 251 West 19th St., New York 11, N. Y.

*President:* Ludwig Arnson.

*Research staff:* Hugo Cohn, Director. 4 chemists, 1 physicist, 11 engineers; technical personnel 10; additional personnel 16.

*Research activities:* Ultra high frequency transmission and reception; selenium rectifiers; high frequency dielectric heating. (Research initiated 1922.)

*Library:* 100 volumes.

*Cooperative research:* Two fellowships are supported.

**1807. Radio Research Laboratories,** 186-88 Front St., Marietta, Ohio.

*Research staff:* Pietro Muscari, Director. Varying number of physicists and engineers; technical personnel 2; additional personnel 3.

*Research activities:* Electronics: cold cathode fluorescent tubes; germicidal lamps. (Research initiated 1920.)

*Library:* 1,000 volumes.

**1808. Radio Speakers, Inc.,** 221 East Cullerton, Chicago, Ill. (Subsidiary of Emerson Radio and Phonograph Corporation.)

*President:* Benjamin Abrams.

*Research staff:* George Holly, Vice President in charge of engineering and production. 4 engineers; technical personnel 12; additional personnel 8.

*Research activities:* The design and development of cone diaphragm loudspeakers.

*Library:* 100 volumes.

**1809. Radiomarine Corporation of America,** 75 Varick Street, New York 13, N. Y. (Subsidiary of Radio Corporation of America.)

*President:* Charles J. Pannill.

*Research staff:* I. F. Byrnes, Chief Engineer; H. B. Martin, Assistant Chief Engineer. 9 engineers; technical personnel 30; additional personnel 6.

*Research activities:* The development, design, and manufacturing processes for marine radiotelephone and radiotelegraph transmitters and receivers, automatic alarms, radio direction finders, and radio navigation aids; the development, design, and production of marine coastal-station radiotelegraph and radiotelephone radio communication equipment. (Research initiated 1930.) Fundamental research for the company is done in RCA Laboratories, a division of the Radio Corporation of America.

**1810. Radiotechnic Laboratory,** 1328 Sherman Ave., Evanston, Ill.

*President:* Charles P. Peirce.

*Research staff:* 6 engineers; technical personnel 10; additional personnel 25.

*Research activities:* Engineering and manufacturing research on radio tube testers, magnetic wire recorders, recorder-reproducers, and airborne magnetic wire recorders. (Research initiated 1928.)

**1811. Radium Emanation Corporation,** Graybar Bldg., New York, N. Y.

*Research staff:* Armando Cervi, Director. 1 chemist, 3 physicists, 1 engineer.

*Research activities:* Radioactive elements and filtration.



1812. Raffi and Swanson, Inc., 311 Eastern Ave., Chelsea 50, Mass.

*President:* Charles L. Raffi.

*Research staff:* Martin S. Swanson, Executive Officer in charge of research; Samuel H. Wingersky, Director. 3 chemists; additional personnel 1.

*Research activities:* Industrial lacquers; synthetic enamels. (Research initiated 1930.)

1813. Rafton Laboratories, Inc., 16 Haverhill St., Shawsheen Village, Andover, Mass.

*President:* Harold R. Rafton.

*Research staff:* Harold R. Rafton, Director; Arthur M. Brooks, Chief Chemist. 5 chemists; additional personnel 3.

*Research activities:* Problems connected with the pulp and paper industry, relating particularly to the filling, sizing, and coating of paper, and to the production and use of alkaline fillers such as calcium carbonate; carbon black. (Research initiated 1928.)

*Library:* 2,000 to 2,500 volumes.

1814. Rahr Malting Company, Manitowoc, Wis.

*President:* G. R. Rahr.

*Research staff:* W. G. Artis, Director. 2 chemists; technical personnel 5; additional personnel 1.

*Research activities:* Enzyme production from plants and cereals; the relationship of these enzymes to the brewing, distilling, fermentation, food, milling, and other industrial processes; the fundamental chemistry of amylolytic enzymes. (Research initiated 1900.)

*Library:* 350 volumes.

*Cooperative research:* Three grants for research are made.

1815. Railway and Industrial Engineering Company, Greensburg, Pa.

*President:* B. W. Kerr.

*Research staff:* G. E. Heberlein, Chief Engineer; H. H. Rudd, Vice President. 2 engineers; technical personnel 1; additional personnel 2.

*Research activities:* The development of power and distribution electrical switching equipment. (Research initiated 1910.)

*Library:* 100 volumes.

1816. Railway Service and Supply Corporation, 510 South Harding St., Indianapolis 7, Ind.

*President:* E. S. Pearce.

*Research staff:* E. S. Pearce, Director. 1 chemist, 1 metallurgist, 4 engineers; additional personnel 8.

*Research activities:* Railroad lubrication and reclamation of lubricating materials; oil and bearing research; special railroad equipment. (Research initiated 1930.)

1817. Rainfair, Inc., 1501 Albert St., Racine, Wis.

*President:* F. F. Sommers.

*Research staff:* G. R. Spangenberg, Director. 3 chemists, 2 engineers.

*Research activities:* The development of crude rubber, synthetic rubber and synthetic resin compounds and cements, and of coated fabrics. (Research initiated 1927.)

*Library:* 200 volumes.

1818. Ralston Purina Company, 835 South 8th St., St. Louis 2, Mo.

*President:* Donald Danforth.

*Laboratories:* Research Laboratories, St. Louis, Mo.; Animal Disease Control Laboratory, St. Louis, Mo.; Research Farm, Gray Summit, Mo.; Plant Control Laboratory, Buffalo, N. Y.; Cereal Control Laboratory, Battle Creek, Mich.; Alfalfa Control Laboratory, Lamar, Colo.

*Research staff:* H. J. Smith, Director; C. S. Johnson, Vice President in charge of products and research; H. C. Schaefer, Manager, Research Laboratories; R. E. Lubbehusen, Manager, Animal Disease Control Laboratory; E. B. Powell, Manager, Research Farm. 17 chemists, 4 biologists, 3 veterinarians; technical personnel 65; additional personnel 32.

*Research activities:* Experimental feeding of livestock, pet stock, poultry, and fur bearing animals; nutritional studies with laboratory animals; the study of animal diseases and parasite control; research on farm accessories; biological, chemical, and physical study of minerals, proteins, and vitamins; research on cereal products. (Research initiated 1917.)

*Library:* 1,447 volumes.

1819. Ransom and Randolph Company, Chestnut and Superior Sts., Toledo 1, Ohio.

*President:* R. E. Munn.

*Research staff:* T. E. Moore, Director. 2 chemists, 4 engineers, 1 physician; technical personnel 3; additional personnel 1.

*Research activities:* Dental materials. (Research initiated 1918.)

*Library:* 1,200 volumes.

*Cooperative research:* One grant for research is made.

1820. Rapid Roller Company, 2558 South Federal St., Chicago 16, Ill.

*President:* David M. Rapport.

*Research staff:* E. Gurin, Director. 4 chemists, 1 engineer; additional personnel 4.

*Research activities:* The use of synthetic rubber, natural rubber, plastics, glue, and glycerin in the manufacture of products for the graphic and mechanical arts. (Research initiated 1920.)

*Library:* 200 volumes.

**1821. Rapinwax Paper Company, 150 Twenty-sixth Ave., S. E., Minneapolis 14, Minn.**

*President:* John J. Ahern.

*Research staff:* C. M. Rhodes, Manager of product development and research; C. T. Brown, Laboratory Director. 5 chemists, 1 engineer; technical personnel 1; additional personnel 4.

*Research activities:* The development of protective packaging materials for foods, principally for the baking, cereal, dairy, frozen food, and packing industries; development of noncorrosive packaging materials for machined metal parts and for metallic surfaces; development of protective coatings and of printing materials with special functional properties; establishment of quality standards and specifications for manufactured products; development of processing methods for the coating, printing, saturating, and laminating of sheet materials such as paper, paperboard, films, metallic foils, and fabrics; special services or testing for other company departments, such as sales, advertising, and production. (Research initiated 1929.)

*Library:* 130 volumes.

**1822. Rare Chemicals, Inc., Broad and Church Sts., Flemington, N. J. (Subsidiary of National Oil Products Company, Inc.)**

*President:* C. P. Gulick.

*Research staff:* Frank Pickel, Director of research; Ralph Wechsler, Treasurer and Officer in charge. 3 chemists, 1 biologist, 2 engineers; technical personnel 4.

*Research activities:* Producers of medicinal and pharmaceutical specialties, such as hormones, anesthetics, and hematinics, regarded as important for public health and the armed forces; manufacturers of sorbose, an intermediate in the production of ascorbic acid (vitamin C); pilot plant production of penicillin. (Research initiated 1927.)

*Library:* A library is maintained.

**1823. Rare Metal Products Company, 522 Cortlandt St., Belleville 9, N. J.**

*President:* D. A. Shirk.

*Research staff:* D. A. Shirk, Director. 2 chemists, 1 engineer; additional personnel 3.

*Research activities:* Various rubber compounds containing antimony sulfide; rubber pigments; scorch inhibitors, deodorizers, etc., in connection with the vulcanization of rubber. (Research initiated 1915.)

**1824. Rath Packing Company, Waterloo, Iowa.**

*President:* R. A. Rath.

*Research staff:* Glenn E. Cooper, Director. 3 chemists; additional personnel 1.

*Research activities:* Investigations in soils, pickles, lard, and shortening, with special work on meats and curing. (Research initiated 1922.)

**1825. Ray Control Company, 975 East Green Street, Pasadena 1, Calif.**

*President:* Oscar Van Leer.

*Laboratory:* 717 North Lake Avenue, Pasadena 6, Calif.

*Research staff:* Peter Pringsheim, Director. 7 physicists; technical personnel 3; additional personnel 4.

*Research activities:* Geometrical optics; spectroscopy (emission, absorption, infrared, Raman); optical engineering. (Research initiated 1943.)

*Library:* 200 volumes.

**1826. Ray-O-Vac Company, 212-216 East Washington Ave., Madison 3, Wis.**

*President:* William W. Cargill.

*Research staff:* Ralph E. Ramsay, Director; Ralph Friess, Assistant Director. 6 chemists, 12 engineers; technical personnel 2; additional personnel 38.

*Research activities:* Dry cells and batteries and their applications; flashlight cases; hearing aids; carbon electrodes for dry cells. (Research initiated 1906.)

*Library:* 500 volumes.

**1827. Ray Oil Burner Company, 401-499 Bernal Ave., San Francisco 12, Calif.**

*President:* Milton S. Ray.

*Laboratory:* 50 Milton St., San Francisco 12, Calif.

*Research staff:* R. Plass, Director. 3 engineers; technical personnel 2.

*Research activities:* Oil and gas combustion engineering. (Research initiated 1872.)

*Library:* 100 volumes.

**1828. Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.**

*President:* Sumner Simpson.

#### RAYBESTOS DIVISION Stratford, Conn.

*Research staff:* Clyde S. Batchelor, Director of laboratories and Chief Chemist; Edward L. Carey, Assistant Chief Chemist. 11 chemists, 1 biologist, 2 metallurgists, 6 engineers; technical personnel 11; additional personnel 6.

*Research activities:* Asbestos products, friction materials, and packing materials.

#### UNITED STATES ASBESTOS DIVISION Manheim, Pa.

*Research staff:* W. J. Joyce, Jr., Chief Engineer; J. D. Rohrer, Chief Chemist. 1 research engineer, 2 packing engineers, 2 development engineers, 1 plant engineer, 4 junior engineers, 1 machine designer, 7 technicians; additional personnel 4.

*Research activities:* Asbestos, asbestos products, heat resistant fibrous materials, friction materials, and packing materials.

MANHATTAN DIVISION  
Passaic, N. J.

*Research staff:* W. L. White, Director of research; P. A. Cady, Director of laboratory; R. J. Gorecki, Director of engineering; K. J. Soule, Chief Chemist. 16 chemists, 7 junior chemists, 9 engineers; technical personnel 21; additional personnel 12.

*Research activities:* Original research on problems connected with the rubber industry; improvement of manufacturing processes; study of crude rubber, reclaimed rubber fabrics, and compounding ingredients; study and development of rubber compounds; physical and chemical testing for control of factory processes; development work on mechanical rubber goods and automotive products.

*Library:* 100 to 300 volumes in each laboratory.

*Cooperative research:* One fellowship is supported.

**Raymond Pulverizer Division, Combustion Engineering Company, Inc.** See Combustion Engineering Company, Inc.

1829. **Rayonier, Inc.**, 122 East 42nd St., New York 17, N. Y.

*President:* Edward Bartsch.

*Laboratory:* Shelton, Wash.

*Research staff:* A. N. Parrett; P. H. Schloser. 30 chemists; additional personnel 40.

*Research activities:* Development of purified forms of wood cellulose for the chemical industry, such as viscose rayon, cellulose acetate, photographic paper, plastics, vulcanized fiber, etc. (Research initiated 1929.)

1830. **Reade Manufacturing Company**, 135 Hoboken Ave., Jersey City, N. J.

*Partners:* Charles H. Reade and Leonard J. Reade.

*Research staff:* Leonard J. Reade, Director; S. M. Herman; Earle P. Turner; F. J. Mann. 3 chemists, 1 engineer.

*Research activities:* The study of chemical agricultural problems, metallurgical problems, and powder metal production. (Research initiated 1883.)

1831. **Real Silk Hosiery Mills, Inc.**, Indianapolis 6, Ind.

*President:* G. A. Efroymsen.

*Research staff:* A. Deane, Director; A. A. Sanderson, full fashioned hosiery; J. Boothby, seamless hosiery; M. Fleischmann, Chemist. 1 chemist, 2 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Developing and testing of dyes, finishes, oils, etc.; testing of yarns and fabrics; testing of finished products.

**Red Comb Laboratory.** See Hales and Hunter Company.

1832. **Red Star Yeast and Products Company**, 221 East Buffalo St., Milwaukee 1, Wis.

*President:* Charles L. Wirth.

*Laboratory:* 325 North 27th St., Milwaukee 8, Wis.

*Research staff:* C. H. Keipper, Director; John C. Garey; Roy Irvin. 6 chemists, 3 biologists, 2 engineers; technical personnel 5; additional personnel 5.

*Research activities:* Biochemical and bacteriological research and control work on the production of bakers', consumers', and active dry yeast; fermentation of alcohol and vinegar; production of bakery product ingredients such as baking powders, frozen eggs, and flavors. (Research initiated 1883.)

*Library:* A library is maintained.

1833. **Reed and Carnrick**, 115 Van Wagenen Ave., Jersey City 6, N. J.

*President:* H. Sheridan Baketel.

*Laboratory:* 155 Van Wagenen Ave., Jersey City 6, N. J.

*Research staff:* Spencer T. Snedecor, Assistant to the President. 21 chemists, 1 biologist, 1 chemical engineer, 10 physicians, 1 physiologist; technical personnel 6; additional personnel 16.

*Research activities:* Endocrines, estrogenic substances, germicides, etc. (Research initiated 1860.)

*Library:* 1,500 volumes.

*Cooperative research:* Several scholarships are supported and fifteen to twenty grants for research are made.

1834. **Reed Roller Bit Company**, Houston, Tex.

*President:* S. P. Farish.

*Research staff:* Frank C. Gignoux, Director. 3 chemists, 2 physicists, 4 metallurgists, 5 engineers.

*Research activities:* The investigation and development of products and processes related to oil well tools and equipment. (Research initiated 1927.)

1835. **Reeves-Ely Laboratories, Inc.**, 62 West 47th St., New York 19, N. Y.

*President:* Hazard E. Reeves.

*Laboratory:* 300 Pearl St., Brooklyn 1, N. Y.

*Research staff:* Clifford Frondel, Director. 1 chemist, 2 physicists, 1 crystallographer, 4 electronics engineers; technical personnel 11; additional personnel 4.

*Research activities:* Primarily in the field of

crystal physics, with particular reference to piezoelectric and photoelectric phenomena and applications. (Research initiated 1942.)

*See also* Reeves Sound Laboratories.

**1836. Reeves Sound Laboratories, 215 East 91st St., New York 28, N. Y.** (Division of Reeves-Ely Laboratories, Inc.)

*President:* Hazard E. Reeves.

*Research staff:* H. D. Belock, Chief Design and Development Engineer; Sidney Godet and Martin Lewson, Engineers, Servo mechanisms and computers; Joseph Daniels, Engineer, Servo analysis; Eleazer Bromberg and Morris Kline, Mathematicians; Herbert Zagor, Circuit Analysis; Y. J. Liu, Consultant. 6 physicists, 2 metallurgists, 32 engineers, 70 in other scientific professions; additional personnel 40.

*Research activities:* Advance gunfire control systems and computers; radar and tracking systems; guided missile controls; aircraft control instruments; flight trainers and aerodynamical computers; precision instruments; Servo mechanisms; sound recording systems. (Research initiated 1942.)

*Library:* 400 volumes.

**1837. Refining, Unincorporated, 1100 Main St., Houston 1, Tex.**

*Laboratory:* 70 West 40th St., New York 18, N. Y.

*Research staff:* M. Mattikow, Director. 8 chemists; technical personnel 2; additional personnel 3.

*Research activities:* Development of fatty oil refining processes; continuous soap process; high temperature soap process, with recovery of glycerin by volatilization; recovery of phosphatides from crude fatty oils; utilization of phosphatides (commercial corn and cotton oil lecithins). (Research initiated 1934.)

**1838. Refinite Corporation, Refinite Bldg., Omaha, Nebr.**

*President:* T. E. Stevens.

*Research staff:* Paul C. Goetz, Chemical Director. 3 chemists, 1 physicist, 3 engineers.

*Research activities:* Zeolites; water softening; removal of iron, manganese, and fluorine from water; control of alkalinity of water; removal of tastes and odors from water; pH control of water; automatic feeds; water filtration; water conditioning for municipal supply; softening problems for industrial and domestic water supply. (Research initiated 1918.)

**1839. Refractory and Insulation Corporation, 120 Wall St., New York 5, N. Y.**

*President:* H. N. Clark.

*Laboratory:* Port Kennedy, Pa.

*Research staff:* H. N. Clark, Director. 2 ceramists; additional personnel 1.

*Research activities:* Refractory cements and insulations. (Research initiated 1929.)

**Regional Research Laboratories.** *See* United States Department of Agriculture, Agricultural Research Administration, Bureau of Agricultural and Industrial Chemistry.

**1840. Reichhold Chemicals, Inc., 601 Woodward Heights Blvd., Detroit 20, Mich.**

*President:* Charles J. O'Conoor.

*Laboratories:* Detroit, Mich.; Elizabeth, N. J.; Brooklyn, N. Y.; San Francisco, Calif.; Tuscaloosa, Ala.

*Research staff:* John J. Bradley, Jr., Director in charge of research. Divisional Directors: P. S. Hewett, chemicals; C. J. Meeske, resins; H. E. Weisberg, color. 33 chemists, 6 engineers; technical personnel 14.

*Research activities:* Synthetic resins for surface coatings, laminates, and adhesives; processed natural resins and their basic raw materials; chemical colors (organic and inorganic), and chemicals. (Research initiated 1925.)

*Library:* 2,000 volumes.

*Scientific periodicals:* By Gum! Vol. I, 1930.

**1841. Reilly Tar and Chemical Corporation, 1615 Merchants Bank Bldg., Indianapolis 4, Ind.**

*President:* P. C. Reilly.

*Research staff:* F. E. Cislak, Director. 14 chemists, 4 engineers; additional personnel 15.

*Research activities:* Coal tar products; plastics; coatings; pickling inhibitors; wood preservation; carburizing compounds; insecticides; germicides. (Research initiated 1900.)

*Library:* 2,000 volumes.

**1842. Reliance Manufacturing Company, 212 West Monroe St., Chicago 6, Ill.**

*President:* A. T. Bard.

*Research staff:* O. J. Mink, Vice President. 2 engineers.

*Research activities:* Finished textiles. (Research initiated 1940.)

**Remington Arms Company, Inc.** *See* du Pont de Nemours and Company, E. I.

**1843. Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y.**

*President:* James H. Rand, Jr.

#### ELECTRONIC DIVISION

North Main and Johnson Sts.,  
Middletown, Conn.

*Research staff:* James J. Lamb, Chief Engineer. 1 chemist, 1 physicist, 11 engineers; technical personnel 40; additional personnel 53.

*Research activities:* Research and development work in electronic devices. (Research initiated 1941.)

**PROPELLER DIVISION**  
Johnson City, N. Y.

*Research staff:* A. A. Bradd, Laboratory Director. 2 chemists, 3 metallurgists, 2 engineers; technical personnel 14; additional personnel 9.

*Research activities:* Methods of improving heat-treating, plating, and machining operations; determination of suitability of alternate materials for production. (Research initiated 1942.)

**PHOTO RECORDS DIVISION**  
Newton, N. J.

*Research staff:* Rowland S. Potter, Director. 3 chemists, 2 physicists, technical personnel 3; additional personnel 1.

*Research activities:* Photographic records. (Research initiated 1945.)

*Library:* A library is maintained.

**LABORATORY OF ADVANCED ENGINEERING**  
South Norwalk, Conn.

*Research staff:* H. T. Anderson, Laboratory Manager. Laboratory personnel 175 to 200.

*Research activities:* General office equipment; electronic, photographic, chemical, and metallurgical investigations; plastics. (Research initiated 1945.)

*Library:* A library is maintained.

**1844. Remler Company, Ltd.,** 2101 Bryant St., San Francisco 10, Calif.

*President:* E. G. Danielson.

*Laboratory:* 2156 Folsome St., San Francisco, Calif.

*Research staff:* H. A. Greene, Director. 3 engineers; technical personnel 9; additional personnel 7.

*Research activities:* Radio receiving sets, sound amplifications, and amplified communication systems. (Research initiated 1923.)

**1845. Remmey Son Company, Richard C.,** Hedley St. and Delaware River, Philadelphia 37, Pa.

*President:* Robert H. Remmey, Jr.

*Research staff:* G. Bickley Remmey, Director. 1 chemist, 1 ceramist, 1 assistant ceramist.

*Research activities:* Refractories: silicon carbide, semisilicon carbide, fused alumina, and mullite; high temperature cements and plastic fire brick. (Research initiated 1930.)

*Library:* A library is maintained.

**1846. Reo Motors, Inc.,** 1331 South Washington Ave., Lansing 20, Mich.

*President:* Henry E. Hund.

*Research staff:* K. K. Probst, Director. 1 metallurgist, 4 engineers; technical personnel 5.

*Research activities:* Post-war light truck projects. (Research initiated 1920.)

**1847. Republic Steel Corporation,** Cleveland 1, Ohio.

*President:* C. M. White.

*Laboratories:* Cleveland, Canton, Massillon, Warren, and Youngstown, Ohio; Buffalo, N. Y.; Chicago, Ill.

*Research staff:* Process and Product Development Division: H. W. McQuaid, Manager. 6 chemists, 2 physicists, 5 metallurgists, 14 engineers; technical personnel 95.

*Research activities:* Investigations on metallurgical problems connected with open-hearth and electric steels, alloy steel bars, slabs, billets, blooms, sheets, plates, strips, rods, wire, and stainless steels.

*Cooperative research:* One fellowship is supported.

**1848. Research Corporation,** 405 Lexington Ave., New York 17, N. Y.

*President:* Joseph W. Barker.

*Laboratories:* Bound Brook, N. J.; Chicago, Ill.

*Research staff:* Harry J. White, Director. 2 chemists, 1 physicist, 2 engineers.

*Research activities:* The removal of dust fumes and mists from gases by means of electrical precipitation. (Research initiated 1912.)

*Cooperative research:* Five grants for research are made.

**1849. Research Products Corporation,** 1011 East Washington Ave., Madison 3, Wis.

*President:* Kemper Slidell.

*Research staff:* M. H. Kliefoth, Director; M. J. Shoemaker, Assistant Director. 4 chemists, 4 engineers; technical personnel 10.

*Research activities:* Water treatment; filtration and conditioning of air. (Research initiated 1938.)

*Library:* A library is maintained.

*Cooperative research:* Occasional fellowships are supported.

**Retort Pharmaceutical Company, Inc.** See Cole Laboratories, Inc.

**1850. Revere Copper and Brass, Inc.,** 230 Park Ave., New York, N. Y.

*President:* C. Donald Dallas.

*Laboratories:* Research Laboratory, Rome, N. Y. Control laboratories: Rome, N. Y.; Chi-

cago Ill.; Baltimore, Md.; Detroit, Mich.; New Bedford, Mass.

*Research staff:* R. A. Wilkins, Director; F. F. Poland, Administrative Assistant. 3 chemists, 5 metallurgists, 4 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Copper base alloys. (Research initiated 1930.)

1851. Revere Sugar Refinery, Charlestown 29, Mass.

*President:* Samuel Zemurray.

*Research staff:* J. M. Brown, Chief Chemist. 6 chemists, 2 biologists; technical personnel 9.

*Research activities:* Research in the manufacture of sugar; process, equipment application, and methods. (Research initiated 1919.)

*Library:* 700 volumes.

1852. Revolver Company, State St. and Bergen Turnpike, North Bergen, N. J.

*President:* H. S. Germond.

*Research staff:* P. D. Germond, Engineer. 3 in scientific professions.

*Research activities:* Basic investigations of the problems involved in the design of mechanical and hydraulic elevators and of automatic material handling machinery, electrical control circuits, etc.

Reynolds Experimental Laboratory, Atlas Powder Company. See Atlas Powder Company.

1853. Reynolds Metals Company, 3rd and Grace Sts., Richmond 19, Va.

*President:* R. S. Reynolds.

#### DEVELOPMENT LABORATORY

10th and Byrd Sts., Richmond 13, Va.

*Research staff:* Arthur Biddle, Director of development. 9 chemists, 1 biologist, 4 engineers; technical personnel 7; additional personnel 10.

*Research activities:* Packaging; the formulation of coatings, adhesives, inks, etc.

*Library:* 300 volumes.

#### METALLURGICAL LABORATORY

Plant No. 1, Louisville, Ky.

*Research staff:* L. E. Householder, in charge. 1 chemist, 6 metallurgists, 1 engineer, 5 spectrographers, 2 metallographers; technical personnel 14; additional personnel 4.

*Research activities:* The metallurgy of aluminum and aluminum alloys.

See also Fulton Sylphon Company and Robertshaw Thermostat Corporation.

1854. Rheem Manufacturing Company, 401 Russ Bldg., San Francisco 4, Calif.

*President:* R. S. Rheem.

*Laboratory:* 170 East California St., Pasadena 5, Calif.

*Research staff:* R. M. Thomas, Director. 1 chemist, 1 physicist, 17 engineers, 1 physician; technical personnel 40; additional personnel 18.

*Research activities:* Thermodynamic and hydraulic research; the design of gas, oil, and electric water heaters, space heaters, etc.; household appliances and industrial containers. (Research initiated 1944.)

*Library:* 400 volumes.

See also Rheem Research Products, Inc.

1855. Rheem Research Products, Inc., 1409 Standard Oil Bldg., Baltimore 2, Md. (Subsidiary of Rheem Manufacturing Company.)

*President:* Richard S. Rheem.

*Laboratory:* 1209 East 25th St., Baltimore 18, Md.

*Research staff:* L. H. Ott, Director of laboratory. 12 chemists, 1 metallurgist; technical personnel 15; additional personnel 4.

*Research activities:* Research and development work in the testing and improvement of steel containers (drums, pails, tanks, water heaters, furnaces, etc.) and of nonresinous protective coatings for zinc, cadmium, magnesium, and ferrous metals. (Research initiated 1941.)

*Library:* 400 volumes.

1856. Rhineland Paper Company, Rhineland, Wis.

*President:* Folke Becker.

*Research staff:* Karl W. Fries, Director. 3 chemists; technical personnel 18.

*Research activities:* The improvement of papers, papermaking methods, and pulping processes; waste utilization. (Research initiated 1926.)

*Library:* 150 volumes.

*Cooperative research:* One fellowship is supported.

1857. Rhoads and Sons, J. E., Box 71, Wilmington 99, Del.

*Senior Partner:* J. Edgar Rhoads.

*Research staff:* Philip G. Rhoads, Director. 1 chemist, 1 engineer; technical personnel 2; additional personnel 1.

*Research activities:* Tanning of leather for transmission belting and other industrial products, including packing leathers, lace leather, and textile leathers. (Research initiated 1909.)

1858. Rhodes Chemical Corporation, Jenkintown, Pa.

*President:* L. F. Hirsh.

*Research staff:* Adolph Gottfurst, Director

and Chemist; John J. Eisenhart, Jr., Plant Manager; Robert Rieder, Plant Engineer. 1 chemist, 1 chemical engineer.

*Research activities:* Manufacture of quaternary ammonium compounds.

**1859. Richmond-Chase Company, 380 Stockton Ave., San Jose 11, Calif.**

*President:* E. N. Richmond.

*Laboratories:* 380 Stockton Ave., San Jose, Calif.; Cinnabar and Montgomery Sts., San Jose, Calif.; A and East Weber Sts., Stockton, Calif.

*Research staff:* E. L. Mitchell, Director; Robert Rowe and Lloyd Honsberger, Chief Chemists. 4 chemists, 1 engineer; technical personnel 9; additional personnel 1.

*Research activities:* The development of new products and processes in canned, frozen, and dehydrated fruits and vegetables. (Research initiated 1937.)

*Library:* 200 volumes.

**1860. Ridbo Laboratories, Inc., 111-117 Pennsylvania Ave., Paterson 3, N. J.**

*President:* Eric Owen Ridgway.

*Research staff:* Eric Owen Ridgway, Director; Frederic Curtis Tucker, Chief Chemist. 8 chemists, 1 physicist, 2 engineers; technical personnel 4; additional personnel 6.

*Research activities:* Chlorination of organic compounds; fundamental research on steroids; synthetic rubber compounding ingredients; tall oil derivatives; abietic acid derivatives; fatty oils and acids; textile finishes; rayon manufacture. (Research initiated 1936.)

*Library:* 1,000 volumes.

**1861. Rider Laboratories, John F., 404 Fourth Ave., New York 16, N. Y.**

*President:* John F. Rider.

*Research staff:* R. Lorenzen, Chief Engineer. 3 engineers, 2 laboratory technicians; additional personnel 4.

*Research activities:* Amplifiers and electrical measurement equipment. (Research initiated 1934.)

*Library:* 5,000 volumes.

**1862. Riegel Paper Corporation, 342 Madison Ave., New York 17, N. Y.**

*President:* John L. Riegel.

*Laboratories:* Main laboratory, Milford, N. J.; branch laboratories, Warren Glen, Hughsville, and Riegelsville, N. J.

*Research staff:* George C. Borden, Jr., Technical Director. 4 chemists, 3 chemical engineers, 1 electrical engineer; technical personnel 38; additional personnel 4.

*Research activities:* Papermaking. (Research initiated 1920.)

*Library:* 700 volumes, 1,000 patents, 4 vertical information files.

*Cooperative research:* One grant for research is made.

**1863. Ringwood Chemical Corporation, Ringwood, Illinois.**

*President:* E. W. Lowe.

*Research staff:* Harold S. King, Chief Chemist. 5 chemists, 1 biologist, 4 engineers; technical personnel 7; additional personnel 2.

*Research activities:* The development of new processes for the manufacture of fine chemicals, both organic and inorganic; exploratory research for new products to manufacture; improvement of present plant processes; experimental work in hydroponics. (Research initiated 1941.)

*Library:* 200 volumes.

**1864. Rinshed-Mason Company, 5935-71 Milford St., Detroit 10, Mich.**

*President:* Herbert W. Mason.

*Research staff:* Frederick G. Weed, Executive Vice President and Director of research. 25 chemists; technical personnel 8; additional personnel 3.

*Research activities:* Standard and special development for the paint, varnish, and lacquer industry. (Research initiated 1918.)

*Library:* 800 volumes.

**1865. Rit Products Corporation, 1401 West Jackson Blvd., Chicago 7, Ill.**

*President:* A. H. Rosenberg.

*Research staff:* Gertz Krit, Chief Chemist. 1 chemist; technical personnel 3; additional personnel 1.

*Research activities:* Investigations in organic synthesis; the application of dyes; the processing of textiles. (Research initiated 1917.)

**1866. Ritter Products Corporation, Ritter Park, 404 West Ave., Rochester 3, N. Y. (Subsidiary of Ritter Company, Inc.)**

*Research staff:* Herbert Banks Johnson, Vice President in charge of research; F. Ritter Shumway, Director; R. B. Packer, Research Engineer. 1 chemist, 1 metallurgist, 3 engineers.

*Research activities:* Scientific development and improvement of the Johnson Process; advanced selective electrostatic separation; electrostatic dust precipitation; improved spice and food products; improved products for metallurgical, chemical, cement, phosphate, ceramic, coal, and other industries.

**1867. Riverbank Laboratories, Geneva, Ill.**

*President:* Maulsby Forrest.

*Research staff:* Paul E. Sabine, Director; B. E. Eisenhour, Sr., Chief of Engineering Di-

vision. 2 physicists, 1 engineer; technical personnel 5; additional personnel 4.

*Research activities:* The development and production of precision frequency standards and devices; research in architectural acoustics, sound absorption and transmission in buildings; noise and vibration control.

*Library:* 2,000 volumes.

**1868. Riverside and Dan River Cotton Mills, Inc., Danville, Va.**

*President:* George S. Harris.

*Research staff:* H. M. Chase, Director of research; H. Y. Jennings, Assistant Director; W. B. Carroll, Assistant Superintendent of dyeing. 11 chemists, 2 physicists, 3 engineers; technical personnel 4; additional personnel 24.

*Research activities:* Fiber bonding of yarns and fabrics of cotton and synthetic fibers; development of new methods of dyeing, drying, and finishing; application of pigments; chemical transformation of cellulose; design of special fabrics and yarns; design and improvement of textile machinery; problems relating to textiles. (Research initiated 1940.)

*Library:* 750 volumes.

**1869. Riverside Cement Company, Riverside, Calif.**

*President:* Garner A. Beckett.

*Research staff:* Hubert Woods, Director. 1 chemist, 1 assistant.

*Research activities:* Portland cement and allied products, including manufacturing problems.

**1870. Riverside Chemical Company, River Rd., North Tonawanda, N. Y.**

*President:* A. C. Rasch.

*Research staff:* C. H. Rasch, Director. 2 chemists, 1 engineer; additional personnel 2.

*Research activities:* Research, development, and control work on chemicals and chemical products; consulting chemical and engineering services. (Research initiated 1925.)

*Library:* 2,500 volumes.

**1871. Riverside Metal Company, Riverside, N. J.**

*President:* H. L. Randall.

*Research staff:* H. S. Freynik, Chief Metallurgist. 2 chemists, 2 metallurgists, 1 metallographer, 4 physical testers; technical personnel 6; additional personnel 2.

*Research activities:* Metallurgical development work in wrought copper base alloys such as phosphor bronzes, nickel silvers, cupro-nickels, brasses, and beryllium copper. (Research initiated 1922.)

*Library:* 1,000 volumes.

**1872. Riverton Lime and Stone Company, Inc., Riverton, Va.**

*President:* E. I. Williams.

*Research staff:* P. L. Rogers, Plant Chemist; E. L. Cameron, Analytical Chemist. 2 chemists; 1 in another scientific profession.

*Research activities:* Hydraulic lime; masonry cements; concrete admixtures; hydrated and quick lime in structural work; rock wool. (Research initiated 1925.)

**1873. Robb and Moody, Chemists, Richmond 19, Va.**

*Owner:* Warren L. Moody.

*Research staff:* Stanley J. Wager, in charge of laboratory. 2 chemists.

*Research activities:* Surface tension de-creasers; increased rate of dispersion additives; textile finishes.

*Library:* A library is maintained.

**1874. Robertshaw Thermostat Company, Youngwood, Pa. (Subsidiary of Reynolds Metals Company.)**

*President:* J. A. Robertshaw.

*Laboratories:* Youngwood and Pittsburgh, Pa.; Los Angeles, Calif.

*Research staff:* Victor Weber, Director, Youngwood Laboratory; C. K. Strobel, Pittsburgh Laboratory; S. G. Eskin, Los Angeles Laboratory. 3 chemists, 12 engineers, 8 instrument makers.

*Research activities:* The development of electrical and gas heat controls, safety devices, and temperature indicating devices. (Research initiated 1914.)

**1875. Robertson Company, H. H., 2400 Farmers Bank Bldg., Pittsburgh 22, Pa.**

*President:* H. H. Robertson.

*Research staff:* J. H. Young, Director. 7 chemists, 1 physicist, 1 metallurgist, 3 engineers; technical personnel 5; additional personnel 4.

*Research activities:* Building products; protective coatings. (Research initiated 1918.)

*Library:* A library is maintained.

*Cooperative research:* Fellowships are supported.

**1876. Robinson Clay Product Company, Second National Bldg., Akron, Ohio.**

*President:* W. E. Robinson.

*Laboratory:* Parral, Ohio. (P. O. address: Dover, Ohio.)

*Research staff:* E. A. Hertzell, Research Engineer. 2 engineers; additional personnel 2.

*Research activities:* The investigation of new raw materials and the development of new clay



- products; new applications for present products. (Research initiated 1926.)  
*Library:* 350 volumes.
- 1877. Robinson Laboratories, Louis G., 219 McFarland St., Cincinnati 1, Ohio.**  
*President:* Louis G. Robinson.  
*Research staff:* Louis G. Robinson, Director; 2 chemists, 2 metallurgists, 1 engineer, 1 ceramist; additional personnel 2.  
*Research activities:* Iron and steel metallurgy; electroplating; heat-treatment of steel or bronze; porcelain enamel (wet or dry process); foundry molding sands; strength of materials (steel, concrete, etc.); metallography (photomicrography); foundry practice; cupola air and tuyere control; the testing and inspecting of road materials (cement, concrete, tar, and asphalt). (Research initiated 1907.)
- 1878. Robison Laboratories, Inc., 1300 Michigan Theater Bldg., Detroit, Mich.**  
*Research staff:* Floyd W. Robison, Director; James K. Robison, Laboratory Director. 3 chemists, 2 biologists, 2 engineers; technical personnel 2; additional personnel 2.  
*Research activities:* Fruit juices; quick frozen foods; refrigeration; dehydration; coffee; carbonated and still beverages. (Research initiated 1921.)
- 1879. Rochester and Pittsburgh Coal Company, 655 Church St., Indiana, Pa.**  
*President:* Heath S. Clark.  
*Laboratory:* 1260 Maple St., Indiana, Pa.  
*Research staff:* C. J. Potter, Assistant to the President; S. Wilson Guthrie, Research Engineer. 2 chemists, 3 engineers, 5 laboratory and engineering assistants; additional personnel 4.  
*Research activities:* Study of bituminous coals for by-products, metallurgical, and other special purposes; the development and production of coals for more efficient performance on various types of fuel-burning equipment. (Research initiated 1926.)  
*Library:* A library is maintained.  
*Cooperative research:* Three grants for research are made.
- 1880. Rochester Button Company, 300 State St., Rochester 4, N. Y.**  
*President:* N. O. Broderson.  
*Laboratories:* Rochester, N. Y.; Brodhead, Wis.  
*Research staff:* N. O. Broderson, Director. 3 chemists, 1 engineer.  
*Research activities:* The development of plastic materials involved in button manufacture; manufacturing problems. (Research initiated 1935.)
- 1881. Rochester Manufacturing Company, Inc., 100 Rockwood St., Rochester 10, N. Y.**  
*President:* William Mulcahy.  
*Research staff:* 3 engineers, 3 draftsmen, 2 laboratory assistants; technical personnel 5; additional personnel 8.  
*Research activities:* The development and improvement of instruments, both electrical and mechanical, for the indication of liquid level, pressure and temperature. (Research initiated 1936.)  
*Library:* 150 volumes.
- 1882. Rockbestos Products Corporation, New Haven 4, Conn.**  
*President:* A. G. Newton.  
*Research staff:* B. H. Reeves, Vice President and General Manager; R. B. Lattin, Director; H. S. Moore, Chief Engineer. Technical personnel 2; additional personnel 4.  
*Research activities:* Heat and flame resistant wires and cables.
- 1883. Rockwell Manufacturing Company, 400 North Lexington Ave., Pittsburgh 8, Pa.**  
*President:* W. F. Rockwell.  
*Laboratories:* Pittsburgh Equitable Meter Division, 400 North Lexington Ave., Pittsburgh 8, Pa.; Nordstrom Valve Division, 2431 Peralta St., Oakland 4, Calif.; National Meter Division, 4207 First Ave., Brooklyn, New York.  
*Research staff:* W. S. Potter, Vice President of research; E. R. Gilmore, Chief Engineer, gas products; W. H. Marsh, Chief Engineer, gasoline products. *Nordstrom Valve Division:* G. F. Scherer, Vice President of research; E. D. Hedene, Vice President of engineering; C. B. Johnson, Chief Engineer (East). *National Meter Division:* A. R. Whittaker, General Manager. *Combined Laboratory Personnel:* 4 chemists, 26 engineers; technical personnel 1; additional personnel 30.  
*Research activities:* Gas and liquid metering and control apparatus and equipment; pressure control apparatus; valves. (Research initiated 1925.)  
*Library:* A library is maintained.  
*Cooperative research:* One fellowship is supported and one grant for research is made.  
*See also* Delta Manufacturing Company; Edward Valves, Inc.; V and O Press Company, Inc.
- 1884. Rockwood and Company, 88 Washington Ave., Brooklyn, N. Y.**  
*President:* Wallace T. Jones.  
*Research staff:* H. Russell Burbank, Executive Vice President in charge of research; W. Tresper Clarke, Chief Chemist; Francis X. Kobe, Assistant Chief Chemist. 10 chemists, 5 chemical and mechanical engineers in asso-

ciated departments, 5 in other scientific professions; additional personnel 2.

*Research activities:* Chocolate and cocoa processing and manufacture; extraction and refining of cocoa butter; by-product adaptation. (Research initiated 1918.)

1885. Rodman Chemical Company, Verona, Pa.

*President:* Hugh Rodman.

*Research staff:* Hugh Rodman, Director. 1 assistant.

*Research activities:* Case hardening of steel and the development of case hardening compounds; development of quenching oils; research on carbon. (Research initiated 1910.)

1886. Roebing's Sons Company, John A., 640 South Broad St., Trenton 2, N. J.

*President:* Charles R. Tyson.

*Research staff:* Charles M. Jones, Vice President in charge of engineering; Dartrey Lewis, Chief Development Engineer; Howard J. Godfrey, Assistant Chief Development Engineer; Wilbur E. Harvey, Chief Metallurgist. 5 chemists, 4 metallurgists, 2 engineers; technical personnel 22; additional personnel 2.

*Research activities:* The development of steel and copper wire, wire rope, cold rolled products, and electrical wire and cables. (Research initiated 1930.)

*Library:* 4,000 volumes.

1887. Roerig and Company, J. B., 536 Lake Shore Drive, Chicago 11, Ill.

*President:* J. B. Roerig.

*Research staff:* George P. Butterfield, Director. 1 chemist, 1 biologist, 1 physician.

*Research activities:* Protein hydrolysates; infant food; vitamins. (Research initiated 1944.)

*Library:* 200 volumes.

*Cooperative research:* One grant for research is made.

1888. Rogers Company, J. and J., Au Sable Forks, N. Y.

*President:* I. H. Chahoon.

*Research staff:* James Rogers II, Vice President and Director of research; Donald Rushmore. 1 chemist; technical personnel 1; additional personnel 3.

*Research activities:* Pulp and paper and the products used in their manufacture. (Research initiated 1939.)

1889. Rogers Corporation, Manchester, Conn.

*President:* W. H. Raye.

*Laboratories:* Manchester and Goodyear, Conn.

*Research staff:* S. Baker, Director. 2 chemists, 2 engineers; technical personnel 4; additional personnel 10.

*Research activities:* Control of present processes and development of new paper and plastic products. (Research initiated 1929.)

1890. Rohm and Haas Company, Washington Square, Philadelphia 5, Pa.

*President:* Otto Haas.

*Laboratory:* 5000 Richmond St., Philadelphia 37, Pa.

*Research staff:* W. S. Johnson, Director. 103 chemists, 2 physicists, 1 biologist, 11 engineers, 1 bacteriologist.

*Research activities:* Chemical and physical investigations of a fundamental and applied nature on the processes and products involved in general inorganic chemicals, special inorganic chemicals, synthetic resins, special chemicals for the leather and textile industries, organic insecticides, and other miscellaneous chemicals.

*Library:* A library is maintained.

*Cooperative research:* Several fellowships and assistantships are supported.

1891. Roma Wine Company, P. O. Box 1592, Fresno 16, Calif.

*President:* B. B. Turner.

*Research staff:* W. E. Kite, General Chemist. 6 chemists, 1 biologist, 1 engineer, 1 bacteriologist; technical personnel 11; additional personnel 2.

*Research activities:* Wine making and brandy distillation; new products from grapes; wine by-products such as cattle feed, fertilizers, and tartrates; general research on equipment, methods, grapes, etc., involved in the production of wines and brandies. (Research initiated 1936.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

1892. Rookwood Pottery, Cincinnati 12, Ohio. (Division of Sperti, Inc.)

*President:* William H. Albers.

*Laboratory:* Mt. Adams, Cincinnati, Ohio.

*Research staff:* John Dee Wareham, Director. 2 chemists, 1 physicist, 1 metallurgist, 2 engineers; technical personnel 3; additional personnel 103.

*Research activities:* Ceramic research in artware pottery; study of clays and glazes. (Research initiated 1880.)

*Library:* 4,300 volumes; 3,200 bound journals.

1893. Root and Simpson, Inc., 1306-8 East 17th Ave., Denver 6, Colo.

*President:* Carl H. Ross.

*Research staff:* Carl H. Ross, Director. 1 chemist; additional personnel 2.

*Research activities:* Work with special ores in connection with the analysis of metals. (Research initiated 1902.)

**1894. Rosco Laboratories, Inc.,** Blawnox, Pittsburgh, Pa.

*President:* W. A. Royston, Jr.

*Research staff:* H. C. O'Brien, Jr., Director; Thomas T. Royston, Vice President. 3 chemists, 2 physicists, 1 biologist, 2 engineers; technical personnel 2; additional personnel 9.

*Research activities:* Corrosion, protective coatings; germicides, fungicides, bactericides; concrete products. (Research initiated 1924.)

**Rose-Derry Company.** *See* Mann and Company, Leo.

**1895. Ross Engineering Corporation, J. O.,** 350 Madison Ave., New York, N. Y.

*President:* S. W. Fletcher.

*Laboratory:* New Brunswick, N. J.

*Research staff:* J. F. Gschwind, Director. 1 chemist, 4 engineers.

*Research activities:* Problems pertaining to heating, ventilating, drying, baking, and air conditioning; the development of direct and indirect gas and oil fired heaters. (Research initiated 1928.)

**1896. Roth Rubber Company,** 1860 South 54th Ave., Cicero 50, Ill.

*President:* W. W. Knight.

*Research staff:* 1 chemist.

*Research activities:* Molded-mechanical rubber.

**1897. Rototiller, Inc.,** 102nd St. and 9th Ave., Troy, N. Y.

*President:* C. W. Kelsey.

*Research staff:* C. W. Kelsey, Director; George Done. 5 engineers and draftsmen; additional personnel 5.

*Research activities:* Tillage and road construction; in-place-mix cement and in-place-mix oil. (Research initiated 1933.)

**1898. Rovin Laboratory,** 15050 Greenfield Road, Detroit, Mich.

*Research staff:* Alexander M. Rovin, Director; F. L. Blanchard, Executive Technical Secretary. 1 chemist, 1 biologist, 1 colloidal chemist, 1 bacteriologist, 1 serologist, 1 veterinarian, 1 technician for scientific literature and laboratory and clinical statistical data.

*Research activities:* Convalescent serums and the study of their by-products to determine the hormonal aspect of their immunizing influence; work with lower animals, particularly donkeys, to develop convalescent serums. Influence of cell secreted substances on the tissue and fluids of the body. (Research initiated 1922.)

*Scientific periodicals:* Endocrines and Immunity. Annual. Vol. I, 1938.

**1899. Roxalin Flexible Finishes, Inc.,** 800 Magnolia Ave., Elizabeth F, N. J.

*President:* Leo Roon.

*Research staff:* Leo Roon, Director; M. A. Dorian, Chief of nitrocellulose development; W. H. Stephens, Chief of synthetic finishes development; R. C. Ellams, Chief of electrical coatings development; W. H. Pesola, Chief of resin development; E. H. Schwencke, Chief of plastics development. 21 chemists, 3 engineers; technical personnel 18; additional personnel 4.

*Research activities:* Development of new organic coatings; formulation of finishing materials of greater durability; investigation of new raw materials and their adaptation to industrial requirements for corrosion resistance, wear resistance, and more permanent protection; research and development work on various plastics and study of their adaptability to the protective coatings industry. (Research initiated 1925.)

*Library:* 200 volumes.

**Royal Laboratory.** *See* Standard Brands, Inc.

**1900. Royster Guano Company, F. S.,** Norfolk, Va.

*President:* C. F. Burroughs.

*Laboratories:* Norfolk, Va.; Baltimore, Md.; Atlanta, Ga.

*Research staff:* A. L. Griffin, Vice President in charge of research; S. F. Thornton, Director. 6 chemists, 1 agronomist; additional personnel 1.

*Research activities:* The preparation of fertilizers and fertilizer materials, and their effect on crop production. (Research initiated 1912.)

**Rubber Latex Products, Inc.** *See* Harrison and Morton Laboratories, Inc.

**1901. Rubicon Company,** Ridge Ave. at 35th St., Philadelphia 32, Pa.

*President:* Josef Doerr.

*Research staff:* N. E. Bonn, Director. 1 chemist, 1 physicist, 5 engineers; additional personnel 2.

*Research activities:* Instruments (including scientific) for electrical, gas analysis, laboratory, measuring, and precision use; chemical instrumentation; electric apparatus and equipment; electrical research; color measurement. (Research initiated 1921.)

*Library:* 200 to 300 volumes.

**1902. Rufert Chemical Company,** Seymour, Conn.

*President:* Franklin Starr Jerome.

*Research staff:* Meyer L. Freed, Technical Director; Matthew C. Blume, Chief Chemist. 3 chemists, 3 assistants; additional personnel 4.

*Research activities:* Nickel catalysts. (Research initiated 1931.)

*Library:* 100 volumes.

**1903. Rumford Chemical Works, 9 Newman Ave., Rumford 16, R. I.**

*President:* A. E. Marshall.

*Research staff:* Raymond L. Copson, Director. 6 chemists, 1 biologist, 3 engineers; additional personnel 3.

*Research activities:* Baking powders and other food products; household cleansers and detergents; phosphates, polyphosphates, and their industrial uses; sulfates and sulfites. (Research initiated 1859.)

*Library:* 1,000 volumes.

*Cooperative research:* Three grants for research are made.

**1904. Russell Manufacturing Company, 400 East Main St., Middletown, Conn.**

*President:* G. M. Williams. *Vice President and General Manager:* C. J. Sherer.

*Research staff:* Gustav Walters and James A. Hendley, Directors; T. Irving Read and Frederick Phil, Assistant Directors. 1 chemist, 1 testing engineer; additional personnel 4.

*Research activities:* Automotive friction materials; plastics and textile plastic combinations; rubber; dyestuffs and dyeing fabrics; application of synthetic fibers; mildewproofing, waterproofing, flameproofing, and pigmenting of fabrics; high speed and power transmission belting. (Research initiated 1918.)

**1905. Russell-Miller Milling Company, Midland Bank Bldg., Minneapolis 1, Minn.**

*President:* Leslie F. Miller.

*Laboratories:* Minneapolis, Minn.; Buffalo, N. Y.; Alton, Ill.; Dallas, Tex.; Billings, Mont.

*Research staff:* B. Sullivan, Chief Chemist. 15 chemists, 1 engineer; technical personnel 9; additional personnel 4.

*Research activities:* The chemistry of wheat and flour; fermentation problems; enzyme studies; histochemistry. (Research initiated 1908.)

**1906. Rustless Iron and Steel Corporation, 3400 East Chase St., Baltimore 12, Md.**

*President:* Calvin M. Verity.

*Research staff:* Alexander L. Feild, Director of Research Division. 4 chemists, 1 physicist, 10 metallurgists, 1 engineer, 1 librarian; technical personnel 26; additional personnel 14.

*Research activities:* The development of new and improved types of stainless steels and high temperature alloys; stainless steel melting processes; corrosion, surface finishing, machining, and fabrication of stainless steel and high temperature alloys. (Research initiated 1931.)

*Library:* 1,500 volumes.

**1907. Rutstein Laboratory, 80 Florida St., Long Beach, Long Island, N. Y.**

*President:* Leo Rutstein.

*Laboratories:* Philadelphia, Pa.; New York, N. Y.

*Research staff:* Leo Rutstein, Director. 3 chemists, 1 physicist, 1 metallurgist, 1 engineer; additional personnel 3.

*Research activities:* Cellulose, cellulose esters, cellulose ethers, rayon, viscose, explosives, paper, plastics, synthetic resins; research on clients' problems in the development of new products, new processes, and new uses for existing products. (Research initiated 1911.)

**1908. Ryan Aeronautical Company, 2701 Harbor Drive, San Diego 12, Calif.**

*President:* T. Claude Ryan.

*Research staff:* H. W. Hasenbeck, Supervisor of laboratories. 4 chemists, 2 physicists, 1 metallurgist, 10 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Flight research instrumentation; chemical processes used in airplane manufacturing; electric and electronic control device development. (Research initiated 1937.)

**1909. Rystan Company, 50 Church St., New York 7, N. Y.**

*President:* O'Neill Ryan, Jr.

*Laboratory:* 120 Liberty St., New York 6, N. Y.

*Research staff:* I. Chamelin, Director of technical research. 3 chemists, 1 physicist, 1 biologist, 1 engineer, 2 physicians; technical personnel 3; additional personnel 6.

*Research activities:* Basic research in the utilization and mode of action of chlorophyll and other natural substances in therapeutics; studies of the physical properties of the substances; improvement of the products already on the market; studies in methods for reduction of manufacturing costs. (Research initiated 1941.)

*Library:* 700 volumes.

*Cooperative research:* One fellowship is supported and seven grants for research are made.

**1910. SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.**

*President:* W. L. Batt.

*Research staff:* Haakon Styri, Director. 2 chemists, 1 physicist, 2 metallurgists, 4 engineers, 2 in other scientific professions; technical personnel 8; additional personnel 1.

*Research activities:* Endurance, friction, and vibration of ball and roller bearings; the investigation and improvement of material for bearings and lubricants, and the protection of bearings; the development and application of bearings. (Research initiated 1920.)

**1911. Saco-Lowell Shops, Boston, Mass.**

*President:* David F. Edwards.

**METALLURGICAL LABORATORY**

Biddeford, Maine

*Research staff:* F. H. Schoenfuss and Howard Handy, Metallurgists. 2 chemical assistants.

*Research activities:* Development of metallurgical materials and their treatment; lubricating oils; foundry practice.

**TEXTILE AND MECHANICAL LABORATORY**

Biddeford, Maine

*Research staff:* E. C. Gwaltney, Director; Robert M. Jones, Textile Research Engineer. 12 assistant engineers, 12 draftsmen and laboratory technicians, 4 machinists, 1 librarian; additional personnel 4.

*Research activities:* Development of methods and machinery for processing cotton, worsted, silk, and rayon; studies of fibers, fiber products, and their measurement. (Research initiated 1922.)

*Library:* A library is maintained.

**1912. Sadtler and Son, Inc., Samuel P., 210 South 13th St., Philadelphia 7, Pa.**

*President:* S. S. Sadtler.

*Research staff:* Philip Sadtler, Vice President in charge of research. 5 chemists; technical personnel 2; additional personnel 2.

*Research activities:* Consulting industrial research on textiles, synthetic fibers, leathers, finishes, polishes and waxes, plastics, asphalts, petroleum, oils, explosives, foods, essential oils, alkaloids, colloid mills, fading and aging, ultraviolet light reaction, cosmetics, emulsions, pulp and paper, paper specialties, synthetic organic chemicals, and inorganic chemicals. (Research initiated 1891.)

*Library:* 1,000 volumes.

**Safe Harbor Water Power Corporation. See Pennsylvania Water and Power Company.**

**St. Clair Rubber Company. See No. 2440 in Addenda.**

**1913. St. John X-ray Service, Inc., Califon, N. J.**

*President:* Herbert R. Isenburger.

*Research staff:* Ancel St. John, Director. 1 physicist, 1 engineer.

*Research activities:* Design and installation of X-ray equipment for industrial plants; X-ray diffraction analysis; radiographic research; X-ray photography and fluoroscopy; nonmedical uses of X-rays; radiographic examination of materials up to 3 inches of steel with X-rays, above 3 inches of steel with gamma-rays; crys-

tal structure investigations; stress analysis; product development; patent work; field inspection with portable X-ray unit and with radium; the examination of paintings and other art objects. (Research initiated 1925.)

*Library:* A library of X-ray literature is maintained.

**1914. St. Joseph Lead Company, 250 Park Ave., New York 17, N. Y.**

*President:* Clinton H. Crane.

*Laboratories:* Bonne Terre and Herculaneum, Mo.

*Research staff:* W. T. Isbell, Director. 1 chemist, 6 metallurgists; technical personnel 15; additional personnel 1.

*Research activities:* Metallurgical problems covering the milling and smelting of ores and lead.

*Library:* 200 volumes.

*See also* St. Joseph Lead Company of Pennsylvania.

**1915. St. Joseph Lead Company of Pennsylvania, 250 Park Ave., New York 17, N. Y. (Subsidiary of St. Joseph Lead Company.)**

*President:* Clinton H. Crane.

*Laboratory:* Josephstown, Beaver County, Pa.

*Research staff:* Carleton C. Long, Director of plant and process research; James J. Rankin, Director of customer and product research. 1 chief physical chemist (rubber technologist), 1 physical chemist (electron microscopist), 1 chief analytical chemist (spectrographer), 1 research analytical chemist, 1 chief pigment chemist, 1 paint chemist and microscopist, 6 engineers, 1 instrument maker, 1 junior rubber technologist, 1 analytical group leader, 1 assistant rubber technologist, 6 analytical assistants; additional personnel 3.

*Research activities: Plant and Process Research:* Methods and practices; process modifications; new processes and products. The principal processes concerned are roasting of metallic sulfides; sulfuric acid production; sintering and residue recovery; electrothermic smelting and refining of zinc and zinc oxide; acid leaching of zinc, lead, and cadmium containing materials; separation and purification of these materials; recovery of zinc metal from lead blast furnace slag. *Customer and Product Research:* Pigment investigations in the fields of rubber, paint, floor covering, ceramic, pharmaceutical, and allied industries in which zinc pigments are consumed; applied research in chemical and metallurgical engineering with the object of improving plant processes and maintaining uniformity of plant products for the production of zinc metal, zinc pigments, and sulfuric acid. (Research initiated 1930.)

*Library:* A library is maintained.

*Cooperative research:* Three fellowships are supported.

**1916. St. Louis Screw and Bolt Company, 6900 North Broadway, St. Louis 15, Mo.**

*President:* Roy W. Miller.

*Research staff:* J. B. Schuck, Engineer; C. J. Kreiner, Experimental Mechanic.

*Research activities:* Production and product research in connection with screws and bolts.

**1917. Saint Louis Testing Laboratories, Inc., 2317 Chouteau Ave., St. Louis 3, Mo.**

*President:* K. S. Klein.

*Research staff:* Frank D. Klein, Technical and Research Director. 2 chemists, 2 physicists, 1 metallurgist, 3 engineers; technical personnel 3; additional personnel 11.

*Research activities:* Chemical, physical, and metallurgical research. (Research initiated 1929.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported.

**1918. St. Regis Paper Company, Panelyte Division, Enterprise Ave., Trenton 4, N. J.**

*President:* Roy K. Ferguson. *Vice President and General Manager, Panelyte Division:* C. Russell Mahaney.

*Research staff:* D. W. Hollingworth, Director. 4 chemists, 1 engineer; technical personnel 8; additional personnel 1.

*Research activities:* Laminated plastics. (Research initiated 1930.)

**1919. Salsbury's Laboratories, Charles City, Iowa.**

*President:* J. E. Salsbury. *Vice President and General Manager:* J. G. Salsbury.

*Research staff:* T. W. Zbornik, Research Committee Chairman. 3 chemists, 1 biological chemist, 3 chemical engineers, 1 bacteriologist, 1 helminthologist, 1 pharmacist, 1 protozoologist, 3 veterinarians; additional personnel 5.

*Research activities:* Poultry protozoa and parasites, pathogenic bacteria and viruses; studies in chemotherapy and immunity; poultry growth and mortality. (Research initiated 1928.)

*Library:* 1,200 volumes.

*Scientific periodicals:* Poultry Health Messenger. Semi-annual. Dr. Salsbury's Laboratory and Field Notes. Bi-monthly.

**1920. Salvus Products, Inc., 1750 North Springfield Ave., Chicago 47, Ill.**

*Vice President and General Manager:* Michael M. Newman.

*Research staff:* Michael M. Newman, Direc-

tor. 1 chemist, 1 physicist, 1 physician; technical personnel 2; additional personnel 5.

*Research activities:* Surgical sutures. (Research initiated 1938.)

**1921. Samson Laboratories, 1619 Spruce St., Philadelphia 3, Pa.**

*Research staff:* Meyer Samson, Director; Herman Brown, Associate Director. 2 chemists, 1 biologist, 1 bacteriologist, 1 hematologist, 1 serologist; technical personnel 2; additional personnel 9.

*Research activities:* Biochemistry; medical chemistry; biologic pregnancy tests, including *Xenopus* tests; serology; milk digestibility. (Research initiated 1924.)

*Library:* 400 volumes.

*Scientific periodicals:* Samson's Laboratory Chats. Vol. I, 1927. Irregular.

**1922. San Antonio Analytical Laboratory, Medical Arts Bldg., San Antonio, Tex.**

*President:* John W. Todd.

*Research staff:* John W. Todd, Director. 3 chemists, 1 biologist and bacteriologist, 1 metallurgist, 1 engineer, 1 laboratory assistant.

*Research activities:* Consultation in food, petroleum, and mineral chemistry; research in food, pharmaceutical, petroleum, and mineral products. (Research initiated 1920.)

*Library:* 1,000 volumes.

**1923. Sanborn Company, 39 Osborn St., Cambridge 39, Mass.**

*President:* James L. Jenks, Jr.

*Research staff:* Crawford Goldthwait, Director. 4 engineers, 1 psychologist, 1 physician; technical personnel 5; additional personnel 2.

*Research activities:* Electronic diagnostic medical apparatus; basal metabolism apparatus. (Research initiated 1936.)

**1924. Sangamo Electric Company, Springfield, Ill.**

*President:* D. S. Funk.

*Research staff:* F. C. Holtz, Vice President and Chief Engineer; J. S. Martin, Assistant Chief Engineer. 5 chemists, 17 engineers, 7 model makers; additional personnel 3.

*Research activities:* Electric meters (watt-hour and thermal demand), time switches, sign flashers, instrument transformers, and automotive recorders. (Research initiated 1912.)

*Library:* 500 volumes.

**1925. Sanvin Chemical Products Company, 1617 Twenty-first Ave., Moline, Ill.**

*President:* R. V. Sanstrom.

*Research staff:* J. M. Canter, Director. 1 chemist.

*Research activities:* Development work in

protective coatings, decorative finishes, latex rubber products, etc. Consulting research in paints and rubber.

**1926. Sargent and Company, E. H., 155 East Superior St., Chicago 11, Ill.**

*President:* T. M. Mints.

*Research staff:* Paul Sherrick, Director. 3 chemists, 2 engineers; additional personnel 3.

*Research activities:* Chemical instrumentation. (Research initiated 1920.)

*Library:* 300 volumes.

**Savage Tool Company.** See DoAll Company.

**1927. Sawyer Electrical Manufacturing Company, 5701 Smithway St., Los Angeles 22, Calif.**

*President:* G. E. Johnson.

*Research staff:* M. B. Sawyer, Vice President and Director of research. 2 chemists, 1 physicist, 1 metallurgist, 12 engineers, 1 psychologist; additional personnel 15.

*Research activities:* Electric motor development. (Research initiated 1933.)

*Library:* A library is maintained.

**1928. Saxl Instrument Company, 38-40 James St., East Providence 14, R. I.**

*President:* Erwin J. Saxl.

*Laboratories:* 38-40 James St., East Providence 14, R. I.; 6 Linnaean St., Cambridge 38, Mass.

*Research staff:* Erwin J. Saxl, Director. 1 chemist, 1 physicist, 1 engineer; technical personnel 3; additional personnel 13.

*Research activities:* Development and production of custom-built scientific instruments and apparatus for scientific institutions and military purposes; special testing problems and methods for the textile, rubber, paper, and metal industries; special aircraft instrumentation problems; general problems in applied and industrial physics. (Research initiated 1929.)

*Library:* 480 volumes.

**1929. Saxonburg Potteries, Saxonburg, Pa.**

*President:* George H. Aderhold.

*Research staff:* George H. Aderhold, Director; J. J. Duke, Assistant.

*Research activities:* Development of pure oxide refractories from zirconium oxide, beryllium oxide, thorium dioxide, zircon, etc.; ceramic research for high temperature bodies, etc. (Research initiated 1930.)

**1930. Seafie Company, Oakmont, Pa.**

*President:* A. V. Murray.

*Research staff:* Harry L. Anthony III, Director. 1 chemist, 1 physicist, 1 metallurgist, 5 engineers; additional personnel 1.

*Research activities:* Pressure vessels; welding. (Research initiated 1939.)

**Scanlan Morris Division, Ohio Chemical and Manufacturing Company.** See Ohio Chemical and Manufacturing Company.

**1931. Schade-Peper Laboratory, Natural Bridge and Brown Road, St. Louis County, Mo.**

*President:* E. C. Peper.

*Research staff:* Carlisle Schade, Chemist. 2 chemists; additional personnel 2.

*Research activities:* Chemical treatment of wood; chemistry of tobacco; organic synthesis. (Research initiated 1933.)

*Library:* 1,000 volumes.

**1932. Schaefer Chemicals, Inc., 14808 Michigan Ave., Dearborn, Mich.**

*President:* Joseph J. Schaefer.

*Research staff:* Joseph F. Miskinis, Director. 2 chemists; additional personnel 1.

*Research activities:* Synthetic organic chemicals; pharmaceuticals. (Research initiated 1945.)

*Library:* 300 volumes.

**1933. Schenley Distillers Corporation, 350 Fifth Ave., New York 1, N. Y.**

*President:* Lester E. Jacobi. *Vice President and Director of research:* E. Clifford Williams.

*Laboratories:* A Central Research Laboratory is in course of organization (December, 1945); laboratories are also maintained by the several subsidiaries of the corporation.

*Cooperative research:* Six fellowships are supported and nine grants for research are made.

#### CENTRAL RESEARCH LABORATORY

*Research staff:* The laboratory (in course of organization December, 1945) will maintain a staff of 50 professionally trained scientific persons, chiefly chemists, physicists, biologists, and chemical engineers.

*Research activities:* Fundamental and applied research in the fermentation, organic chemical, antibiotic, and other microbiological fields; new developments in the use of the products and by-products of the fermentation and allied industries for pharmaceutical, nutritional, and industrial needs.

*Library:* A library will be maintained.

#### ANTIBIOTIC LABORATORY

Lawrenceburg, Ind.

*Research staff:* George E. Ward, Director of laboratory. 10 chemists, 2 physicists, 8 biochemists and biologists; technical personnel 30; additional personnel 10.

**Research activities:** Fundamental and applied research and process development in antibiotics and in microbiological processes and products. (Research initiated 1945.)

**Library:** A library is maintained.

**DISTILLERY CENTRAL LABORATORY**

Lawrenceburg, Ind.

**Research staff:** George De Becze, Director of laboratory. 9 chemists and bacteriologists; technical personnel 22; additional personnel 4.

**Research activities:** Studies in fermentation, mycology, analytical procedures, distillation techniques, and microbiological processes; control of factory operations in these fields. (Research initiated 1933.)

**Library:** A library is maintained.

**NUTRITIONAL LABORATORY**

Lawrenceburg, Ind.

**Research staff:** Harry J. Konen, Director of laboratory. 2 chemists, 3 biochemists; technical personnel 9; additional personnel 3.

**Research activities:** Studies on the nutritional value of products and by-products of the fermentation and distillery industries; development of new uses for such products for animal and human consumption. (Research initiated 1941.)

**Library:** A library is maintained.

**DIVISIONAL RESEARCH LABORATORY**

(A division of the Central Research Laboratory)

Larchmont, N. Y.

(Temporary Location)

**Research staff:** A. J. Liebmann, Director of laboratory. 5 chemists, 1 physicist, 5 biochemists and biologists; technical personnel 10; additional personnel 3.

**Research activities:** Fermentation, microbiological, and pharmaceutical research. (Research initiated 1945.)

**Library:** A library is maintained.

Laboratories devoted mainly to operational control but conducting research investigations when needed in the fields of distilling, wine-making, brewing, and the by-products of these industries are located at the following plants of the corporation or of its subsidiaries: Schenley, Pa.; Cedarhurst, Md.; Louisville, Ky.; Milwaukee, Wis.; Fresno, Los Angeles, and San Francisco, Calif. The total staff of these operational control laboratories is between 50 and 60.

**1934. Schepp Laboratories, 21-23 Summit Ave., East Paterson, N. J. (Division of William J. Schepp Company, Inc.)**

**President:** William J. Schepp.

**Research staff:** William J. Schepp, Director.

3 chemists, 1 pharmacist, 2 laboratory assistants; additional personnel 1.

**Research activities:** Surface chemistry: large surfaces, fine powders, and colloids. Agricultural chemistry: chemical plant feeding, insecticides, etc. Medical chemistry: pharmacological work; pathological work on the skin and mucous membranes. Pharmaceutical chemistry: chemical and medicinal products. Ionic exchange: anti-static, anionic, and cationic products. Control of surface charges of sub-sieve size particles; dispersions, suspensions, emulsions, etc. (Research initiated 1937.)

**Library:** A few hundred volumes.

**Scherbatakov, S. A. See No. 2441 in Addenda.**

**1935. Schering Corporation, 86 Orange St., Bloomfield, N. J.**

**President:** Francis C. Brown.

**Research staff:** Erwin Schwenk, Director of chemical research; Bradley Whitman; Domenick Papa; Richard Tislowitz; Sibylle Tolksdorf. 8 chemists, 1 biologist, 1 physician; technical personnel 24; additional personnel 14.

**Research activities:** Pharmaceutical products, particularly those of fundamental character in the hormone field; checking and improvement of the chemical quality, medical adaptability, and efficiency of the company's products, equipment, and processes. (Research initiated 1934.)

**Library:** 4,000 volumes.

**Cooperative research:** Twelve grants for research are made.

**1936. Schieffelin and Company, 16-30 Cooper Square, New York 3, N. Y.**

**President:** W. J. Schieffelin, Jr.

**Research staff:** Francis M. Whitacre, Scientific Director; E. W. Blanchard, Research Director; A. H. Stuart, Chemical Research Director. 7 chemists, 1 biologist, 1 engineer, 2 pharmacists; technical personnel 2; additional personnel 3.

**Research activities:** Synthetic and extracted endocrine substances; bactericidal, fungicidal, and parasitocidal antiseptics; protein chemistry. (Research initiated 1935.)

**Library:** 700 volumes.

**1937. Schirgun Corporation, 165 East 72nd St., New York 21, N. Y.**

**Vice President:** Henry Schirokauer.

**Laboratory:** 250 East 43rd St., New York 17, N. Y.

**Research staff:** Henry Schirokauer, Director. 3 physicists, 1 metallurgist, 25 engineers; technical personnel 15; additional personnel 5.

**Research activities:** Automotive internal combustion engine; automatic machinery; automatic



guns; aircraft and anti-aircraft armament; control apparatus. (Research initiated 1941.)

*Library:* 200 volumes.

1938. Schlage Loek Company, P. O. Box 3324, San Francisco 19, Calif.

*President:* Charles Kendrick.

*Laboratory:* 2201 Bayshore Blvd., San Francisco, Calif.

*Research staff:* 1 chemist, 6 engineers; technical personnel 35; additional personnel 55.

*Research activities:* Metal and metal working. (Research initiated 1925.)

1939. Schlegel Manufacturing Company, 277 North Goodman St., Rochester 7, N. Y.

*President:* Charles P. Schlegel.

*Research staff:* Emil Kayser, Director. 1 chemical engineer, 1 machine designer, 1 draftsman; additional personnel 2.

*Research activities:* The application of natural and synthetic textile fibers; textile finishes; adhesives. (Research initiated 1940.)

1940. Schleicher and Schuell Company, Carl, 116 West 14th St., New York 11, N. Y.

*President:* Russell J. Eddy.

*Laboratories:* New York, N. Y.; South Lee, Mass.

*Research staff:* John Keosian, H. Yagoda, and Jessie E. Minor, Directors. 4 chemists, 1 biologist, 1 engineer; additional personnel 3.

*Research activities:* Methods of testing filter papers for uniformity, retentivity, and density; development of wet-strength absorbent papers; fibers; methods of reducing ash content. (Research initiated 1942.)

*Library:* 300 volumes.

1941. Schlitz Brewing Company, 235 West Galena St., Milwaukee, Wis.

*President:* Erwin C. Uihlein.

*Research staff:* James W. Lawrie, Director. 9 chemists, 1 physicist, 2 biologists, 1 engineer; technical personnel 5; additional personnel 4.

*Research activities:* Problems connected with the brewing of beer; catalysis; solution; identification of minute quantities of materials; enzyme activities; vitamins. (Research initiated 1884.)

*Library:* 2,000 volumes.

*Cooperative research:* One fellowship is supported and two grants for research are made.

1942. Scholler Brothers, Inc., Collins and Westmoreland Sts., Philadelphia 34, Pa.

*President:* F. C. Scholler.

*Research staff:* Edwin C. Dreby, Director. 4 chemists, 1 physicist; additional personnel 2.

*Research activities:* The development of

finishes for the textile industry; scouring and fulling agents. (Research initiated 1907.)

*Library:* 195 volumes.

*Cooperative research:* Two grants for research are made.

1943. Schultz Die Casting Company, 1810 Clinton St., Toledo, Ohio.

*President:* John A. Zapf.

*Research staff:* Charles R. Muenger, Director. 2 engineers.

*Research activities:* Zinc die castings. (Research initiated 1937.)

1944. Schwarz Laboratories, Inc., 202 East 44th St., New York 17, N. Y.

*President:* Robert Schwarz.

*Research staff:* Earl D. Stewart, Director. 28 chemists, 1 biologist, 3 engineers, 1 assistant biologist, 1 assistant engineer, 4 technologists; technical personnel 5; additional personnel 29.

*Research activities:* Chemical and biological problems relating to food, beverages, brewing, industrial fermentations, pharmaceuticals, and yeast and its derivatives. (Research initiated 1869.)

*Library:* 5,000 volumes.

1945. Schweizer Aircraft Corporation, County Airport, Elmira, N. Y.

*President:* Ernest Schweizer.

*Research staff:* Ernest Schweizer, Chief Engineer. 1 engineer; technical personnel 2; additional personnel 2.

*Research activities:* Aircraft metals. (Research initiated 1943.)

1946. Schwitzer-Cummins Company, 1125 Massachusetts Ave., Indianapolis 7, Ind.

*President:* Louis Schwitzer.

*Research staff:* Kurt A. Beier, Chief Engineer; James A. Hardy, Chief Research Engineer. 1 metallurgist, 5 engineers; technical personnel 3; additional personnel 4.

*Research activities:* Heating and air conditioning equipment; automotive and industrial blowers and fans; small automotive and industrial fluid pumps; engine superchargers. (Research initiated 1918.)

1947. Sciaky Brothers, 4915 West 67th St., Chicago 38, Ill.

*President:* David Sciaky.

*Research staff:* David Sciaky, Director. 1 metallurgist, 4 engineers; technical personnel 2; additional personnel 1.

*Research activities:* Resistance welding; metallurgy; electronics applied to resistance welding. (Research initiated 1942.)

*Library:* 200 volumes.

*Scientific periodicals:* Resistance Welding at Work. Vol. I, 1942.

1948. Scien-Tech, 1819 Broadway, New York 23, N. Y.

*Research staff:* N. T. Farinacci, Director. 2 chemists, 2 engineers, 2 geologists.

*Research activities:* The application of catalysis, kinetics, and thermodynamics to organic and inorganic processes; the application of polarography, X-ray diffraction, and other physical methods to analysis and control; technical aspects of patents and litigation; cosmetics, hormones, and vitamins; production of pyridine and other nitrogen bases; hydrogenolysis of acids and esters to alcohols; recovery of alumina from clays; coating compositions; improved filters for tobacco smoke; hydrogenation and dehydrogenation catalysts. (Research initiated 1944.)

*Library:* 200 volumes.

Scintilla Magneto Division, Bendix Aviation Corporation. See Bendix Aviation Corporation.

1949. Scott and Bowne, 60 Orange St., Bloomfield, N. J.

*President:* Charles J. Weedon.

*Research staff:* J. S. Scheuer, Director; N. A. Ashcroft, Vice President and Treasurer; J. H. Spence, Secretary. 5 chemists, 1 engineer; technical personnel 8.

*Research activities:* Vitamins A and D; cod liver oil; emulsions.

*Library:* 150 volumes.

1950. Scott and Company, Ernest, Fall River, Mass.

*Research staff:* Herbert Austin, Managing Owner. 1 chemist, 1 engineer.

*Research activities:* Vacuum evaporation and distillation; solvent extraction. (Research initiated 1908.)

1951. Scott Paper Company, Chester, Pa.

*President:* Thomas B. McCabe.

*Research staff:* F. W. Brainerd, Staff Technical Director; K. W. Britt, Assistant Staff Technical Director; H. M. Ostertag, Director of mechanical development. 5 chemists, 1 metallurgist, 4 engineers; technical personnel 5.

*Research activities:* Chemical and mechanical problems directly connected with the manufacture of toilet tissue, paper towels, facial tissue, and waxing tissue. (Research initiated 1928.)

*Library:* 400 volumes.

1952. Seovill Manufacturing Company, 99 Mill St., Waterbury 91, Conn.

*President:* L. P. Sperry.

*Research staff:* William B. Price, Director; F. M. Barry; R. W. Belfit. 9 chemists, 5 metallurgists; technical personnel 18; additional personnel 8.

*Research activities:* Metals, alloys, and their applications; lacquers, enamels, plates, etc., for metal finishing; lubricating oils. (Research initiated 1898.)

*Library:* 1,270 volumes.

1953. Sriver and Quinn, Inc., 1366 Willow St., Los Angeles 13, Calif. (Subsidiary of Interchemical Corporation.)

*President:* William H. Dernel.

*Research staff:* 2 chemists, 1 paint technician.

*Research activities:* The development of paints, varnishes, lacquers, enamels, synthetics, adhesives, resins, cable and wire coatings; sanitary lining for cans, kits, drums, tanks, etc.; metal lithographic coatings; finishes for metal, wood, plastics, fabrics, glass, etc. (Research initiated 1928.)

1954. Seagram and Sons, Inc., Joseph E., 7th St. Road, Louisville 1, Ky.

*President:* Samuel Bronfman. *Manager of Research and Control:* L. A. Smith.

*Library:* 1,500 volumes.

*Cooperative research:* Eight fellowships are supported.

#### PHYSICOCHEMICAL LABORATORY

*Research staff:* W. H. Stark, Director. 11 chemists, 2 biochemists, 1 physicist, 1 biologist. 4 engineers, 4 bacteriologists; additional personnel 10.

*Research activities:* Fermentation process development; distillation; yeast physiology; chemistry of alcoholic beverages; raw material improvement; by-product utilization. (Research initiated 1940.)

#### PSYCHOPHYSICAL LABORATORY

*Research staff:* J. D. Ruttle and D. Foster, Directors. 1 chemist, 2 engineers, 4 psychologists, 1 economist, 2 home economists, 1 historian, 1 mathematician; additional personnel 18.

*Research activities:* Package development and improvement; blended product development and improvement; psychophysical studies of difference; psychometric study of preference; stimulus threshold studies; studies of advertising effectiveness. (Research initiated 1938.)

#### EXPERIMENTAL FARM

*Research staff:* M. H. Blow, Manager. (Research initiated 1942.)

**1955. Sealed Power Corporation, 500 Sanford St., Muskegon 61, Mich.**

*President:* Charles E. Johnson.

*Research staff:* J. H. Ballard, Chief Engineer; H. N. Myers, Chief Metallurgist. 1 chemist, 4 metallurgists, 3 engineers; technical personnel 7; additional personnel 2.

*Research activities:* Engineering design of piston rings, pistons, and cylinder sleeves; stress analysis, wear testing, creep testing, and gasoline engine dynamometer testing; new alloys and improved materials for piston rings, pistons, and sleeves. (Research initiated 1930.)

*Library:* 300 volumes.

*Cooperative research:* One grant for research is made.

**1956. Sealright Company, Inc., Fulton, N. Y. (Subsidiary of Oswego Falls Corporation.)**

*President:* E. W. Skinner.

*Research staff:* I. L. Wilcox, Director. 7 chemists, 2 biologists, 1 engineer, 1 physician; technical personnel 8; additional personnel 2.

*Research activities:* Problems dealing with the manufacture and development of wood pulp, paperboard, moist food containers, paper cups, paper milk bottles, milk bottle caps, and adhesives; coating and bacteriological problems connected with these subjects. (Research initiated 1927.)

**Sealtest, Inc. See National Dairy Products Corporation.**

**1957. Searle and Company, G. D., P. O. Box 5110, Chicago 80, Ill.**

*President:* John G. Searle.

*Laboratory:* Searle Parkway and Niles Ave., Skokie, Ill.

*Research staff:* Albert L. Raymond, Director. 12 chemists, 2 chemical engineers, 2 physicians, 1 bacteriologist, 1 pharmacologist, 2 pharmacists, 1 physiologist; technical personnel 12; additional personnel 5.

*Research activities:* The synthesis of chemotherapeutics; the preparation, purification, and isolation of biologically-active principles. (Research initiated 1924.)

*Library:* 2,000 volumes.

*Cooperative research:* Eight fellowships are supported and fifteen grants for research are made.

**1958. Sears, Roebuck and Company, 925 South Homan Ave., Chicago 7, Ill.**

*President:* A. S. Barrows.

*Research staff:* A. T. Chameroy, Manager. 10 chemists, 2 physicists, 2 metallurgists, 23 engineers, 17 textile chemists and engineers, 3 home economists, 4 designers, 4 librarians; technical personnel 9; additional personnel 23.

*Research activities:* The improvement, development, and evaluation of merchandise; the establishment of test procedures, quality standards, and specifications for merchandise. (Research initiated 1911.)

*Library:* 3,500 volumes.

**1959. Seeger-Sunbeam Corporation, St. Paul 6, Minn.**

*President:* Walter G. Seeger.

*Laboratories:* St. Paul 6, Minn.; 225 West Morgan Ave., Evansville 7, Ind.

*Research staff:* St. Paul, Minn.: C. E. Lund, Director; W. A. Ellsworth, Chief Engineer. 5 chemists, 14 engineers; additional personnel 20. Evansville, Ind.: 3 chemists, 1 physicist, 2 metallurgists, 55 engineers; additional personnel 58.

*Research activities:* Domestic and commercial refrigeration; low temperature refrigeration; insulation; paints; porcelain; plastics materials and processes; condensing units and related electrical equipment. (Research initiated 1931.)

*Library:* 300 volumes.

**1960. Seiberlich, Joseph, Mast Road, Durham, N. H.**

*Research staff:* Joseph Seiberlich, Director. Special staff hired according to research projects.

*Research activities:* Cellulose, lignin, cellulose derivatives, and the chemistry of starch. (Research initiated 1939.)

*Library:* 1,000 volumes.

**1961. Seiberling Rubber Company, Akron 9, Ohio.**

*President:* J. P. Seiberling.

*Laboratory:* Barberton, Ohio.

*Research staff:* E. H. Gibbs, Manager, Development Department; R. T. La Porte, Chief Chemist. 9 chemists, 2 engineers; technical personnel 14; additional personnel 9.

*Research activities:* Tire construction and compounding; heels, soles, and mechanical goods. (Research initiated 1921.)

**1962. Seismograph Service Corporation, 709 Kennedy Bldg., Tulsa 3, Okla.**

*President:* G. H. Westby.

*Laboratory:* 910 South Boston St., Tulsa 3, Okla.

*Research staff:* J. E. Hawkins, Research and Development Director. 2 physicists, 5 engineers, 1 geologist; technical personnel 4; additional personnel 1.

*Research activities:* Seismograph and geophysical prospecting. (Research initiated 1944.)

*Library:* 100 volumes.

1963. **Selas Corporation of America**, Erie Ave. and D St., Philadelphia 34, Pa.

*President:* Frederic O. Hess.

*Research staff:* E. Blaha, Manager, Ceramic Division; A. Furczyk, Chief Development Engineer; 3 chemists, 2 physicists, 2 metallurgists, 8 engineers; technical personnel 2; additional personnel 3.

*Research activities:* High-speed gas combustion and heating; gas carburetion; continuous heating processes; surface hardening; aircraft heating; separation of immiscible liquids; gas-liquid separation. (Research initiated 1930.)

*Library:* 200 volumes.

1964. **Selectronic Dispersions, Inc.**, 98 Greenwood Ave., Montclair, N. J.

*President:* Raymond M. Tierney.

*Research staff:* H. Jenett, Vice President and General Manager. 2 chemists, 1 engineer; technical personnel 2; additional personnel 2.

*Research activities:* Electronic dispersions of plastics materials. (Research initiated 1944.)

*Library:* A library is maintained.

**Semet-Solvay Company.** See Allied Chemical and Dye Corporation.

1965. **Servel, Inc.**, Evansville 20, Ind.

*President:* Louis Ruthenburg.

*Research staff:* William R. Hainsworth, Vice President in charge of research; C. T. Ashby, Manager of development; N. E. Berry, Director of research; R. S. Taylor, Chief Engineer; A. C. Shuart, Assistant Chief Engineer; C. E. Ploeger, Chief Engineer, Electric Refrigeration Division. 17 chemists, 6 metallurgists, 40 engineers, 9 technical assistants; additional personnel 125.

*Research activities:* Absorption refrigeration; household and commercial air conditioning; heating systems; water heaters; kitchen accessories. (Research initiated 1926.)

*Library:* A library is maintained.

*Cooperative research:* Two grants for research are made.

1966. **Servicised Products Corporation**, 6051 West 65th St., Chicago 38, Ill.

*President:* A. C. Fischer.

*Research staff:* A. C. Fischer, Director. 2 to 5 chemists, 1 engineer; technical personnel 3; additional personnel 20.

*Research activities:* Construction materials; molded and sheet rubber products. (Research initiated 1923.)

*Library:* 100 volumes.

1967. **Seydel Chemical Company**, 225 Mercer St., Jersey City 2, N. J.

*President:* Herman Seydel.

*Research staff:* Herman Seydel, Director; Albert H. Reiners, Chemist.

*Research activities:* Medicinals; process improvement in fine organic chemical manufacture; food protection, mainly through application of benzoates. (Research initiated 1904.)

*Library:* A library is maintained.

*Cooperative research:* Six grants for research are made.

1968. **Seydel-Woolley and Company**, 748 Rice St., N. W., Atlanta, Ga.

*President:* Vasser Woolley.

*Research staff:* Paul V. Seydel, Director. 4 chemists, 2 engineers; technical personnel 1; additional personnel 1.

*Research activities:* Textile chemistry. (Research initiated 1924.)

*Library:* 200 volumes.

1969. **Seymour Manufacturing Company**, Seymour, Conn.

*President:* F. S. Jerome.

*Research staff:* T. C. Merriman, Metallurgist. Laboratory personnel 11.

*Research activities:* Refractory nonferrous alloys. (Research initiated 1914.)

**Shakeproof Lock Washer Company.** See Illinois Tool Works.

1970. **Shallcross Manufacturing Company**, P. O. Box 325, Collingdale, Pa.

*President:* D. H. Shallcross, Sr.

*Research staff:* F. D. V. Mitchell, Chief Engineer. 1 chemist, 1 physicist, 6 engineers; technical personnel 8.

*Research activities:* Electrical measurements. (Research initiated 1936.)

*Library:* 100 volumes.

1971. **Sharp and Dohme, Inc.**, 640 North Broad St., Philadelphia 30, Pa.

*President:* John S. Zinsser.

*Laboratory:* Medical-Research Division, Glendolen, Pa.

*Research staff:* W. A. Feirer, Vice President and Division Director; L. Earle Arnow, Director of research. 28 chemists, 7 physicians, 13 bacteriologists, 11 pharmacists, 16 pharmacologists; technical personnel 9; additional personnel 25.

*Research activities:* Refinement and stabilization of serums and antitoxins; new antigens; the chemistry of antibodies and viruses; germicides and antiseptics; synthetic organic compounds, including sulfonamide derivatives and

barbiturates, alkyl polyhydroxyphenols, nucleotides, nucleic acids, and endocrine products; pharmaceutical preparations; biochemical products. (Research initiated 1845.)

*Library:* 6,000 volumes, 250 periodicals.

*Cooperative research:* Thirty-five grants for research are made.

**1972. Sharples Chemicals, Inc.,** 123 South Broad St., Philadelphia 9, Pa.

*President:* P. T. Sharples.

*Laboratory:* Wyandotte, Mich.

*Research staff:* J. F. Olin, Director; T. E. Deger, Assistant Director. 39 chemists, 19 chemical engineers; technical personnel 20; additional personnel 14.

*Research activities:* The development of organic chemicals, particularly those derived from petroleum hydrocarbons; investigation of the chlorination, alkylation, hydrolysis, amination and esterification of organic compounds; the testing of chemicals in the textile, rubber, detergent, surface coating, and resin fields. (Research initiated 1933.)

*Library:* 800 volumes.

*Cooperative research:* One fellowship is supported.

**1973. Sharples Corporation,** 23rd and Westmoreland Sts., Philadelphia 40, Pa.

*President:* P. T. Sharples.

*Laboratory:* 201 Spring Garden St., Philadelphia 23, Pa.

*Research staff:* Foster C. Nix, Director. 11 chemists, 4 physicists, 1 engineer; technical personnel 2; additional personnel 11.

*Research activities:* The development of classification and auxiliary equipment used in the classification of fine particles; fundamental studies and development of centrifugal processes in chemical industries and of precision centrifugal casting processes of metals. (Research initiated 1915.)

*Library:* 1,000 volumes.

**1974. Sharples Laboratory,** 88 Broad St., Boston 10, Mass.

*Senior Business Partner:* Ellis W. Coates.

*Research staff:* Harry O. Kulberg, Director. 2 chemists, 1 biologist, 2 engineers; additional personnel 1.

*Research activities:* Sugar; utilization of waste products. (Research initiated 1870.)

*Library:* 100 volumes.

**Shartle Brothers Machine Company.** See Black Clawson Company, Inc.

**1975. Shattuck Chemical Company,** S. W., 1805 South Bannock St., Denver 5, Colo.

*Research staff:* J. Seward Potter, Vice Presi-

dent and Director. 3 chemists; additional personnel 2.

*Research activities:* The improvement of rare metal processes, etc. (Research initiated 1918.)

**1976. Shawinigan Resins Corporation,** 614 Monsanto Ave., Springfield 2, Mass. (Parent companies: Monsanto Chemical Company and Shawinigan Products Corporation.)

*President:* Felix N. Williams.

*Research staff:* R. N. Crozier, Chief Chemist. 11 chemists, 2 engineers; additional personnel 3.

*Research activities:* Vinyl resins, including polyvinyl esters and their hydrolysis products; polyvinyl acetals. (Research initiated 1938.)

*Library:* 200 volumes.

**1977. Shea Research Laboratory,** Arnold F., 45 Terrace St., Keene, N. H.

*Research staff:* Arnold F. Shea, Director. 1 chemist, 1 cosmetologist.

*Research activities:* Household products, cleaners, and cosmetics. (Research initiated 1943.)

*Library:* 130 volumes.

**1978. Sheaffer Pen Company,** W. A., 311 Avenue H, Fort Madison, Iowa.

*President:* C. R. Sheaffer.

*Research staff:* Robert S. Casey, Director of research; W. K. Olson, Director of development; C. F. Bailey, Research Laboratory; L. P. Martin, Development Department. 4 chemists; technical personnel 9; additional personnel 2.

*Research activities:* The development and evaluation of the fundamental behavior of writing inks and writing equipment; chemical theory, colloidal state, etc., of iron compounds, tannic acid, and dyes; spectrophotometry; use and properties of metals, alloys, plastics, etc. (Research initiated 1921.)

*Library:* 300 volumes.

**Sheffield Farms Company, Inc.,** See National Dairy Products Corporation.

**1979. Sheffield Steel Corporation,** Sheffield Station, Kansas City 3, Mo.

*President:* R. L. Gray.

*Research staff:* F. A. McCoy, Chief Metallurgist. 15 chemists, 5 metallurgists, 2 engineers; technical personnel 4; additional personnel 5.

*Research activities:* The development of new products and the improvement of existing products; economic studies. (Research initiated 1915.)

*Library:* 500 volumes.

*Cooperative research:* Four grants for research are made.

1980. Shefford Cheese Company, Green Bay, Wis. (Subsidiary of Standard Brands, Inc.)

*President:* Frank T. Lewis.

*Research staff:* Edward H. Freidel, Director. 2 chemists, 1 bacteriologist; technical personnel 1; additional personnel 4.

*Research activities:* Cheese and other dairy products. (Research initiated 1938.)

1981. Shell Development Company, Shell Bldg., San Francisco 6, Calif.

*President:* A. E. Lacomblé.

*Laboratories:* Research laboratories, Emeryville, Calif.; Engineering laboratories, San Francisco and Wilmington, Calif.

*Research staff:* A. E. Lacomblé, Director; W. J. Hund, Laboratories Manager and Associate Director; O. A. Beck, K. R. Edlund, T. W. Evans, B. S. Greensfelder, A. G. Loomis, S. H. McAllister, and S. Tymstra, Associate Directors; A. J. Johnson, Vice President of engineering; T. W. Rosebaugh, Chief Engineer. 304 chemists, 12 physicists, 118 engineers; technical personnel 156; additional personnel 480.

*Research activities:* Petroleum production, manufacture, and products, and the derivation of chemicals from petroleum. (Research initiated 1920.)

*Cooperative research:* Two fellowships are supported and two grants for research are made.

1982. Shell Oil Company, Inc., (East of the Rockies Territory), 50 West 50th St., New York 20, N. Y.

*President:* Alexander Fraser.

#### WOOD RIVER RESEARCH LABORATORIES

P. O. Box 262, Wood River, Ill.

*Research staff:* M. P. L. Love, Director; R. J. Greenshields, Chief Research Engineer; F. F. Farley, Chief Research Chemist. 27 chemists, 1 physicist, 20 engineers; technical personnel 34; additional personnel 24.

*Research activities:* The development of new petroleum products and the improvement of existing products. (Research initiated 1925.)

*Library:* 1,300 volumes.

#### HOUSTON MANUFACTURING RESEARCH LABORATORY

P. O. Box 2527, Houston 1, Tex.

*Research staff:* H. R. Kemmerer, Director. 18 chemists, 16 engineers; technical personnel 39; additional personnel 24.

*Research activities:* The development of new

processes and the improvement of existing processes. (Research initiated 1925.)

*Library:* 750 volumes.

#### HOUSTON EXPLORATION AND PRODUCTION RESEARCH LABORATORY

Houston, Tex.

*Research staff:* H. Gershinowitz, Director; M. K. Hubbert, Associate Director. 35 chemists, 35 physicists, 5 engineers, 10 geologists; technical personnel 2; additional personnel 25.

*Research activities:* The development of new methods of discovery of petroleum and of exploitation of petroleum reservoirs. (Research initiated 1946.)

1983. Shell Oil Company, Inc., (Pacific Coast Territory), 100 Bush St., San Francisco 6, Calif.

*Chairman of the Board and Executive Vice President:* S. Belither.

*Manager of development:* Monroe E. Spaght.

*Cooperative research:* Several fellowships are supported.

#### MARTINEZ REFINERY

Martinez, Calif.

*Research staff:* John M. Brackenbury, Chief Technologist. 28 chemists and chemical engineers; 5 engineers; technical personnel 20.

*Research activities:* The development and improvement of processes and products in the field of petroleum refining. (Research initiated 1925.)

*Library:* A library is maintained.

#### WILMINGTON REFINERY

Wilmington, Calif.

*Research staff:* John E. Marsland, Chief Technologist. 35 chemists and chemical engineers; technical personnel 18.

*Research activities:* The development and improvement of processes and products in the field of petroleum refining. (Research initiated 1925.)

*Library:* A library is maintained.

#### AGRICULTURAL LABORATORY

Modesto, Calif.

*Research staff:* Roy Hansberry, Director. 10 agricultural scientists in entomology, plant pathology, plant physiology, horticulture, nematology, soils, and agricultural engineering; 10 laboratory assistants; additional personnel 15.

*Research activities:* The development of new agricultural chemicals from petroleum or to be used with petroleum products. (Research initiated 1945.)

*Library:* A library is maintained.

- 1984. Shellmar Products Company, Mount Vernon, Ohio.**  
*President:* B. W. Martin.  
*Research staff:* C. A. Southwick, Jr., Director of research and development. 6 chemists, 4 engineers; technical personnel 4; additional personnel 4.  
*Research activities:* Packaging and packaging materials; printing; plastics, contact resins, and laminated structures. (Research initiated 1932.)  
*Library:* The company maintains a library.
- Shelton Looms.** See Blumenthal and Company, Sidney.
- 1985. Sherman Laboratories, 14600 East Jefferson Ave., Detroit, Mich.**  
*President:* A. G. Sherman.  
*Research staff:* Philip A. Kober, Director. 3 chemists, 2 bacteriologists; additional personnel 5.  
*Research activities:* Biochemical and bacteriological research; organic synthetic chemicals.
- 1986. Sherwin-Williams Company, 101 Prospect Ave., N. W., Cleveland 1, Ohio.**  
*President:* A. W. Steudel.  
*Laboratories:* Cleveland and Dayton, Ohio; Chicago, Ill.; Newark and Bound Brook, N. J.; Detroit, Mich.; Oakland, Calif.; Coffeyville, Kans.; Montreal, Que.  
*Research staff:* N. E. Van Stone, Vice President and Director of operations. 169 chemists; technical personnel 188; additional personnel 78.  
*Research activities:* Paints, varnishes, lacquers, linseed oil, white lead, lithopone, dry colors, dyes, intermediates, coal tar products, and insecticides. (Research initiated 1893.)  
*Library:* Eight libraries; 2,698 volumes.  
*Cooperative research:* Three fellowships are supported.
- See also Acme White Lead and Color Works and Lowe Brothers Company.
- 1987. Shilstone Testing Laboratory, 510 Gravier St., New Orleans 12, La.**  
*President:* Herbert M. Shilstone.  
*Laboratories:* 301 M and M Bldg., Houston, Tex.; 615 Old Robestown Road, Corpus Christi, Tex.  
*Research staff:* Herbert M. Shilstone, Jr., Director; Cecil M. Shilstone, Manager of Louisiana and Mississippi Divisions. 6 chemists, 1 biologist and bacteriologist, 1 metallurgist, 4 engineers; technical personnel 15; additional personnel 7.  
*Research activities:* Industrial chemistry; designing and testing of structural building materials. (Research initiated 1930.)
- 1988. Shriver and Company, Inc., T., Harrison, N. J.**  
*President:* John L. Hutton.  
*Research staff:* Carl A. Jahreis, Director; Charles Mueser. 2 chemists, 1 engineer.  
*Research activities:* Filter presses and pumps. (Research initiated 1910.)
- 1989. Sickles Company, F. W., 165 Front St., Chicopee, Mass.**  
*President:* R. F. Sickles.  
*Research staff:* Howard J. Benner, Chief Engineer. 1 chemist, 1 physicist, 1 metallurgist, 18 engineers; technical personnel 31; additional personnel 11.  
*Research activities:* The development of component radio parts, particularly coils and condensers for use in electronics. (Research initiated 1932.)  
*Library:* 100 volumes.  
*Cooperative research:* One fellowship is supported.
- 1990. Siebel and Company, E. A., 8 South Dearborn St., Chicago 3, Ill.**  
*President:* Edna K. Siebel.  
*Research staff:* Peter J. F. Weber, Director; Robert V. Siebel, Associate Director. 6 chemists, 2 biologists, 1 engineer; technical personnel 10; additional personnel 6.  
*Research activities:* Yeast, brewing, and vitamins. (Research initiated 1917.)  
*Library:* 1,000 volumes.
- 1991. Siebel Sons' Company, J. E., 958-966 Montana St., Chicago 14, Ill.**  
*President:* Fred P. Siebel, Jr.  
*Research staff:* A. G. Schreck, Vice President in charge of laboratories; Kurt Becker, Director. 10 chemists, 4 biologists and bacteriologists, 3 engineers; technical personnel 4; additional personnel 12.  
*Research activities:* Commercial and noncommercial research related to enzymatic processes, fermentology, the food industries in general and brewing and baking in particular, beverages, cereals and products relating to feeds, sugars and syrups, cleansers and detergents, and shortenings; biological and bacteriological investigations. (Research initiated 1938.)  
*Scientific periodicals:* *Brewers Digest*. Vol. I, 1926. Monthly. *Bakers Digest*. Vol. I, 1927. Bi-monthly.  
*Cooperative research:* Several grants for research are made.
- 1992. Sierra Talc Company, 724 South Spring St., Los Angeles 14, Calif.**  
*President:* Vincent G. Dodds.  
*Laboratory:* 2149 Bay St., Los Angeles 21, Calif.

*Research staff:* Richard S. Lamar, Director. 3 chemists, 2 engineers, 1 geologist; technical personnel 2.

*Research activities:* Improvement of the quality of talc products; development of new production methods; search for new outlets for talc. (Research initiated 1940.)

**1993. Signode Steel Strapping Company, 2600 North Western Ave., Chicago, Ill.**

*President:* J. W. Leslie.

#### DIVISION A LABORATORY

*Research staff:* J. M. Moon, Chief Research Engineer. 4 engineers; technical personnel 4; additional personnel 3.

*Research activities:* Packaging and carloading; product use; processes of loading and bracing merchandise in freight cars; packaging systems. (Research initiated 1920.)

#### DIVISION B LABORATORY

*Research staff:* E. L. Magnus, Manager, Rolling Mill Development. 1 metallurgist, 4 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Development of rolling mill equipment and processes in the manufacture of steel strapping.

#### DIVISION C LABORATORY

*Research staff:* W. C. Childress, Chief Development Engineer. 5 engineers; technical personnel 4; additional personnel 2.

*Research activities:* Development of tools and other equipment for application of steel strapping.

*Library:* 200 volumes.

**Sikorsky Aircraft, Division of United Aircraft Corporation.** See United Aircraft Corporation.

**1994. Silk Grading and Testing Laboratory, and Textile Testing and Research Laboratories, 22 West 26th St., New York 10, N. Y.**

*President:* Harry Levine.

*Research staff:* Harry Levine, Director. Silk Grading and Testing Laboratory: 2 textile technologists; additional personnel 2. Textile Testing and Research Laboratories: 2 textile technologists; additional personnel 3.

*Research activities:* Quality control of raw silk and other fibers for fabric manufacturing purposes and for consumer wear. Textiles, fibers, yarns, and fabrics, and the processing of these materials; oils, dyes, and finishes pertaining to textiles; consumer wear of textiles. (Research initiated 1928.)

**1995. Simonds Saw and Steel Company, 470 Main St., Fitchburg, Mass.**

*President:* Daniel Simonds.

*Laboratory:* Lockport, N. Y.

*Research staff:* A. D. Potts, Director; L. F. Van Mater, Chief Metallurgist. 3 chemists, 4 metallurgists; additional personnel 3.

*Research activities:* The development of steels and alloys. (Research initiated 1910.)

*Library:* 800 volumes.

#### ABRASIVE COMPANY

Tacony and Fraley Sts., Philadelphia 37, Pa.

*General Manager:* J. W. McLean.

*Research staff:* W. L. Kenagy, Director. 2 chemists, 2 engineers, 1 ceramic technologist, 6 assistants; additional personnel 1.

*Research activities:* The development and control of abrasives and abrasive products. (Research initiated 1915.)

**1996. Simons, Inc., Harold L., 11-25 Forty-fourth Road, Long Island City 1, N. Y.**

*President:* Harold L. Simons.

*Research staff:* 3 chemists, 1 engineer.

*Research activities:* Synthetic, aromatic, and fine chemicals, and the study of allied problems. (Research initiated 1922.)

*Library:* A library is maintained.

**1997. Simplex Wire and Cable Company, 79 Sidney St., Cambridge 39, Mass.**

*President:* Everett Morss.

*Laboratories:* General Laboratories, 66 Sidney St., Cambridge, Mass.; Electrical Laboratories, 61 Pacific St., Cambridge, Mass.

*Research staff:* John T. Blake, Director. 8 chemists, 3 physicists, 4 engineers; technical personnel 6; additional personnel 22.

*Research activities:* Study of dielectrics and electrical insulation, rubber, plastics, and metals. (Research initiated 1924.)

*Library:* 500 volumes.

**1998. Sinclair and Valentine Company, 611 West 129th St., New York 27, N. Y.**

*President:* A. J. Math.

*Research staff:* George Cramer, Director. 12 chemists, 3 engineers; technical personnel 10; additional personnel 3.

*Research activities:* Resins, dyes, oils, fats, waxes, pigments, synthetic resins, varnishes, mineral oils, paper, baking, etc. (Research initiated 1915.)

*Cooperative research:* Two fellowships are supported.



**1999. Sinclair Refining Company, 630 Fifth Ave., New York 20, N. Y.** (Subsidiary of Sinclair Oil Corporation.)

*President:* G. H. Taber, Jr.

*Laboratory:* East Chicago, Ind.

*Research staff:* E. W. Isom, Vice President and Director; E. C. Herthel, Manager. 54 chemists, 59 engineers, technical personnel 110; additional personnel 50.

*Research activities:* Petroleum chemical by-products, catalysts, petroleum hydrocarbons and derivatives, improved lubricants and improvement agents, special products, process engineering and design pilot plants, refinery operations analysis, and economic research. (Research initiated 1916.)

*Library:* 3,000 volumes.

**2000. Singer Manufacturing Company, Elizabethport, N. J.**

*Laboratories:* General laboratory, Elizabethport, N. J.; Wood Products laboratory, South Bend, Ind. (sewing machines).

*Research staff:* A. A. Ackerman, sewing machine development; W. J. Peets, special plant machinery; M. Naul, electrical apparatus; C. T. Willard, metallurgical and plant processes; C. E. Lentz, wood products. 25 chemists, engineers, and specialists serving the above divisions.

*Research activities:* Metallurgical, electrical, and mechanical research in connection with the development of the sewing machine, plant machinery, and electrical apparatus. (Research initiated 1900.)

**2001. Skelly Oil Company, Tulsa 2, Okla.**

*President:* W. G. Skelly.

*Laboratory:* Pawhuska, Okla.

*Research staff:* J. W. Vaiden, Vice President in charge of manufacturing; Frank E. Fisher, Director of research; C. M. Hollenbeck, Chief Chemist; C. R. Eberline, Chief of engineering section. 8 chemists, 7 engineers; technical personnel 15; additional personnel 7.

*Research activities:* Improvement of old and development of new products and processes for utilization of natural gas and petroleum. (Research initiated 1930.)

*Library:* 800 volumes.

**2002. Skenandoa Rayon Corporation, 1201 Broad St., Utica 2, N. Y.**

*President:* I. Rogosin.

*Research staff:* Alfred Seely Brown, Director. 4 chemists; technical personnel 1.

*Research activities:* Problems related to viscose rayon manufacture. (Research initiated 1945.)

*Library:* 300 volumes.

**2003. Skinner and Sherman, Inc., 246 Stuart St., Boston 16, Mass.**

*President:* Hervey J. Skinner.

*Research staff:* Burton G. Philbrick, Vice President and Director of bacteriological research; Herbert L. Sherman, Director of research. 14 chemists, 4 biologists, 2 technicians; additional personnel 4.

*Research activities:* Bacteriology, pulp and paper, disinfectants, foods, general testing and analysis. (Research initiated 1921.)

*Library:* 1,000 volumes.

**Slater and Sons, Inc., S. See Carter Fabrics Corporation.**

**2004. Sloane-Blabon Corporation, Trenton 3, N. J.**

*President:* Houlder Hudgins.

*Laboratories:* Trenton, N. J.; Philadelphia, Pa.

*Research staff:* W. C. Weigle, Vice President in charge of research and development; James W. Kemmler, General Plant Chemist. 7 chemists, 5 engineers; technical personnel 5; additional personnel 2.

*Research activities:* The chemistry of drying oils. (Research initiated 1931.)

*Library:* 200 volumes.

**2005. Smith and Company, Graydon, 150 Causeway St., Boston 14, Mass.**

*Research staff:* Graydon Smith, Director. 1 physicist, 2 engineers; technical personnel 6; additional personnel 1.

*Research activities:* Electronics; textiles; miscellaneous projects relating to the improvement of manufactured products. (Research initiated 1935.)

*Library:* 100 volumes.

**2006. Smith and Corona Typewriters, Inc., L. C., 701 East Washington St., Syracuse 1, N. Y.**

*President:* H. W. Smith.

*Laboratories:* Syracuse, Groton, and Cortland, N. Y.; Aurora and Chicago, Ill.

*Research staff:* 2 chemists, 1 metallurgist, 6 engineers; technical personnel 11.

*Research activities:* Typewriters, gelatin rolls, duplicating machines, ribbons, carbons, rubber for typewriter platens, and paper testing. (Research initiated 1932.)

**2007. Smith and Son Manufacturing Company, Lee S., 7325 Penn Ave., Pittsburgh 8, Pa.**

*President:* Lynn A. Smith.

*Research staff:* K. H. Strader, Vice President in charge of production and research. 4 chemists, 1 engineer; technical personnel 3; additional personnel 1.

*Research activities:* Plastic dental materials; prosthetic products.

**2008. Smith and Sons Carpet Company, Alexander, Yonkers 1, N. Y.**

*President:* Frederick B. Klein.

*Research staff:* M. L. Griggs, Vice President in charge of manufacturing and research; A. G. Ashcroft, Director. 7 chemists, 4 engineers, 1 statistician; technical personnel 10; additional personnel 11.

*Research activities: Research Laboratories:* Studies of the fundamental properties of fibers and the effects of scouring, dyeing, drying, carding, spinning, and other processes on their characteristics; the uses of fibers and yarns. *Product Engineering Laboratories:* Standardization, quality control, technical service, and development of materials, products, and processes in the manufacture of pile floor coverings and related materials. (Research initiated 1933.)

*Library:* 400 volumes.

*Cooperative research:* One grant for research is made.

**2009. Smith Company, J. Hungerford, 410 North Goodman St., Rochester 9, N. Y.**

*President:* William F. Martin.

*Research staff:* F. B. Jack, Vice President in charge of research; John R. Dean, Plant Manager. 1 chemist, 1 biologist; additional personnel 2.

*Research activities:* Chemical and bacteriological research on raw materials for use in the making of fountain and ice cream flavors. (Research initiated 1913.)

*Library:* 500 volumes.

**2010. Smith Company, S. Morgan, York, Pa.**

*President:* Beauchamp E. Smith.

*Research staff:* George A. Jessop, Vice President, General Manager, and Chief Engineer; J. D. Scoville, Assistant Chief Engineer; Rolfe Sahle, Hydraulic Laboratory. 7 engineers; technical personnel 40.

*Research activities:* The designing and testing of hydraulic turbines in model sizes of approach and discharge water passages, particularly scroll cases and draft tubes; the designing and testing of impulse wheels, pumps, valves, and special equipment. (Research initiated 1922.)

**2011. Smith-Emery Company, 920 Santee St., Los Angeles 15, Calif.**

*President:* E. O. Slater.

*Laboratories:* Los Angeles and San Diego, Calif.

*Research staff:* G. L. Cheney, Director; D. F.

Roberts, Civil Engineer. 9 chemists, 5 physicists, 1 biologist, 1 metallurgist, 2 engineers; technical personnel 6; additional personnel 11.

*Research activities:* Development of commercial processes for recovery of minerals; designing of plants for milling ores or producing industrial products; investigation and testing of structural materials and soils. (Research initiated 1910.)

*Library:* 900 volumes.

**2012. Smith, Kline and French Laboratories, 429 Arch St., Philadelphia 5, Pa.**

*President:* C. Mahlon Kline.

*Laboratory:* 800 North Delaware Ave., Philadelphia 23, Pa.

*Research staff:* W. Furness Thompson, Assistant Director of research; Walter G. Karr, Director of laboratories; Theodore B. Wallace, Medical Administrator. 24 chemists, 1 biologist, 1 engineer, 1 physician, 1 bacteriologist; technical personnel 18; additional personnel 35.

*Research activities:* Pharmaceutical products, particularly those derived through synthetic organic chemical research. (Research initiated 1925.)

*Library:* 600 volumes.

*Cooperative research:* Several fellowships and scholarships are supported and twenty-seven grants for research are made.

**2013. Smith Pharmacal Company, Carroll Dunham, Orange, N. J.**

*President:* Carroll Dunham Smith.

*Research staff:* Joseph W. Kouten, Director of laboratories. 16 chemists, 1 physicist, 4 biologists, 2 engineers, 1 physician; technical personnel 11.

*Research activities:* Cardiac glucides, anti-luetics, vitamins, and hormones. (Research initiated 1844.)

*Library:* 3,000 volumes.

*Cooperative research:* Four fellowships are supported and two grants for research are made.

**2014. Smithers Laboratories, V. L., 2706 First Central Tower, Akron, Ohio.**

*Laboratory:* 54 Cherry St., Akron, Ohio.

*Research staff:* V. L. Smithers, Director; I. C. Poules, Chief Chemist. 3 chemists, 1 engineer; additional personnel 18.

*Research activities:* Chemical and physical tests on rubber, rubber compounds, and materials used by the rubber industry; high frequency dielectric treatment of rubber and plastics; testing of automotive type storage batteries; experimental research work under the direction of clients. (Research initiated 1925.)

**2015. Smyth Laboratories, Inc.,** 34th St., below Chestnut St., Philadelphia 4, Pa.

*President:* Herman A. Shelanski.

*Research staff:* Herman A. Shelanski, Director; Henry Field Smyth, Sr., Research Consultant. 2 chemists, 1 physicist, 2 biologists, 1 engineer, 3 physicians, 1 geologist; technical personnel 5; additional personnel 3.

*Research activities:* Industrial toxicology; investigations of public health, industrial health, and bacteriological problems; clinical and laboratory investigations of pharmaceutical products. (Research initiated 1940.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**2016. Snell, Inc., Foster D.,** 305 Washington St., Brooklyn 1, N. Y.

*President:* Foster Dee Snell.

*Research staff:* Cyril S. Kimball, J. Mitchell Fain, Leonard C. Cartwright, Albert F. Guiteras, Cornelia A. Tyler, and Rebecca L. Shapiro, Directors. 32 chemists, 1 biologist, 3 engineers, 1 physician, 3 bacteriologists; additional personnel 20.

*Research activities:* Surface-active agents, soaps, and other detergents; rubber and plastics; paper and foil packaging; household, industrial, and automotive specialties; bacteriology and toxicology; plant design and engineering; industrial surveys including market surveys. (Research initiated 1925.)

*Library:* 1,200 volumes.

**2017. Socony-Vacuum Oil Company, Inc.,** 26 Broadway, New York 4, N. Y.

*President:* B. B. Jennings.

*Research staff:* W. M. Holaday, Director of laboratories; L. C. Beard, Jr., and B. W. Story, Assistant Directors.

RESEARCH AND DEVELOPMENT DEPARTMENT  
Paulsboro, N. J.

*Research staff:* P. V. Keyser, Jr., Research Director. 99 chemists, 4 physicists, 136 engineers; additional personnel 489.

*Research activities:* The study of problems covering improvement in the quality and methods of manufacture of petroleum products; the study of service conditions to be met by petroleum products; the investigation of automotive problems involving both fuels and lubricants; research along various lines of interest in connection with the manufacture, marketing, and use of the products of crude petroleum. (Research initiated 1914.)

*Library:* 6,000 bound volumes, 30,000 patents.

TECHNICAL SERVICE DEPARTMENT

412 Greenpoint Ave.

Brooklyn 22, N. Y.

*Research staff:* T. G. Roehner, Technical Director. 63 chemists, 1 physicist, 1 metallurgist, 15 engineers; technical personnel 37; additional personnel 119.

*Research activities:* Product development and control; automotive fuel and lubricant testing; various process activities.

*Library:* 1,300 volumes.

*See also* Magnolia Petroleum Company.

**2018. Solar Aircraft Company,** 2200 Pacific Highway, San Diego 12, Calif.

*President:* Edmund T. Price.

*Laboratories:* San Diego, Calif.; Des Moines, Iowa.

*Research staff:* H. A. Campbell, Manager of research and Chief Metallurgist; R. C. Gross, Manager of commercial research. 4 chemists, 1 physicist, 2 metallurgists, 8 engineers; technical personnel 10; additional personnel 10.

*Research activities:* Physical and mechanical properties of stainless and complex alloys at high temperatures; fabrication, processing, and welding properties of these alloys; development of welding fluxes for these alloys; study of heat exchange phenomena in the heat transfer systems operating at high temperatures; study of the behavior of stainless and complex alloys operating in aircraft engine exhaust systems and in jet propulsion engines. (Research initiated 1935.)

*Library:* 3,000 volumes.

**2019. Solar Corporation,** 944 West Bruce St., Milwaukee 4, Wis.

*President:* C. L. Feldtkeller.

*Laboratories:* Milwaukee, Wis.; 3362 East Layton Ave., Cudahy, Wis.

*Research staff:* Vincent P. Lamm, Chemical Director. 4 chemists, 3 physicists, 1 engineer; additional personnel 3.

*Research activities:* Fundamental and practical research on coatings for wood; the use of various polyhydric alcohols and fatty acids in the formation of alkyd resins; new methods of producing phenolic resins for varnish coatings; study on the influence of impurities in lead on the properties of storage battery grids. (Research initiated 1931.)

*Solvay Process Company. See* Allied Chemical and Dye Corporation.

**2020. Sommer Chemical Laboratories, Inc.,** Suite 933, 152 West Wisconsin Ave., Milwaukee 3, Wis.

*President:* R. N. Bauer.

*Research staff:* R. N. Bauer and P. N. Sampson, Directors. 2 chemists.

*Research activities:* General chemical research. (Research initiated 1900.)

**2021. Sonneborn Sons, Inc., L.,** 88 Lexington Ave., New York 16, N. Y.

*President:* F. Sonneborn.

*Laboratories:* Belleville, N. J.; Petrolia and Franklin, Pa.

*Research staff:* F. W. Breth, Director. 20 chemists, 3 engineers; additional personnel 1.

*Research activities:* The study of highly refined mineral oils used for medicinal and technical purposes; the study of amorphous hydrocarbons of high melting point; the investigation of sulfonated mineral oils; the purification of organic substances by adsorption. (Research initiated 1915.)

**2022. Sonntag Scientific Corporation,** 1 Seneca Place, Greenwich, Conn.

*President:* Alfred Sonntag.

*Research staff:* B. J. Lazan, Chief Engineer. 1 physicist, 1 metallurgist, 5 engineers; additional personnel 28.

*Research activities:* Fatigue of structural materials, structural materials, and structures; development of machinery and instruments for fatigue and vibration research. (Research initiated 1942.)

*Library:* 125 volumes.

**2023. Sonoco Products Company,** Hartsville, S. C.

*President:* James L. Coker.

*Research staff:* C. K. Dunlap, Vice President in charge of engineering and development; J. E. Mills, Chief Chemist; J. E. Copenhaver, Assistant to Chief Chemist. 14 chemists; additional personnel 5.

*Research activities:* Paper and paper products. (Research initiated 1935.)

*Library:* 400 volumes.

**2024. Sonotone Corporation,** Elmsford, N. Y.

*President:* Dean Babbitt.

*Research staff:* Emil H. Greibach, Director; Harry A. Pearson, Assistant Director. 3 chemists, 3 physicists, 1 metallurgist, 17 engineers; technical personnel 22; additional personnel 10.

*Research activities:* Hearing aids, audiometry, acoustics, vacuum tubes, and general communications applications for war and peace-time purposes. (Research initiated 1929.)

*Library:* 500 volumes.

**2025. Sorensen and Company, Inc.,** 375 Fairfield Ave., Stamford, Conn.

*President:* Edward M. Sorensen.

*Research staff:* Edward M. Sorensen, Director. 3 engineers; technical personnel 5; additional personnel 8.

*Research activities:* Electronics: voltage regulation problems; remote control devices, by wire and radio. (Research initiated 1940.)

*Library:* 100 volumes.

**2026. Soundview Pulp Company,** Everett, Wash.

*President:* V. M. Dickey.

*Research staff:* N. W. Coster, Director. 4 chemists.

*Research activities:* The manufacture of bleached sulfite pulp, including the development of new control methods and their application, new process methods, and changes in present ones; recovery of by-products. (Research initiated 1936.)

**2027. South Florida Test Service,** P. O. Box 387, Miami 3, Fla.

*Owner:* E. M. DeNoon.

*Research staff:* E. M. DeNoon, Director. 1 chemist, 1 engineer; additional personnel 4.

*Research activities:* Design, development, and testing of new materials and products. (Research initiated 1931.)

*Library:* A library is maintained.

**South Wind Heater Division, Stewart-Warner Corporation.** See Stewart-Warner Corporation.

**2028. Souther Engineering Company,** Henry, 11 Laurel St., Hartford, Conn.

*President:* James A. Newlands.

*Research staff:* James A. Newlands, Director; F. P. Gilligan, metallurgical research; I. L. Newell, chemical research. 5 chemists, 1 biologist and bacteriologist, 2 metallurgists, 1 engineer; additional personnel 5.

*Research activities:* Oils and greases; ferrous and nonferrous metals; methods of heat-treatment; electroplating; foundry practice and boiler water treatment. (Research initiated 1898.)

**2029. Southern Biological Supply Company, Inc.,** 517 Decatur St., New Orleans 16, La.

*President:* Percy Viosca, Jr.

*Research staff:* Henry B. Chase, Jr., Vice President in charge of research. 2 biologists.

*Research activities:* Life histories of reptiles, amphibians of Louisiana, and certain luminous beetles; fish investigations; general class work biology. (Research initiated 1919.)

*Library:* 300 volumes.

**2030. Southern California Citrus Foods, 1460 North Olive St., Anaheim, Calif.**

*President:* F. S. Gunter.

*Research staff:* Hans Zullig, Chief Chemist. 2 chemists; technical personnel 2.

*Research activities:* Citrus by-products. (Research initiated 1938.)

**2031. Southern California Gas Company, P. O. Box 3249, Terminal Annex, Los Angeles 54, Calif.**

*President:* F. S. Wade.

*Laboratories:* 1700 Santa Fe Ave., Los Angeles, Calif.

*Research staff:* H. L. Masser and F. M. Banks, Vice Presidents in charge of research; Guy Corfield, Research Engineer. 5 chemists, 12 engineers; technical personnel 10; additional personnel 4.

*Research activities:* Problems incident to the transmission, distribution, storage, and metering of natural gas; the protection of underground pipes; soil corrosion; electrolysis; improvements in gas-consuming appliances. (Research initiated 1930.)

**2032. Southern Chemical Cotton Company, Chattanooga 10, Tenn.**

*President:* W. Donald Munson.

*Research staff:* W. G. Tebbens, Director; W. S. Hude, Research Advisor; E. L. Powell. 5 chemists; technical personnel 16; additional personnel 4.

*Research activities:* Processes for the preparation of high alpha-, derivative grade cellulose from cotton linters. (Research initiated 1927.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported and two grants for research are made.

**2033. Southern Dyestuff Corporation, Box 1045, Charlotte, N. C.**

*President:* John L. Crist.

*Research staff:* E. D. Robinson, Chief Chemist; David F. Mason, Chemist. 3 chemists; technical personnel 2; additional personnel 2.

*Research activities:* The development and improvement of the manufacture of dyestuffs. (Research initiated 1936.)

**2034. Southern Ferro Alloys Company, 2108 Chestnut St., Chattanooga 2, Tenn.**

*Vice President and General Manager:* John Kruesi.

*Research staff:* Frank E. Nabers, Jr., Vice President in charge of sales engineering; F. V. Andrae, Chief Engineer and Director of research. 1 chemist, 1 metallurgist; technical personnel 2.

*Research activities:* Production and improvements on products. (Research initiated 1939.)

*Library:* 100 volumes.

**2035. Southern Pacific Company, 65 Market St., San Francisco 5, Calif.**

*President:* A. T. Mercier.

*Laboratory:* Sacramento, Calif.

*Research staff:* B. M. Brown, General Superintendent of motive power; P. V. Garin, Engineer of tests and Director of research; G. E. Noyes, Chief Chemist; B. F. Kline, J. G. Maurer, A. S. Pedrick, and H. S. Knauer, Assistant Engineers of tests. 6 chemists, 1 metallurgist, 6 engineers, 1 geologist; technical personnel 9; additional personnel 6.

*Research activities:* Improvements in metallic and nonmetallic materials used in railroad operations, including metallurgical work, fuels, boiler water, lubricating oils, protective coatings, cleaners, etc; inspection and testing of purchased materials; reclamation of used materials. (Research initiated 1890.)

*Library:* 200 volumes.

**Southern Pine Chemical Company. See Glidden Company.**

**2036. Southern Research Institute, 917 South 20th St., Birmingham 5, Ala.**

*Chairman, Board of Trustees:* Thomas W. Martin.

*Laboratories:* 917 South 20th St., and 2119 Eighth Ave., South, Birmingham, Ala.

*Research staff:* Wilbur A. Lazier, Director; E. N. Kemler, Head, Engineering Research Division. 17 chemists, 1 physicist, 2 metallurgists, 3 engineers, 1 bacteriologist, 1 dietician; additional personnel 8.

*Research activities:* Southern Research Institute is a newly organized nonprofit general research institute, supported by private capital subscriptions and endowments. It is dedicated to the purpose of making industrial research facilities and services more easily accessible to industry, on a fee basis which provides full protection of the sponsors' interests. The greater part of the research program consists of specific projects for business and trade associations and industrial sponsors in the fields of applied chemistry, physics, metallurgy, engineering, and food technology. Subjects under investigation include work on peanut foods, tobacco, ink, essential oils, citrus by-products, cotton textiles, paper products, sleep equipment, marine gear, oil exploration, grey iron castings, wood preserving, synthetic drugs, oleomargarine, soft drinks, and dairy products. (Research initiated 1944.)

*Library:* 1,500 volumes.

**2037. Southern Wood Preserving Company,** Station A, Atlanta, Ga.

*President:* R. H. White, Jr.

*Laboratory:* East Point, Ga.

*Research staff:* J. Alvin Vaughan, Director. 1 chemist, 1 engineer; additional personnel 2.

*Research activities:* Wood conditioning and preservation; synthetic production of coal-tar creosote; development of creosoting processes for wood. (Research initiated 1931.)

**2038. Southwestern Engineering Company,** 4800 Santa Fe Ave., Los Angeles 11, Calif.

*President:* Horace G. Miller.

*Research staff:* E. R. Cullity, Vice President in charge of research; Robert Lord, Chief Experimental Metallurgist. 2 experimental metallurgists, 3 consulting metallurgists.

*Research activities:* Treatment methods for metallic and nonmetallic ores.

*Scientific periodicals:* Flotation Process. Irregular.

**2039. Southwestern Laboratories,** Fort Worth, Tex.

*President:* F. B. Porter.

*Laboratories:* Fort Worth, Dallas, Houston, and Corpus Christi, Tex.

*Research staff:* R. H. Fash, Research Director, and in charge of petroleum production problems; B. P. Harper and T. E. Tomlinson, soil and concrete work; William A. Jackson, concrete work; C. A. Perkins, wood treatment. 11 chemists, 14 engineers, 10 inspectors; technical personnel 15; additional personnel 10.

*Research activities:* Petroleum production; cottonseed oil; the preservative treatment of wood. (Research initiated 1916.)

**2040. Sowa Chemical Company,** 305 East 46th St., New York 17, N. Y.

*President:* Frank J. Sowa.

*Research staff:* Frank J. Sowa, Director. 4 chemists, 1 physicist, 1 biologist, 1 engineer.

*Research activities:* Organic research and development; bactericides and fungicides; tobacco; plastics; brake linings; organo-silicon compounds and products; corrosion problems; insecticides and insect repellents; food products; plastic playing cards; boron and boron compounds. (Research initiated 1939.)

*Library:* 300 volumes.

**2041. Spalding and Brothers, Inc.,** A. G., 19 Beekman St., New York, N. Y.

*President:* C. F. Robbins.

*Laboratory:* Chicopee, Mass.

*Research staff:* E. P. Kearsley, Director. 6 chemists, 1 physicist, 1 metallurgist, 1 engineer, 1 wood technologist, 4 laboratory assistants; additional personnel 2.

*Research activities:* Athletic equipment. (Research initiated 1909.)

*Library:* 500 volumes.

*Cooperative research:* One grant for research is made.

**2042. Sparhawk Company,** foot of Rockland Road, Sparkill, N. Y.

*President:* Charles V. Sparhawk.

*Research staff:* Charles V. Sparhawk, Director. 2 chemists, 1 biologist, 1 consultant; technical personnel varies with season and necessity.

*Research activities:* Perfume fixatives from American musks; pest control repellents; animal baits and lures for use of trappers and exterminators. (Research initiated 1941.)

*Library:* 500 volumes.

**2043. Sparks-Withington Company,** Automotive Division, Jackson, Mich.

*President:* H. G. Sparks.

*Research staff:* Leslie I. Steinbach, Director. 3 chemists, 1 physicist, 1 biologist, 1 metallurgist, 7 engineers; technical personnel 8; additional personnel 13.

*Research activities:* Engineering in the field of radio, home appliances, acoustical and warning signals, refrigeration, and farm equipment. (Research initiated 1939.)

*Library:* 1,500 to 2,000 volumes.

**2044. Spartan Aircraft Company,** 1900 North Sheridan Road, Tulsa, Okla.

*President:* J. Paul Getty.

*Research staff:* W. E. Richard, Executive Process Engineer and Laboratory Director. 4 chemists, 1 metallurgist, 2 engineers; technical personnel 2; additional personnel 3.

*Research activities:* Aircraft, heating, refrigeration, and gas. (Research initiated 1942.)

*Cooperative research:* Two scholarships are supported.

**2045. Spaulding Fibre Company, Inc.,** 310 Wheeler St., Tonawanda, N. Y.

*President:* Charles C. Steck.

*Research staff:* Harold C. Steadman, Works Manager; Earl A. Russell, Director; R. S. Chase; F. S. Grazen; H. C. Buicke; Neil MacFadyen. 4 chemists, 2 engineers; technical personnel 1; additional personnel 2.

*Research activities:* Vulcanized fiber and laminated phenolic plastic materials. (Research initiated 1925.)

*Cooperative research:* One grant for research is made.

**2046. Spaulding-Moss Company,** 42 Franklin St., Boston 10, Mass.

*President:* Charles Spaulding.

*Laboratory:* 113-5 Purchase St., Boston 10, Mass.

*Research staff:* Merrill N. Friend, Chief Chemist. 1 chemical engineer; technical personnel 2; additional personnel 4.

*Research activities:* Photolithography, photography, light-sensitive iron, silver, chromium, and diazo compounds. (Research initiated 1932.)

*Library:* 150 volumes.

**2047. Special Chemicals Company, 30 Irving Place, New York 3, N. Y.**

*Partners:* Lionel Cinamon and Bessie P. Cinamon.

*Research staff:* Oscar Horowitz, Director; Irving Eisenstadt, Chemist. 1 chemist, 1 chemical engineer; technical personnel 3.

*Research activities:* The development of new products for use in the metal and metal fabricating industry, and improvement of present products. (Research initiated 1927.)

*Library:* 225 volumes.

**2048. Specialty Builders, 1018 South La Brea Ave., Los Angeles 35, Calif.**

*Superintendent:* Don José.

*Research staff:* Grace Wade, Director. 2 physicists, 3 engineers, 1 psychologist, 1 photographer, 1 optical engineer; additional personnel 3.

*Research activities:* Engineering research for the developing of ideas and inventions; mechanical, electrical, photographic, optical, and wood industrial experimental research; industrial project engineering. (Research initiated 1933.)

*Library:* 200 volumes; 50,000 classified clippings covering the last twenty-five years.

**2049. Speer Carbon Company, St. Marys, Pa.**

*President:* Andrew Kaul III.

*Research staff:* Arthur S. Bemis, Vice President in charge of production and research; Harald W. Abbott, Director of Laboratories; Millard S. May, Service Manager. 3 chemists, 5 engineers; technical personnel 27; additional personnel 7.

*Research activities:* The development of carbon, electrographite, and metalgraphite suitable for use in industry; the investigation of the properties of various carbon materials and their characteristics when used on industrial apparatus such as motors, generators, electric furnaces, electrolytic cells, etc. (Research initiated 1898.)

*Library:* 250 volumes.

*See also* International Graphite and Electrode Corporation.

**Spencer Lens Company.** *See* American Optical Company.

**2050. Sperry and Company, D. R., Batavia, Ill.**

*President:* D. R. Sperry, Sr.

*Laboratory:* North Aurora, Ill.

*Research staff:* D. R. Sperry, Sr., Director. 2 engineers.

*Research activities:* Filtration. (Research initiated 1914.)

*Library:* A library is maintained.

**2051. Sperry Gyroscope Company, Inc., Great Neck, N. Y. (Affiliate of Sperry Corporation.)**

*President:* R. E. Gillmor.

*Laboratory:* Garden City, N. Y.

*Research staff:* Carl A. Frische, Chief Research Director. 5 chemists, 75 physicists, 1 metallurgist, 275 engineers; technical personnel 1050; additional personnel 850.

*Research activities:* Aircraft and marine instruments; fire control; radio and servo-mechanisms; aircraft radio navigation; flight research. (Research initiated 1920.)

*Library:* 3,132 volumes.

*Cooperative research:* One grant for research is made.

**2052. Sperry Products, Inc., 1505 Willow Ave., Hoboken, N. J.**

*President:* J. B. Farwell.

*Research staff:* Elmer A. Sperry, Jr. and Harcourt C. Drake, Directors. 8 engineers; technical personnel 2.

*Research activities:* Development of equipment for nondestructive testing such as detector cars for rails, electric detectors for tubing and bar stock, supersonic instruments for miscellaneous materials; rail flash welding; hydraulic controls. (Research initiated 1926.)

**Spool Cotton Company.** *See* Clark Thread Company.

**2053. Sprague Electric Company, North Adams, Mass.**

*President:* Robert C. Sprague.

*Laboratories:* Beaver St., Marshall St., and Brown St. plants, North Adams, Mass.

*Research staff:* Preston Robinson, Director; John Burnham, Assistant Director. 8 chemists, 2 physicists, 8 engineers; technical personnel 25; additional personnel 3.

*Research activities:* Electrical condensers; solid and liquid electrical insulation. (Research initiated 1929.)

*Library:* 300 volumes.

*Cooperative research:* Three grants for research are made.

**Sprague Sells Division Laboratory.** *See* Food Machinery Corporation.

**2054. Spreckels Sugar Company, 2 Pine St., San Francisco 11, Calif.**

*President:* Frank J. Belcher, Jr.

*Laboratory:* Woodland, Calif.

*Research staff:* P. W. Alston, General Chemist; R. A. McGinnis, Research Director. 5 chemists; technical personnel 3; additional personnel 1.

*Research activities:* The processing of sugar beets to granulated sugar; associated problems. (Research initiated 1939.)

*Library:* 400 volumes.

**2055. Spring Perch Company, Inc., Hamburg Turnpike, Lackawanna, N. Y.**

*President:* Harold T. Dow.

*Research staff:* Harold T. Dow, Director; C. W. Bartlett, Engineer. 1 metallurgist, 1 engineer; additional personnel 2.

*Research activities:* Research in the riding qualities of leaf springs. (Research initiated 1935.)

**Square D Company.** See No. 2442 in *Addenda*.

**2056. Squibb and Sons, E. R., 745 Fifth Ave., New York, N. Y.**

*President:* Lowell P. Weicker.

**SQUIBB INSTITUTE FOR MEDICAL RESEARCH**  
New Brunswick, N. J.

*Research staff:* James A. Shannon, Director. 25 chemists, 1 physicist, 8 biologists, 2 engineers, 5 physicians, 4 microbiologists; technical personnel 60; additional personnel 20.

*Research activities:* Organic medicinal, and physical chemistry; pharmacology; bacteriology; virus diseases; antibiotics and chemotherapeutic agents; nutrition. (Research initiated 1938.)

*Library:* 6,000 volumes.

*Scientific periodicals:* The Field and the Work of the Squibb Institute. Vol. I, 1938.

*Cooperative research:* Four fellowships are supported and three grants for research are made.

**NEW BRUNSWICK MANUFACTURING**  
**LABORATORY**

New Brunswick, N. J.

*Research staff:* H. A. Holaday, Acting Director of products development. 19 chemists, 1 physicist, 1 biologist, 3 engineers, 15 biochemists, 8 bacteriologists, 2 pharmacologists, 2 veterinarians, 1 statistician, 3 virologists, 1 pathologist, 1 mycologist; technical personnel 57; additional personnel 55.

*Research activities:* Antibiotics; biologicals, including antigens, virus products, human blood products, serums, and antitoxins; vitamins and

other nutritional products; endocrines; anesthetics; alkaloids; synthetic medicinal chemicals; bacteriology; pharmacology and animal pathology; optical physics; parenteral solutions; product, process, and equipment research. (Research initiated 1915.)

**BROOKLYN MANUFACTURING LABORATORY**  
25 Columbia Heights, Brooklyn 2, N. Y.

*Research staff:* Walter G. Christiansen, Technical Director of product development and control. 20 chemists; technical personnel 2; additional personnel 5.

*Research activities:* All Brooklyn activities relate to the creation of market forms of medicinal drugs, pharmaceuticals, vitamin preparations, etc. (Research initiated 1858.)

*Library:* 15,000 volumes; 50,000 periodicals.

**2057. Stackpole Carbon Company, St. Marys, Pa.**

*President:* Lyle G. Hall.

*Research staff:* V. H. Sanders, Director; H. J. LeGrys, Chief Chemist. 5 chemists, 1 physicist, 2 metallurgists, 12 engineers; additional personnel 35.

*Research activities:* Search for new uses for carbon and graphite; improvement of manufacturing processes; development work on resistors, iron cores, volume controls, and tone controls for radio work; suppressors for automobile radios; improvement of brushes for motors and generators; carbon rods, paste, and blocks for welding; furnace electrodes; anodes for electrolytic cells; electrical contacts; battery carbons; impervious carbon; electrical switches; permanent magnets; sintered iron; powder metallurgy; carbon piles; condensers; ceramic resistors; other carbon specialties. (Research initiated 1915.)

*Library:* 2,000 volumes.

*Cooperative research:* One grant for research is made.

**2058. Staley Manufacturing Company, A. E., Decatur 60, Ill.**

*President:* A. E. Staley, Jr.

*Research staff:* W. W. Moyer, Director of research; H. File, Technical Director; L. O. Gill, Technical Service Director. 31 chemists, 1 physicist, 2 biologists, 8 engineers; technical personnel 45; additional personnel 12.

*Research activities:* The development of new products from corn, soybeans, and derived raw materials; starch, syrup, dextrose, proteins, amino acids, corn and soybean oils; production of chemical specialties such as levulinic acid and inositol; production of nutrients for fermentation processes; improved products for food and industrial uses; problems pertaining to the processing of corn and soybeans. (Research initiated 1912.)



*Library:* 2,000 volumes.

*Cooperative research:* Occasional grants for research are made.

**2059. Stamford Rubber Supply Company, off Shippan Ave., Stamford, Conn.**

*President:* Kirglsley A. Gillespie.

*Research staff:* Robert M. Gillespie, Director. 4 chemists; technical personnel 2; additional personnel 1.

*Research activities:* The vulcanization of fatty oils by sulfur or sulfur monochloride in solid and dispersed phases. (Research initiated 1916.)

*Library:* 500 volumes.

**2060. Stanco, Inc., 216 West 14th St., New York 11, N. Y. (Subsidiary of Standard Oil Company of New Jersey.)**

*President:* F. W. Moss.

*Laboratory:* Elizabeth, N. J.

*Research staff:* E. B. Hunn, Director. 11 chemists, 2 entomologists; technical personnel 15; additional personnel 2.

*Research activities:* The development of household and agricultural insecticides and insect repellents; the development of petroleum specialty products such as polishes, cleaning preparations, etc., for household, automobile, and industrial application; pharmaceutical specialty products. (Research initiated 1931.)

*Cooperative research:* Two fellowships are supported.

*See also* Daggett and Ramsdell.

**2061. Standard Brands, Inc., 595 Madison Ave., New York 22, N. Y.**

*President:* James S. Adams.

*Research staff:* John L. Bogert, Vice President in charge of research and development; H. C. Bennett, Assistant to Vice President.

#### FLEISCHMANN LABORATORIES

810 Grand Concourse, Bronx 51, N. Y.

*Research staff:* Robert F. Light, Laboratory Manager; George W. Kirby, Technical Director. 24 chemists, 4 biologists, 7 engineers, 5 bacteriologists; technical personnel 25; additional personnel 27.

*Research activities:* Problems relating to foods and to the baking industry; investigations on yeast, alcohol, malt products, dough improvers, vitamins, coffee, frozen foods, baking technology, enzymes, baking powders, nutritive evaluation of foods, and other related subjects; development of improved manufacturing procedures. (Research initiated 1922.)

*Library:* 1,700 volumes.

*Cooperative research:* Ten fellowships are supported and three grants for research are made.

#### ROYAL LABORATORY

Kent Ave. and Morton St., Brooklyn 11, N. Y.

*Research staff:* Charles G. Ferrari, Assistant to Vice President; Margaret H. Kennedy, Laboratory Director. 4 chemists; additional personnel 1.

*Research activities:* Baking powders, gelatin, puddings, flavors, starches, cocoa, carbohydrates, and shortening. (Research initiated 1898.)

*See also* Shefford Cheese Company; Standard Margarine Company; Strong, Cobb and Company, Inc.

**Standard Coated Products Division, Interchemical Corporation. See Interchemical Corporation.**

**2062. Standard Margarine Company, Indianapolis 6, Ind. (Subsidiary of Standard Brands, Inc.)**

*President:* F. T. Lewis.

*Research staff:* A. A. Robinson, Technical Director. 3 chemists; technical personnel 3.

*Research activities:* Fats and oils. (Research initiated 1944.)

**2063. Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Ill.**

*Chairman of the Board:* Robert E. Wilson.

*President:* A. W. Peake.

*Laboratories:* Whiting, Ind.; Wood River, Ill.; Sugar Creek, Mo.; Neodesha, Kans.; Casper and Greybull, Wyo.

*Research staff:* J. K. Roberts, General Manager of research; M. T. Carpenter, Executive Director; W. H. Bahlke, D. P. Barnard, J. H. Forrester, R. C. Gunness, and T. H. Rogers, Associate Directors of research. 3 assistant directors of research; 1 superintendent and 2 assistant superintendents of technical service; 5 chief chemists. 208 chemists and chemical engineers, 3 physicists, 11 mechanical engineers; additional personnel 442.

*Research activities:* The study of refinery processes (cracking, alkylation, polymerization, isomerization, acid treating, filtration, and dewaxing); catalytic reactions; the utilization of motor fuels and lubricants. The improvement of products including motor and Diesel fuels and lubricants; specialty products such as solvents, tree sprays, insect sprays, polishes and transformer oils, chemicals, and domestic and industrial heating oils. The investigation of the physical properties of hydrocarbons; theoretical studies of unit processes such as fractionation, absorption, heat flow and flow of fluids; theoretical organic chemistry (mechanism of reactions and synthesis). (Research initiated 1890.)

*Library:* 5,500 volumes.

*See also* Stanolind Oil and Gas Company.

**Standard Oil Company of California.** *See* California Research Corporation and American Bitumuls Company.

**2064. Standard Oil Company of New Jersey—Louisiana Division, Baton Rouge 1, La.**

*President:* M. J. Rathbone.

*Research staff:* C. L. Brown, Director; A. Voorhies, Jr., Associate Director; R. W. Richardson, Assistant Director. 52 chemists, 2 physicists, 42 engineers; additional personnel 300.

*Research activities:* The development of new processes for petroleum refining, and new products therefrom; the manufacture of chemicals, rubber, etc., from petroleum raw materials. (Research initiated 1927.)

*Library:* 4,000 volumes.

**2065. Standard Oil Company (Ohio), Midland Bldg., Cleveland 15, Ohio.**

*President:* W. T. Holliday.

*Laboratory:* Chemical Research Laboratory, 2127 Cornell Road, Cleveland 6, Ohio.

*Research staff:* Everett C. Hughes, Chief, Chemical Research Division; E. B. McConnell, Chief, Refineries Process and Development Division; Jos. August, Chief, Technical Service Division. 33 chemists, 32 engineers; technical personnel 32; additional personnel 31.

*Research activities:* Petroleum. (Research initiated 1929.)

*Library:* 1,000 volumes.

*Cooperative research:* Four fellowships are supported and one grant for research is made.

**2066. Standard Oil Development Company, 30 Rockefeller Plaza, New York 20, N. Y. (The Technical Subsidiary of Standard Oil Company of New Jersey.)**

*President:* R. P. Russell.

*Laboratories:* Linden, N. J. (Mail address: P. O. Box 243, Elizabeth B, N. J.)

*Research staff:* *Research and Development Departments:* E. V. Murphree, Vice President in charge; W. C. Asbury and W. J. Sweeney, Assistant Managers. *Esso Laboratories:* Research Division: E. D. Reeves, Director; F. L. Miller, Associate Director; A. J. Blackwood, S. C. Fulton, and C. O. Tongberg, Assistant Directors. Chemical Division: P. K. Frolich, Director; J. R. Brown, Jr., C. E. Morrell, and W. J. Sparks, Assistant Directors. Development Division: A. D. Green, Manager; E. J. Gohr, Associate Manager. Process Division: H. G. M. Fischer, Manager; N. F. Myers, Associate Manager; A. P. Hewlett, Assistant Manager. *Technical Service Departments:* N. E.

Loomis, Vice President in charge. General Engineering Department: E. H. Barlow, Chief Engineer; C. E. Paules, Assistant Engineer. Process Engineering Department: E. W. Luster, Chief Engineer; P. J. Byrne, Jr., Assistant Chief Engineer. Standard Inspection Laboratory: E. W. Dean, Director; C. A. Neusbaum, Assistant Director. *Legal Department:* W. R. Carlisle, Vice President in charge. *Patent Department:* W. E. Currie, Vice President in charge; P. L. Young, Manager. 165 chemists, 4 physicists, 2 metallurgists, 264 engineers; technical personnel 53; additional personnel 901.

*Research activities:* Petroleum, natural gas, and the production of chemicals from petroleum raw materials. (Research initiated 1919.)

*Library:* 15,000 volumes, pamphlets, and other catalogued material; 10,000 bound and unbound journals and periodicals.

*Cooperative research:* Several grants for research are made.

**2067. Standard Products Company, 505 Boulevard Bldg., Detroit 2, Mich.**

*President:* J. S. Reid.

*Laboratory:* 100 South Mill St., Plymouth, Mich.

*Research staff:* D. R. Stamy, Director. 2 chemists, 1 physicist, 1 metallurgist, 4 engineers; additional personnel 10.

*Research activities:* Helicopter rotor blades; single valve engine for Signal Corps; plastic vision devices for Ordnance Department; mirrorizing; centrifugal castings; dispensing machines; broilers; plastic ice trays. (Research initiated 1940.)

**2068. Standard Steel Spring Company, 4th Ave., Coraopolis, Pa.**

*President:* R. C. Enos.

*Research staff:* C. J. Queenan, Executive Vice President in charge of research; M. B. Hammond, Vice President in charge of research and development; L. C. Conradi, Technical Director; F. W. Stockton, Electrochemical Research; G. B. Bowman, Chief Chemist; C. W. Holmes, Chief Metallographer. 2 chemists, 1 physicist, 1 metallurgist, 6 engineers, 1 in another scientific profession; technical personnel 27; additional personnel 7.

*Research activities:* Corrosion proof metallic coatings; carbon steel physical research; electroplating. (Research initiated 1928.)

*Library:* 400 volumes.

**2069. Standard Testing Laboratories, Inc., 309 Cortlandt St., Belleville 9, N. J.**

*President:* Walter Hornbruch.

*Research staff:* Walter Hornbruch, Director. 3 chemists, 1 metallurgist; technical personnel 2; additional personnel 1.

*Research activities:* Process to recover tin,

antimony, and copper from furnace speiss; analytical methods on tin ores; extraction of mercury from mercury-bearing zinc scrap; extraction of tungsten and molybdenum from various forms of scrap and residues. (Research initiated 1927.)

*Library:* 100 volumes.

**2070. Standard Varnish Works, 2600 Richmond Terrace, Staten Island 3, N. Y.**

*President:* J. Heath Wood.

*Research staff:* M. H. Corbin, Vice President and Director of research. 19 chemists, 4 engineers; additional personnel 2.

*Research activities:* Paints, enamels, varnishes, and protective coatings. (Research initiated 1870.)

*Library:* 400 volumes.

**2071. Stange Company, William J., 2536 West Monroe St., Chicago 12, Ill.**

*President:* William B. Durling.

*Research staff:* Aladar Fonyo, Vice President in charge of research. 8 chemists.

*Research activities:* Process development in the production of food flavoring materials, food coloring, and antioxidants; new applications of materials to products of the food industry. (Research initiated 1904.)

*Cooperative research:* Two fellowships are supported.

**2072. Stanley Chemical Company, East Berlin, Conn. (Subsidiary of Stanley Works.)**

*President:* William J. Kerin.

*Research staff:* E. M. Hayden, Vice President in charge of research. 7 chemists, 1 engineer; technical personnel 2; additional personnel 5.

*Research activities:* Problems connected with the production of coatings for industrial finishing. (Research initiated 1919.)

**Stanley Mill, Inc. See Carter Fabrics Corporation.**

**2073. Stanley Works, corner of Grove Hill and Lake St., New Britain, Conn.**

*President:* R. E. Pritchard.

*Research staff:* B. M. Crum, Technical Director. 5 chemists, 2 metallurgists, 1 engineer; technical personnel 3; additional personnel 1.

*Research activities:* Methods, materials, and design of woodworking tools, both hand and electrically driven; builders' hardware; hot and cold rolled steel; lacquers and enamels. (Research initiated 1911.)

AMERICAN TUBE AND STAMPING DIVISION  
Seaview Ave., Bridgeport 7, Conn.

*Research staff:* James E. Malloy, Metallur-

gical Engineer; Robert L. Baldwin, Chief Chemist. 5 chemists, 2 metallurgists, 1 engineer; technical personnel 1; additional personnel 3.

*Research activities:* Improvement of the quality of hot rolled and cold rolled strip steel; spectrographic analysis of raw materials and the finished product with the object of improving quality and reducing costs. (Research initiated 1923.)

*See also Stanley Chemical Company.*

**2074. Stanolind Oil and Gas Company, Stanolind Bldg., Tulsa 2, Okla. (Subsidiary of Standard Oil Company of Indiana.)**

*President:* E. F. Bullard.

*Research staff:* George Roberts, Jr., Manager, Research Department.

*Exploration Research Section:* Daniel Silverman, Supervisor; V. Emanuel, Design and Construction Supervisor. 1 research group supervisor, 3 technical group supervisors, 1 physicist, 11 research engineers; technical personnel 11; additional personnel 45.

*Production Research Section:* Joseph B. Clark, Jr., Supervisor. 3 technical group supervisors, 1 chief chemist, 6 chemists, 8 research engineers; technical personnel 24; additional personnel 3.

*Process Research Section:* George Roberts, Jr., Supervisor; John A. Phinney, Process Design Supervisor; Robert V. Safford, Pilot Plant Supervisor. 3 process engineers, 1 equipment engineer, 2 research engineers, 3 apprentice engineers; technical personnel 27; additional personnel 12.

*Research activities: Exploration Research Section:* Geophysical instruments and equipment; investigation of new methods of geophysical prospecting; electronic instruments applicable to the production of oil and gas; problems of electrical and mechanical wave propagation basic to geophysical prospecting.

*Production Research Section:* Chemical and engineering problems related to the production of oil and the manufacture of natural gasoline; development of new production methods and equipment; routine and control analyses work. *Process Research Section:* Investigation and evaluation of processes related to the utilization of natural gas, including experimental studies and design of commercial installations. (Research initiated 1933.)

*Library:* 600 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

**2075. Stearns and Company, Frederick, 6533 East Jefferson, Detroit 31, Mich. (Division of Sterling Drug, Inc.)**

*Vice President and General Manager:* J. Mark Hiebert.

*Research staff:* Melville Sahyun, Vice President in charge of research. 12 chemists, 4 engineers, 3 physicians; technical personnel 20.

*Research activities:* Protein nutrition; amino acids; sympathomimetics; antispasmodics; antibiotics; enzymes; ophthalmic studies; analgesics. (Research initiated 1855.)

*Library:* 2,000 volumes.

*Cooperative research:* Fifteen fellowships are supported and five grants for research are made.

**2076. Stebbins Engineering and Manufacturing Company, Eastern Blvd., Watertown, N. Y.**

*President:* C. F. Richter. *Vice President:* E. F. Tucker.

*Research staff:* Beaumont Thomas, Chief Chemist. 3 chemists, 9 engineers; technical personnel 5.

*Research activities:* The investigation and development of construction materials for acid-proof and corrosionproof linings for chemical process vessels; corrosion studies. (Research initiated 1936.)

*Library:* 2,000 volumes.

**2077. Stein, Hall and Company, Inc., 285 Madison Ave., New York 17, N. Y.**

*President:* Edwin Stein.

*Laboratories:* Starch and Allied Research, Plant and Applied Research, and Paper Laboratories, New York, N. Y.; Adhesive, and Food Laboratories, New York, N. Y., and Chicago, Ill.; Textile Laboratories, New York, N. Y., Providence, R. I., and Charlotte, N. C.

*Research staff:* Alexander Frieden, Vice President and Technical Director. In charge of laboratories: G. V. Caesar, Starch and Allied Research; T. G. Heiser, Plant and Applied Research; J. V. Bauer, Adhesives; S. J. Werbin, Food, New York; Elmer Glabe, Food, Chicago; F. G. LaPiana, Textiles, Providence; D. E. Truax, Textiles, Charlotte. 25 chemists, 1 physicist, 3 engineers, 8 assistant chemists; technical personnel 5; additional personnel 7.

*Research activities:* The development of new products, new processes, and new applications relating to the manufacture and use of starches, dextrines, gums, resins, egg products, tapioca, vegetable stabilizers; burlap as applied to textiles, adhesives, paper, and food; the development of new plant methods; the investigation of competitive products; service testing for customers; pilot plant tests; routine testing of raw and manufactured materials. (Research initiated 1910.)

*Cooperative research:* One fellowship is supported.

**2078. Stein Laboratories, Fred, 121 North 4th St., Atchison, Kans.**

*President:* Fred W. Stein.

*Research staff:* Fred W. Stein, Director;

E. A. Moore, Vice President; E. S. Arthur; J. L. Tomlinson. 2 chemists, 2 engineers; technical personnel 4; additional personnel 6.

*Research activities:* The development of electronic apparatus for the measurement of the characteristics of materials: the moisture content of woods, grains, oils, dairy products, fruits, etc.; the development of a practical apparatus to be used for these purposes. (Research initiated 1937.)

**2079. Steinway and Sons, 109 West 57th St., New York, N. Y.**

*President:* Theodore E. Steinway.

*Laboratory:* Steinway, Long Island City, N. Y.

*Research staff:* P. H. Bilhuber, Vice President in charge of research. 2 engineers, 2 in other scientific professions.

*Research activities:* Piano tone, touch, and design; gray iron castings; general acoustics; wood finishes; woodworking; high frequency heating. (Research initiated 1878.)

*Library:* 200 volumes.

**2080. Stella Cheese Company, 20 North Jefferson St., Chicago, Ill.**

*President:* A. Castigliano.

*Laboratory:* Cumberland, Wis.

*Research staff:* 1 chemist, 1 bacteriologist.

*Research activities:* Dairy products, especially cheese, with particular attention to rennet. (Research initiated 1937.)

**2081. Stephens-Adamson Manufacturing Company, Aurora, Ill.**

*President:* L. S. Stephens.

*Research staff:* A. D. Sinden, Assistant Chief Engineer. 1 engineer; additional personnel 2.

*Research activities:* Problems in the design and manufacture of material handling, conveying, transmission, screening, and crushing machinery. (Research initiated 1935.)

**2082. Stepl Laboratories, 1012 North 3rd St., Milwaukee, Wis.**

*President:* John F. Stepl.

*Research staff:* John F. Stepl, Director. 2 chemists, 1 biologist and bacteriologist; additional personnel 1.

*Research activities:* Food products, beer, grain, and malt. (Research initiated 1926.)

**2083. Sterling Varnish Company, Haysville, Pa.**

*President:* C. H. Fink.

*Research staff:* C. H. Cook, Director. 4 chemists, 1 engineer; additional personnel 3.

*Research activities:* Insulating varnishes for electrical insulation and other technical coatings. (Research initiated 1894.)

- 2084. Stern and Company, Inc., Edward, 140 North 6th St., Philadelphia 6, Pa.**  
*President:* Charles Weyl.  
*Research staff:* Carl C. Chambers, Director of research; Walter A. Goldsmith, Technical Director. 3 engineers; technical personnel 2; additional personnel 1.  
*Research activities:* Lithographic, letterpress, and special process printing; process photography; optics: fine line reticles. (Research initiated 1929.)  
*Library:* 100 volumes.  
*Cooperative research:* Two grants for research are made.
- 2085. Stetson Company, John B., 5th St. and Montgomery Ave., Philadelphia 22, Pa.**  
*President:* George L. Russell, Jr.  
*Research staff:* Alfred E. Hodshon, Vice President in charge of research; Harold H. Tucker, Director. 3 chemists, 1 engineer; technical personnel 7; additional personnel 1.  
*Research activities:* Chemical treatment of fur fibers and new methods of hat manufacturing for improvement in quality and reduction in cost. (Research initiated 1920.)
- 2086. Stevens and Company, Inc., J. P., 44 Leonard St., New York, N. Y.**  
*President:* R. T. Stevens.  
*Research staff:* J. B. Goldberg, Director. 1 chemist, 1 engineer, 3 textile technicians; additional personnel 3.  
*Research activities:* Fabric improvement through the investigation of complaints, cause of defects, etc. (Research initiated 1937.)
- 2087. Stevens and Sons Company, M. T., North Andover, Mass.**  
*President:* Nathaniel Stevens.  
*Laboratory:* Textile Research and Control Laboratory, The Derby Company, 49 Blanchard St., Lawrence, Mass.  
*Research staff:* R. E. Derby, Director; E. B. Bell, textile process research; James Cummings, dye research. 4 chemists; additional personnel 2.  
*Research activities:* Development of textile processes. (Research initiated 1924.)
- 2088. Stewart-Warner Corporation, 1826 Diversey Parkway, Chicago 14, Ill.**  
*President:* James S. Knowlson.  
*Laboratories:* 1826 Diversey Parkway, Chicago, Ill.; Die Casting Division, 4535 Fullerton Ave., Chicago, Ill.; South Wind Heater Division, 1514 Drovers St., Indianapolis, Ind.; Bassick Company, 38 Austin St., Bridgeport, Conn.; Stewart-Warner-Alemite Corporation of Canada, Belleville, Ont.  
*Research staff:* George F. Thomas, Director; A. W. Le Fevre, Automotive and Alemite Products; G. W. Oehlsch, Jr., Radio and Television (Stewart-Warner Corporation, Chicago); B. E. Sandell, Die Castings and Metallurgy (Die Casting Division); W. F. Herold, Caster Division; E. G. Rasmussen, Automotive Division (The Bassick Company); F. R. Pounsett, Electronics, Radio, Amplifiers (Stewart-Warner-Alemite Corporation of Canada). 1 chemist, 1 physicist, 1 metallurgist, 59 engineers; technical personnel 63; additional personnel 36.  
*Research activities:* Automobile accessories, lubricating devices, radio and television, gasoline burning heaters, furniture casters, chair irons, automobile hardware, and new products.
- 2089. Stillwell and Gladding, Inc., 130 Cedar St., New York 6, N. Y.**  
*President:* Ralph W. Bailey.  
*Research staff:* Henry E. Cutts, Vice President in charge of research. 4 chemists; technical personnel 3; additional personnel 2.  
*Research activities:* General analytical work on organic and inorganic compounds; the investigation of chemical formulas for factory control; salvage work on damaged cargoes. (Research initiated 1868.)  
*Library:* 500 volumes.
- 2090. Stimson Lumber Company, Forest Grove, Oreg.**  
*President:* C. W. Stimson.  
*Research staff:* Arnold E. Lubach, Chemical Engineer. 1 chemist; technical personnel 1.  
*Research activities:* Plastics and adhesives; waste wood utilization. (Research initiated 1938.)
- 2091. Stokely-Van Camp, Inc., 941 North Meridian St., Indianapolis, Ind.**  
*President:* William B. Stokely.  
*Laboratory:* 2002 South East St., Indianapolis, Ind.  
*Research staff:* George C. Kolb, Chief Chemist. 6 chemists, 1 physicist, 1 biologist; technical personnel 6; additional personnel 12.  
*Research activities:* Canned foods: the preservation of their food values; the effects of different processing procedures on their retention of color, flavor, and food values; the utilization of their by-products; sanitation in canning operations. (Research initiated 1881.)  
*Library:* 500 volumes.
- 2092. Stokes Machine Company, F. J., Tabor Road, Philadelphia 20, Pa.**  
*President:* F. J. Stokes, Sr.  
*Research staff:* Earl W. Flosdorf, Director. 3 chemists, 2 physicists, 1 biologist, 1 metallurgist, 20 engineers; technical personnel 1; additional personnel 4.

*Research activities:* Tablet machines, plastic molding presses, water stills, vacuum equipment, high vacuum pumps, and pharmaceutical equipment. (Research initiated 1900.)

**2093. Stokes Rubber Company, Jos., Trenton 4, N. J.**

*President:* W. J. B. Stokes.

*Research staff:* E. R. Laning, Chief Chemist. 3 chemists, 3 engineers; technical personnel 3.

*Research activities:* Rubber chemistry. (Research initiated 1930.)

*Library:* 100 volumes.

**2094. Stoner-Mudge, Inc., 2000 Westhall St., Pittsburgh 12, Pa.**

*President:* F. R. Stoner, Jr.

*Research staff:* D. M. Gray, Vice President in charge of research; G. M. Shiffler, Manager, Works Laboratory; G. W. Seagren, Senior Fellow, Mellon Institute of Industrial Research. 9 chemists, 1 physicist, 1 metallurgist, 4 engineers; technical personnel 9; additional personnel 4.

*Research activities:* Protective coatings based on synthetic resins and elastomeric compounds. (Research initiated 1932.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported.

**Stonewall Plant, Merck and Company, Inc. See Merck and Company, Inc.**

**2095. Strasburger and Siegel, 15 South Gay St., Baltimore 2, Md.**

*Research staff:* 4 chemists; additional personnel 3.

*Research activities:* Consulting research for the food industry. (Research initiated 1926.)

*Library:* 150 volumes.

**2096. Strathmore Paper Company, West Springfield, Mass.**

*President:* John D. Zink.

*Laboratories:* West Springfield and Woro-noco, Mass.

*Research staff:* Percival Gooding, Technical Director. 5 chemists; technical personnel 9; additional personnel 7.

*Research activities:* New paper products and improvement of present products. (Research initiated 1912.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported.

**2097. Straub and Company, W. F., 5520 North-west Highway, Chicago 30, Ill.**

*President:* E. E. McDow.

*Research staff:* W. F. Straub, Director. 3 chemists, 1 engineer.

*Research activities:* Food technology. (Research initiated 1919.)

**2098. Stromberg-Carlson Company, 100 Carlson Road, Rochester 3, N. Y.**

*President:* Ray H. Manson.

*Research staff:* Frederic C. Young, Vice President in charge of engineering and research; George R. Town, Manager of engineering and research; Benjamin Olney, Director of research. 6 chemists, 4 physicists, 1 metallurgist, 99 engineers, 2 mathematicians, 41 draftsmen, 23 mechanics, 1 librarian, 50 technicians; additional personnel 52.

*Research activities:* Design and development of telephone and radio apparatus; electroacoustics and electromechanics; television; applications of electronic tubes; noise reduction; electric recording and reproducing; design and development of sound systems. (Research initiated 1902.)

*Library:* 3,100 volumes.

*Scientific periodicals:* The Engineers' Notebook. Vol. I, 1944.

*Cooperative research:* One grant for research is made.

**2099. Strong, Cobb and Company, Inc., 2654 Lisbon Road, Cleveland 4, Ohio. (Pharmaceutical Division of Standard Brands, Inc.)**

*President:* George Miller.

*Research staff:* W. W. Hosler, Vice President in charge of production and laboratories; Eugene U. Still, Director of research; Robert F. Prindle, Director of chemical laboratory; Jerome Adelstein, Director of pharmacy laboratory; Michael G. Girbino, Chief Pharmacy Chemist; Robert L. Lane, Senior Biochemist. 24 chemists, 1 biologist, 1 engineer, 1 bacteriologist; technical personnel 5; additional personnel 6.

*Research activities:* Vitamin technology, pharmacy, and organic syntheses (hypnotics, anesthetics, fungicides, vitamins, amino acids, and bactericides). (Research initiated 1833.)

*Library:* 3,000 volumes.

*Cooperative research:* A variable number of fellowships are supported and six to ten grants for research are made.

**2100. Struthers-Dunn, Inc., 1321 Arch St., Philadelphia 7, Pa.**

*President:* H. W. Pfeffer.

*Research staff:* Charles A. Packard, Chief

- Engineer. 3 engineers; technical personnel 9; additional personnel 5.  
*Research activities:* Remote control electric relay switches. (Research initiated 1930.)
- 2101. Stuart Oil Company, Ltd., D. A., 2727 South Troy St., Chicago 23, Ill.**  
*President:* William H. Oldacre.  
*Research staff:* William H. Oldacre, Director; Harry A. Erickson. 3 chemists, 1 metallurgist, 2 engineers; additional personnel 6.  
*Research activities:* Cutting fluids and lubricants; drawing and metal-working oils and compounds. (Research initiated 1916.)  
*Library:* 100 volumes.
- 2102. Studebaker Corporation, South Bend 27, Ind.**  
*President:* Paul G. Hoffman.  
*Research staff:* Stanwood W. Sparrow, Director; H. E. Churchill, Chief Research Engineer; W. J. Harris, Chief Metallurgist. 4 chemists, 8 metallurgists, 17 engineers; technical personnel 12; additional personnel 54.  
*Research activities:* Automotive problems. (Research initiated 1926.)
- 2103. Stupakoff Ceramic and Manufacturing Company, Latrobe, Pa.**  
*President:* Semon H. Stupakoff.  
*Research staff:* R. L. Stone, Director of research; J. S. White, Technical Director of research; Frank R. Prescott, Chief of Physics Section; G. F. Bernardini, Chief of Chemistry Section; D. E. Stark, Acting Chief of Electronics Section; R. L. Stone, Acting Chief of Ceramic Section. 2 chemists, 1 physicist, 3 metallurgists, 6 ceramic engineers, 1 electrical engineer; technical personnel 6; additional personnel 7.  
*Research activities:* Ceramic: Body development for electronic applications; raw materials control. Electronic: Development of capacitor parts. Metallurgy: Development of special glass to metal seals. (Research initiated 1897.)  
*Library:* 1,000 volumes.
- 2104. Sturtevant Company, B. F., Hyde Park, Boston, Mass.**  
*President:* E. B. Freeman.  
*Research staff:* H. F. Hagen, Director; R. L. Lincoln, Head, Dust Laboratory; J. Cassie, Head, Installation Analysis Department; J. W. Sullivan, Head, Unit Heater Department; R. Case, Head, Unit Ventilator Department; H. Hemming, Head, Car Cooling and Conditioning Department; C. R. Keep, Head, Air Conditioning Department. 2 physicists, 5 engineers; technical personnel 3.  
*Research activities:* Fans, blowers, unit heaters, unit ventilators, cooling and conditioning units and central systems, and turbines. (Research initiated 1904.)
- 2105. Sturtevant Mill Company, Harrison Square, Boston 22, Mass.**  
*President:* Joseph L. Sturtevant.  
*Research staff:* William T. Doyle, Vice President in charge of research. 3 engineers, 2 in other scientific professions; additional personnel 2.  
*Research activities:* Crushing, grinding, pulverizing, screening, separating by air separators, and mixing and paper mill machinery. (Research initiated 1895.)
- 2106. Submerged Combustion Company of America, Inc., 759 Logan St., Hammond, Ind.**  
*President:* Theo. S. See.  
*Research staff:* Walter George See, Chief Engineer and Service Manager. 2 engineers.  
*Research activities:* New applications and processes that can be carried on with Submerged Combustion Burners. (Research initiated 1930.)
- 2107. Subterrex, 2711 Westheimer, Houston 6, Tex.**  
*Owner and General Manager:* E. E. Rosaire.  
*Research staff:* E. E. Rosaire, Director. 1 chemist; additional personnel 1.  
*Research activities:* Geochemical prospecting for petroleum. (Research initiated 1937.)  
*Library:* 250 volumes.
- 2108. Suhm Company, Inc., 1942-1950 South Kinnickinnic Ave., Milwaukee, Wis.**  
*President:* John J. Suhm.  
*Research staff:* Clarence F. Suhm, Director. 3 chemists, 2 engineers; additional personnel 1.  
*Research activities:* Water correction problems; household insecticides; disinfectants (sodium hypochlorites).
- 2109. Sullivan Machinery Company, Michigan City, Ind.**  
*President:* J. D. A. Morrow.  
*Laboratories:* Michigan City, Ind.; Claremont, N. H.  
*Research staff:* W. W. Paget, Research Engineer; John Miller, Chief Metallurgist. 1 chemist, 1 metallurgist, 3 engineers, 2 geologists; technical personnel 3.  
*Research activities:* Testing of iron and steel; development of sintered metal products used in diamond drilling; high-altitude low temperature testing. (Research initiated 1940.)  
*Library:* 200 volumes.

**2110. Sullivan Mining Company, Box 209, Kellogg, Idaho.**

*President:* Stanly A. Easton.

*Research staff:* W. G. Woolf, Superintendent; A. Y. Bethune, Chief Metallurgist in charge of laboratory. 2 chemists, 4 metallurgists, 1 engineer; technical personnel 5; additional personnel 2.

*Research activities:* Development and improvement of the electrolytic zinc process and zinc-base die-casting alloys; properties and new uses for superpurity high grade zinc metal. (Research initiated 1927.)

*Library:* 200 volumes.

*Cooperative research:* One fellowship is supported.

**2111. Sulphite Pulp Manufacturers' Committee on Waste Disposal, Box 498, Appleton, Wis.**

*Chairman of Executive Committee:* J. M. Conway.

*Laboratory:* Institute of Paper Chemistry, Appleton, Wis.

*Research staff:* H. A. Rothchild, Chairman of Technical Division; J. M. Holderby, Coordinator of research (on leave with U. S. Army); A. J. Wiley, Acting Coordinator of research. 2 chemists, 2 fermentation biochemists, 1 chemical engineer, 1 pilot plant operator; additional personnel 2.

*Research activities:* Fermentative utilization of wood sugars and related compounds present in sulfite waste liquor; chemical utilization of the lignin fraction of sulfite waste liquor; the study of various practical methods of utilizing or disposing of sulfite waste liquor or of derived products for agricultural uses, road construction, river reeration, etc. (Research initiated 1939.)

*Cooperative research:* Several grants for research are made.

**2112. Summerill Tubing Company, Bridgeport, Montgomery County, Pa.**

*President:* E. L. Parker.

*Research staff:* R. R. Lawson, Executive Vice President in charge of research; Arthur J. Williamson, Chief Metallurgist. 2 chemists, 2 metallurgists, 2 engineers; technical personnel 6.

*Research activities:* Improvement of the quality of the present product; reduction of costs; new alloys in tubing form; standardization; new sizes and alloys for new applications; sales and service. (Research initiated 1925.)

*Library:* 200 volumes.

*Cooperative research:* Occasional grants for research are made.

**2113. Sun Chemical Corporation, 100 Sixth Ave., New York 13, N. Y.**

*President:* Albin K. Schoepf.

*Laboratories:* Sun Chemical Corporation, 100

Sixth Ave., New York, N. Y.; Pigments Division, Harrison, N. J.; American Printing Ink Company, Chicago, Ill.; Eagle Printing Ink Company, Jersey City, N. J.; Fuchs and Lang Manufacturing Company, East Rutherford, N. J.; A. C. Horn Company, Long Island City, N. Y.; E. J. Kelly Company, Kalamazoo, Mich.; George H. Morrill Company, Norwood, Mass.; Warwick Chemical Company, West Warwick, R. I.; Warwick Chemical Corporation, 221 West 57th St., New York, N. Y.; Warwick Wax Company, Chanute, Kans.

*Research staff:* William F. Talbot, Executive Officer in charge of research; Paul V. McKinney, Director of research; Floyd E. Barmeier, Director of development; Cecil E. Johnson, Assistant Director of development. 57 chemists; technical personnel 37; additional personnel 25.

*Research activities:* Printing ink including news, lithographic, and rotogravure ink; dry colors; lithographic presses and equipment; miscellaneous lithographic supplies, such as adhesives, etc. Paints, varnishes, and industrial finishes and coatings. Special chemicals including wetting agents and detergents, textile treating agents, and waterproofing and moisture-proofing materials and waxes. (Research initiated 1908.)

*Library:* 500 volumes.

**2114. Sun Oil Company, 1608 Walnut St., Philadelphia 3, Pa.**

*President:* J. Howard Pew.

*Laboratories:* Marcus Hook and Norwood, Pa.

*Research staff:* J. Bennett Hill, Manager, Development Division; Stewart S. Kurtz, Jr., Manager, Experimental Division. 50 chemists, 2 physicists, 3 metallurgists, 67 engineers; technical personnel 115; additional personnel 36.

*Research activities:* Fundamental and applied petroleum research; development of new products and methods; investigation of refinery construction materials; corrosion. (Research initiated 1919.)

*Library:* 6,000 volumes.

*Cooperative research:* Three grants for research are made.

**2115. Superheater Company, 60 East 42nd St., New York 17, N. Y.**

*President:* F. A. Schaff.

*Laboratory:* East Chicago, Ind.

*Research staff:* Arthur Williams, Chief Engineer. 1 chemist, 8 engineers.

*Research activities:* Locomotive and power plant supplies. (Research initiated 1930.)

**2116. Superior Laboratories, 10 West Ohio St., Indianapolis 4, Ind.**

*Owner:* R. A. Havens.

*Research staff:* R. A. Havens, Director; Lee



Fagg; Earl Shoemaker; June Tucker. 1 chemist, 3 biologists; technical personnel 12 to 25; additional personnel 5.

*Research activities:* Food processing research and technology; training and supervision of the work of food technologists; analysis of food products; research on a commercial method of recovering vitamin A. (Research initiated 1933.)

*Library:* 100 volumes.

2117. Superior Oil Company, 930 Edison Bldg., Los Angeles 13, Calif.

*President:* W. M. Keck.

*Laboratory:* Geological Laboratory, Rio Bravo Oil Field, P. O. Box 1031, Bakersfield, Calif.

*Research staff:* R. B. Hutcheson, Chief Paleontologist and Stratigrapher. 2 geologists; technical personnel 3; additional personnel 1.

*Research activities:* Subsurface and surface stratigraphy and structure; petrological, sedimentary, and fluid content studies of oil and gas reservoirs; fluorescent studies of crude petroleum; physical and chemical problems. (Research initiated 1931.)

*Library:* 150 volumes.

2118. Superior Portland Cement, Inc., Concrete, Wash.

*President:* E. P. Lucas.

*Laboratories:* Concrete and Seattle, Wash.

*Research staff:* 2 chemists; technical personnel 10 to 15.

*Research activities:* The development of plant processes and the improvement of portland cement. (Research initiated 1908.)

2119. Superior Railway Products Corporation, 7501 Thomas Blvd., Pittsburgh, Pa.

*Vice President and General Manager:* W. A. Pennington.

*Research staff:* W. E. Youngk, Chief Engineer. 4 engineers.

*Research activities:* Locomotive soot blowers, flue rollers, and friction bearings.

2120. Superior Zinc Corporation, 1600 Walnut St., Philadelphia 3, Pa.

*President:* L. H. Watmough.

*Laboratory:* Bristol, Pa.

*Research staff:* T. R. Janes, Vice President in charge of research; A. M. Kazimer, Director. 1 chemist, 1 metallurgist; technical personnel 2; additional personnel 1.

*Research activities:* The improvement and utilization of zinc. (Research initiated 1926.)

2121. Supplee Research Corporation, G. C., Bainbridge, N. Y.

*President:* G. C. Supplee.

*Research staff:* G. C. Supplee, Director. 2

chemists, 2 biologists; technical personnel 2; additional personnel 2.

*Research activities:* Food and pharmaceutical research, vitamin technology, nutrition, processing, and analytical methods. (Research initiated 1944.)

*Library:* A library is maintained.

2122. Surface Combustion Corporation, 2375 Dorr St., Toledo 1, Ohio.

*President:* Frank H. Adams.

*Laboratories:* Toledo and Columbus, Ohio.

*Research staff:* E. G. de Coriolis (Toledo), industrial furnaces; J. I. Trimble (Columbus), space heating equipment. 2 chemists, 2 metallurgists, 12 engineers; technical personnel 15; additional personnel 8.

*Research activities:* Industrial furnaces, metallurgical gas atmospheres, gas generators, and gas plants; space heating equipment for homes and factories, aircraft heaters, and ground heaters; air dehumidification and air conditioning. (Research initiated 1926.)

2123. Surpass Leather Company, 9th and Westmoreland Sts., Philadelphia, Pa.

*President:* Harold Connett.

*Research staff:* Edward J. White, Director; Reuben G. Henrich. 2 chemists.

*Research activities:* Processing of goat skins for leather manufacture. (Research initiated 1910.)

2124. Surprenant Electrical Insulation Company, 84 Purchase St., Boston 10, Mass.

*Owner:* Albert H. Surprenant.

*Laboratory:* Haven Manufacturing Company, 172 Sterling St., Clinton, Mass.

*Research staff:* George E. Forsberg, Plant Manager; Frederic R. Butler. 2 chemists, 3 engineers; technical personnel 1.

*Research activities:* Development of resins, lacquers, and adhesives for electrical insulation, plastic tubing, tape, etc. (Research initiated 1944.)

*Library:* 100 volumes.

2125. Susquehanna Pipe Line Company, 1608 Walnut St., Philadelphia 3, Pa.

*President:* J. N. Pew, Jr.

*Research staff:* 1 physicist, 1 engineer; technical personnel 1; additional personnel 1.

*Research activities:* Corrosion of metals; development of corrosion testing methods and equipment. (Research initiated 1935.)

2126. Swain Nelson Company, 2320 Glenview Road, Glenview, Ill.

*President:* Gerald Nelson.

*Laboratory:* West Lake Ave. Plant, Glenview, Ill.

*Research staff:* J. O. Crawford, Chief Chemist; J. N. Graef, Chief Engineer. 2 chemists, 1 physicist, 7 engineers; additional personnel 3.  
*Research activities:* Photography; sports; landscaping. (Research initiated 1856.)

**2127. Swan-Finch Oil Corporation, 1605 RCA Bldg., West, New York 20, N. Y.**

*President:* E. V. Moncrieff.  
*Laboratories:* 120 Lister Ave., Newark 5, N. J.

*Research staff:* Carl E. Hartwig, Director. 6 chemists; additional personnel 2.

*Research activities:* Lubricating greases, core oils, cutting oils, grinding oils, drawing compounds, lubricating oils, quenching oils, etc. (Research initiated 1893.)

*Library:* 300 volumes.

**2128. Swartzbaugh Manufacturing Company, 1336 West Bancroft St., Toledo 6, Ohio.**

*President:* C. E. Swartzbaugh.  
*Research staff:* William P. Von Behren, Vice President and Director of engineering. 6 engineers; technical personnel 2.

*Research activities:* Domestic electrical appliances and miscellaneous domestic devices. (Research initiated 1930.)

*Library:* 1,000 volumes.

**2129. Swift and Company, Union Stockyards, Chicago 9, Ill.**

*President:* John Holmes.  
*Research staff:* R. C. Newton, Vice President in charge of research; H. S. Mitchell, Chief Chemist; H. E. Robinson, H. H. Young, and C. C. Zeigler, Assistant Chief Chemists.

*Library:* 3,100 volumes; 3,100 volumes of bound and unbound journals; 22,000 patents; 8,000 pamphlets; 110 current periodicals.

*Cooperative research:* Nineteen fellowships are supported and twenty-seven grants for research are made.

*Laboratories:* Laboratories are maintained at the following plants, refineries, etc. (Research initiated 1900.) Also three laboratories are maintained in Canada, at Toronto, Ont.; Edmonton, Alta.; and Winnipeg, Man.

SWIFT AND COMPANY  
Chicago, Ill.

*Research staff:* H. S. Mitchell, Chief Chemist; H. E. Robinson, H. H. Young, and C. C. Zeigler, Assistant Chief Chemists. 103 technically trained chemists, physicists, biologists, chemical engineers, bacteriologists, microscopists, histologists, nutritionists, dietitians, home economists, veterinarians, etc.; additional personnel 80.

*Research activities:* Pure and applied research and plant development work on fresh

and cured meats; table-ready meats and smoked meat products; edible fats, shortenings, and margarine; soaps, detergents, and glycerin; industrial oils; skins and wool; gelatin, glue, and adhesives; milk, cream, eggs, cheese, and ice cream; poultry; by-products and waste recovery.

SWIFT AND COMPANY  
Fort Worth, Tex.

*Research staff:* J. S. Sandifer, Head Chemist. 2 in scientific professions, 3 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; edible fats, oils, and margarine; industrial oils; dairy and poultry products.

SWIFT AND COMPANY  
Harrison, N. J.

*Research staff:* S. W. Van Duyne, Head Chemist. 3 in scientific professions, 2 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh meat products; gelatin; glues and adhesives; packing-house by-products.

SWIFT AND COMPANY  
Kansas City, Kans.

*Research staff:* R. G. O'Brien, Head Chemist. 2 in scientific professions, 3 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, shortening, and margarine; glues and adhesives; packinghouse by-products.

SWIFT AND COMPANY  
Los Angeles, Calif.

*Research staff:* S. E. Tierney, Head Chemist. 3 in scientific professions, 4 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, shortening, and margarine; dairy products; packinghouse by-products.

SWIFT AND COMPANY  
National Stock Yards, Ill.

*Research staff:* R. F. Lund, Head Chemist. 4 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, shortening, and margarine; packinghouse by-products.

SWIFT AND COMPANY  
North Portland, Oreg.

*Research staff:* T. C. Bond, Head Chemist. 3 in scientific professions.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, shortening, and margarine; dairy and poultry products; glues and adhesives; packinghouse by-products.

ST. LOUIS INDEPENDENT PACKING COMPANY  
St. Louis, Mo.

*Research staff:* R. R. Marsh, Head Chemist. 1 laboratory assistant.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, and shortening; glues and adhesives; packinghouse by-products.

SWIFT AND COMPANY  
South Omaha, Nebr.

*Research staff:* R. W. Starmann, Head Chemist. 5 in scientific professions, 3 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, and shortening; glues and adhesives; dairy and poultry products; packinghouse by-products.

SWIFT AND COMPANY  
South St. Joseph, Mo.

*Research staff:* S. D. Clark, Head Chemist. 1 chemist, 3 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, and shortening; dairy and poultry products; glues and adhesives; packinghouse by-products.

SWIFT AND COMPANY  
South St. Paul, Minn.

*Research staff:* A. G. DePoy, Head Chemist. 3 in scientific professions, 3 laboratory assistants.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, and shortening; dairy and poultry products; glues and adhesives; packinghouse by-products.

SWIFT AND COMPANY  
South San Francisco, Calif.

*Research staff:* J. L. Hale, Head Chemist. 1 chemist, 1 laboratory assistant.

*Research activities:* Process and product control of processing methods for fresh and cured meats; table-ready meats and smoked meat products; fats, oils, and shortening; glues and adhesives; dairy and poultry products; packinghouse by-products.

SWIFT AND COMPANY REFINERY  
Atlanta, Ga.

*Research staff:* E. B. Connell, Head Chemist. 2 in scientific professions, 4 laboratory assistants.

*Research activities:* Process and product control of processing methods for fats, oils, shortening, and margarine.

SWIFT AND COMPANY REFINERY  
Newark, N. J.

*Research staff:* R. H. Rogers, Head Chemist. 4 in scientific professions, 1 laboratory assistant.

*Research activities:* Process and product control of processing methods for fats, oils, and shortenings.

SWIFT AND COMPANY SOAP WORKS  
East Cambridge, Mass.

*Research staff:* J. F. Thompson, Head Chemist. 3 laboratory assistants.

*Research activities:* Process and product control of processing methods for fats, oils, and shortening; soap, glycerin, and alkalis; fresh and cured meats; table-ready meats and smoked meat products; packinghouse by-products.

2130. Sylvania Electric Products, Inc., 500 Fifth Ave., New York 18, N. Y.

*President:* Walter E. Poor.

*Laboratories:* Long Island City, N. Y.; Salem and Boston, Mass.; Emporium, Pa.

*Research staff:* Roger M. Wise, Vice President in charge of engineering. 34 chemists or chemical engineers, 44 physicists, 116 electrical engineers, 14 mechanical engineers, 5 metallurgical engineers, 4 ceramic engineers; technical personnel 24; additional personnel 662.

*Research activities:* Radio receiving tubes, fluorescent and incandescent lamps, lighting fixtures, transmitting tubes, industrial electronic products, and fluorescent powders.

*Libraries:* 1,600 volumes.

*Scientific periodicals:* Sylvania News, Technical Section. Engineering News Letters.

*Cooperative research:* A number of fellowships are supported and several grants for research are made.

*See also* Colonial Radio Corporation.

2131, Sylvania Industrial Corporation, Fredericksburg, Va.

*President:* F. H. Reichel.

*Research staff:* Ralph T. K. Cornwell, Di-

rector. 13 chemists, 2 engineers; technical personnel 30; additional personnel 3.

*Research activities:* Cellulose and regenerated cellulose, moisture-vaporproof lacquers and coating compositions, cellulose ethers as textile sizes, rubber products, plastics, and cellulose products. (Research initiated 1929.)

*Library:* 300 to 500 volumes.

*Cooperative research:* Two fellowships are supported.

**2132. Symington-Gould Corporation, 25 Lincoln Ave., Rochester 3, N. Y.**

*President:* J. A. Sauer.

*Laboratories:* Rochester and Depew, N. Y.

*Research staff:* Donald S. Barrows, Vice President in charge of research; C. Irving Lusink, Chief Mechanical Engineer. 2 chemists, 1 physicist, 2 metallurgists, 4 engineers; technical personnel 3; additional personnel 7.

*Research activities:* The development of improved railroad equipment including car trucks, couplers, draft attachments, and draft gears; general technical research and routine testing for production control. (Research initiated 1910.)

**2133. Synthetic Chemicals, Inc., 335 McLean Blvd., Paterson 3, N. J.**

*Vice President:* J. W. Orelup.

*Research staff:* J. W. Orelup, Director. 4 chemists.

*Research activities:* Wetting and leveling agents; detergents; emulsifying and dispersing agents; dyeing assistants. (Research initiated 1929.)

*Library:* A library is maintained.

**2134. Synthetic Yarns, Inc., 443 Clinton St., Woonsocket, R. I.**

*President:* Charles R. Steedman.

*Research staff:* W. H. Kahler, Director. 2 chemists, 1 engineer; additional personnel 2.

*Research activities:* Theoretical and experimental studies of the cellulose and viscose rayon process employed by the company; development of modifications of the process, new processes, and new products. (Research initiated 1932.)

**2135. Synthetical Laboratories, 5558 Ardmore Ave., Chicago 30, Ill.**

*Research staff:* Nicholas D. Cheronis, Director. 5 chemists; additional personnel 3.

*Research activities:* Amino compounds, particularly amino acids; development of water repellence and fungicides; synthetic polymers; chemotherapeutic research. (Research initiated 1919.)

*Library:* 500 volumes.

**Tagliabue Division, C. J., Portable Products Corporation.** See Portable Products Corporation.

**2136. Takamine Laboratory, Inc., Clifton, N. J.**

*President:* Eben T. Takamine.

*Research staff:* Eben T. Takamine, Director; S. E. Doebbeling; Mildred Adams. 4 chemists, 1 biologist, 1 engineer; technical personnel 6.

*Research activities:* Enzymes, amino acids, problems in the chemistry of starches and proteins; food technology; textiles; dry cleaning; pharmaceuticals. (Research initiated 1914.)

*Library:* 1,500 volumes.

**2137. Takk Corporation, Newark, Ohio.**

*President:* F. W. Atkinson.

*Research staff:* Robert B. Taylor, Director. 2 physicists, 2 engineers; technical personnel 2; additional personnel 6.

*Research activities:* High voltage electrification systems; electrostatic charge eliminators; electrical instruments in the field of electronics. (Research initiated 1944.)

**Tar and Chemical Division, Koppers Company, Inc.** See Koppers Company, Inc.

**2138. Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.**

*President:* L. B. Swift.

*Research staff:* K. H. Hubbard, Chief Engineer; K. L. Tate, industrial instrument designing; R. E. Clarridge, application engineering. 4 chemists, 6 physicists, 3 metallurgists, 30 engineers; technical personnel 40; additional personnel 20.

*Research activities:* The development of instruments and the means of their application for the measurement and control of temperature, pressure, flow of fluids, liquid level, and humidity in domestic and industrial arts; instruments for the measurement of blood pressure; meteorological instruments; the study of the properties of materials for use in instruments. (Research initiated 1911.)

*Library:* 3,300 volumes.

**2139. Taylor, White Extracting Company, Pine St. and Cooper River, Camden, N. J.**

*President:* Jesse S. White.

*Research staff:* Roy H. Wisdom, Plant Manager; William A. Felder, Chief Chemist. 2 chemists; 1 chemical engineer.

*Research activities:* Natural dyes and tanning materials, processing of these materials for use by the trade, and the application of the products to their various uses. (Research initiated 1928.)

*Library:* 100 volumes.

**2140. Taylor-Winfield Corporation**, 1052 Mahoning Ave., Warren, Ohio.

*President:* J. A. Anderson.

*Research staff:* C. E. Smith, Chief Electrical Engineer; M. M. Seeloff, Chief Engineer. 1 chemist, 1 physicist, 1 metallurgist, 6 engineers; technical personnel 30; additional personnel 12.

*Research activities:* Design of special machines; development of resistance welding methods; investigation of methods of welding ferrous and nonferrous metals. (Research initiated 1920.)

*Library:* A library is maintained.

**2141. Tech Laboratories**, 337 Central Ave., Jersey City 7, N. J.

*President:* M. Bjorndal.

*Research staff:* 1 chemist, 1 physicist, 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Development of new instruments for geophysical research; improvement of processes and methods. (Research initiated 1935.)

*Library:* 200 volumes.

**2142. Technical Fisheries Company**, 1332 Evans Ave., San Francisco 24, Calif.

*Partners:* Erling F. Week and Howard A. Nibecker.

*Laboratories:* Research Division Laboratory, South Linden Ave., San Francisco, Calif.; Poultry Oil Division Laboratory, Commercial Way, Burlingame, Calif.

*Research staff:* Gilbert T. Bentley, Director. 6 chemists, 2 engineers; technical personnel 5; additional personnel 4.

*Research activities:* Vitamins A and D. (Research initiated 1942.)

*Library:* 100 volumes.

**2143. Technical Service Bureau, Inc.**, 407 South Dearborn St., Chicago 5, Ill.

*President:* Clyde A. Crowley.

*Research staff:* Clyde A. Crowley, Director; Henry L. Bowlby, Executive Vice President and Director of engineering; G. H. Goodyear and P. J. Murdoch, Research Chemists. 3 chemists, 2 engineers, 5 technical associates; additional personnel 12.

*Research activities:* Organic synthesis, esterification, and related physicochemical applications for the organic chemicals industry. (Research initiated 1932.)

*Library:* 5,000 volumes.

**2144. Technicolor Motion Picture Corporation**, 6311 Romaine St., Hollywood 38, Calif.

*President:* Herbert T. Kalmus.

*Research staff:* L. E. Clark, Acting Director

of research. 4 chemists, 3 physicists, 3 engineers; technical personnel 5; additional personnel 2.

*Research activities:* Motion picture photography in natural colors.

*Library:* 1,000 volumes.

**2145. TelAutograph Corporation**, 16 West 61st St., New York 23, N. Y.

*President:* Walter F. Vieh.

*Research staff:* G. T. Stanton, Chief Engineer. 4 engineers; technical personnel 5; additional personnel 3.

*Research activities:* Electrical transmission of written characters: servo-mechanisms; electronics; relay and switching circuits. (Research initiated 1938.)

**2146. Teletype Corporation**, 1400 West Wrightwood Ave., Chicago 14, Ill. (Subsidiary of Western Electric Company, Inc.)

*President:* C. H. Franks.

*Research staff:* J. O. Carr, Vice President in charge of sales, development, and research; W. J. Zenner, Engineer of development and research. 30 engineers, 14 designers; technical personnel 39; additional personnel 5.

*Research activities:* The creation of new and improved printing telegraph apparatus and systems. (Research initiated 1907.)

*Library:* 200 volumes.

**2147. Telex, Inc.**, 12 North Washington Avenue, Minneapolis 1, Minn.

*President:* Stanley Nowak.

*Laboratory:* 1633 Eustis St., Telex Park, Minneapolis, Minn.

*Research staff:* Paul Thompson, Chief Electronic Engineer; Clayton Mullin, Chief Mechanical Engineer. 1 physicist, 3 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Electronics; electroacoustics; acoustics; psychology. (Research initiated 1938.)

**2148. Telling-Belle Vernon Company**, 3740 Carnegie Ave., Cleveland 15, Ohio.

*President:* Frank W. Edwards.

*Research staff:* Joseph G. Leeder, Director. 1 chemist; technical personnel 6; additional personnel 1.

*Research activities:* The control, development, and improvement of dairy processes and products.

**2149. Tennessee Coal, Iron and Railroad Company**, Brown-Marx Bldg., Birmingham, Ala. (Subsidiary of U. S. Steel Corporation of Delaware.)

*President:* Robert Gregg.

*Laboratories:* Chemical, Physical, and Metal-

lurgical Laboratories, Bessemer, Fairfield, and Ensley, Ala.

*Research staff:* R. H. Ledbetter, Manager, Department of Metallurgy, Inspection, and Research. 11 chemical supervisors and assistants, 51 chemists, 9 metallurgical supervisors and assistants, 16 metallurgists, 33 metallurgical observers, 20 pyrometrists, 4 metallographists, 2 testing engineers; technical personnel 35; additional personnel 46.

*Research activities:* The investigation and development of methods, procedures, and materials used in the manufacture of iron and steel. (Research initiated 1928.)

*Library:* 1,765 volumes.

**Tennessee Copper Company.** See Tennessee Corporation.

**2150. Tennessee Corporation,** 61 Broadway, New York 6, N. Y.

*President:* E. H. Westlake.

*Laboratory:* Tennessee Copper Company, Copperhill, Tenn.

*Research staff:* J. N. Houser, Vice President and General Manager, Tennessee Copper Co.; T. A. Mitchell, Manager, Tennessee Copper Co.; E. H. Conroy, Superintendent, Research Department; G. E. Harike, Assistant Superintendent; A. A. Nikitin, Director of agricultural research. 5 chemists, 1 metallurgist, 8 chemical engineers, 3 technicians; additional personnel 3.

*Research activities:* Development and Experiment Station testing of fungicides, insecticides, and agricultural chemicals; utilization of by-products and development of new chemicals from raw materials and products; new and improved processes for metallurgical treatment of sulfide ores and manufacture of heavy chemicals; plant operating and production problems, control of product quality; flotation and ore treatment; technical sales assistance. (Research initiated 1928.)

*Library:* 500 volumes.

*Cooperative research:* Ten grants for research are made.

**2151. Tennessee Eastman Corporation,** Kingsport, Tenn. (Subsidiary of Eastman Kodak Company.)

*President:* James C. White.

*Research staff:* J. G. McNally, Director. 42 chemists, 8 physicists, 7 engineers; additional personnel 22.

*Research activities:* Organic chemistry, plastics, and textiles. (Research initiated 1920.)

*Library:* 7,000 volumes.

*Cooperative research:* Three fellowships are supported and two grants for research are made.

**2152. Tennessee Enamel Manufacturing Company,** Nashville 9, Tenn.

*President:* W. B. Evans.

*Research staff:* Louis E. Nordholt, Vice President in charge of research. 2 chemists, 2 engineers; technical personnel 6.

*Research activities:* Gas heating appliances; development and manufacture of frits for porcelain enamel. (Research initiated 1924.)

*Library:* 200 volumes.

**2153. Tenney Associates, Inc., A. M.,** 10 East 40th St., New York 16, N. Y.

*President:* A. M. Tenney.

*Research staff:* Harold DeWitt Smith, Textile Technologist. 3 chemists, 2 engineers, 1 textile technician; technical personnel 1.

*Research activities:* Product development of textiles made of acetate rayon and other fibers, including construction, physical properties, and dyeing techniques. (Research initiated 1935.)

*Library:* A library is maintained.

**2154. Terrell's Laboratories,** Fort Worth 2, Tex.

*President:* T. C. Terrell.

*Laboratories:* Fort Worth, Abilene, Corpus Christi, and Amarillo, Tex.; Muskogee, Okla.

*Research staff:* T. C. Terrell and May Owen, Directors. 3 chemists, 2 biologists, 7 physicians, 1 geologist; technical personnel 20; additional personnel 60.

*Research activities:* Use of the preparation, Foille, for the treatment of burns; the effect of glove powder on peritoneal tissues; granulomatous reaction and adhesions in man and rabbits; the relation of cryptococcus infection of lymph nodes to changes in lymph nodes simulating lympho-sarcoma, Hodgkin's type; vitamin D assays; microanalysis of soil-gas; the determination of plant sensitivity by the use of ether extract; research work on hypertension, using kidney and pancreas extracts; the use of chromogens of penicillin in infections. (Research initiated 1915.)

*Library:* A library is maintained.

**2155. Terven Company, Lewis A.,** P. O. Box 192, Main Office, Salinas, Calif.

*President:* Lewis A. Terven.

*Research staff:* Duncan W. Cleaves, Chemist. *Research activities:* The processing, packing, and marketing of carrots and carrot by-products. (Research initiated 1946.)

**2156. Tested Papers of America, Inc.,** 230 N. Michigan Ave., Chicago 1, Ill.

*President:* Frank P. Vaughan.

*Research staff:* James O. Nichols, Technical Director. 2 chemists; additional personnel 1. *Research activities:* Improvement in the retail and industrial supply lines of paper prod-

ucts; the development of new paper products; the improvement and development of testing methods. (Research initiated 1939.)

**Ternstedt Manufacturing Division, General Motors Corporation.** See General Motors Corporation.

**2157. Texas Company, 135 East 42nd St., New York 17, N. Y.**

*President:* Harry T. Klein.

*Laboratories:* Beacon, N. Y.; Houston, Port Arthur, and Port Neches, Tex.; Lawrenceville, Ill.

*Research staff:* M. Halpern, Vice President, Refining Department; R. Ogarrio, Vice President, Producing Department; W. E. Kuhn, Manager, Technical and Research Division; L. C. Kemp, Jr., Assistant Manager and Director of Research, Technical and Research Division; R. F. Baker, Chief Geologist. 187 chemists, 12 physicists, 19 engineers, 111 chemical engineers, 24 mechanical engineers; technical personnel 521; additional personnel 344. *Research activities:* Petroleum—its production, refining, products, and application. (Research initiated 1908.)

*Library:* 10,000 volumes.

*Scientific periodicals:* Lubrication. Monthly. Vol. I, 1913.

**2158. Texas Gulf Sulphur Company, Inc., 75 East 45th St., New York 17, N. Y. (Executive Office); Second National Bank Bldg., Houston 2, Tex. (Principal Office).**

*President:* Walter H. Aldridge.

*Laboratories:* Newgulf, Wharton County, Tex.; 72 Centre St., New Rochelle, N. Y.

*Research staff:* W. W. Duecker, Manager, Research Department, New York, N. Y. 9 chemists, 3 engineers.

*Research activities:* Research in connection with the production of sulfur, the treatment and utilization of waste products, equipment for handling sulfur, and basic investigations relating to uses of sulfur. (Research initiated 1919.)

*Library:* A library is maintained.

*Cooperative research:* One fellowship is supported and five grants for research are made.

**2159. Texoma Natural Gas Company, 20 North Wacker Drive, Chicago 5, Ill.**

*Vice President:* Floyd C. Brown.

*Laboratory:* Fritch, Tex.

*Research staff:* E. G. Hammerschmidt, Director. 2 chemists, 1 chemical engineer.

*Research activities:* Industrial water conditioning, corrosion control, and protective coatings. (Research initiated 1931.)

*Library:* 200 volumes.

**2160. Texsun Citrus Exchange, Weslaco, Tex.**

*President:* F. B. Holland.

*Research staff:* Everette M. Burdick, Director. 1 chemist; technical personnel 1.

*Research activities:* Citrus fruits, citrus juices, and by-products. (Research initiated 1945.)

**2161. Textile Foundation, Inc., Princeton, N. J.**

*Chairman, Board of Directors:* Franklin W. Hobbs.

*Laboratories:* Textile Research Institute Laboratories, Princeton, N. J.

*Research staff:* Henry Eyring, Director; R. E. Rose, Research Counsellor. 3 chemists; additional personnel 4.

*Research activities:* Textiles. (Research initiated 1930.)

*Library:* 100 volumes.

*Cooperative research:* Six fellowships are supported.

**2162. Textile, Plastics and Technical Service, Inc., Norristown Penn-Trust Bldg., Main and Swede Sts., Norristown, Pa.**

*President:* Gustave E. Landt.

*Research staff:* Gustave E. Landt, Director. 4 chemists; technical personnel 4.

*Research activities:* Fireproofing; textile coatings; paints. (Research initiated 1945.)

**2163. Textile Research Institute, Inc., 10 East 40th St., New York 16, N. Y.**

*Chairman of Board of Directors:* H. Wickliffe Rose.

*Laboratory:* Engineering Annex Bldg., Nassau St. and Washington Road, Princeton, N. J.

*Research staff:* Giles E. Hopkins, Director. 1 chemist, 1 physicist, 7 engineers; additional personnel 3.

*Research activities:* Textile fibers, textile manufacturing processes, and functional characteristics of textile products; infrared drying; equilibrium moisture data on textile fibers and products; improvement of electrical characteristics of varnished cambric. (Research initiated 1944.)

*Library:* 400 volumes.

*Scientific periodicals:* Textile Research Journal. Vol. I, 1930.

*Cooperative research:* Nine fellowships are supported.

**Textile Testing and Research Laboratories** See Silk Grading and Testing Laboratory, and Textile Testing and Research Laboratories.

**2164. Textor Laboratories, 1627 East 25th St., Cleveland 14, Ohio.**

*President:* Ralph B. Textor.

*Research staff:* Adolph Floria, Director. 5

chemists, 2 metallurgists, 4 engineers; technical personnel 19; additional personnel 4.

*Research activities:* The development of new products and the improvement of old products; investigation of manufacturing problems; data for patent applications; reports on the suitability of advertising statements; the examination of mineral properties of coal, iron ore, etc., for improvement in the quality of the product mined; studies on new uses for existing products; the utilization of scrap and waste materials. (Research initiated 1895.)

*Library:* 500 volumes.

**2165. Thermatomic Carbon Company, Terre Haute, Ind.** (Subsidiary of Commercial Solvents Corporation.)

*Research staff:* Jerome Martin, Director of research. 3 chemists; additional personnel 3.

*Research activities:* Research on fundamental properties of carbon black; research on methods of making carbon black. (Research initiated 1932.)

**2166. Thiokol Corporation, 780 North Clinton Ave., Trenton 7, N. J.**

*President:* J. W. Crosby.

*Research staff:* J. C. Patrick, Director. 20 chemists; technical personnel 10; additional personnel 10.

*Research activities:* Polysulfide polymers. (Research initiated 1929.)

*Library:* 500 volumes.

**2167. Thompson Aircraft Products Company, 23555 Euclid Ave., Euclid 17, Ohio.**

*President:* F. C. Crawford.

*Research staff:* K. M. Bartlett, Director of research; T. R. Thoren, Director of development; A. T. Colwell, Vice President in charge of engineering. 10 chemists, 10 metallurgists, 30 engineers; technical personnel 10; additional personnel 15.

*Research activities:* The development of improved materials, processes, and products in the field of automotive and aircraft engine parts and accessories manufacture. Turbosuperchargers for aircraft and gas turbine sub assemblies and parts. (Research initiated 1924.)

**2168. Thompson and Company, Oakmont, Pa.**

*President:* J. V. Thompson.

*Research staff:* W. C. Nicoll, Technical Director. 5 chemists, 1 biologist, 1 engineer; technical personnel 8; additional personnel 3.

*Research activities:* Protective and decorative coatings. (Research initiated 1915.)

*Library:* 165 volumes.

*Cooperative research:* One grant for research is made.

**2169. Thompson and Lichtner Company, Inc., 620 Newbury St., Boston, Mass.**

*President:* Sanford E. Thompson.

*Research staff:* Miles N. Clair, Director. 3 chemists, 1 physicist, 12 engineers, 1 geologist; additional personnel 18.

*Research activities:* The study of structural materials: cement, concrete, steel, building units, and gypsum; soils, from the structural viewpoint; industrial processes for the manufacture of paper, leather, textiles, and metals. (Research initiated 1905.)

*Library:* 300 volumes.

**2170. Thompson Company, William T., 2727 Hyperion Ave., Los Angeles 27, Calif.**

*President:* William T. Thompson.

*Research staff:* William T. Thompson, Director. 11 chemists, 2 biologists, 2 engineers; technical personnel 9; additional personnel 14.

*Research activities:* Natural extraction of vitamins and amino acids; organic synthesis of hormones and sterols. (Research initiated 1930.)

*Library:* 3,000 volumes.

**2171. Thompson, Weinman and Company, Inc., Cartersville, Ga.**

*President:* W. J. Weinman.

*Laboratory:* 92 Greenwood Ave., Montclair, N. J.

*Research staff:* Ray L. McCleary, Director. 3 chemists; additional personnel 3.

*Research activities:* Investigation of the use of inert pigment fillers such as calcium carbonate, clays, talcs, etc., in rubber, paints, paper, plastics, and ceramics.

**2172. Thresher Varnish Company, 1100 East Monument Ave., Dayton 1, Ohio.** (Subsidiary of Pittsburgh Plate Glass Company.)

*President:* Charles L. Sullivan, Jr.

*Research staff:* J. E. Heller, Director. 3 chemists; technical personnel 6; additional personnel 2.

*Research activities:* Synthetic enamel and varnish; pyroxylin products, especially for improvement in finishes for railway and industrial use. (Research initiated 1859.)

*Library:* A library is maintained.

**2173. Thurston Laboratories, Emory W., 1207 South Vermont, Los Angeles 6, Calif.**

*President:* Emory W. Thurston.

*Research staff:* Benjamin H. Ershoff, Director; H. B. McWilliams. 1 chemist, 3 pharmacists, 2 physicians; additional personnel 4.

*Research activities:* Vitamin-endocrine interrelationships. (Research initiated 1922.)

*Library:* A library is maintained.



*Scientific periodicals:* Nutritional Therapy. Vol. I, 1937.

**1274. Thwing-Albert Instrument Company,** Penn St. and Pulaski Ave., Philadelphia 44, Pa.

*President:* C. B. Thwing.

*Research staff:* Edward J. Albert, Director. 1 chemist, 2 physicists, 1 metallurgist, 2 engineers.

*Research activities:* Measurement of temperatures by resistance, thermoelectric, and radiation methods; pH determinations; the study of the physical qualities of paper and other weak strength materials. (Research initiated 1900.)

**1275. Tide Water Associated Oil Company,** 17 Battery Place, New York, N. Y.

*President:* William F. Humphrey. *Vice President and Chairman of Operating Committee:* B. I. Graves.

WESTERN DIVISION  
Associated, Calif.

*Research staff:* H. Y. Hyde, General Supervisor; A. G. Kaufmann; A. Lazar; C. F. Becker; C. K. Viland. 12 chemists, 1 physicist, 8 engineers; technical personnel 12; additional personnel 18.

*Research activities:* Petroleum research: the development of refining processes and new products. (Research initiated 1925.)

*Library:* 700 volumes.

EASTERN DIVISION  
Bayonne, N. J.

*Research staff:* John T. McCoy, General Supervisor, Research and Development Department; R. J. Hawes, Supervisor of development; A. W. Lewis, Supervisor of research; H. E. Achilles, Supervisor of technical service; C. W. Frankenfield, Supervisor, Automotive Laboratory; H. T. Hutton, Patent Attorney. 15 chemists, 8 chemical engineers, 4 automotive engineers, 1 patent attorney, 1 research librarian; technical personnel 43; additional personnel 9.

*Research activities:* The development of improved lubricants, fuels, and other products from petroleum; investigations of new methods of petroleum refining; efficiency tests on plant operating units. (Research initiated 1924.)

*Library:* 1,700 volumes.

**1276. Tillotson Manufacturing Company,** Toledo 12, Ohio.

*President:* H. R. Schausten.

*Research staff:* E. A. Rullison, Chief Engineer. 4 engineers; technical personnel 3.

*Research activities:* Carburetor development; fuel strainers. (Research initiated 1914.)

*Library:* 100 volumes.

**2177. Tilo Roofing Company, Inc.,** Stratford, Conn.

*President:* R. J. Tobin.

*Research staff:* J. R. Brown, Director. 1 chemist, 1 engineer.

*Research activities:* Asphalt roofing and siding; cement-asbestos siding; development of new products; improvement in the quality of the products. (Research initiated 1934.)

*Cooperative research:* One fellowship is supported.

**2178. Timber Engineering Company,** 1319 Eighteenth St., N. W., Washington 6, D. C.

*President:* H. G. Uhl.

*Laboratory:* 4812 Minnesota Ave., N. E., Washington, D. C.

*Research staff:* J. L. Stearns, Laboratory Superintendent; Eduard Farber, Chief Chemist; C. A. Rishell, Director of research. 3 chemists, 2 engineers, 4 wood technologists; additional personnel 4.

*Research activities:* Wood impregnation; hydrolysis of wood; lignin and its derivatives; wood plastics; wood resins; mechanical testing of wood products. (Research initiated 1943.)

*Library:* 2,500 volumes; 1,000 pamphlets.

**2179. Timken Detroit Axle Company,** 100 Clark St., Detroit, Mich.

*President:* Walter F. Rockwell.

*Research staff:* M. B. Morgan, Director. 5 chemists, 4 engineers, 2 metallurgists, 1 metallographer.

*Research activities:* Automotive drives, rear and front axles, and transmissions for automotive vehicles. (Research initiated 1909.)

**2180. Timken Roller Bearing Company,** 1835 Dueber Ave., S. W., Canton 6, Ohio.

*President:* W. E. Umstatt.

*Research staff:* A. L. Bergstrom, Vice President in charge of engineering; W. G. Hildorf, Director of metallurgy; R. L. Wilson, Chief Metallurgical Engineer; E. G. Boden, Experimental Engineer in charge of Physics Laboratory; O. J. Horger, Chief Engineer, Railway Division. 8 chemists, 63 metallurgists, 13 engineers; technical personnel 50; additional personnel 107.

*Research activities:* General research relating to the use and manufacture of antifriction bearings; fatigue testing; photoelastic studies; general research on alloy steels, tubing, refractories, and lubricants. (Research initiated 1909.)

*Cooperative research:* Several grants for research are made.

**2181. Titanium Alloy Manufacturing Company,** Niagara Falls, N. Y.

*President:* Winthrop Sargent, Jr.

*Research staff:* Edwin T. Goodridge, Vice

President in charge of research; George F. Comstock, metallurgical research; Eugene Wainer, chemical and ceramic research. 10 chemists, 2 physicists, 5 metallurgists, 4 ceramic engineers; technical personnel 8; additional personnel 4.

*Research activities:* Chemical, ceramic, and metallurgical studies connected with the development and application of zirconium and titanium products. (Research initiated 1906.)

*Library:* 3,500 volumes.

*Scientific periodicals:* TAM Daily Reminder. Monthly.

*Cooperative research:* Two fellowships are supported and one grant for research is made.

**2182. Titanium Pigment Corporation, 111 Broadway, New York, N. Y.** (Subsidiary of National Lead Company.)

*President:* C. F. Garesché.

*Laboratories:* Research Laboratories, Sayreville, N. J.; Technical Service Laboratories, New York, N. Y.; Development Laboratories, Sayreville, N. J. and St. Louis, Mo.; Development Engineering Groups, Sayreville, N. J. and St. Louis, Mo.

*Research staff:* J. L. Turner, Technical Director; D. W. Robertson, General Sales Engineer; R. Dahlstrom, Director of research; C. L. Schmidt, Development Manager; R. P. Smith, Chief Development Engineer. 57 chemists, 3 physicists, 1 metallurgist, 13 engineers, 33 technicians; additional personnel 16.

*Research activities:* Titanium pigments; titanium. (Research initiated 1928.)

*Library:* 1,500 volumes at Sayreville and St. Louis.

**2183. Tobacco By-Products and Chemical Corporation, Richmond 6, Va.**

*President:* S. L. Carter.

*Laboratories:* Louisville, Ky.; Richmond, Va.

*Research staff:* R. B. Arnold, Director of research, Richmond, Va.; A. L. Galloway, Chief of research, Louisville, Ky. 6 chemists, 3 biologists, 1 engineer; technical personnel 1; additional personnel 2.

*Research activities:* The use of nicotine as an insecticide by developing new products and new methods of application; improvement in manufacturing processes. (Research initiated 1925.)

*Library:* 800 volumes.

*Cooperative research:* Four fellowships are supported and two grants for research are made.

**2184. Toch Brothers, 2600 Richmond Terrace, Staten Island 3, N. Y.**

*Research staff:* 9 chemists; additional personnel 6.

*Research activities:* Paints, enamels, and waterproofing compounds and processes.

**2185. Todd and Hedeon Laboratories, 180 West 1st St., Waterloo, Iowa.**

*Research staff:* J. P. Henry, Director. 1 chemist, 2 engineers; additional personnel 1.

*Research activities:* Agricultural processing; veterinary pharmaceuticals. (Research initiated 1944.)

*Library:* 200 volumes.

**2186. Todd Company, Inc., 1150 University Ave., Rochester 3, N. Y.**

*President:* Walter L. Todd.

*Laboratories:* Chemical, Machine Design, and Printing Engineering Laboratories, Rochester, N. Y.

*Research staff:* Raymond E. Bohrer, Managing Director; Burgess W. Smith, Technical Director, Chemical Laboratory; Walter B. Payne, Chief Designer and Engineer, Machine Product Design Laboratory; Irving F. Niles, Chief Engineer, Printing Engineering Laboratory. 2 chemists, 2 engineers, 4 designers, 1 ink maker, 8 machinists; additional personnel 3.

*Research activities:* *Chemical:* Problems incident to the manufacture and development of safety paper and bank checks, involving ink, papermaking and processing, organic synthesis of dyes and intermediates, and photo-reproduction process. *Machine Design:* Problems incident to the design, development, and fabrication of business machines, including check writing, check signing, sheet feeding, and cutting and handling equipment. *Printing Engineering:* Problems incident to methods and equipment for processing safety paper, and for fabricating checks and other negotiable instruments therefrom, in sheet, multicopy sets, or continuous rolls or packs. (Research initiated 1900.)

**2187. Tokheim Oil Tank and Pump Company, 1602 Wabash Ave., Fort Wayne 1, Ind.**

*President:* C. C. Oberly.

*Research staff:* G. W. Wright, Factory Superintendent; R. H. Hill, Chief Engineer; William L. Hudson, Assistant to Chief Engineer. 1 chemist, 3 engineers; technical personnel 20.

*Research activities:* Dispensing equipment for gasoline, motor fuel, and lubricating oil; farm implements and attachments; air compressors.

*Library:* 200 volumes.

**2188. Toledo Scale Company, 5225 Telegraph Road, Toledo 12, Ohio.**

*President:* Hubert D. Bennett.

*Research staff:* Donald D. Mallory, Technical Director. 1 physicist, 1 biologist, 1 metallurgist, 8 engineers; technical personnel 11; additional personnel 3.

*Research activities:* Mechanical, metallurgical, electrical, and optical research in connection with the manufacture of automatic dial scales; sanitary research in connection with the manufacture of food processing machines. (Research initiated 1926.)

*Cooperative research:* Two fellowships are supported and one grant for research is made.

**2189. Toledo Testing Laboratory, 1810 North 12th St., Toledo 2, Ohio.**

*President:* M. V. Nardiello.

*Research staff:* M. V. Nardiello, Director. 2 chemists, 2 physicists, 1 metallurgist, 9 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Portland cement concrete. Construction materials: cement, lime, mortars, plasters, concrete masonry units, ceramics, bitumens including bituminous paving mixtures. Electronics: development of nondestructive tests of solids, metallic and nonmetallic (sonics). Metallurgy: copper-zinc alloys. (Research initiated 1927.)

*Library:* 350 volumes.

**2190. Tomahawk Kraft Paper Company, Tomahawk, Wis.**

*President:* S. B. Bugge.

*Research staff:* J. A. Extrom, Director. 6 chemists, 2 engineers.

*Research activities:* The improvement of paper products and routine control work. (Research initiated 1924.)

**2191. Torrington Manufacturing Company, 70 Franklin St., Torrington, Conn.**

*President:* John P. Elton.

*Research staff:* Philip M. Nigro, Director. 4 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Research related to the manufacture of air impelling devices; analysis and control of electroplating and organic finishing. (Research initiated 1938.)

**Tower Varnish and Drier Company. See Davies-Young Soap Company.**

**2192. Travelers Insurance Companies, 700 Main St., Hartford 1, Conn.**

*President:* Jesse W. Randall.

*Research staff:* Reuel C. Stratton, Supervising Chemical Engineer. 1 chemist, 3 chemical engineers, 1 mechanical engineer; additional personnel 2.

*Research activities:* *Chemical:* The control of accident prevention and occupational disease by chemical engineering; the analysis of poisonous, inflammable, or explosive materials, and research to provide controls and substitutes of

a less harmful or dangerous nature; the development of analytical procedure and new instruments for detecting minute quantities of dust or toxic substances; research to produce suitable conditioning of feedwaters for power boiler operation and new methods and substances for such conditioning; control of safety in chemical plant operation, approval of the design and application of high pressure units used for chemical purposes, and the development of new and safer processes by chemical engineering, including the design of special apparatus and equipment. *Mechanical:* Research to control industrial accidents by the design and construction of new safety devices, the study of plant procedure, and the revision of engineering operating principles, including the design and development of new industrial machinery. (Research initiated 1910.)

*Library:* 300 volumes.

*Scientific periodicals:* Travelers Standard. Vol. 1, 1912.

**2193. Treesdale Laboratories, Inc., 1100 Benedum-Trees Bldg., Pittsburgh 22, Pa.**

*President:* John A. Beattie.

*Laboratory:* Mars, Pa.

*Research staff:* Paul F. Webster, Director; James F. McCarthy, Research Chemist. 2 chemists; additional personnel 2.

*Research activities:* The improvement of flame, mildew, and waterproofing processes and their application to textiles. (Research initiated 1932.)

**2194. Tremco Manufacturing Company, 8701 Kinsman Road, Cleveland, Ohio.**

*President:* William C. Treuhaft.

*Research staff:* Gordon E. Hann, Director; Stanley Gridley, Associate Director. 6 chemists; technical personnel 1; additional personnel 1.

*Research activities:* Original research dealing with principles in the field of maintenance and construction of buildings and structures, such as waterproofing, preservation, surface protection, etc.; the development and improvement of products to solve current problems. (Research initiated 1928.)

*Library:* 150 volumes.

**Tretolite Company. See Petrolite Corporation, Ltd.**

**2195. Trojan Powder Company, Allentown, Pa.**

*President:* William E. Hall.

*Laboratories:* Allentown, Pa.; Robert, Calif.

*Research staff:* Walter O. Snelling, Director; Richard N. Boyd, Assistant Director. 10 chemists, 3 physicists, 1 engineer; technical personnel 12; additional personnel 5.

*Research activities:* The investigation and

development of new explosives; explosives phenomena; industrial chemicals and special chemicals for detonators and primers; raw materials for synthetic resin manufacture; investigation of plasticizing materials. (Research initiated 1910.)

*Library:* 679 volumes.

**2196. Trubek Laboratories**, William St. and Erie Railroad, East Rutherford, N. J.

*President:* R. Trubek.

*Research staff:* Joseph Ziv, Chief Chemist. 6 chemists; 1 in another scientific profession; additional personnel 3.

*Research activities:* Synthetic aromatic chemicals. (Research initiated 1931.)

*Library:* 300 volumes.

*Cooperative research:* Three grants for research are made.

**2197. Truesdail Laboratories, Inc.**, 520 West Avenue 26, Los Angeles 31, Calif.

*President:* Roger W. Truesdail.

*Research staff:* C. E. P. Jeffreys, Director. 6 chemists, 1 physicist, 3 biologists; additional personnel 3.

*Research activities:* Vitamin investigations; bacteriological studies; pharmacological investigations pertaining specifically to alkaloid and drug detections in horse urine and saliva; research upon specific nutritive values of foods; formulations of new products; improvement of plant processes; utilization of by-products; research as a basis of patent applications; water purification; investigations arising from damage claims and suits; research and technical surveys for investors; liability insurance investigations; supervision of research in clients' laboratories. (Research initiated 1931.)

*Library:* 1,000 volumes.

*Scientific periodicals:* Chemistry in Action. Vol. I, 1939.

**2198. Trumper Laboratory**, 349 Montgomery Ave., Bala-Cynwyd, Pa.

*Research staff:* Max Trumper, Director. 2 chemists, 1 physician, 1 bacteriologist.

*Research activities:* Water pollution, industrial toxicology, and clinical biochemistry. (Research initiated 1925.)

*Library:* 300 volumes.

**2199. Tubize Rayon Corporation**, 2 Park Ave., New York 16, N. Y.

*President:* John E. Bassill.

*Laboratory:* Rome, Ga.

*Research staff:* W. B. Cooper, Director; B. B. Allen, Assistant Director; W. H. Bradshaw, Technical Consultant; C. R. Dolmetsch, Assistant Technical Director. 11 chemists, 4 engineers; technical personnel 9; additional personnel 24.

*Research activities:* Processes for manufacturing improved viscose and acetate rayon yarns. (Research initiated 1928.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported.

**2200. Tung-Sol Lamp Works, Inc.**, 95 Eighth Ave., Newark 4, N. J.

*President:* Louis Rieben.

*Laboratory:* 125 First St., Newark 7, N. J.

*Research staff:* Robert H. Fidler, Director. 1 chemist, 3 physicists, 1 metallurgist, 2 engineers; technical personnel 4; additional personnel 5.

*Research activities:* Applied research associated with the problems encountered in the manufacture of radio tubes for the armed services, with particular emphasis on facilities and equipment to reduce losses and simplify analysis; the mechanism of emission from oxide coated cathodes; fluorescent and phosphorescent materials, sources, and phenomena. (Research initiated 1941.)

*Cooperative research:* One grant for research is made.

**2201. Turco Products, Inc.**, 6135 South Central Ave., Los Angeles 1, Calif.

*President:* S. G. Thornbury.

*Laboratories:* Research Laboratory, 5800 South Broadway, Los Angeles, Calif.; Production and Control Laboratories: Los Angeles, Calif., Chicago, Ill., and Houston, Tex.; Technical Service Laboratories: Los Angeles and San Francisco, Calif.

*Research staff:* S. G. Thornbury, Acting Director. 13 chemists, 2 engineers; technical personnel 2; additional personnel 3.

*Research activities:* Detergents, paint stripping, metal treating, carbon removal, water treatment, disinfectants. (Research initiated 1927.)

*Library:* 325 volumes.

*Cooperative research:* Three grants for research are made.

**2202. Twin Disc Clutch Company**, 1328 Racine St., Racine, Wis.

*President:* P. H. Batten.

*Laboratories:* Racine, Wis.; Rockford, Ill.

*Research staff:* N. F. Adamson, Vice President in charge of engineering; J. B. Jenkins, Manager, Hydraulic Division. 5 engineers; technical personnel 2.

*Research activities:* The testing of friction clutches, hydraulic couplings, hydraulic torque converters, and power transmissions; materials used; production difficulties. (Research initiated 1936.)

*Library:* A limited library is maintained.

**2203. Twining Laboratories, P. O. Box 1472, Fresno 16, Calif.**

*Owner:* F. E. Twining.

*Research staff:* F. W. Twining, Director. 10 chemists, 1 physicist, 2 biologists, 1 metallurgist, 2 engineers, 1 geologist, 2 technicians; additional personnel 6.

*Research activities:* Fruit products; petroleum products. (Research initiated 1900.)

*Library:* 11,200 volumes.

**2204. Tyer Rubber Company, Railroad St., Andover, Mass.**

*President:* Hugh Bullock.

*Research staff:* B. H. Capen, Chief Chemist; J. E. Williamson, Chemical Engineer; E. H. Sheehan, Chemist. 1 chemist, 3 chemical engineers; additional personnel 4.

*Research activities:* The development of rubber compounds, products, and processes in the following fields: waterproof footwear, canvas footwear, rubber roll covers, molded goods, drug sundries, and extruded rubber products. (Research initiated 1923.)

**USL Battery Corporation. See Electric Auto-Lite Company.**

**2205. Udyllite Corporation, 1651 East Grand Blvd., Detroit 11, Mich.**

*President:* L. K. Lindahl.

*Research staff:* R. B. Saltonstall, Technical Director. 5 chemists, 4 engineers; technical personnel 4.

*Research activities:* Development of electroplating solutions and processes, and of electroplating and polishing equipment. (Research initiated 1919.)

*Library:* 200 volumes.

**2206. Una Welding, Inc., 1615 Collamer Ave., Cleveland 10, Ohio.**

*President:* P. K. Poulton.

*Research staff:* L. B. Mumma, Director of engineering and research; D. B. Howard, Chief Metallurgist. 2 chemists, 1 metallurgist, 3 engineers; technical personnel 3; additional personnel 7.

*Research activities:* The development of welding equipment, electrodes, and fluxes; welding methods and procedures. (Research initiated 1918.)

*Cooperative research:* One fellowship is supported.

**2207. Underwood Corporation, 1 Park Ave., New York 16, N. Y.**

*President:* L. C. Stowell.

*Laboratory:* General Research Laboratory, 56 Arbor Street, Hartford 6, Conn.

*Research staff:* G. W. Spahr, Director. 6 chemists, 1 physicist, 1 metallurgist, 8 engineers; technical personnel 25; additional personnel 21.

*Research activities:* The development of typewriters and of adding and accounting machines. (Research initiated 1936.)

**2208. Underwriters Laboratories, Inc., 207 East Ohio Street, Chicago 11, Ill.**

*President:* Alvan Small.

*Laboratories:* Chicago, Ill.; New York, N. Y.; and San Francisco, Calif.

*Research staff:* R. B. Shepard, Electrical Department; A. H. Nuckolls, Chemical Department; J. A. Neale, Chief Engineer; S. V. James, Casualty and Automotive Department; H. B. Micheal, Burglary Protection Department; R. W. Hendricks, Hydraulic Department; G. E. Manning, Inspection Department. 21 chemists, 1 metallurgist; 27 laboratory assistants; technical personnel 115.

*Research activities:* Investigations and tests of devices, materials, and systems affecting fire, life, and automotive hazards, and theft and accident prevention. (Research initiated 1894.)

*Scientific periodicals:* Bulletins of Research. Irregular.

**2209. Union Bag and Paper Corporation, 233 Broadway, New York 7, N. Y.**

*President:* Alexander Calder.

*Laboratories:* Savannah, Ga.; Hudson Falls, N. Y.

*Research staff:* H. S. Daniels, Vice President in charge of research; John B. Calkin, Coordinator of research; M. L. Taylor, Technical Director. 10 chemists, 20 engineers; additional personnel 20.

*Research activities:* Kraft pulping and paper-making; paper bag manufacture; recovery and processing of by-products from Kraft pulping; protective papers, forestry and tall oil and other chemical derivatives. (Research initiated 1900.)

**2210. Union Carbide and Carbon Corporation, 30 East 42nd St., New York 17, N. Y.**

*President:* Fred H. Haggerson.

*Laboratories:* Laboratories are maintained by the following operating units of Union Carbide and Carbon Corporation:

#### BAKELITE CORPORATION

30 East 42nd St., New York 17, N. Y.

*President:* J. W. McLaughlin.

#### PLASTICS LABORATORIES

230 Grove St., Bloomfield, N. J.

*Research staff:* G. O. Curme, Jr., Vice President of Union Carbide and Carbon Corporation,

in charge of research; V. H. Turkinston, Superintendent. 49 in scientific professions; additional personnel 70.

*Research activities:* Fundamental research on synthetic organic resins, both thermosetting and thermoplastic, and the development of synthetic resinous compositions for use as molding plastics; impregnating materials; adhesives and bonding agents for plywoods, abrasives, resistors, carbon brushes, etc.; laminating varnishes for the production of laminated materials; synthetic resins for paints and varnishes; heat-hardening lacquers and varnishes; cast resinoids; resinoid cements; wire-coating compounds; calendaring and coating compounds, including flame-resistant materials; the studying and measuring of electrical and physical properties of plastics on precision equipment; the correlation of resinous structure with properties, and the evaluation of new resins in terms of present day industrial requirements and future applications. (Research initiated 1914.)

**CARBIDE AND CARBON CHEMICALS CORPORATION**  
30 East 42nd St., New York 17, N. Y.

*President:* J. G. Davidson.

*Research staff:* G. O. Curme, Jr., Vice President of Union Carbide and Carbon Corporation, in charge of research; G. A. Perkins, Director of research. Research was initiated in 1914.

*Cooperative research:* Thirty-one fellowships are supported.

**SOUTH CHARLESTON LABORATORIES**  
South Charleston, W. Va.

*Research staff:* E. W. Rugeley, Superintendent. 65 in scientific professions; additional personnel 149.

*Research activities:* The development of new organic chemicals and economic processes for their commercial manufacture; the conversion of laboratory methods and techniques to those necessary for manufacture on an industrial scale. The types of organic chemicals are largely limited to alcohols, aldehydes, ketones, acids, anhydrides, amines, ethers, and esters. These chemicals are synthetically produced from raw materials derived from natural gas. The development of synthetic plastics, especially the thermoplastic type of resins, including studies of methods of polymerization and the various factors which influence physical and chemical characteristics and therefore the possible application of these synthetic resins.

**LABORATORY FOR ANTI-FREEZE AND COOLING  
SYSTEM PRODUCTS FOR COMBUSTION  
ENGINES**

East Park Drive and Woodward Ave.  
Tonawanda, N. Y.

(Division of General Research Laboratories)  
This division is operated by Linde Air Prod-

ucts Company for Carbide and Carbon Chemicals Corporation and for the Eveready Division of National Carbon Company. See under Linde Air Products Company, General Research Laboratory for further information.

**ELECTRO METALLURGICAL COMPANY**  
30 East 42nd St., New York, N. Y.

*President:* W. J. Priestley. *Vice President in charge of research:* J. H. Critchett.  
Research was initiated in 1906.

**MANUFACTURING PROCESSES LABORATORY**  
Union St., Niagara Falls, N. Y.

*Research staff:* R. M. Briney, Manager. 18 in scientific professions; additional personnel 50.

*Research activities:* Complete processing of ores for their beneficiation by ore dressing and chemical methods; the design of electric smelting furnaces of various types; the development of new and the improvement of current methods—largely electric furnace—for manufacturing silicon, manganese, chromium, tungsten, calcium and their alloys as well as alloys of vanadium and zirconium, boron and others for use in ferrous and nonferrous metallurgy; the improvement of methods of manufacturing calcium carbide, the generation of acetylene, the utilization of by-products, and broadening the uses for acetylene.

**METALLURGICAL LABORATORY**  
Royal Ave., Niagara Falls, N. Y.

*Research staff:* B. E. Field, Manager; 48 in scientific professions; additional personnel 80.

*Research activities:* The study of the uses of ferroalloys and alloying metals to improve the manufacturing methods and raise the quality of steel, iron, and nonferrous metallurgical products; search for metals and combinations of metals to make stronger, tougher, more corrosion-resistant or otherwise improved metal products; small-scale development of manufacturing methods; the study of welding by oxyacetylene and automatic electric methods; the improvement of welding equipment, materials, and supplies and of methods of constructing and maintaining railway equipment by welding; research on Haynes stellite and other nonferrous cutting, abrasion, and corrosion-resisting materials; metallurgical consultation and service with customers.

*Cooperative research:* One fellowship is supported.

**HAYNES STELLITE COMPANY**  
30 East 42nd St., New York 17, N. Y.

*President:* E. E. LeVan. *Executive officer in charge of research:* J. H. Critchett.  
Research was initiated 1915.

**METALLURGICAL RESEARCH LABORATORY**

Kokomo, Ind.

*Research staff:* F. S. Badger, Laboratory Director; 10 in scientific professions; additional personnel 20.

*Research activities:* The development of special tool metal compositions, hard-facing welding rod compositions and corrosion-resistant metals; the devising of methods for manufacturing and testing these metals and modifying them to meet special needs; finding new applications for the products.

**KEMET LABORATORIES COMPANY, INC.**

30 East 42nd St., New York 17, N. Y.

*President:* J. A. Holladay. *Vice President in charge of research:* J. H. Critchett.

Research was initiated in 1915.

**RARE METALS LABORATORY**

West 117th St. and Madison Ave.

Cleveland, Ohio

*Research staff:* John D. McQuade, Laboratory Director; 3 in scientific professions; additional personnel 2.

*Research activities:* The creation of new and the improvement of present getters and grid wires for radio tubes and other electronic devices; technical consultation and service with customers.

**LINDE AIR PRODUCTS COMPANY**

30 East 42nd St., New York 17, N. Y.

*President:* S. B. Kirk. *Vice President in charge of research:* L. A. Bliss.

Research was initiated in 1907.

**GENERAL RESEARCH LABORATORY**

East Park Drive and Woodward Ave.,

Tonawanda, N. Y.

*Research staff:* L. I. Dana, Director; 65 in scientific professions; additional personnel 50.

*Research activities:* The principal division of this laboratory is devoted to research and development on the production, storage, and distribution of gaseous oxygen and other atmospheric gases; this includes production and storage of large quantities of liquid oxygen, new methods of distribution in trucks and tank cars, and the design and development of consumers' equipment for conversion into gaseous oxygen and its use; research is also carried out on uses for oxygen and acetylene; research on inorganic chemicals. The other division of this laboratory is devoted to the development of cooling and lubricating agents and associated products for internal-combustion engines and similar industrial uses; this includes research on antifreeze compounds, especially ethylene glycol and the

antifreeze alcohols, rust inhibitors, stop leaks, and cleaning compositions. Engineering research is devoted to problems of combustion-engine maintenance and operation, especially as respects cooling and lubrication, as a practical background for product development. The work relating to automotive engines is carried out for the Eveready Division of National Carbon Company, Inc., and Carbide and Carbon Chemicals Corporation.

**PROCESS AND APPARATUS DEVELOPMENT**

**LABORATORY**

646 Frelinghuysen Ave., Newark, N. J.

*Research staff:* J. H. Zimmerman, Director; 67 in scientific professions; additional personnel 65.

*Research activities:* The development of apparatus, machines, and equipment for the utilization of oxygen, acetylene, and other industrial gases, especially the development of oxyacetylene cutting and welding equipment; the development of new processes for the industrial utilization of oxygen and acetylene, together with associated apparatus.

**NATIONAL CARBON COMPANY, INC.**

30 East 42nd St., New York 17, N. Y.

*President:* A. V. Wilker. *Vice President in charge of research:* L. M. Currie.

Research was initiated in 1892.

**GENERAL RESEARCH LABORATORY**

1280 West 73rd St., Cleveland, Ohio

*Research staff:* H. D. Batchelor, Director; 30 in scientific professions; additional personnel 56.

*Research activities:* This is the central research laboratory, where the basic research on all of the company's battery and carbon products is carried out. The goals are improved product merit and lowered cost of present products, together with new types of primary batteries and new carbon products. For all dry cells there is a constant drive for longer life; and for the smaller sizes, used in portable radios and earphone batteries, there is special pressure for more energy per unit of weight, volume, and cost. The great responsiveness of carbon to changes in properties, resulting from different physical and chemical treatments, offers an unlimited research approach, and leads to a large number of diverse and useful products. Favorable discoveries of this laboratory are passed on to one of the several Product and Process Laboratories which are located at some of the plants. Here the discovery is further evaluated, and if it is sufficiently attractive, the necessary applied research is carried out to permit incorporating

the discovery into full-scale commercial production.

*Cooperative research:* Three fellowships are supported.

PRODUCT AND PROCESS LABORATORY

1251 West 76th St., Cleveland, Ohio

*Research staff:* R. L. Glover, Laboratory Director; 10 in scientific professions; additional personnel 16.

*Research activities:* The products involved are small-size dry cells, used mainly for flashlights, hearing aids, and radio batteries. The work is directed toward increase in economy, portability, dependability, and other service factors of these batteries; results are accomplished through improvement in current manufacturing processes, commercial-scale development of new processes, or the development of new types of small-size primary batteries.

PRODUCT AND PROCESS LABORATORY

Tiffin and Town Sts., Fostoria, Ohio

*Research staff:* W. W. Lozier, Laboratory Director; 11 in scientific professions; additional personnel 25.

*Research activities:* The principal products involved are arc carbons, carbon brushes, and smaller-size carbon specialties for a wide variety of industrial uses. For the arc carbons used in the taking and projection of moving pictures, much work is done to improve the brilliancy, economy, color characteristics, operating convenience, and other service qualities. Work is also being done on expanding the use of carbon arc light in such fields as irradiation of food products, accelerated testing, and other photochemical applications. The work on carbon brushes includes the study of the basic phenomena of commutation, and the relations of brush composition and processing to commutation. The work on carbon specialties covers improvement in the quality and performance characteristics of these products, which have such industrial uses as porous carbon for electrochemical and filtering purposes, and impervious carbon for chemical and engineering uses. Suitable commercial-scale manufacturing methods are developed for new carbon products.

PRODUCT AND PROCESS LABORATORY

1425 West State St., Fremont, Ohio

*Research staff:* C. R. Fisher, Laboratory Director; 4 in scientific professions; additional personnel 8.

*Research activities:* This laboratory is concerned with three types of primary batteries: the large size dry cells for telephone and ignition service; caustic soda cells for railroad and general signal service; and air depolarized cells,

which provide the "A" power for nonportable, battery operated radios. The work is mainly devoted to improving the service factors of these batteries. This is accomplished by improvement in present manufacturing processes and by development of new processes and new types of primary batteries.

PRODUCT AND PROCESS LABORATORY

3625 Highland Ave., Niagara Falls, N. Y.

*Research staff:* A. W. Hosig, Laboratory Director. 7 in scientific professions; additional personnel 11.

*Research activities:* The products involved are carbon and graphite electrodes for use in electric furnaces and electrolytic processes, together with such carbon specialties as furnace linings and large carbon tubes and plugs. Among the objectives are the improvement in the service properties of present products and the development of new uses for carbon products.

LABORATORY FOR ANTI-FREEZE AND COOLING  
SYSTEM PRODUCTS FOR COMBUSTION  
ENGINES

East Park Drive and Woodward Ave.,  
Tonawanda, N. Y.

(Division of General Research Laboratories.)

This division is operated by Linde Air Products Company for the Eveready Division of National Carbon Company and for Carbide and Carbon Chemicals Corporation. See under Linde Air Products Company, General Research Laboratory, for further information.

PREST-O-LITE COMPANY, INC.

30 East 42nd St., New York 17, N. Y.

*President:* S. B. Kirk. *Vice President in charge of research:* L. A. Bliss.

Research was initiated in 1916.

ACETYLENE RESEARCH LABORATORY

Speedway, Indianapolis, Ind.

*Research staff:* Charles Ness, Director. 17 in scientific professions; additional personnel 10.

*Research activities:* The development of processes and equipment for the efficient production, distribution, and utilization of acetylene; the utilization of by-products and allied company products.

U. S. VANADIUM CORPORATION

NIACET CHEMICALS DIVISION

910 Niagara Bldg., Niagara Falls, N. Y.

*President:* J. R. Van Fleet.

*Laboratory:* 47th St. and Pine Ave., Niagara Falls, N. Y.



*Research staff:* C. J. Herrly, Director. 10 chemists, 4 engineers, 3 chemical engineers; technical personnel 8; additional personnel 6.

*Research activities:* Synthetic organic chemicals from acetylene. (Research initiated 1925.)

*Library:* 350 volumes.

**Union Malleable Iron Company.** See Deere and Company.

**2211. Union Oil Company of California,** 617 West 7th St., Los Angeles 14, Calif.

*President:* Reese H. Taylor.

*Laboratories:* Wilmington and Oleum, Calif.

*Research staff:* D. E. Carr, Manager of research; C. E. Swift, Patent Counsel and Associate Manager of research; B. T. Anderson and R. I. Stirton, Assistant Managers. 77 chemists, 3 physicists, 4 biologists, 23 engineers; technical personnel 95; additional personnel 20.

*Research activities:* Problems connected with the production and refining of petroleum and the utilization of its products. (Research initiated 1893.)

*Library:* 4,000 volumes.

*Cooperative research:* Eight grants are made for research.

**2212. Union Paste Company,** 1605 Hyde Park Ave., Hyde Park 36, Mass.

*Partners:* Herbert W. Kelley and A. B. Crowell, Jr.

*Research staff:* Robert L. Newell and F. Parker Bartlett, Jr., Co-Directors. 6 chemists; technical personnel 2; additional personnel 4.

*Research activities:* Water resistant adhesives. (Research initiated 1911.)

**2213. Union Starch and Refining Company,** Columbus, Ind.

*President:* Irwin Miller.

*Laboratory:* Granite City, Ill.

*Research staff:* J. E. Cleland, Technical Director. 5 chemists, 1 biologist and bacteriologist, 2 engineers; technical personnel 9; additional personnel 4.

*Research activities:* Hydrolysis of starch; caramel colors; feeds; proteins; pharmaceuticals. (Research initiated 1930.)

*Library:* 300 volumes.

*Cooperative research:* One grant for research is made.

**Union Steel Castings Division, Blaw-Knox Company.** See Blaw-Knox Company.

**2214. Union Switch and Signal Company,** Pittsburgh 18, Pa. (Affiliated with Westinghouse Air Brake Company.)

*President:* George A. Blackmore.

*Research staff:* L. O. Grondahl, Director of

research and engineering. 2 chemists, 2 physicists, 2 metallurgists, 10 engineers; technical personnel 10; additional personnel 6.

*Research activities:* The development of railway signaling, train control, and train communication apparatus; the development and study of copper oxide rectifier problems. (Research initiated 1916.)

*Library:* 1,000 volumes.

**2215. United Air Lines, Inc.,** 5959 South Cicero Ave., Chicago 38, Ill.

*President:* W. A. Patterson.

*Research staff:* J. A. Herlihy, Vice President of operations and engineering; W. C. Mentzer, Chief Engineer; R. D. Kelly, Superintendent of engineering development; W. W. Davies, Supervisor of aircraft planning; J. R. Cunningham, Director of communications; A. D. Tuttle, Medical Director. 1 biologist, 42 engineers, 2 in other scientific professions; technical personnel 9; additional personnel 74.

*Research activities:* Development of air transport facilities, including mechanical and electrical communications. (Research initiated 1932.)

**2216. United Aircraft Corporation,** 400 Main St., East Hartford 8, Conn.

*President:* H. M. Horner.

*Research staff:* L. S. Hobbs, Vice President in charge of engineering; F. W. Caldwell, Director of research.

*Research activities:* Aircraft engines and propellers; aircraft and related research projects. (Research initiated 1929.)

*Library:* 3,500 volumes.

#### UAC RESEARCH DEPARTMENT

WIND TUNNEL AND THERMODYNAMIC LABORATORY  
East Hartford, Conn.

*Research staff:* F. W. Caldwell, Director. 2 physicists, 29 engineers; technical personnel 32; additional personnel 14.

#### PRATT AND WHITNEY AIRCRAFT

EXPERIMENTAL, DEVELOPMENT AND INSTALLATION  
LABORATORIES  
East Hartford, Conn.

*Research staff:* W. A. Parkins, Engineering Manager. 16 chemists, 2 physicists, 24 metallurgists, 295 engineers; technical personnel 316; additional personnel 384.

#### HAMILTON STANDARD PROPELLERS

EXPERIMENTAL AND DEVELOPMENT LABORATORIES  
East Hartford, Conn.

*Research staff:* Erle Martin, Engineering Manager. 2 chemists, 5 metallurgists, 81 engi-

neers, 4 mathematicians; technical personnel 63; additional personnel 266.

CHANCE VOUGHT AIRCRAFT

EXPERIMENTAL AND DEVELOPMENT LABORATORIES  
Stratford, Conn.

*Research staff:* P. S. Baker, Engineering Manager. 7 chemists, 4 metallurgists, 220 engineers, 5 mathematicians; technical personnel 32; additional personnel 338.

SIKORSKY AIRCRAFT

EXPERIMENTAL AND DEVELOPMENT LABORATORIES  
Bridgeport, Conn.

*Research staff:* I. I. Sikorsky, Engineering Manager. 1 metallurgist, 35 engineers; technical personnel 43; additional personnel 31.

2217. United Biscuit Company of America, 1041 West Harrison St., Chicago, Ill.

*President:* K. F. MacLellan.

*Research staff:* Jan Micka, Director. Additional personnel 1.

*Research activities:* The baking of various food products. (Research initiated 1930.)

2218. United Carbon Company, Inc., Charleston, W. Va.

*President:* Oscar Nelson.

*Laboratories:* Charleston, W. Va.; Borger, Tex.; Ryus, Kans.

*Research staff:* I. Drogin, Director. 17 chemists, 2 engineers; technical personnel 16; additional personnel 7.

*Research activities:* The recovery of carbon black through better plant design, construction, and operation; physical and chemical properties of carbon black in relation to its use in rubber compounding, lacquer and paint formulation, printing ink manufacture, plastics, and paper stocks; the development of improved types of black. (Research initiated 1930.)

2219. United Chromium, Inc., 51 East 42nd St., New York 17, N. Y.

*President:* R. O. Loengard.

*Laboratories:* Waterbury, Conn.; Detroit, Mich.; Carteret, N. J.

*Research staff:* T. G. Coyle, Vice President and Technical Director; G. Dubpernell, Manager, Waterbury; J. E. Stareck, Director, Detroit; F. L. Scott, Manager, Carteret. 18 chemists, 4 engineers, 6 in other scientific professions; additional personnel 6.

*Research activities:* The primary field of research is metal finishing. This includes electroplating processes and materials, and organic coatings for both decorative and engineering applications. The Detroit and Waterbury labo-

ratories work principally on electrodeposition and related processes; the Carteret laboratory, on the study and development of organic coatings. Electrochemical research is carried out on chromium, copper, nickel, and other plating processes and related treatments; also included are chemical processes such as dip treatments for metals and metal coatings. Organic coating work is on synthetic resin and nitrocellulose type coatings for use as maintenance and special chemically resistant finishes, and on clear and pigmented coatings for manufactured articles. Constituting an important part of the research are special purpose coatings such as plating rack coatings, stop-off lacquers, resists and compounds, and cements. (Research initiated 1925.)

*Library:* 800 volumes.

*Cooperative research:* Two grants for research are made.

2220. United Cinephone Corporation, Torrington, Conn.

*President:* L. R. Ripley.

*Research staff:* John M. Miller, Jr., Director. 8 engineers; technical personnel 10; additional personnel 18.

*Research activities:* Audio and industrial electronics, electrotherapy, radio receivers, electronic test equipment, and radio speakers. (Research initiated 1937.)

*Library:* 150 volumes.

2221. United Engineering and Foundry Company, First National Bank Bldg., Pittsburgh 22, Pa.

*President:* K. C. Gardner, Sr.

*Laboratories:* Metallurgical, chemical, and engineering laboratories: Pittsburgh, New Castle, and Vandergrift, Pa.; Canton, Ohio.

*Research staff:* F. C. Biggert, Chairman of Board and Director of engineering and research; M. D. Stone, Manager of Development Department; F. H. Allison, Chief Metallurgist. 1 chemist, 4 metallurgists, 5 engineers; technical personnel 3; additional personnel 7.

*Research activities:* Rolling mill machinery including forging presses and processing and finishing equipment for both ferrous and non-ferrous industries; machinery for rubber, plastics, and plywood; iron and steel rolls and castings, etc. (Research initiated 1900.)

*Cooperative research:* Ten grants are made for research.

2222. United Feldspar and Minerals Corporation, Minpro Division, Spruce Pine, N. C.

*Research staff:* J. E. Boyd, Vice President in charge of production and research; S. G. Wiseman, Chief Chemist. 2 chemists; technical personnel 2.

*Research activities:* The development and

testing of ceramic raw materials, nonmetallic ore dressing, and processing methods. (Research initiated 1926.)

**2223. United Fruit Company, 1 Federal Street, Boston 10, Mass.**

*President:* Samuel Zemurray.

*Laboratory:* Pier 7, North River, New York, N. Y.

*Research staff:* Hartley Rowe, Chief Engineer. 3 chemists, 2 biologists, 1 engineer; technical personnel 2.

*Research activities:* Food chemistry, insecticides, miscellaneous crops and marketing, nutritional values. (Research initiated 1926.)

*Library:* 1,000 volumes.

**2224. United International Research, Inc., 343 East 63rd St., New York 21, N. Y.**

*President:* Alfred R. Globus.

*Research staff:* Alfred R. Globus, Director. 1 chemist, 1 metallurgist, 1 chemical engineer, 1 electrochemist. Also connected with the company are a number of additional professionally trained consultants in various scientific fields.

*Research activities:* Electrochemical and electrometallurgical research; organic research on solvents, plastics, and reagents; powder metallurgy. (Research initiated 1941.)

**2225. United Merchants Laboratories, Inc., 601 West 26th St., New York 1, N. Y.** (Research and Engineering Division of United Merchants and Manufacturers, Inc.)

*Executive Vice President:* C. L. Mantell.

*Research staff:* T. J. Dabrowski, Assistant Technical Director; H. P. Waechter, Chief Engineer. 8 chemists, 2 physicists, 1 biologist, 1 metallurgist, 13 engineers, 4 textile technologists; technical personnel 2; additional personnel 10.

*Research activities:* Textile products and processes development. (Research initiated 1940.)

*Library:* 1,000 volumes.

*Cooperative research:* Three fellowships are supported.

**2226. United-Rexall Drug Company, 314 West 5th St., Los Angeles 14, Calif.**

*President:* J. W. Dart.

*Laboratories:* 43 Leon St., Boston 15, Mass.; 3901 North Kingshighway Blvd., St. Louis 15, Mo.

*Research staff:* Philip K. Bates, Director; C. O. Ewing, Associate Director and Chief Chemist; J. A. C. Bowles, Associate Director. 29 chemists, 3 biologists; technical personnel 2; additional personnel 20.

*Research activities:* The development of medicinal products; toiletries, food products,

and candies; processing, research, and test procedure including instrumentation. (Research initiated 1905.)

*Library:* 2,000 volumes.

*Cooperative research:* Four grants for research are made.

**2227. United Shoe Machinery Corporation, 140 Federal St., Boston 7, Mass.**

*President:* A. W. Todd.

*Laboratories:* Beverly, Mass.; Chemical Laboratories, B. B. Chemical Company, Cambridge, Mass.

*Research staff:* *Boston:* Administrative and maintenance personnel 43. *Beverly:* Clifford Roberts, Vice President and Director of research; John Homan, Assistant Director. 5 chemists, 2 physicists, 1 metallurgist, 50 engineers; 209 technical research assistants, 114 machinists, 30 pattern makers; additional personnel 114. *B. B. Chemical Company:* Webb Hyde, President; Russell K. Nash, Executive Director. 35 chemists; technical personnel 26; additional personnel 12.

*Research activities:* *Beverly:* Problems in mechanical, electrical, chemical, and metallurgical development relating to machines used in the manufacture of shoes, leather, and shoe findings; problems in the improvement of shoes, shoe manufacturing methods, findings, and shoe parts, including wooden heels, eyelets, tacks, nails and shanks, shoe laces, and shoe forms; machines and methods involving the manufacture of shoe factory equipment and equipment for factories making brushes, shoe lasts, and paper shoe boxes, and for tanning leather. *B. B. Chemical Company:* Problems in chemical development relating to products used in the shoe, leather tanning, and allied trades. (Research initiated 1899.)

*Library:* *Beverly:* 500 volumes.

**2228. United States Bronze Powder Works, Inc., 220 West 42nd St., New York, N. Y.** (Subsidiary of International Bronze Powders, Ltd.)

*President:* T. J. Mullen.

*Laboratory:* Closter, N. J.

*Research staff:* Henry H. Mandle, Executive Officer in charge of research; Edward F. Collins, Director. 3 chemists, 1 engineer, 3 assistants.

*Research activities:* The improvement of milling equipment and the development of a process for the continuous production of fine metallic powders in a controlled atmosphere; study of the relation of particle size, superficial area, and flake thinness of metallic powders as affecting covering capacity, leafing property, and weather resistance; study of the various methods used in milling and polishing

operations of bronze powders; investigations and research in the field of nonlamellar powders. (Research initiated 1923.)

**2229. United States Department of Agriculture,** Agricultural Research Administration, Bureau of Agricultural and Industrial Chemistry, Washington 25, D. C.

*Chief of Bureau of Agricultural and Industrial Chemistry:* O. E. May.

*Laboratories:* Four Regional Research Laboratories were established by the U. S. Department of Agriculture in 1938, to conduct researches into and to develop new scientific, chemical, and technical uses, and new and extended markets and outlets for farm commodities and products and by-products thereof, including research on food products of farm commodities.

**EASTERN REGIONAL RESEARCH LABORATORY**

Wyndmoor (Montgomery County), Pa.  
P. O., Chestnut Hill Station, Philadelphia 18, Pa.

*Research staff:* P. A. Wells, Director. 95 chemists, 4 physicists, 2 biologists, 14 engineers, 1 technical editor; technical personnel 50; additional personnel 105.

*Research activities:* Investigations are in progress on apples and other fruits, white potatoes and other vegetables, milk products, animal fats and oils, and tanning materials and leather.

*Library:* 5,500 volumes.

**NORTHERN REGIONAL RESEARCH LABORATORY**

825 North University St., Peoria 5, Ill.

*Research staff:* H. T. Herrick, Director. 79 chemists, 1 physicist, 26 engineers, 5 microbiologists, 4 bacteriologists, 3 agricultural technologists, 1 chemical technologist, 1 paper technologist, 1 zymologist, 1 industrial analyst, 1 statistician; technical personnel 49; additional personnel 119.

*Research activities:* Investigations are in progress on corn, wheat, and other cereal crops; soybeans and other oil seed crops; and agricultural residues.

*Library:* 5,000 volumes.

**SOUTHERN REGIONAL RESEARCH LABORATORY**

2100 Robert E. Lee Blvd., New Orleans 19, La.

*Research staff:* Walter M. Scott, Director. 60 chemists, 7 physicists, 4 biochemists, 14 chemical engineers, 4 mechanical engineers, 5 chemical technologists, 21 cotton technologists, 1 textile technologist, 1 technologist, 2 agricultural economists, 1 technical editor; technical personnel 40; additional personnel 115.

*Research activities:* Investigations are in progress on cotton, sweet potatoes, and peanuts.

*Library:* 7,000 volumes.

**WESTERN REGIONAL RESEARCH LABORATORY**

800 Buchanan St., Albany 6, Calif.

*Research staff:* T. L. Swenson, Director. 87 chemists, 5 physicists, 14 engineers, 7 biochemists, 2 microbiologists, 5 bacteriologists, 1 histologist, 1 chemical technologist, 1 food technologist, 3 economists, 2 industrial analysts, 1 technical editor; technical personnel 37; additional personnel 75.

*Research activities:* Investigations are in progress on apples and other fruits, white potatoes and other vegetables, alfalfa, wheat, and poultry products.

*Library:* 6,000 volumes.

**2230. United States Envelope Company,** 70 Grove St., Worcester 5, Mass.

*President:* W. E. Swift.

*Laboratory:* 84 Prescott St., Worcester 5, Mass.

*Research staff:* Roy C. Charron, Director. 2 chemical engineers; technical personnel 3.

*Research activities:* Lacquers and waterproofing materials for coating papers. (Research initiated 1921.)

**2231. United States Finishing Company,** Norwich, Conn.

*President:* Grant A. McClatchie.

*Laboratory:* 40 Fountain St., Providence, R. I.

*Research staff:* Charles F. Watkins, Vice President in charge of research; L. Balassa, Director. 4 chemists, 1 biologist; technical personnel 1; additional personnel 1.

*Research activities:* Fundamental and applied research on textile finishing products and processes. Development of new products and processes for finishing cotton, rayons, linen, wool mixtures, and synthetic fibers. (Research initiated 1929.)

*Library:* 200 volumes.

*Cooperative research:* Three grants for research are made.

**2232. United States Gypsum Company,** 300 West Adams St., Chicago 6, Ill.

*President:* W. L. Keady.

*Laboratory:* 1253 Diversey Parkway, Chicago, Ill.

*Research staff:* H. N. Huntzicker, Director. 31 chemists, 2 physicists, 9 engineers; technical personnel 6; additional personnel 18. In addition to this staff, the company has more than 150 chemists and engineers available in 31 manufacturing plant laboratories to take problems assigned to them or to supplement research and developmental work conducted at their respective plants.

*Research activities:* Product and process research and development in gypsum and lime building and industrial products; asphalt and asbestos-cement roofing and siding; paints; metal products; wood fiber decorative board, hardboard, acoustical, and insulation products; paper products. These activities include research on sound control and thermal insulation; the development of roof, wall, and floor construction systems; and the study of special problems relating to the use of such industrial products as nonferrous metal casting plasters, oil well cements, and pottery and dental plasters. (Research initiated 1925.)

*Library:* 2,400 volumes.

**2233. United States Heat Treating Company,** 319 Dakota St., San Antonio 1, Tex.

*President:* Harry Pennington.

*Research staff:* Harry Pennington, Director; Harry Pennington, Jr., Assistant Director. 1 chemist; 2 physicists, 2 metallurgists, 6 engineers, 1 geologist; technical personnel 4; additional personnel 6.

*Research activities:* Increasing the recovery percentage of the known oil from an oil sand; oil well equipment, tools, appliances, and methods relating to the discovery of oil and its production; aerial geological reconnaissance in color relief; the chroming of bores of aircraft engines, including equipment; electrolytic reduction of manganese ores of low grade producing pure manganese; mechanical transmissions for rotary drilling rigs having internal combustion engines; aircraft engine assembly tools. (Research initiated 1927.)

*Library:* 6,500 volumes.

**2234. United States Hoffman Machinery Corporation,** 219 Lamson St., Syracuse 6, N. Y.

*President:* Albert C. Bruce.

*Research staff:* Edgar R. Clark, Director. 2 chemists, 3 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Dry cleaning of textiles; laundering; filtration; distillation; froth flotation. (Research initiated 1928.)

*Cooperative research:* One fellowship is supported.

**2235. U. S. Industrial Chemicals, Inc.,** 60 East 42nd St., New York 17, N. Y.

*Chairman of the Board:* C. E. Adams.

*President:* Glenn L. Haskell.

*Laboratories:* Stamford, Conn. (operated jointly with Air Reduction Company, Inc.); Baltimore, Md.; Newark, N. J.

*Research staff:* L. W. Bass, Director of research and development; K. A. Earhart, resin research; A. J. Fisher, Jr., technical sales; H. L. Fisher, organic research; F. M. Hilde-

brandt, fermentation research; T. H. Manninen, engineering development; L. Trubek, resin development; D. G. Zink, technical development. 47 chemists, 23 engineers, 4 bacteriologists, 2 entomologists; additional personnel 50.

*Research activities:* Solvents, alcohols and derivatives, plasticizers, synthetic and natural resins, organic chemicals, antifreeze, fermentation products, insecticides, and insectifuges. (Research initiated 1916.)

*Library:* 2,000 volumes.

*Cooperative research:* Four grants for research are made.

**2236. United States Metals Refining Company,** Carteret, N. J. (Subsidiary of American Metal Company.)

*President:* Heath Steele.

*Research staff:* Max F. W. Heberlein, Director. 2 chemists, 5 metallurgists; additional personnel 9.

*Research activities:* The development of smelting, fire refining, and electrolytic refining of nonferrous metals and powdered metals by electrolytic and other methods; the utilization of by-products of metallurgical processes. (Research initiated 1917.)

*Library:* 1,000 volumes.

*Cooperative research:* Two fellowships are supported.

**2237. United States Pipe and Foundry Company,** Burlington, N. J.

*President:* N. F. S. Russell.

*Research staff:* A. E. Schuh, Director. 4 chemists, 1 physicist, 4 metallurgists, 5 engineers; technical personnel 7; additional personnel 3.

*Research activities:* Metallurgy of cast iron; centrifugal casting of iron, steel, ferrous alloys, and bimetallic tubular structures; allied pipe production problems: melting methods, coatings, linings, corrosion, etc. (Research initiated 1930.)

*Library:* 1,200 volumes.

*Scientific periodicals:* U. S. Piper. Vol. I, 1927.

**2238. United States Playing Card Company,** Cincinnati 12, Ohio.

*President:* M. A. Follman.

*Research staff:* Charles H. Waldhauer, Vice President in charge of manufacturing; Alfred Hugentober, Director of research.

*Research activities:* Problems relating to paper, paper coatings and impregnants, and the maintenance of quality standards.

**2239. United States Radiator Corporation, 1500  
United Artists Bldg., Detroit 31, Mich.**

*Laboratories:* 127 Campbell Ave., Detroit, Mich.

*Research staff:* A. A. Emrick, Chief Engineer; J. W. Turner, Chief Engineer, Pacific Steel Boiler Division. 1 chemist, 6 engineers; additional personnel 3.

*Research activities:* Designing and testing of boilers and other heating equipment. (Research initiated 1920.)

*Cooperative research:* One grant for research is made.

**2240. United States Rubber Company, 1230  
Sixth Ave., New York 20, N. Y.**

*Chairman of the Board:* F. B. Davis, Jr.

*President:* H. E. Smith.

*Research staff:* W. A. Gibbons, Director, Research and Technical Development Department.

**GENERAL LABORATORIES**

Market and South Sts., Passaic, N. J.

*Research staff:* E. Hazell, Manager.

*Research activities:* Research and development work on various phases of rubber manufacture, rubber chemicals, textiles, and new products.

**NAUGATUCK CHEMICAL DIVISION**

Naugatuck, Conn.

*Research staff:* M. G. Shepard, Manager.

*Research activities:* Research, development, and control work on synthetic rubber, rubber chemicals, aromatic chemicals, agricultural chemicals, dye intermediates, reclaimed rubber, latex compositions, aqueous dispersions, plastics, lacquers, and high explosives.

**TIRE DEVELOPMENT AND SPECIFICATION  
DEPARTMENT**

Detroit, Mich. and Indianapolis, Ind.

*Research staff:* L. B. Martin, Manager; A. W. Bull, Associate.

*Research activities:* The quality, appearance, and material cost of tires, tubes, bicycle tires and tubes, and motor products.

**FOOTWEAR DIVISION**

*Research staff:* G. W. Blair, Manager.

**DIVISIONAL PLANT, NAUGATUCK, CONN.**

*Research staff:* J. E. Robinson, Manager.

*Research activities:* Style, design, construction, compound, and process development for various types of waterproof and canvas footwear.

**DIVISIONAL PLANT, MISHAWAKA, IND.**

*Research staff:* J. F. Schott, Manager.

*Research activities:* Style, design, construction, compound, and process development for various types of waterproof and canvas footwear, clothing, coated fabrics, and foam rubber products.

**WIRE AND CABLE DEPARTMENT**

Bristol, R. I.

*Research staff:* E. G. Sturdevant, Manager.

*Research activities:* Control and development work on various types of insulated wire and cable.

**GENERAL PRODUCTS DIVISION**

Providence, R. I.

*Research staff:* S. I. Strickhouser, Manager.

*Research activities:* Control and development work on latex thread and Lastex, cut rubber thread, golf balls, soles and heels, bathing goods, sundries, battery separators, rolls, and tank lining.

**MECHANICAL GOODS DIVISION**

Passaic, N. J.

*Research staff:* R. D. Gartrell, Manager.

*Research activities:* Development work on mechanical rubber goods.

**L. H. GILMER COMPANY DIVISION**

Tacony, Philadelphia, Pa.

*Research staff:* R. Y. Case, Manager.

*Research activities:* Control and development work on V-belts.

**TEXTILE DIVISION**

1230 Sixth Ave., New York, N. Y.

*Laboratories:* Hogansville, Ga.

*Research staff:* R. C. Harrington, Technical Director.

**2241. United States Smelting Refining and Mining Company, 75 Federal St., Boston 6, Mass.**

*President:* N. W. Rice.

*Laboratories:* Central Laboratory, Cambridge, Mass. Field and Operating Units Research, Salt Lake City, Utah; Bayard, N. Mex.; Gold Road, Ariz.; Fairbanks and Cape Nome, Alaska; Pachuca, Mexico.

*Research staff:* Galen H. Clevenger, Consulting Metallurgist. About 50 chemists, physicists, metallurgists, engineers, and geologists.

*Research activities:* Nonferrous metals and coal; new metallurgical processes and improvements in existing procedures; new uses for products; problems connected with the finding

and development of new ore bodies. (Research initiated 1917.)

*Cooperative research:* Two scholarships are supported.

**2242. U. S. Standard Products Company, Woodworth, Wis.**

*President:* R. J. Coleman.

*Research staff:* F. H. Eggert, Director of laboratories; Max N. Huffman, in charge of research. 6 chemists, 4 biologists.

*Research activities:* Biologicals and medicaments. (Research initiated 1920.)

**2243. United States Steel Corporation of Delaware, 436 Seventh Ave., Pittsburgh 30, Pa.**

*President:* B. F. Fairless.

*Laboratory:* Lincoln Highway, Kearny, N. J.

*Research staff:* John Johnston, Director; J. B. Austin and R. B. Sosman, Assistant Directors; R. H. Aborn, Supervisor of metallurgy. 11 chemists, 3 physicists, 14 metallurgists, 2 engineers, 1 petrographer; technical personnel 17; additional personnel 10.

*Research activities:* The metallurgy of steels and their properties in relation to structure; the physical chemistry of steel making; alloy systems; heat-treatment; refractories; corrosion; physical testing. (Research initiated 1908.)

*Library:* 3,500 volumes.

*Cooperative research:* Five fellowships are supported and six grants for research are made.

*See also* American Bridge Company; American Steel and Wire Company; Carnegie-Illinois Steel Corporation; Columbia Steel Company; National Tube Company; Oil Well Supply Company; Tennessee Coal, Iron and Railroad Company; and Universal Atlas Cement Company.

**2244. United States Stoneware Company, Box 350, Akron 9, Ohio.**

*President:* J. M. W. Chamberlain.

*Research staff:* D. F. Siddall, Director of research and development. 5 chemists, 1 metallurgist, 6 engineers, 2 mechanical and development engineers; technical personnel 3; additional personnel 3.

*Research activities:* Chemical process equipment, design, and materials; synthetic resins, plastics, and rubber; corrosion resistant alloys, lead, steel, etc.; ceramics. (Research initiated 1938.)

*Library:* 600 volumes.

**2245. United States Sugar Corporation, Clewiston, Fla.**

*President:* Clarence R. Bitting.

*Research staff:* B. A. Bourne, Vice President and Director of research. 2 chemists, 3 biolo-

gists, 1 agronomist; technical personnel 2; additional personnel 4.

*Research activities:* Sugar cane and sweet potato breeding and genetics; agronomic testing of new varieties of sugar cane and sweet potato; pathological and physiological studies of sugar cane and sweet potato; soil and fertilizer investigations; testing of new agricultural crop plants for local adaptability; starch processing and production; pasture grass investigations; adaptability of leading beef cattle breeds; dry lot cattle feeding trials with local by-product feeds; lemon grass and citronella grass oils; peanut, sesame, and castor oil production. (Research initiated 1929.)

*Library:* 1,500 volumes.

*Cooperative research:* Two scholarships are supported and one grant for research is made.

**2246. United States Testing Company, Inc., Engineering and Research Division, 1415 Park Ave., Hoboken, N. J.**

*President:* D. E. Douty.

*Laboratories:* Central laboratory, Hoboken, N. J. Branch Laboratories: Boston, Mass.; Chicago, Ill.; New York, N. Y.; Philadelphia, Pa.; Woonsocket, R. I.

*Research staff:* T. Smith Taylor, Director; A. L. Brassell, Vice President and General Manager; B. A. Schroeder, Chief Chemist; Edward Kennedy, Chemical Engineer; H. S. Wyckoff, Chief Engineer. 11 chemists, 10 physicists, 3 biologists, 3 metallurgists, 25 engineers, 1 physician; technical personnel 101; additional personnel 96.

*Research activities:* The development of instruments and methods of measurement of various properties of materials in the fields of paper, textiles, leather, rubber, dyes, paints, and oils; production and performance standards in these fields. Measurement and analysis in the fields of acoustics, electricity and electronics, heat, mechanics, optics, and general physics; the design and construction of special instruments and apparatus, and the development of methods for use in laboratory or industrial applications in the above fields. The investigation and reporting of industrial problems. The establishment of standards of quality and performance of industrial and domestic consumer products, and the certification of maintenance of such standards. (Research initiated 1880.)

*Library:* 3,046 volumes.

**U. S. Vanadium Corporation, Niacet Chemicals Division. See Union Carbide and Carbon Corporation.**

**2247. U. S. Vitamin Corporation, 250 East 43rd St., New York 17, N. Y.**

*President:* H. B. Burns.

*Laboratories:* Subsidiary companies: Pro-

fessional Laboratories, Inc. and Dietetic Research Laboratories, Inc., both at 21 Hudson St., New York 13, N. Y. Affiliated company: H. E. Dubin Laboratories, Inc., 250 East 43rd St., New York 17, N. Y.

*Research staff:* Louis Freedman, Director; H. E. Dubin, Technical Director; Casimir Funk, Research Consultant. 10 chemists, 1 biologist, 1 chemical engineer, 1 physician; technical personnel 6; additional personnel 12.

*Research activities:* Nutrition, vitamins, pharmaceuticals, and hormones. (Research initiated 1933.)

*Library:* 500 volumes.

*Cooperative research:* Two grants for research are made.

2248. United Western Laboratories, Inc., 619 Twenty-second St., Denver 5, Colo.

*President:* Emmett Powers.

*Research staff:* Emmett Powers, Director. 3 chemists, 2 engineers, 3 physicians; technical personnel 3; additional personnel 6.

*Research activities:* Pharmaceutical and food research. (Research initiated 1916.)

*Library:* 250 volumes.

2249. Universal Atlas Cement Company, 135 East 42nd St., New York 17, N. Y. (Subsidiary of United States Steel Corporation of Delaware.)

*President:* Blaine S. Smith.

*Laboratories:* Buffington, Ind.

*Research staff:* G. L. Lindsay, Director of tests and research; C. L. Davis, Engineer of tests; F. P. Diener, Chemical Engineer; W. C. Hansen, Manager of research laboratories. 8 chemists, 1 physicist, 2 engineers; technical personnel 15; additional personnel 11.

*Research activities:* Manufacturing processes, raw materials, intermediates, and finished products; the application of science to the manufacture and use of cements. (Research initiated 1925.)

2250. Universal Moulded Products Corporation, Bristol, Va.

*President:* T. H. McKoy, Jr.

*Research staff:* R. J. Nebesar, Vice President and Chief Engineer. 1 chemist, 8 engineers; technical personnel 3; additional personnel 2.

*Research activities:* Low pressure molding of fibreglas-sandwich, fibreglas laminates, impregnated paper, and wood. (Research initiated 1941.)

*Library:* 100 volumes.

2251. Universal Oil Products Company, 310 South Michigan Ave., Chicago 4, Ill.

*President:* David W. Harris.

*Laboratory:* Riverside, Ill.

*Research staff:* C. G. Gerhold, Manager;

E. R. Kanhofer, Assistant Manager; Louis S. Kassel, Research Coordinator. 48 chemists, 3 physicists, 27 engineers; technical personnel 75; additional personnel 69.

*Research activities:* Petroleum refining. (Research initiated 1921.)

*Library:* 4,000 volumes.

*Scientific periodicals:* Library Bulletin Abstracts. Vol. I, 1926. Survey of Foreign Petroleum Literature. Vol. I, 1937.

*Cooperative research:* Three fellowships are supported and three grants for research are made.

Universal Research Laboratories. See Associated Broadcasters, Inc.

2252. Universal Sanitary Manufacturing Company, Box 391, New Castle, Pa.

*President:* W. Keith McAfee.

*Research staff:* J. R. Beam, Director. 1 chemist, 2 engineers, 2 draftsmen.

*Research activities:* Ceramic research: new bodies and glazes, new and improved raw materials, criteria for fundamental process control, and the physics and chemistry of the ceramic industry. Hydraulic research: fundamental hydraulics of water closet bowls and product improvement. (Research initiated 1934.)

*Cooperative research:* Two grants for research are made.

2253. Univis Lens Company, 401 Leo St., Dayton, Ohio.

*President:* M. H. Stanley.

*Research staff:* Stanley Emerson, Director of research; C. V. Smith, Laboratory Director; Paul Grady, Industrial Engineer. 1 chemist, 1 physicist, 1 consulting metallurgist, 2 engineers, 2 optometrists; additional personnel 2.

*Research activities:* Plastic ophthalmic lenses, including contact lenses; glass multifocal ophthalmic lens; special ophthalmic lenses. (Research initiated 1940.)

*Library:* 100 volumes.

*Cooperative research:* One grant for research is made.

2254. Upjohn Company, Kalamazoo 99, Mich.

*President and General Manager:* D. S. Gilmore.

*Research staff:* Merrill C. Hart, Vice President and Director of research. 34 chemists, 2 physicists, 16 biologists, 5 engineers, 1 physician, 14 bacteriologists, 7 pharmacologists, 4 pharmacists, 28 in other scientific professions; technical personnel 40; additional personnel 13.

*Research activities:* Vitamins, hormones, synthetic amines and hypnotics, antiseptics, antibiotics, vaccines, pharmacological chemistry, viruses, and blood substitutes. (Research initiated 1886.)



*Library:* 10,000 volumes.

*Cooperative research:* Thirty-one scholarships and grants for research are supported.

**2255. Upson Company, Upson Point, Lockport, N. Y.**

*President:* Charles A. Upson.

*Research staff:* Walter P. Ericks, Research Director. 2 chemists, 2 engineers; technical personnel 3; additional personnel 1.

*Research activities:* Upson board panels, improved coated fiberboard, technical boards for industry, new fiber developments, and insulation. (Research initiated 1924.)

*Library:* 300 to 325 volumes.

**2256. Utah Copper Company, Kearns Bldg., Salt Lake City 1, Utah.** (Subsidiary of Kennecott Copper Corporation.)

*President:* D. D. Moffat.

*Laboratory:* Arthur Plant, Garfield, Utah.

*Research staff:* T. A. Janney, Chief Metallurgical Engineer. 6 chemists, 3 engineers; additional personnel 2.

*Research activities:* The treatment of ores by the flotation process; lixiviation and related investigations; flotation agents. (Research initiated 1913.)

*Library:* 200 volumes.

**2257. Utah-Idaho Sugar Company, Beneficial Life Bldg., Salt Lake City 13, Utah.**

*President:* George Albert Smith.

*Laboratories:* West Jordan and St. George, Utah; Toppenish, Wash.

*Research staff:* Bion Tolman, Director; Ford Scalley, in charge of sugar beet seed production and processing; R. S. Gaddie, General Chemist; Earl Trinniman, Chief Engineer. 6 chemists, 1 biologist, 2 engineers, 2 agronomists; additional personnel 6.

*Research activities:* Research relating to various agronomic phases of sugar beet production; bacteriological and chemical studies relating to the processing of beet sugar; the development of improved machinery.

*Cooperative research:* Two fellowships are supported and two grants for research are made.

**2258. Utilities Research Commission, 72 West Adams St., Chicago, Ill.**

*Chairman:* Alex D. Bailey.

*Laboratories:* Half of the research work is done in the laboratories of the companies which the Utilities Research Commission represents: Commonwealth Edison Company, Public Service Company of Northern Illinois, Western United Gas and Electric Company, and Illinois Northern Utilities Company. A quarter of the research work is done in the Engineering Experiment Stations at the University of Illinois,

Iowa State College, and Armour Research Foundation. The remainder of the work is done at miscellaneous agencies such as the Engineering Foundation, Industrial Hygiene Foundation, etc.

*Research staff:* Henry P. Ruge, Assistant Director of research.

*Research activities:* Lead cable sheath studies, boiler water treatment, rotary collector-ring brushes, and welding; the investigation of heat transfer media, off-season gas sales, and fluorescent lighting; the study of air hygiene; food sterilization; electric range and water heaters, high frequency heating; electronic fault-locating equipment; supersonics; insulating materials; year-round air conditioning; service problems. (Research initiated 1924.)

**2259. V and O Press Company, Inc., Hudson, N. Y.** (Subsidiary of Rockwell Manufacturing Company.)

*President:* H. F. Zorn.

*Research staff:* James Giffen, Director; R. A. Freeman, Chief Engineer. 2 engineers; additional personnel 7.

*Research activities:* The development of power presses, dies, and automatic feeding and handling devices used in conjunction with power presses; equipment for roll threading, trimming, and marking of cups, shells, etc.; high speed notching equipment for lamination and similar work. (Research initiated 1895.)

*Library:* A library is maintained.

**2260. Valentine and Company, Inc., 11 East 36th St., New York 16, N. Y.** (Subsidiary of Valspar Corporation.)

*President:* Thurlow J. Campbell.

*Laboratory:* Brooklyn, N. Y.

*Research staff:* Harold C. Parks, Chief Chemist. 6 chemists; technical personnel 10; additional personnel 3.

*Research activities:* The standardization, improvement, and development of varnishes, enamels, paints, lacquers, and other types of protective coatings. (Research initiated 1867.)

*Library:* 1,000 volumes.

**2261. Valentine Sugars, Valite Division, Whitney Bldg., New Orleans 6, La.**

*President:* J. W. Jay.

*Laboratory:* Valentine Plantation, Lockport, La.

*Research staff:* Will J. Gibbens, Jr., Managing Partner; T. R. McElhinney, Technical Director; T. D. Woodruff, Assistant to Director. 3 chemists, 6 engineers; technical personnel 2; additional personnel 5.

*Research activities:* Utilization of agricultural wastes; synthetic resins; molding com-

pounds; fermentation; pulping. (Research initiated 1939.)

*Library:* 1,800 volumes.

**2262. Valentine's Meat-Juice Company, 1600 Chamberlayne Parkway, Richmond 9, Va.**

*President:* C. Braxton Valentine.

*Research staff:* W. A. Peabody, Vice President in charge of chemical research. 3 chemists, 1 biologist, 1 laboratory assistant.

*Research activities:* Liver and beef extracts; proteins and amino acids; vitamin B-complex; creatine and derivatives; pharmaceutical specialties. (Research initiated 1923.)

*Cooperative research:* One grant for research is made.

**Valite Division, Valentine Sugars. See Valentine Sugars.**

**2263. Valley Forge Laboratories, Inc., Conshohocken, Pa.**

*President:* Robert F. Nelson.

*Laboratory:* West Conshohocken, Pa.

*Research staff:* C. M. Connor, Technical Director. 2 chemists, 1 biologist, 1 engineer; technical personnel 2.

*Research activities:* Cellulose fiber, paper printing, and packaging. (Research initiated 1934.)

**2264. Valley Mould and Iron Corporation, Hubbard, Ohio.**

*President:* William Haig Ramage.

*Research staff:* Edmund J. Kauffman, Director. 2 chemists, 2 metallurgists, 2 engineers, 1 engineer draftsman; technical personnel 1; additional personnel 1.

*Research activities:* The improvement of ingot molds and steels, and their application to the steel industry. (Research initiated 1921.)

*Library:* 300 volumes.

**2265. Valley Research Corporation, Indian Bay, Montague, Mich.**

*President:* Clifford B. Pape.

*Research staff:* Clifford B. Pape, Director; Frans Vaurio; Meredith Beyers. 3 chemists, 1 physicist, 1 metallurgist, 2 engineers; additional personnel 8.

*Research activities:* Developing and testing the efficiency of various types of moisture-vapor proof barriers for packaging uses; heat seal coatings and laminations. (Research initiated 1944.)

*Library:* 125 volumes.

**2266. Valvoline Oil Company, 507 Schmidt Bldg., Cincinnati 2, Ohio.**

*President:* G. P. Doll.

*Laboratory:* 318 Atlantic Ave., Franklin, Pa.

*Research staff:* L. A. Calkins, Chief Engineer; R. L. Sailer, Acting Chief Engineer; D. A. Smith, Chief Chemist; C. N. Rill, Director of rust preventive research. 4 chemists, 1 physicist, 3 engineers; technical personnel 7; additional personnel 7.

*Research activities:* Lubrication and lubricating problems; rust preventives. (Research initiated 1934.)

*Library:* 200 volumes.

**van Ameringen-Haebler, Inc. See No. 2443 in Addenda.**

**2267. Van Camp Laboratories, Terminal Island, Calif. (Subdivision of Van Camp Sea Food Company, Inc.)**

*Research staff:* Sven H. Lassen, Director; Ernest Geiger. 5 chemists, 5 biologists, 1 physician; technical personnel 12; additional personnel 8.

*Research activities:* Vitamins A and D; amino acids; proteins; sterols. (Research initiated 1937.)

*Library:* 450 volumes.

*Cooperative research:* Several grants for research are made.

**2268. Van Cleef Brothers, 7800 Woodlawn Ave., Chicago 19, Ill.**

*Partners:* Noah Van Cleef, Felix Van Cleef, and Paul Van Cleef.

*Research staff:* Carl E. Frick, Director; J. E. A. Hopkins, Chief Chemist. 4 chemists; technical personnel 3; additional personnel 1.

*Research activities:* Natural and synthetic rubber; plastics; coated fabrics; adhesive tapes. (Research initiated 1910.)

*Library:* 1,000 volumes.

**2269. Van der Horst Corporation of America, Olean, N. Y.**

*President:* Hendrick van der Horst.

*Research staff:* Russell Pyles, Chief Engineer. 2 chemists, 1 physicist, 1 metallurgist, 7 engineers; technical personnel 11; additional personnel 7.

*Research activities:* Research on porous chromium and hard chromium, electrochemical methods, production methods, engine testing, product development, inspection, technical service, etc. (Research initiated 1941.)

*Library:* 200 volumes.

- 2270. Van Trump Testing Laboratory, 329**  
South Wood St., Chicago 12, Ill.  
*President and Owner:* Isaac Van Trump.  
*Laboratories:* Chicago, Ill.; Little Rock, Ark.  
*Research staff:* Isaac Van Trump, Director.  
*Chicago Laboratory:* Roderick Van Trump and K. S. Van Trump. *Little Rock Laboratory:* D. D. Ricketts, A. T. Beard, H. A. Dreher, and J. W. Hill. *Combined Laboratory Personnel:* 6 chemists, 1 metallurgist, 5 to 12 engineers; technical personnel 1; additional personnel 3.  
*Research activities:* Asphalts, petroleum, bauxite, tars, soils, cements, clays, paints, and engineering materials. (Research initiated 1910.)  
*Library:* 450 to 500 volumes.
- 2271. Vanadium-Alloys Steel Company, La-**  
trobe, Pa.  
*President:* Roy C. McKenna.  
*Research staff:* George A. Roberts, Chief Metallurgist; H. G. Johnstin, Metallurgical Engineer. 2 chemists, 10 metallurgists; technical personnel 6; additional personnel 4.  
*Research activities:* Ferrous and nonferrous compositions, processes, and heat-treatment. (Research initiated 1920.)  
*Library:* 1,500 volumes.  
*Scientific periodicals:* Metallurgical Bulletin, Volume I, 1938.  
*Cooperative research:* One fellowship is supported and one grant for research is made.
- 2272. Vanadium Corporation of America, 420**  
Lexington Ave., New York 17, N. Y.  
*President:* E. D. Bransome.  
*Laboratory:* Bridgeville, Pa.  
*Research staff:* Jerome Strauss, Vice President and Technical Director; H. T. Chandler, Vice President in charge of products development; H. E. Dunn, Director of processes; D. L. Edlund, Manager of research and development; H. W. Rathmann, Assistant Manager. 5 chemists, 8 metallurgists, 3 engineers, 6 assistants; additional personnel 3.  
*Research activities:* Various phases of ore dressing: crushing, grinding, magnetic separation, classification, flotation, etc.; roasting, calcining, hydrolysis, filtering; extraction of semirare and rare metals from their ores and the production of semifinished metallic products; studies of the manufacture and properties of alloy steels and nonferrous alloys; the preparation of inorganic and organic compounds of semirare and rare metals and their industrial application. (Research initiated 1925.)  
*Library:* 4,500 volumes.
- 2273. Vanderbilt Company, R. T., 230 Park**  
Ave., New York 17, N. Y.  
*President:* R. T. Vanderbilt.  
*Laboratory:* East Norwalk, Conn.  
*Research staff:* W. H. Cope, Laboratory
- Manager. 26 chemists, 2 physicists, 1 engineer, 15 in other scientific professions; additional personnel 20.  
*Research activities:* Rubber, paint, textiles, ceramics, and paper.
- 2274. Varcum Chemical Corporation, Niagara**  
Falls, N. Y.  
*President:* G. E. Lewis.  
*Research staff:* R. D. McDonald, Director. 7 chemists; technical personnel 3; additional personnel 2.  
*Research activities:* Development work in new or improved resins, particularly of the phenol-formaldehyde type. (Research initiated 1933.)
- 2275. Velsicol Corporation, 120 East Pearson**  
St., Chicago 11, Ill.  
*Executive Vice President:* J. Hyman.  
*Research staff:* A. S. Behrman, Vice President and Director of research. 15 chemists, 2 biologists, 1 engineer, 1 mathematician, 1 entomologist; technical personnel 12; additional personnel 11.  
*Research activities:* Petroleum chemicals and derivatives: resins, insecticides, solvents, etc. (Research initiated 1931.)  
*Library:* 500 volumes.  
*Cooperative research:* Four fellowships are supported and occasional grants for research are made.
- 2276. Vendo Company, 1907 Grand Ave., Kansas**  
City 8, Mo.  
*President:* E. F. Pierson.  
*Laboratory:* 2500 Washington St., Kansas City, Mo.  
*Research staff:* J. E. Hagstrom, Chief Engineer; W. R. Roeyer, Chief of administration. 1 chemist, 1 physicist, 1 biologist, 5 engineers, 1 psychologist, 1 physician; technical personnel 10; additional personnel 3.  
*Research activities:* Vending machinery. (Research initiated 1937.)  
*Library:* 500 volumes.
- 2277. Vermont Marble Company, Proctor, Vt.**  
*President:* Redfield Proctor.  
*Research staff:* Harold Ladd Smith, Director. 1 chemist.  
*Research activities:* Maintenance of markets and creation of new outlets for marble; development of by-product uses and of artistic designs for marble. (Research initiated 1922.)
- 2278. Verona Chemical Company, 26 Verona**  
Ave., Newark 4, N. J.  
*President:* Franklin H. Stafford.  
*Research staff:* H. H. Dorer, Chief Chemist. 4 chemists.

*Research activities:* Fine chemicals and aromatics.

*Library:* A library is maintained.

**2279. Vestal Chemical Company, 4963 Manchester Ave., St. Louis 10, Mo.**

*President:* F. J. Pollnow.

*Research staff:* F. J. Pollnow, Jr., Director. 3 chemists, 1 engineer, 1 bacteriologist; additional personnel 3.

*Research activities:* Soaps and detergents; wax, resin, and oil emulsions; germicides. (Research initiated 1923.)

**2280. Vick Chemical Company, 122 East 42nd St., New York 17, N. Y.**

*President:* W. Y. Preyer.

*Laboratory:* 35-22 Linden Place, Flushing, N. Y.

*Research staff:* W. J. Kirn, Executive officer in charge of research; B. Puetzer, Research Director; Thomas C. Grubb, Chief Bacteriologist; M. K. McPhail, Chief Pharmacologist. 9 chemists, 6 biologists, 1 physician; technical personnel 2; additional personnel 14.

*Research activities:* Pharmaceutical research on the chemistry, bacteriology, and pharmacology of antibiotics, germicides and antiseptics, viruses, and analgesics; synthetic organic compounds; cosmetics. (Research initiated 1935.)

*Library:* 1,000 volumes.

*Cooperative research:* Five fellowships are supported and four grants for research are made.

*See also* Baker Chemical Company, J.T., and Merrell Company, William S.

**2281. Victor Animatograph Corporation, 809 Kahl Bldg., Davenport, Iowa.**

*President:* A. F. Victor.

*Research staff:* A. F. Victor, Director; S. G. Rose, Vice President and General Manager; J. W. Jensen, Chief Engineer. 1 chemist, 4 engineers; additional personnel 18.

*Research activities:* The creation and development of improved motion picture mechanisms for the field of amateur and nontheatrical apparatus other than 35 mm. (Research initiated 1910.)

*Library:* 200 volumes.

**2282. Victor Chemical Works, 141 West Jackson Blvd., Chicago 4, Ill.**

*President:* August Kochs.

*Laboratories:* Chicago Heights, Ill.; Nashville and Mt. Pleasant, Tenn.

*Research staff:* Howard Adler, Director. 54 chemical engineers; additional personnel 100.

*Research activities:* Study of the manufacture of phosphorus, its compounds, phosphates,

oxalates, and formates, and their industrial applications including: baking, leavening, food enrichment, industrial and household cleaning, fireproofing, textile and leather processing, waterproofing, rustproofing, water treating, plasticizing, petroleum refining, and oil well drilling; synthesis of organic phosphorus compounds for use as intermediates in the preparation of plastics, plasticizers, drugs, petroleum additives, and surface active compounds. (Research initiated 1903.)

*Library:* 1,200 volumes.

**2283. Victor Ring Traveler Company, 20 Mathewson St., Providence 3, R. I.**

*President:* John E. Hull.

*Research staff:* Eric G. Peterson, Metallurgist. 1 metallurgist; additional personnel 1.

*Research activities:* The study of metal to metal wear and metal to yarn wear; the improvement of heat-treatment; new alloys and materials; improvement of design and application of proper style traveler to different shaped rings. (Research initiated 1920.)

**2284. Victoreen Instrument Company, 5806 Hough Ave., Cleveland 3, Ohio.**

*President:* John A. Victoreen.

*Laboratories:* 5806 Hough Ave., Cleveland 3; 3800 Perkins Ave., Cleveland 14, Ohio.

*Research staff:* John A. Victoreen, Director. 2 chemists, 2 physicists; 3 engineers; technical personnel 10; additional personnel 17.

*Research activities:* The development of instruments for the measurement of X-rays, and for Alpha, Beta, and Gamma rays; sub-miniature electrometer tubes; miniature vacuum sealed resistors up to  $10^{14}$  ohms. (Research initiated 1932.)

**2285. Vidal Corporation, Central Airport, Camden, N. J.**

*President:* Thomas H. McKoy, Jr.

*Research staff:* Thomas Carroll, Vice President in charge of engineering and research; Karl Kopplin, Director of research. 2 engineers; technical personnel 3; additional personnel 3.

*Research activities:* Molding laminated plastic products employing fluid pressure; the development of combinations of materials and methods of molding as applied to the manufacture of marine structures, aircraft and aircraft components, automotive parts, seating and furniture applications, and other products. (Research initiated 1937.)

*Library:* 200 volumes.

- 2286. Vincent, Inc., George**, 119 West 24th St., New York 11, N. Y.  
*President:* George Vincent.  
*Research staff:* Howard L. Vincent, Director. 2 chemists.  
*Research activities:* Impregnating and coating of paper and allied fibrous materials; research on transparent paper; theoretical and technological research on paper and synthetic resins. (Research initiated 1929.)  
*Library:* 350 volumes.
- 2287. VioBin Corporation**, 105 West Main St., Monticello, Ill.  
*President:* Ezra Levin.  
*Research staff:* Ezra Levin, Director. 3 chemists, 1 biologist; technical personnel 4; additional personnel 5.  
*Research activities:* Detailed chemical, biological, and engineering studies of wheat germ and corn germ; solvent extraction of agricultural products; biochemical study of factors in oils and residues. (Research initiated 1939.)  
*Cooperative research:* One fellowship is supported and five grants for research are made.
- 2288. Virginia-Carolina Chemical Corporation**, P. O. Box 1136, Richmond 8, Va.  
*President:* A. L. Ivey.  
*Laboratories:* Carteret, N. J.; Richmond, Va.  
*Research staff:* W. P. terHorst, Director of research and development, Carteret, N. J.; Robert H. Kean, Technical Director, Chemicals Division, Richmond, Va. 9 chemists, 1 engineer; technical personnel 1; additional personnel 15.  
*Research activities:* Fertilizers and phosphates; the utilization of agricultural products; the development of new products. (Research initiated 1939.)  
*Cooperative research:* One grant for research is made.
- 2289. Virginia Dare Extract Company, Inc.**, Bush Terminal Bldg., No. 10, Brooklyn, N. Y.  
*President:* Bernard H. Smith.  
*Research staff:* Clarke E. Davis, Director; 4 chemists.  
*Research activities:* Flavor problems affecting the ice cream, bottling, baking, confectionery, and similar trades. (Research initiated 1923.)
- 2290. Virginia Smelting Company**, West Norfolk, Va.  
*President:* A. H. Eustis.  
*Research staff:* Robert Le Baron, Director of research and development; 10 chemists, 1 engineer; technical personnel 5; additional personnel 3.  
*Research activities:* Liquid sulfur dioxide and derivative compounds; textile chemicals; aerosols. (Research initiated 1921.)  
*Library:* 1,000 volumes.  
*Cooperative research:* Three fellowships are supported.
- 2291. Visco Products Company, Inc.**, 1404 Sterling Bldg., Houston 2, Tex.  
*President:* F. H. Thorne.  
*Laboratory:* Sugar Land, Tex.  
*Research staff:* W. H. Kirkpatrick, Chief Chemist. 4 chemists, 1 engineer; technical personnel 2; additional personnel 1.  
*Research activities:* The development of emulsion breaker chemicals, surface active reagents, interfacial active reagents, and synthetic wetting agents and detergents. (Research initiated 1929.)  
*Library:* A library is maintained.
- 2292. Visking Corporation**, 6733 West 65th St., Chicago, Ill.  
*President:* E. O. Freund.  
*Research staff:* W. F. Henderson, Director and Chief Chemist. 15 chemists, 1 physicist, 1 biologist and bacteriologist; technical personnel 1; additional personnel 13.  
*Research activities:* Problems relating to the manufacture of cellulose sausage casings. (Research initiated 1926.)  
*Library:* 500 volumes.  
*Cooperative research:* Three grants for research are made.
- 2293. Vitamin Food Company, Inc.**, 187 Sylvan Ave., Newark 4, N. J.  
*President:* R. M. Allen.  
*Research staff:* R. M. Allen, Director. 2 chemists, 1 biologist, 1 yeast technician.  
*Research activities:* Yeast growing and extraction; the biological study of vitamin B complex; research in human pellagra clinics throughout the South; cooperative work in medical centers; the study of anemia, alcoholic polyneuritis, neuritis, and arthritis; child feeding. (Research initiated 1930.)  
*Cooperative research:* One grant for research is made.
- 2294. Vita-Zyme Laboratories, Inc.**, 546 West Washington Blvd., Chicago 6, Ill.  
*President:* B. L. Sarett.  
*Research staff:* Dwight Lynds Baker, Director. 2 chemists, 1 bacteriologist; technical personnel 1; additional personnel 6.  
*Research activities:* The development of production techniques and the industrial application of enzyme preparations. (Research initiated 1941.)

**2295. Vitrefrac Corporation**, 5050 Pacific Blvd., Los Angeles 11, Calif. (Subsidiary of Parafine Companies, Inc.)

*President:* R. H. Shainwald.

*Research staff:* R. W. Ellison, Director. 1 chemist; additional personnel 1.

*Research activities:* Investigations on refractory compositions and on processes of fabrication of refractory articles. (Research initiated 1920.)

**2296. Vogt Machine Company**, Henry, 1000 West Ormsby St., Louisville 10, Ky.

*President:* G. A. Heuser.

*Research staff:* Archibald Hurtgen, Director; William Plinke. 2 metallurgists, 2 engineers; technical personnel 2; additional personnel 2.

*Research activities:* Ice and refrigeration; welding-alloys; drop forged steel valves and fittings; refinery pressure vessels; heat exchangers; heat-treating, nitriding, fusion and gas welding, etc. (Research initiated 1928.)

*Library:* A library is maintained.

**2297. von Goehde Laboratories**, 5 St. Albans Road, Boston 15, Mass.

*Research staff:* H. L. von Goehde, Director. 2 chemists, 1 physicist, 2 in other scientific professions; technical personnel 1.

*Research activities:* Food technology; agricultural and chemurgic problems; paints and lacquers; cosmetics; packing and dehydrating; sterilization of fruit and vegetables in transit or storage; extracts and flavors, particularly terpenless aromatic extracts such as coffee, tea and herbs in general. (Research initiated 1930.)

*Library:* 370 volumes.

*Cooperative research:* Two fellowships are supported and one grant for research is made.

**2298. Voris Laboratories**, Hagerstown, Md.

*President:* L. R. Voris.

*Research staff:* L. R. Voris, Director; W. J. Gilbert, Assistant. 2 chemists, 1 biologist, 1 metallurgist, 1 engineer, 1 geologist; technical personnel 1.

*Research activities:* Fuels, including coals, oils, etc. (Research initiated 1922.)

*Library:* A library is maintained.

**2299. Vulcan Mold and Iron Company**, Latrobe, Pa.

*President:* Edward R. Williams.

*Research staff:* Edward R. Williams, Director; Richard E. Ballentine. 1 engineer; additional personnel 1.

*Research activities:* Improvement of products; development of new manufacturing methods and manufacturing control methods.

*Cooperative research:* One grant for research is made.

**2300. Vulcan Proofing Company**, 1st Ave. and 58th St., Brooklyn 20, N. Y.

*President:* Clarence Kenyon.

*Research staff:* A. J. Weiss, Director. 5 chemists; technical personnel 8; additional personnel 3.

*Research activities:* Coated fabrics using rubber, synthetic rubbers, synthetic resins, and cellulose coatings. Printers' blankets, diaphragms, balloon cloth, inflatable boat fabrics, and special coated fabrics for solvent and oil resistance or for gas and air holding. (Research initiated 1917.)

*Library:* 150 volumes.

**2301. W. and F. Manufacturing Company, Inc.**, 251 Seneca St., Buffalo 4, N. Y.

*President:* F. C. Gurley.

*Research staff:* F. C. Gurley, Director. 2 chemists; technical personnel 3; additional personnel 15.

*Research activities:* The use of waxes in products such as candles, containers, fuels, etc. (Research initiated 1930.)

*Library:* 250 volumes.

**2302. WMC Precision Works**, 8419 Terrace Drive, El Cerrito, Calif.

*President:* Willi M. Conn.

*Research staff:* Willi M. Conn, Director. 1 physicist, 2 engineers; technical personnel 1; additional personnel 1.

*Research activities:* The application of physics to industrial problems; spectrographic tests; X-ray diffraction work; ceramic tests; high temperature work; automatic welding; fluxes for welding steel. (Research initiated 1937.)

*Library:* A library is maintained.

**2303. Wadsworth Watch Case Company**, 5th and Clay Sts., Dayton, Ky.

*President:* F. B. Stegeman.

*Research staff:* H. Kendall Stegeman, Manager of Research Department; H. Seman Payne, Assistant Manager. 2 chemists, 3 in other scientific professions.

*Research activities:* Precious metal alloys, including formulating, melting, working, and forming; electroplating of metals and alloys; photoengraving; welding and soldering; heat-treatment of dies and tools; plant processes. (Research initiated 1920.)

**Waggner Paint Company.** See Pratt and Lambert, Inc.

**2304. Wagner Electric Corporation, 6400 Plymouth Ave., St. Louis 14, Mo.**

*President:* P. B. Postlewaite.

*Research staff:* A. H. Timmerman, Vice President in charge of research; G. A. Waters, Chief Engineer; Burns Dick, Consulting Engineer; Hans Weichsel, Consulting Engineer. 1 chemist, 1 physicist, 1 metallurgist, 33 engineers; additional personnel 50.

*Research activities:* The problems incident to the design and manufacture of electric motors, fans, transformers, and hydraulic brakes. (Research initiated 1913.)

**2305. Wahl, Manfred, The Kenilworth, Alden Park, Germantown, Philadelphia 44, Pa.**

*Research staff:* Manfred Wahl, Director. 2 chemists, 3 biologists; technical personnel 3.

*Research activities:* Industrial microbiology for the improvement of processes and products in the field of food and fermentation; experiments on penicillin. (Research initiated 1907.)

*Library:* 400 volumes.

*Cooperative research:* One fellowship is supported and two grants for research are made.

**2306. Wahl-Henius Institute, 64 East Lake St., Chicago 1, Ill.**

*President:* Robert I. Tenney.

*Research staff:* Fred A. Wilcox, Technical Director. 5 chemists, 1 biologist, 2 bacteriologists; technical personnel 2; additional personnel 6.

*Research activities:* Enzyme production and action; brewing and malting; fermentation industries; antibiotics; food processing and stabilization. (Research initiated 1886.)

*Library:* 4,000 volumes.

**2307. Wakefield Brass Company, F. W., Vermilion, Ohio.**

*President:* A. F. Wakefield.

*Research staff:* George P. Wakefield, Development Engineer. 2 engineers; additional personnel 3.

*Research activities:* Commercial lighting fixtures. (Research initiated 1931.)

*Library:* 100 volumes.

*Cooperative research:* Two grants for research are made.

**2308. Walker, Hiram—Gooderham and Worts, Peoria, Ill.**

*President:* H. C. Hatch.

*Laboratories:* Research laboratory, Peoria, Ill. Control laboratories: Walkerville and Toronto, Ont.; Dumbarton, Scotland; Peoria, Ill.

*Research staff:* C. S. Boruff, Director. 11 chemists, 2 biologists and bacteriologists; technical personnel 20; additional personnel 5.

*Research activities:* Grain; the production of American, Canadian, and Scotch whiskies, cordials, and gins; maturing and blending; industrial alcohol; wood distillation; by-products; unit processes connected with the production of whiskies, gins, cordials, etc. (Research initiated 1934.)

*Cooperative research:* Two fellowships are supported and two grants for research are made.

**2309. Walker and Whyte, Inc., 409 Pearl St., New York 7, N. Y.**

*President:* Marshall S. Walker.

*Research staff:* Marshall S. Walker, Director of research. 3 chemists, 1 metallurgist, 1 engineer, 4 refinery representatives, 1 laboratory assistant.

*Research activities:* Sampling and analytical methods involved in products containing tungsten, tin, gold, silver, and other ores. (Research initiated 1925.)

**2310. Wallace and Tiernan and Associated Companies, 11 Mill St., Belleville, N. J.**

*President:* M. F. Tiernan.

*Research staff:* John C. Baker and C. F. Wallace, Directors. 9 chemists, 1 physicist, 4 biologists, 23 engineers, 1 physician; technical personnel 3; additional personnel 5.

*Research activities:* The application and control of chlorine gas; flour treatment; fruit sterilization; condenser cleaning; laundry bleaching; electric signaling and sound producing devices for marine use; chemical feeding devices; organic peroxides; electrolytic cells; hypochlorites; color analyzers; signal equipment; therapeutic chemicals. (Research initiated 1919.)

*Library:* 2,500 volumes.

**2311. Wallace Laboratories, Inc., Georges Road and U. S. Route No. 1, New Brunswick, N. J.**

*President:* John H. Wallace, Jr.

*Research staff:* John H. Wallace, Jr., Director. 8 chemists, 2 biologists, 2 physicians; technical personnel 8; additional personnel 8.

*Research activities:* Pharmaceuticals; cosmetics; special chemicals. (Research initiated 1934.)

*Library:* 500 volumes.

*Cooperative research:* One fellowship is supported and three grants for research are made.

**2312. Wallerstein Laboratories, 180 Madison Ave., New York 16, N. Y.**

*President:* Leo Wallerstein.

*Laboratories:* 180 Madison Ave., New York 16, N. Y.; 125 Lake Ave., Mariners Harbor, Staten Island 3, N. Y.

*Research staff:* Leo Wallerstein, Director;

Philip P. Gray, Head of New York Laboratory; Julius Pfannmuller, Head of Staten Island Laboratory. 15 chemists, 3 biologists and bacteriologists, 2 engineers; technical personnel 20; additional personnel 20.

*Research activities:* Production and industrial utilization of enzymes in foods, textiles, tanning, paper, etc.; food products; problems connected with the fermentation industries; tyrothricin, gramicidin, and other antibiotics. (Research initiated 1902.)

*Scientific periodicals:* Wallerstein Laboratories Communications. Vol. I, 1937. Tri-annually.

**2313. Waltham Watch Company, Crescent St., Waltham 54, Mass.**

*President:* Ira Guilden.

*Research staff:* N. Nazar, Director. 9 chemists, 2 physicists, 2 metallurgists, 6 engineers; technical personnel 24; additional personnel 6.

*Research activities:* Metallurgical problems of watches and instrument manufacture; watch, clock, and instrument design; manufacturing methods and machine design.

*Library:* 450 volumes.

**2314. Wander Company, 360 North Michigan Ave., Chicago 1, Ill.**

*President:* James G. McMillan.

*Laboratory:* Villa Park, Ill.

*Research staff:* Rudolf Bunkfeldt, Acting Director; R. W. Haman, Head of laboratories. 5 chemists, 1 bacteriologist; additional personnel 9.

*Research activities:* Food research: product improvement and new products; vitamin assay methods. (Research initiated 1930.)

*Library:* 500 volumes.

*Cooperative research:* One to four grants for research are made each year.

**2315. Ward Leonard Electric Company, 31 South St., Mt. Vernon, N. Y.**

*President:* Dawson J. Burns.

*Research staff:* Frank G. Logan, Vice President and Manager of research and development. 3 chemists, 2 physicists, 11 electrical engineers; additional personnel 14.

*Research activities:* Ceramics; vitreous enamels; electromechanical devices; electromagnetic devices; arc rupturing methods and means; industrial electronic circuits and components. (Research initiated 1892.)

*Library:* A library is maintained.

**Wardway Paint Works, Division of Montgomery Ward and Company. See Montgomery Ward and Company.**

**2316. Warner and Company, Inc., William R., 113 West 18th St., New York 11, N. Y.**

*President:* Erwin A. Fauser.

*Laboratories:* Applied Research Laboratories, Pilot Plant Development Laboratories, Warner Institute for Therapeutic Research, and Hudson Dermatological Research Laboratories are located at 113 West 18th St., New York 11, N. Y. Applied Research Laboratories are also located at 404 South 4th St., St. Louis, Mo.

*Research staff:* Robert T. Conner, Acting Director of research and Technical Director; H. A. Gee, Director of pilot plant laboratories; A. L. Flohr, Chief Chemist, New York; H. A. Vogler, Chief Chemist, St. Louis; F. J. Austin, Manager of chemical laboratories; H. R. Baldwin, Manager of biological laboratories. 28 chemists, 1 biologist, 3 engineers, 1 physician, 7 in other scientific professions; additional personnel 30.

*Research activities:* Fundamental research on the development of diagnostic methods, new therapeutic agents, and pharmaceuticals; applied research on the technological development of pharmaceutical products and cosmetics. (Research initiated 1937.)

*Library:* 1,500 bound books and pamphlets; 530 volumes of bound periodicals.

*Cooperative research:* Five fellowships are supported and eleven grants for research are made.

**2317. Warner and Swasey Company, 5701 Carnegie Ave., Cleveland 3, Ohio.**

*President:* Charles J. Stilwell.

*Research staff:* William J. Burger, Director of engineering; Max E. Lange, Director of research. 1 physicist, 7 engineers, 2 technicians; additional personnel 7.

*Research activities:* Problems encountered in the design and manufacture of turret lathes; the testing and developing of new designs. (Research initiated 1935.)

**2318. Warner Company, 219 North Broad St., Philadelphia 7, Pa.**

*President:* Charles Warner.

*Laboratory:* Devault, Pa.

*Research staff:* C. J. Lewis, Technical Director; James A. Murray, Chemical Director; D. E. Washburn, Chief Chemist. 3 chemists, 1 engineer; technical personnel 4; additional personnel 3.

*Research activities:* Lime, lime products and derivatives, and concrete. (Research initiated 1915.)

*Library:* 600 volumes.

**Warner Institute for Therapeutic Research. See Warner and Company, Inc., William R.**



- 2319. Warner Jenkinson Manufacturing Company, 2526 Baldwin St., St. Louis, Mo.**  
*President:* W. F. Meyer.  
*Research staff:* J. C. McCormack; J. M. Blatterman. 4 chemists.  
*Research activities:* Essential oils; flavoring extracts; coal tar dyes used in foods. (Research initiated 1911.)
- 2320. Warren Company, S. D., 89 Broad St., Boston 1, Mass.**  
*President:* George Olmsted.  
*Laboratory:* Cumberland Mills, Maine.  
*Research staff:* Frederick H. Frost, Research Manager; Joseph J. Thomas, Research Development. 12 chemists, 1 physicist, 3 engineers; technical personnel 5; additional personnel 3.  
*Research activities:* Pulp and paper investigations; coated papers; pigments; adhesives; protective films; insulation; special products. (Research initiated 1929.)  
*Library:* 1,200 volumes.  
*Cooperative research:* One grant for research is made.
- 2321. Warren Corporation, Northam, Stamford, Conn.**  
*President:* Northam Warren.  
*Laboratories:* Stamford, Conn.; Montreal, Que.; Slough, Bucks, England.  
*Research staff:* Henry J. Wing, Director. 6 chemists; additional personnel 8.  
*Research activities:* Finger nail preparations, such as polish, emollient creams, and cuticle removers; personal deodorants, in cream and liquid form. (Research initiated 1911.)
- 2322. Warren Featherbone Company, Three Oaks, Mich.**  
*Chairman of the Board:* F. W. Chamberlain.  
*President:* H. H. Cutler.  
*Research staff:* Charles E. Whalen, Director of research in marketing.  
*Research activities:* Applied research on the company's products, including fold tape, elastic, notion specialties, and textile products. (Research initiated 1925.)
- 2323. Warren Refining and Chemical Company, 308 Euclid Ave., Cleveland 14, Ohio.**  
*President:* Ralph S. Geddes.  
*Laboratory:* 5151 Denison Ave., Cleveland 2, Ohio.  
*Research staff:* John L. Finkelmann, Vice President and Director of research. 2 chemists; technical personnel 2; additional personnel 1.  
*Research activities:* Development of lubricating greases, lubricating oils, metal working oils (cutting oils, drawing compounds, etc.), and factory maintenance products. (Research initiated 1939.)
- Warwick Chemical Company. See Sun Chemical Corporation.**
- Warwick Chemical Corporation. See Sun Chemical Corporation.**
- 2324. Warwick Mills; Greenville Mills, Inc.; Amoskeag Fabrics, Inc., 77 Franklin St., Boston 10, Mass.**  
*President:* Gordon Osborne.  
*Laboratory:* 178 Atlantic Ave., Boston 10, Mass.  
*Research staff:* G. H. Hotte, Technical Director. 2 chemists, 1 physicist, 2 engineers, 1 psychologist; technical personnel 11; additional personnel 5.  
*Research activities:* Textiles. (Research initiated 1939.)  
*Library:* 300 volumes.
- Warwick Wax Company. See Sun Chemical Corporation.**
- 2325. Washine-National-Sands, Inc., 37-02 Northern Blvd., Long Island City 1, N. Y.**  
*President:* Leon Schwartzberg.  
*Research staff:* S. I. Escott, Vice President in charge of research; Morris M. Schlier, Director. 1 chemist.  
*Research activities:* Compounds for use in laundry and textile specialties. (Research initiated 1926.)
- 2326. Washington Brick and Lime Company, Spokane 8, Wash.**  
*President:* Neal R. Fosseen.  
*Laboratories:* Clayton and Dishman, Wash.  
*Research staff:* Neal R. Fosseen, Director; Howard H. Mansur, Production Manager. 1 chemist.  
*Research activities:* Refractories, heavy clay products, and terra cotta. (Research initiated 1920.)
- 2327. Washington Institute of Technology, Inc., McLachlen Bldg., Washington 1, D. C.**  
*President:* Sydney F. Mashbir.  
*Laboratory:* 5005 Calvert Road, College Park, Md.  
*Research staff:* Charles B. Pear, Jr., Director. 6 engineers; technical personnel 7; additional personnel 12.  
*Research activities:* Radio and electronics; radio-meteorology. (Research initiated 1933.)  
*Library:* 100 volumes.
- 2328. Washington Laboratories, Pier 66, Seattle 1, Wash.**  
*Managing Partner:* George W. Burchard, Jr.  
*Research staff:* Glenn H. Watters, Director.

4 chemists, 1 biologist, 1 engineer; technical personnel 1; additional personnel 10.

*Research activities:* Vitamins A and D from fish livers and fish viscera; amino acids from fish protein; hormones; recovery, extraction, and purification problems, new methods of assay, etc. (Research initiated 1940.)

*Cooperative research:* Two grants for research are made.

**2329. Water Service Laboratories, 423 West 126th St., New York 27, N. Y.**

*President:* Henry L. Shuldener.

*Research staff:* Henry L. Shuldener, Director. 3 chemists, 4 engineers; additional personnel 35.

*Research activities:* The causes and prevention of internal pipe corrosion by municipal water supplies, including the rusting of iron pipes, the dezincification of brass pipes, and the corrosion of copper pipes. (Research initiated 1927.)

*Library:* 200 volumes.

**2330. Waterbury Battery Company, 1036 South Main St., Waterbury, Conn.**

*President:* M. L. Martus.

*Research staff:* James G. Ross, Director. Additional personnel 3.

*Research activities:* Primary and storage battery research and development; electrical and electrochemical research. (Research initiated 1898.)

**2331. Waters Conley Company, 501 First Ave., N. W., Rochester, Minn.**

*President:* Glen M. Waters.

*Laboratory:* 418 First Ave., N. W., Rochester, Minn.

*Research staff:* R. E. Jones, Director of engineering. 10 engineers; technical personnel 12; additional personnel 5.

*Research activities:* The development of mechanical, acoustic, and electromechanical transducers; special electromechanical and electronic equipment used for biophysical research. (Research initiated 1940.)

*Library:* 200 volumes.

**2332. Watervliet Paper Company, Watervliet, Mich.**

*President:* G. K. Ferguson.

*Research staff:* H. S. Faram, Director. 4 chemists, 2 engineers; additional personnel 1.

*Research activities:* Materials used in coating papers; the preparation of paper fibers; gloss ink-coated papers. (Research initiated 1922.)

**2333. Watkins Company, J. R., 150-178 Liberty St., Winona, Minn.**

*President:* E. L. King, Jr.

*Laboratories:* Winona, Minn.; Newark,

N. J.; Memphis, Tenn.; Oakland, Calif.; Montreal, Que.; Winnipeg, Man.

*Research staff:* J. P. Pompa, Director; A. M. Ramsden, General Manufacturing Superintendent; M. H. Doner, Director of insecticides. 17 chemists, 1 engineer, 1 entomologist, 2 pharmacists; additional personnel 6.

*Research activities:* Foods, insecticides, cosmetics, pharmaceuticals, and animal nutrition. (Research initiated 1868.)

*Library:* 200 volumes.

*Cooperative research:* Ten fellowships are supported and ten grants are made for research.

**2334. Waugh Laboratories, 420 Lexington Ave., New York 17, N. Y. (Division of Waugh Equipment Company.)**

*President:* A. J. Pizzini.

*Laboratories:* New York, N. Y.; 180 East California St., Pasadena, Calif.

*Research staff:* N. H. Roy, Director; Emmett M. Irwin, Manager, Pasadena Laboratory. 1 physicist, 16 engineers; technical personnel 11; additional personnel 11.

*Research activities:* The design and development of scientific testing instruments and laboratory testing equipment, with emphasis placed on instruments for indication and measurement of strains, vibrations, and noises in equipment and structures. In conjunction with research, an engineering consulting and test service is furnished to the Armed Services and industrial organizations. (Research initiated 1938.)

**2335. Waukesha Motor Company, Waukesha, Wis.**

*President:* J. E. De Long.

*Research staff:* J. B. Fisher, Vice President and Chief Engineer; A. W. Pope, Director; H. Wiles, Assistant Director. 1 metallurgist, 6 engineers; additional personnel 11.

*Research activities:* Internal combustion engines using gasoline, gas, and oil; engine fuels; air conditioning; refrigeration. (Research initiated 1922.)

*Library:* 300 volumes.

**2336. Waverly Oil Works Company, 54th St. and A.V.R.R., Pittsburgh, Pa.**

*President:* S. M. Vockel.

*Research staff:* W. T. Sieber, Director. 3 chemists; technical personnel 6.

*Research activities:* Studies of petroleum and its products; the development of new products and their uses; special attention is given to the development of new petroleum greases and soaps. (Research initiated 1920.)

**2337. Way Laboratory Service, H. O., 308 Western Reserve Bldg., Cleveland 13, Ohio.**

*Research staff:* H. O. Way, Director. 1 chemist, 2 biologists; additional personnel 1.

*Research activities:* Food and sanitation. (Research initiated 1922.)

*Library:* 100 volumes.

**2338. Wayne Laboratories, 17 East Main St., Waynesboro, Pa.**

*Owner:* John J. Shank.

*Research staff:* John J. Shank, Director; J. S. Martin; W. H. Martin. 6 chemists, 1 physicist, 4 metallurgists, 2 engineers, 2 bacteriologists.

*Research activities:* Asphalt and asphalt products; accelerated weathering; particle size and filler investigations; the use of fillers in plastics; ceramic glazes; silicosis and industrial dust control, and methods for the determination of free silica in rocks and rock products. (Research initiated 1920.)

*Library:* A library is maintained.

**2339. Wayne Pump Company, Fort Wayne, Ind.**

*President:* Benjamin F. Geyer.

*Research staff:* Robert J. Jauch, Vice President, in charge of development and research; Samuel E. Gilmore, Engineer in laboratory; Fred W. Sturm, Chief Designer. 7 engineers, 8 in other scientific professions; additional personnel 3.

*Research activities:* Meter, visible, and piston gasoline pumps; lubricating oil, kerosene, grease, and alcohol dispensing equipment; auto lifts; auto washers; air compressors; air stands; grease guns; gear flushers; stop pumps; coin-operated pumps. (Research initiated 1923.)

**2340. Weatherhead Company, 300 East 131st St., Cleveland 8, Ohio.**

*President:* A. J. Weatherhead, Jr.

*Research staff:* Norman Paquin, Director of engineering; John Campbell, Chief Development Engineer; Ch. Crawley, Chief Product Engineer; Robert Phillips, Director of laboratories. 6 chemists, 2 physicists, 4 metallurgists, 50 engineers; technical personnel 50; additional personnel 30.

*Research activities:* The development of new devices and the improvement of items now in production for parts and accessories used on hydraulic, pneumatic, and electrical equipment for aviation, automotive, refrigeration, liquid petroleum gas, and industrial fields. (Research initiated 1931.)

*Library:* A library is maintained.

*Cooperative research:* Six fellowships are supported.

**2341. Weber Company, F., 1220 Buttonwood St., Philadelphia, Pa.**

*President:* E. G. Weber.

*Research staff:* F. W. Weber, Technical Director. 2 chemists.

*Research activities:* Colors and materials; waterproof drawing inks. (Research initiated 1853.)

**2342. Weber Laboratories, M., 551 Prospect St., Maplewood, N. J.**

*Research staff:* M. G. Weber, Director. Additional personnel 2.

*Research activities:* The development of new food products, and the improvement of existing manufacturing processes. (Research initiated 1931.)

**2343. Webster and Company, Warren, 1625 Federal St., Camden, N. J.**

*President:* E. Kessler Webster.

*Research staff:* J. E. Tolan, Research Engineer.

*Research activities:* Steam heating, design, apparatus development, and testing.

**2344. Webster Electric Company, 1900 Clark St., Racine, Wis.**

*President:* S. A. Loeb.

*Research staff:* A. C. Kleckner, Vice President and Director. 10 engineers; technical personnel 4; additional personnel 6.

*Research activities:* Commercial design and application of small transformers, sound distribution and public address systems, phonograph pick-ups; strainers, pumps, and regulating valve for oil burning equipment; thermo-drive pulley. (Research initiated 1909.)

**2345. Weidenhoff, Inc., Joseph, 4310 West Roosevelt Road, Chicago 24, Ill. (Subsidiary of Bowser, Inc.)**

*President:* Earl N. Webber.

*Research staff:* B. J. Haskins, Director of research. 1 physicist, 3 engineers; technical personnel 6; additional personnel 2.

*Research activities:* Automotive and aviation maintenance and testing equipment.

*Library:* A library is maintained.

**Weirton Steel Division, National Steel Corporation. See National Steel Corporation.**

**2346. Weisberg, Louis, 71 West 45th St., New York 19, N. Y.**

*Research staff:* Louis Weisberg, Director. 1 chemist, 1 engineer; additional personnel 2.

*Research activities:* Electrochemistry; electroplating, particularly gold alloys, nickel, copper, zinc, and tin; bright deposits; electro-galvanizing and continuous plating on strip and wire; electrolytic metal powders; corrosion resistance of electroplated coatings; synthetic plastics; hydrogen annealing of metals, mainly nonferrous metals; diffusion of metals in alloys. (Research initiated 1921.)

**2347. Weisselberg, Arnold, 277 Broadway, New York 7, N. Y.**

*Owner:* Arnold Weisselberg.

*Laboratories:* Wyssmont Company (drying) and Norman Laboratories (electrical), 305 Broadway, New York 7, N. Y.

*Research staff:* Arnold Weisselberg and William Z. Norman, Directors. 5 engineers, 1 mathematician; technical personnel 2; additional personnel 2.

*Research activities:* Drying and diffusion; electrical and electronic measuring; vibration; electrochemistry: current density distribution. (Research initiated 1938.)

*Library:* 160 volumes.

**2348. Welch Manufacturing Company, W. M., 1515 Sedgwick St., Chicago 10, Ill.**

*President:* M. W. Welch.

*Research staff:* G. M. Hobbs, Director. 2 chemists, 3 physicists, 1 biologist and bacteriologist, 1 engineer.

*Research activities:* The development and improvement of laboratory instruments. (Research initiated 1917.)

**Well Services Electrical Laboratories. See Halliburton Oil Well Cementing Company.**

**2349. Well Surveys, Inc., 624 East 4th St., Tulsa 3, Okla.**

*President:* W. G. Green.

*Laboratory:* 226 East 4th St., Tulsa, Okla.

*Research staff:* R. E. Fearon, Laboratory Supervisor. 1 chemist and physicist, 4 engineers; additional personnel 1.

*Research activities:* Radioactivity, nuclear physics, geophysics, and well logging. (Research initiated 1939.)

*Library:* 200 volumes.

**Wellcome Research Laboratories. See Burroughs Wellcome and Company.**

**2350. Wenger Laboratories, 75 South Main St., Salt Lake City 1, Utah.**

*President:* Ray G. Wenger.

*Research staff:* Arthur W. Wenger, Director of laboratory. 2 chemists and bacteriologists; technical personnel 2.

*Research activities:* Medical and industrial bacteriology; industrial and public health sanitation. (Research initiated 1938.)

*Cooperative research:* Two grants for research are made.

**2351. Werner Textile Consultants, Inc., 60 East 42nd St., New York 17, N. Y.**

*President:* Herbert L. Werner.

*Research staff:* Herbert L. Werner, Director; Werner Floersheim, Chief Engineer. 1

chemist, 2 textile consultants; technical personnel 1; additional personnel 8.

*Research activities:* The development of textile manufacturing processes, improvement of existing manufacturing methods and machinery, setting up of complete control laboratories, and designing of detailed testing layouts and procedures. (Research initiated 1943.)

*Library:* 150 volumes.

**2352. Wesix Electric Heater Company, 390 First St., San Francisco 5, Calif.**

*President:* W. Wesley Hicks.

*Laboratory:* 2030 Francisco St., Berkeley 4, Calif.

*Research staff:* Arthur J. Kercher, Director. 1 engineer; technical personnel 2.

*Research activities:* Electric heating, temperature, and time control. (Research initiated 1913.)

*Cooperative research:* One fellowship is supported.

**2353. West Company, 1117 Shackamaxon St., Philadelphia 25, Pa.**

*President:* H. O. West.

*Research staff:* E. H. Grafton, Director. 1 chemist; technical personnel 1.

*Research activities:* Rubber chemistry. (Research initiated 1938.)

*Library:* A library is maintained.

**2354. West Point Manufacturing Company, West Point, Ga.**

*President:* George H. Lanier.

*Laboratory:* Shawmut, Ala.

*Research staff:* M. Earl Heard, Director. 4 chemists, 1 physicist, 8 engineers; technical personnel 12; additional personnel 15.

*Research activities:* Textiles: raw materials through the finished product; machine development, product development, methods and control, and fundamental studies. (Research initiated 1943.)

*Library:* 1,070 volumes.

*Cooperative research:* Six grants for research are made.

**Western Cartridge Company. See Olin Industries, Inc.**

**2355. Western Condensing Company, 935 East John St., Appleton, Wis.**

*President:* D. D. Peebles.

*Research staff:* Nelson E. Rodgers, Acting Director of research. 4 chemists, 3 bacteriologists, 1 nutritionist; technical personnel 1; additional personnel 3.

*Research activities:* The derivation of nutritionally valuable products from whey and other

milk solids; fermentation, nutrition, proteins, and lactose. (Research initiated 1940.)

*Library:* 250 volumes.

*Cooperative research:* One fellowship is supported.

**2356. Western Development Company, 213 East Central, Wichita 2, Kans.**

*Senior Partner:* Paul E. Plymell.

*Research staff:* 1 consulting metallurgist, 2 engineers, 1 economist, 1 librarian, 1 draftsman; additional personnel 3.

*Research activities:* Industry analysis and product design for clients. (Research initiated 1945.)

*Library:* 300 volumes.

*Cooperative research:* One grant for research is made.

**2357. Western Electric Company, Inc., 195 Broadway, New York 7, N. Y.**

*President:* C. G. Stoll.

*Laboratories:* Hawthorne Works, Hawthorne Station, Chicago 23, Ill.; Kearny Works, 100 Central Ave., Kearny, N. J.; Point Breeze Works, 2500 Broening Highway, Baltimore 24, Md.

*Research staff:* Stanley Bracken, Vice President in charge of research; H. C. Beal, Engineer of manufacture, New York; R. M. La-Clair, Assistant Engineer of manufacture, New York; A. C. Jones, Engineer of manufacture, Hawthorne; H. Rossbacher, Engineer of manufacture, Kearny; D. M. Taggart, Engineer of manufacture, Point Breeze; F. J. Feely, Manager, Electronics Shop, Allentown, Pa.; F. R. Lack, Vice President in charge of Specialty Products Division, New York. 18 chemists, 6 physicists, 12 metallurgists, 1,627 engineers; technical personnel 664; additional personnel 922.

*Research activities:* Chemical, metallurgical, and physical studies of raw materials; cost reduction and quality improvement of the product; introduction of improved manufacturing processes and development of new methods, machinery, and tools; quality control studies. (Research initiated 1915.)

*Library:* 6,500 volumes.

*See also* Bell Telephone Laboratories, Inc.; Nassau Smelting and Refining Company, Inc.; Teletype Corporation.

**2358. Western Electrochemical Company, 2640-50 East Washington Blvd., Los Angeles 23, Calif.**

*President:* Kenneth Walsh.

*Research staff:* Joseph C. Schumacher, Director; David H. Eason, Howard J. Humphries, and Fred P. Geibel, Chemists. 3 chemists; technical personnel 10.

*Research activities:* Studies in the electrochemical field.

*Library:* A library is maintained.

**2359. Western Felt Works, 4115 Ogden Ave., Chicago, Ill.**

*President:* Henry Faurot.

*Research staff:* Herman Boxser, Director. 3 chemists; additional personnel 4.

*Research activities:* The manufacture of felt; synthetic rubber; resin applications. (Research initiated 1927.)

**2360. Western Pine Association, 510 Yeon Bldg., Portland 4, Oreg.**

*Secretary-Manager:* S. V. Fullaway, Jr.

*Laboratory:* 7733 S. E. 13th Ave., Portland 2, Oreg.

*Research staff:* Albert Hermann, in charge of research laboratory. 4 chemists, 2 engineers; additional personnel 3.

*Research activities:* Improvement of products, utilization of mill and woods waste, recovery of naval stores, etc. (Research initiated 1925.)

*Library:* 1,500 volumes.

**2361. Western Precipitation Corporation, 1016 West 9th St., Los Angeles 15, Calif.**

*President:* W. A. Schmidt.

*Research staff:* Leo W. Briggs, Director, Development Department. 4 chemists, 1 metallurgist, 4 engineers; technical personnel 4; additional personnel 2.

*Research activities:* Electrical precipitation of suspended particles; mechanical dust collectors, separators, classifiers, dispersers, etc.; drying of solutions, sludges, solids, etc., in suspension; spray drying, dispersion drying, and related problems; recovery of industrial wastes. (Research initiated 1915.)

*Library:* 1,300 volumes.

**2362. Western Sugar Refinery, 2 Pine St., San Francisco 11, Calif. (Division of J. D. and A. B. Spreckels Company.)**

*President:* Frank J. Belcher, Jr.

*Research staff:* P. W. Alston, General Chemist; M. F. Schweiger, Head Research Chemist; E. T. Winslow, Chief, Development Group. 6 chemists; technical personnel 2; additional personnel 1.

*Research activities:* The development of new products and processes in connection with sugar refining. (Research initiated 1930.)

*Library:* 2,000 volumes.

**2363. Western Union Telegraph Company, 60 Hudson St., New York 13, N. Y.**

*President:* A. N. Williams.

*Laboratories:* 60 Hudson St., New York 13, N. Y.; Water Mill, Long Island, N. Y.

*Research staff:* F. E. d'Humy, Vice President and Chief Engineer; H. P. Corwith, Assistant Chief Engineer in charge of research; F. B. Bramhall, Transmission Research Engineer; W. A. Dudley, Automatics Research Engineer; E. C. Homer, Electronics Research Engineer; G. W. Janson, Equipment Research Engineer; J. Z. Millar, Radio Research Engineer; C. E. Mobius, Physical and Chemical Research Engineer; R. J. Wise, Telefax Research Engineer. 2 chemists, 2 physicists, 1 metallurgist, 88 engineers; technical personnel 33; additional personnel 7.

*Research activities:* Broadly, the development and improvement of communication systems, comprising the investigation of transmission mediums, principally land line, submarine cable, and radio; and the design of equipment for providing rapid and efficient written communication thereover. Study of the transmission characteristics of circuits and the mitigation of interference from various sources, including power; other telegraph circuits, lightning, and magnetic storms. The development of mechanisms for automatic and semiautomatic transmission, reception, relaying, and delivery of telegrams, using both printing and facsimile methods; carrier methods and equipment for extending and exploiting the frequency spectra of transmission media. The investigation of materials used in lines and equipment, including timbers, metals, insulating and other finishes, etc.; the causes and mitigation of decay and corrosion, including electrolysis. The development of special items, and the adaptation of standard equipment, for military use. (Research initiated 1916.)

*Library:* 20,000 volumes.

Western United Gas and Electric Company. See Utilities Research Commission.

2364. Western Waxed Paper Company, 1311 Sixty-third St., Oakland, Calif. (Division of Crown Zellerbach Corporation.)

*Research staff:* W. R. Barber, Director; A. S. Hammond, Advisory Director. 4 chemists, 1 engineer.

*Research activities:* The improvement in the quality of the product and process of manufacture of wax paper. (Research initiated 1935.)

2365. Westinghouse Air Brake Company, Wilmerding, Pa.

*President:* G. A. Blackmore.

*Research staff:* C. D. Stewart, Vice President; J. C. McCune, Director; E. E. Hewitt, Chief Engineer; C. F. Hammer, Engineer of tests; C. E. Macfarlane, Chief Chemist. 2 chemists, 10 to 50 engineers and assistants.

*Research activities:* The resistance to the flow of air through pipes; the extraction of moisture

from compressed air; the determination of variations in static and kinetic friction as related to the movement of valvular parts and the rolling of car wheels on rails; the creation of sound under air pressure, with particular reference to directional control; the adaptation of modern plastics; the means for detecting car wheel slip and means for offsetting either the effect or the cause or both; composition materials for air packed pistons, gaskets, etc. (Research initiated 1900.)

See also Union Switch and Signal Company.

2366. Westinghouse Electric Corporation, East Pittsburgh, Pa.

*President:* G. H. Bucher.

WESTINGHOUSE RESEARCH LABORATORIES  
Ardmore Blvd., East Pittsburgh, Pa.

*Research staff:* L. Warrington Chubb, Director; C. R. Hanna, J. A. Hutcheson, J. Slepian, Associate Directors. 37 chemists, 47 physicists, 12 metallurgists, 98 electrical and mechanical engineers, 5 ceramists, 3 mathematicians, 66 laboratory assistants and draftsmen; additional personnel 137.

*Research activities:* Physics and electrophysics; mechanics; electronics; metallurgy; magnetism; chemistry; insulation; electromechanics. (Research initiated 1903.)

*Library:* 12,365 volumes; 130 microfilmed volumes.

*Cooperative research:* Twenty-five graduate fellowships and three professorships are supported, and 143 grants for research are made.

ENGINEERING LABORATORIES AND STANDARDS  
DEPARTMENT  
East Pittsburgh, Pa.

*Research staff:* Thomas Spooner, Manager. 5 supervisors, 31 engineers, 5 assistants; additional personnel 8.

*Research activities:* Fourteen development laboratories make a wide variety of electrical and mechanical tests and measurements in connection with the development of new devices, such as lightning arresters, circuit interrupting devices, railway and trolley bus motors and control, mercury arc rectifiers (ignitrons) for all types of applications, capacitors, and other products; high voltage and lightning phenomena, properties of insulating materials, radio influence, and other problems. Seven laboratories deal with problems in connection with welding development, control equipment, barrier layer rectifiers, and mechanical calculating machines.

MATERIALS ENGINEERING LABORATORIES

East Pittsburgh, Pa.

*Research staff:* J. B. Seastone, Manager of materials engineering; W. H. Brandt, Assistant Manager of materials engineering; W. E. Mahin, Manager of metallurgical engineering; L. R. Hill, Manager of insulation engineering; M. W. Rider, Manager, Materials Engineering Laboratories. 18 chemists, 3 physicists, 20 metallurgists, 18 engineers; technical personnel 14; additional personnel 53.

*Research activities:* The development of metals and insulating materials and their application to the products of the company; the development of alloys for special applications; metallurgical processes such as casting and heat treating; pilot plant operations on these processes; application problems on all types of metals and alloys. (Research initiated 1910.)

*Library:* 300 volumes.

LAMP DIVISION

Bloomfield, N. J.

*Vice President:* Ralph C. Stuart.

*Research staff:* Harvey C. Rentschler, Director. Charles M. Slack and John W. Marden, Assistant Directors. 4 chemists, 8 physicists, 1 biologist, 2 metallurgists, 8 engineers, 3 in other scientific professions; technical personnel 10; additional personnel 7.

*Research activities:* Specific research relating to radiation from solids, gases, and vapors; electron emission; gas discharges; high frequency phenomena; X-rays and their applications. General research on phosphors, ceramics, ultraviolet radiations, and photoelectricity. Investigations of the rare metals, including their properties, methods for their production and fabrication, and their application. Special problems in electrodeposition. (Research initiated 1917.)

*Library:* 4,000 volumes.

WESTINGHOUSE X-RAY DIVISION

2519 Wilkens Ave., Baltimore 3, Md.

*Research staff:* A. P. Craig, X-ray Division Manager; H. D. Moreland, Manager of engineering. 1 physicist, 14 engineers; technical personnel 15; additional personnel 6.

*Research activities:* The development of medical and industrial X-ray equipment and related apparatus; the development of electro-medical apparatus. (Research initiated 1897.)

2367. Weston Dodson and Company, Inc., 528 North New St., Bethlehem, Pa.

*President:* Alan C. Dodson.

*Research staff:* Charles G. Schantz, Fuel Engineer. 1 chemist, 2 engineers, 2 inspectors, 12 assistant inspectors; additional personnel 2.

*Research activities:* Combustion improve-

ment; investigation of the fusion temperature of ash; improved preparation methods; control and improvement of anthracite and bituminous coal. (Research initiated 1918.)

*Library:* 200 volumes.

2368. Weston Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark, N. J.

*President:* Edward F. Weston.

*Research staff:* W. N. Goodwin, Jr., Vice President and Director of research and engineering. 1 chemist, 4 physicists, 2 metallurgists, 28 engineers; additional personnel 8.

*Research activities:* Fundamental research and engineering development leading to the design of instruments, mostly electrical, for use in the measurement of electrical phenomena, light, heat, temperature, sound, and speed. (Research initiated 1885.)

Westport Mill Research and Testing Laboratories. See Dorr Company, Inc.

2369. Westvaco Chlorine Products Corporation; Monarch Chemical Company; Barium Products, Ltd., 405 Lexington Ave., New York 17, N. Y.

*President:* W. B. Thom.

*Laboratories:* Carteret, N. J.; South Charleston, W. Va.; Newark, Calif.; Modesto, Calif.

*Research staff:* A. G. Aitchison, Technical Director; J. S. Thomas, Carteret Division Chief; W. B. Rose, South Charleston Division Chief; A. G. Stern, Western Division Chief. 35 chemists, 14 engineers; technical personnel 13; additional personnel 10.

*Research activities:* Chlorine-caustic cells, chlorinated solvents, organic chlorinations, dry cleaning, metal degreasing, synthetic adsorbents, phosphates, hydrogen peroxide, magnesia compounds, barium compounds, insecticides, catalysts, plasticizers, organic bromides, and basic refractories. (Research initiated 1930.)

*Library:* New York, 760 volumes; Carteret, 700 volumes; South Charleston, 900 volumes; Newark, 725 volumes.

*Cooperative research:* One fellowship is supported and one grant for research is made.

Westwell Chemical Company. See Leffingwell Company.

2370. Weyerhaeuser Timber Company, Pulp Division, Longview, Wash.

*President:* F. E. Weyerhaeuser.

*Research staff:* R. S. Hatch, Director. 8 chemists; technical personnel 2; additional personnel 1.

*Research activities:* Wood pulp, timber, and their by-products. (Research initiated 1933.)

*Library:* 500 volumes.

**2371. Wheeling Steel Corporation, Wheeling, W. Va.**

*President:* A. J. McFarland.

*Laboratories:* Benwood, Wheeling, W. Va.; Steubenville, Yorkville, and Portsmouth, Ohio.

*Research staff:* E. G. Hill, Director of metallurgy and development. 2 chemists, 1 physicist, 3 metallurgists, 1 metallographer; additional personnel 2.

*Research activities:* New and improved methods of making, heat-treating, cleaning, and coating steel; corrosion of flat steel, coated. (Research initiated 1926.)

*Library:* 2,500 volumes.

**2372. Whip-Mix Corporation, Inc., 411-415 West Avery Ave., Louisville 8, Ky.**

*President:* Edm. A. Steinbock.

*Research staff:* Robert Neiman, Director. 1 chemist, 1 metallurgist, 1 engineer; additional personnel 1.

*Research activities:* Precision casting of metals and alloys; materials for patterns, investments, dies; process and apparatus; casting shrinkages of alloys. Dental products: gypsum and investments. (Research initiated 1925.)

*Library:* 500 volumes.

**2373. White and Bagley Company, Box 1171, Worcester 1, Mass.**

*President:* H. P. Bagley.

*Research staff:* George H. Ryan, Technical Director. 3 chemists; additional personnel 2.

*Research activities:* Metal working coolants of water-soluble, emulsifiable, and straight oil types; industrial and automotive lubricating oils and compounds; sulfonation procedures for the preparation of leather treating products and for special uses. (Research initiated 1923.)

*Library:* 200 volumes.

**2374. White Dental Manufacturing Company, S. S., 211 South 12th St., Philadelphia 44, Pa.**

*President:* F. E. Steen.

*Laboratories:* Philadelphia, Pa.; Prince Bay, Staten Island, N. Y.

*Research staff:* R. B. Savin, Manager, Research and Development; W. S. Crowell, Director, Philadelphia; R. C. Angell, Director, Prince Bay. 5 chemists, 6 engineers; technical personnel 12; additional personnel 5.

*Research activities:* Physical metallurgy, colloid chemistry, general chemistry, compressed gases, rubber, sanitation, mechanical research, ceramics, and plastics. (Research initiated 1890.)

*Library:* 6,000 volumes.

**White House Milk Company.** See Great Atlantic and Pacific Tea Company.

**2375. White Laboratories, Inc., 113 North 13th St., Newark 7, N. J.**

*President:* J. De Cesare.

*Research staff:* C. W. Sondern, Director of laboratories; Charles L. Barthen, Director of research. 15 chemists, 3 biologists, 1 physician; technical personnel 3; additional personnel 3.

*Research activities:* Nutrition (vitamins and minerals); pharmaceuticals; organic synthesis. (Research initiated 1922.)

*Library:* 400 volumes.

*Cooperative research:* Three fellowships are supported and eight grants for research are made.

**2376. White Motor Company, 842 East 79th St., Cleveland 1, Ohio.**

*President:* Robert F. Black.

*Research staff:* Robert R. Abbott, Director of metallurgy. 3 chemists, 1 physicist, 2 metallurgists, 1 engineer; technical personnel 3; additional personnel 3.

*Research activities:* Structure and treatment of ferrous and nonferrous metals; oils and greases. (Research initiated 1920.)

**2377. White Research Associates, 899 Boylston St., Boston, Mass.**

*Owner:* Walter W. Cowhig.

*Research staff:* Wilbert H. Cook, Technical Director. 2 physicists, 10 engineers; technical personnel 80; additional personnel 40.

*Research activities:* Electronics. (Research initiated 1943.)

*Library:* 500 volumes.

**Whitemarsh Research Laboratories.** See Pennsylvania Salt Manufacturing Company.

**2378. Whiting Corporation, Harvey, Ill.**

*President:* Stevens H. Hammond.

*Research staff:* I. R. Metcalf, Director. 1 chemist, 1 physicist, 6 engineers; technical personnel 7; additional personnel 3.

*Research activities:* Improvement and development of new products, methods of manufacture, and application in the fields of material handling, foundry, industrial tools, maintenance equipment, and chemical apparatus. (Research initiated 1916.)

*Library:* 3,000 volumes.

**2379. Whiting Paper Company, Holyoke, Mass.**

*President:* William Whiting.

*Research staff:* C. L. Reece, Director. 1 chemist.

*Research activities:* The development and investigation of various papermaking materials, and specific problems which may arise. (Research initiated 1930.)



**2380. Whiting-Plover Paper Company, Stevens Point, Wis.**

*President:* F. B. Whiting.

*Research staff:* L. A. Moss, Director. 2 chemists, 1 engineer; technical personnel 3.

*Research activities:* The improvement of present products and plant processes; the development of new products; the investigation of new types of raw materials. (Research initiated 1927.)

*Library:* 300 volumes.

*Cooperative research:* One grant for research is made.

**2381. Whittemore Brothers Corporation, 68 Albany St., Cambridge 39, Mass.**

*President:* Carl T. Whittemore.

*Research staff:* Alton B. Poole, Director. 2 chemists.

*Research activities:* Shoe polishes; leather dressings, dyes, etc.; waxes. (Research initiated 1910.)

**2382. Whitten Company, J. O., 134 Cross St., Winchester, Mass.**

*President:* Samuel E. Perkins.

*Research staff:* R. A. Acheson, Director. 2 chemists, 1 bacteriologist.

*Research activities:* Treatment of bone and hide preparatory to the manufacture of gelatin. (Research initiated 1902.)

**2383. Wickenden, Leonard, 120 Wall St., New York 5, N. Y.**

*Research staff:* Leonard Wickenden, Director. 2 chemists; additional personnel 3.

*Research activities:* Processes of manufacturing and uses of activated carbons; the refining of sugars and syrups. (Research initiated 1941.)

*Library:* 100 volumes.

**2384. Wickwire Spencer Steel Company, 500 Fifth Ave., New York 18, N. Y.**

*President:* E. P. Holder.

*Laboratories:* Buffalo, N. Y.; Palmer and Worcester, Mass.; Mt. Wolf, Pa.; Newark, N. J.

*Research staff:* R. T. Dunlap, Vice President in charge of operations; B. L. McCarthy, Chief Metallurgist; Fred A. Webber, Wire Mill Metallurgist; D. A. Sutch, Metallurgist, Buffalo; B. B. Tremere, Metallurgist, Palmer; R. R. Tatnall, Metallurgical Engineer, Worcester; D. L. Hoenstine, Superintendent, American Wire Fabrics Corporation, Mt. Wolf; L. D. Granger, Assistant to the Vice President, Wickwire Spencer Metallurgical Corporation, Newark.

*Research activities:* Applied research in the

development of wire mill practices, wire mill products, powder metallurgy, and the manufacture of alloy wire. (Research initiated 1922.)

**2385. Wico Electric Company, West Springfield, Mass.**

*President:* K. A. Harmon.

*Research staff:* A. L. Brownlee, Assistant Chief Engineer. 7 engineers; technical personnel 15; additional personnel 5.

*Research activities:* Electrical circuits and allied subjects. (Research initiated 1920.)

**2386. Wiedemann, H. E., 1604 Chemical Bldg., St. Louis 1, Mo.**

*Research staff:* H. E. Wiedemann, Director. 2 chemists.

*Research activities:* Consultation in industrial research problems. (Research initiated 1905.)

**2387. Wilbur-Suchard Chocolate Company, Inc., Lititz, Pa.**

*President:* Walter H. Mann.

*Research staff:* R. C. Welch, Director and Superintendent; J. Brehm, Chief Chemist. 3 chemists, 1 engineer; technical personnel 4.

*Research activities:* Production and control work in the manufacture of chocolate; development of new products. (Research initiated 1920.)

**Wilcox-Rich Division, Eaton Manufacturing Company. See Eaton Manufacturing Company.**

**2388. Wiley and Company, Inc., Calvert and Read Sts., Baltimore 2, Md.**

*President:* J. Rich Holland.

*Research staff:* J. Rich Holland, Director. 3 chemists, 2 engineers; additional personnel 2.

*Research activities:* Phosphates, fertilizers, detergents, and waste and pollution problems. (Research initiated 1906.)

*Library:* 800 volumes.

**Wilhelm Company, A. See Glidden Company.**

**2389. Willard Storage Battery Company, 246-286 East 131st St., Cleveland 1, Ohio.**

*President:* S. W. Rolph.

*Research staff:* L. E. Wells, Chief Engineer; C. C. Rose, Chemical Engineer. 6 chemists, 1 metallurgist, 4 engineers; technical personnel 11; additional personnel 7.

*Research activities:* Storage batteries. (Research initiated 1921.)

*Library:* 250 volumes.

**2390. Williams and Company, C. K., 640 North 13th St., Easton, Pa.**

*President:* Morris R. Williams.

*Research staff:* Joseph W. Ayers, Vice President and Director of research; Robert A. Stephens, Chief Research Chemist. 4 chemists, 1 physicist, 4 chemical engineers, 11 in other scientific professions; additional personnel 2.

*Research activities:* Inorganic pigments and extenders, principally synthetic iron oxides, calcium carbonate, cuprous oxide, and lamp-black; the application of pigments to rubber, paint, rouge, paper, plastics, varnish, lacquer, ceramics, linoleum, and building materials. (Research initiated 1929.)

*Library:* 200 volumes.

**2391. Williams and Company, J. H., 400 Vulcan St., Buffalo, N. Y.**

*President:* A. D. Armitage.

*Research staff:* W. C. Kress, Vice President in charge of research. 2 chemists, 2 metallurgists, 3 engineers.

*Research activities:* The manufacture of drop-forged tools; the production and heat-treatment of quality drop-forgings; alloy steels and nonferrous alloys. (Research initiated 1902.)

**2392. Williams Company, J. B., 222 Williams St., Glastonbury, Conn.**

*President:* Everett B. Hurlburt.

*Research staff:* Everett B. Hurlburt, Director. 2 chemists; additional personnel 2.

*Research activities:* Oils, fats, and soaps. (Research initiated 1890.)

*Library:* A few hundred volumes.

**2393. Williams Laboratories, Bruce, 620 Joplin St., Joplin, Mo.**

*Laboratories:* Joplin Mo.; Picher, Okla.; Batesville, Ark.

*Research staff:* Bruce Williams, Director; Glenn Summers, Chief Chemist. 7 chemists, 2 metallurgists, 3 engineers; technical personnel 2; additional personnel 4.

*Research activities:* Water pollution by mine effluents; the use of waste material from mines for roads and concrete; zinc smelting by-products. (Research initiated 1898.)

*Library:* 200 volumes.

**Williams Oil-O-Matic Corporation. See Eureka Vacuum Cleaner Company.**

**2394. Willson Products, Inc., Reading, Pa.**

*President:* Thomas A. Willson.

*Research staff:* E. L. Hettinger, optical research; W. J. Wiswesser, industrial hygiene. 2 chemists, 1 physicist, 1 chemical engineer, 1

instrument technician, 1 optical technician; technical personnel 2.

*Research activities:* The development and improvement of eye protective glasses and personal protective devices, such as goggles, respirators, gas masks, welding helmets, air sampling equipment, aviation goggles, and sun glasses. (Research initiated 1916.)

*Library:* 125 volumes.

**2395. Wilmington Chemical Corporation, Wilmington 99, Del.**

*President:* G. G. Urquhart.

*Research staff:* H. I. du Pont, Vice President in charge of research; F. S. Rostler, Consultant; R. Weil and H. W. Sternberg, Chemists. 7 chemists; technical personnel 6; additional personnel 3.

*Research activities:* Petroleum plasticizers for compounding rubber, both synthetic and natural; resin compounds for rubber. (Research initiated 1938.)

*Library:* 600 volumes.

**2396. Wilmot and Cassidy, Inc., 108 Provost St., Brooklyn 22, N. Y.**

*President:* Thomas A. Cassidy.

*Laboratory:* 292 Freeman St., Brooklyn, N. Y.

*Research staff:* Thomas A. Cassidy, Director. 1 chemist, 1 engineer; technical personnel 1.

*Research activities:* Oil additives; plasticizers. (Research initiated 1930.)

*Library:* 250 volumes.

**2397. Wilmotte Laboratory, Inc., 1469 Church St., N. W., Washington 5, D. C.**

*President:* Raymond M. Wilmotte.

*Laboratory:* Washington, D. C.; 236 West 55th St., New York 19, N. Y.

*Research staff:* Raymond M. Wilmotte, Director. 1 physicist, 15 engineers; technical personnel 18; additional personnel 15.

*Research activities:* Consulting work: application of electronic controls to industrial processes, including inspection, sorting, and counting; directive broadcast antenna design; applications of dielectric heating; acoustics. (Research initiated 1931.)

**2398. Wilson and Company, Inc., 4100 South Ashland Ave., Chicago 9, Ill.**

*President:* Edward F. Wilson.

*Laboratories:* Albert Lea, Minn.; Buenos Aires, Argentina; Calumet City, Ill.; Camden, N. J.; Cedar Rapids, Iowa; Chattanooga, Tenn.; Chicago, Ill.; Kansas City, Kans.; Los Angeles, Calif.; New York, N. Y.; Oklahoma City, Okla.; Omaha, Nebr.; Philadelphia, Pa.; Sao Paulo, Brazil.

*Research staff:* L. M. Tolman, Director, Research and Technical Department; G. A. Crapple, Chief Chemist and Assistant Director of research. 50 chemists, 6 chemical engineers, 13 bacteriologists and biochemists; technical personnel 41; additional personnel 20.

*Research activities:* Fresh, cured, smoked, and frozen meat; sausage; canned meats; fats and oils, including lard, vegetable oils, tallows, greases, and fatty acids; soap; tennis strings and surgical sutures; hair products; bone products; gelatin; pharmaceuticals; enzymes; animal by-products; sporting goods. (Research initiated 1918.)

*Library:* 2,000 volumes.

*Cooperative research:* Two fellowships are supported.

**Winchester Repeating Arms Company.** See Olin Industries, Inc.

**2399. Winthrop Chemical Company, Inc.,** 170 Varick St., New York 13, N. Y. (Division of Sterling Drug, Inc.)

*President:* Theodore G. Klumpp.

*Laboratory:* Rensselaer, N. Y.

*Research staff:* M. L. Tainter, Director. 45 chemists, 21 biologists, 2 physicians, 5 pharmacists; technical personnel 64; additional personnel 11.

*Research activities:* Medical research and related fields; pharmaceuticals. (Research initiated 1919.)

*Library:* 10,000 volumes.

*Cooperative research:* Four fellowships are supported and five grants for research are made.

**Wirthmore Research Laboratory.** See Cox Company, Charles M.

**Witco Chemical Company.** See Continental Carbon Company.

**2400. Woburn Chemical Corporation (N. J.),** 1200 Harrison Ave., Harrison, N. J.

*President:* A. G. H. Reimold.

*Research staff:* K. Schrøder, Director. 5 chemists; technical personnel 2.

*Research activities:* Fatty acids and allied synthetic products; synthetic drying oil. (Research initiated 1926.)

*Library:* 150 volumes.

**2401. Wolf, H. Comer,** 110-112 South Main St., Irvine, Ky.

*Laboratories:* Irvine and Lexington, Ky.

*Research staff:* B. M. Wolf, Administration Director; Robert Witt, Jr., Plant Superintendent. 2 chemists, 1 physicist, 3 metallurgists, 2 metallurgical engineers; technical personnel 2; additional personnel 5.

*Research activities:* Critical minerals; mineralogy; ore dressing; smelting and refining; low temperature distillation of coal; production of high octane motor fuel from coal and from oil shales. (Research initiated 1919.)

*Library:* 2,000 volumes.

**2402. Wolf Alport Chemical Corporation,** 1127 Irving Ave., Brooklyn 27, N. Y.

*Treasurer:* Harry W. Wolff.

*Research staff:* Harry W. Wolff, Director. 1 chemist.

*Research activities:* Rare earth and thorium; rubber accelerators. (Research initiated 1922.)

*Library:* 100 volumes.

**2403. Wolverine Shoe and Tanning Corporation,** Rockford, Mich.

*President:* V. W. Krause.

*Research staff:* 1 chemist.

*Research activities:* Work shoes, gloves, etc. (Research initiated 1918.)

**2404. Wolverine Tube Division of Calumet and Hecla Consolidated Copper Company,** 1411 Central Ave., Detroit 9, Mich.

*President:* E. R. Lovell.

*Research staff:* J. S. Rodgers, Technical Supervisor. 1 chemist, 2 metallurgists; technical personnel 9; additional personnel 1.

*Research activities:* The development and improvement of processes; metallurgical control of production processes; development and application of new alloys. (Research initiated 1927.)

*Library:* 300 volumes.

*Cooperative research:* One fellowship is supported and three grants for research are made.

**2405. Wood Industries, Inc.,** Gar, 7924 Riopelle St., Detroit 11, Mich.

*President:* Charles W. Perrelle.

*Research staff:* L. S. Wood, Vice President in charge of engineering; G. D. Shaeffer, Chief Engineer; R. S. Jenkins, Executive Vice President. 4 engineers; technical personnel 6.

*Research activities:* Home heating; earth and material handling methods and equipment. (Research initiated 1925.)

**2406. Wood Manufacturing Company, Inc.,** John, Conshohocken, Pa.

*Research staff:* R. J. Dougherty, Research Engineer. 1 engineer, 1 draftsman; additional personnel 1.

*Research activities:* The development of gas and electric hot water heaters and their controls and accessories. (Research initiated 1925.)

**BENNETT PUMPS DIVISION**  
Muskegon, Mich.

*President:* W. E. Maun.

*Research staff:* D. S. Willson, Research Engineer. 1 chemist, 2 engineers, 2 assistant engineers; additional personnel 2.

*Research activities:* The development, manufacture, and maintenance of dispensing equipment used at automotive service stations. (Research initiated 1937.)

**Wood Preserving Division, Koppers Company, Inc.** See Koppers Company, Inc.

**2407. Woodlawn Finishing Company, P. O. Box 157, Central Falls, R. I.**

*President:* Norman E. McCulloch.

*Laboratory:* 1 Moshassuck St., Pawtucket, R. I.

*Research staff:* 1 chemist; additional personnel 1.

*Research activities:* Application of dyes to yarns, and development of the process. (Research initiated 1916.)

**2408. Worcester Salt Company, 40 Worth St., New York, N. Y.**

*President:* Daniel Peterkin, Jr.

*Laboratory:* Silver Springs, N. Y.

*Research staff:* Fred D. Everett, Chemist. 1 chemist; technical personnel 1.

*Research activities:* The manufacture and use of salt. (Research initiated 1924.)

**2409. Worthington Pump and Machinery Corporation, 401 Harrison Ave., Harrison, N. J.**

*President:* Clarence E. Searle.

*Laboratories:* Harrison, N. J.; Buffalo, N. Y.; Holyoke, Mass.

*Research staff:* Paul Diserens, Director of research and development. 5 chemists, 1 biologist, 6 metallurgists, 16 engineers; technical personnel 2; additional personnel 12.

*Research activities:* Hydraulics, hydrodynamics, thermodynamics, electricity, and mechanical and electrical developments in these fields. (Research initiated 1922.)

*Library:* A library is maintained.

*Cooperative research:* Two fellowships are supported.

**2410. Wrigley Jr. Company, William, 410 North Michigan Ave., Chicago 11, Ill.**

*President:* James C. Cox.

*Research staff:* Robert L. Wilson, Director. 5 chemists; technical personnel 2.

*Research activities:* Chewing gum bases, flavors, and packaging. (Research initiated 1935.)

*Library:* A library is maintained.

*Cooperative research:* Four grants for research are made.

**2411. Wrisley Company, Allen B., 6801 West 65th St., Chicago 38, Ill.**

*President:* Wrisley B. Oleson.

*Research staff:* Elmer R. Luckow, Chief Chemist. 4 chemists, 4 engineers; technical personnel 2; additional personnel 10.

*Research activities:* Applied research in soaps, glycerin, and cosmetics. (Research initiated 1919.)

*Library:* 350 volumes.

*Cooperative research:* One fellowship is supported.

**2412. Wurlitzer Company, Rudolph, 105 West Adams St., Chicago, Ill.**

*President:* R. C. Roling.

*Laboratory:* North Tonawanda, N. Y.

*Research staff:* Carl E. Johnson, Manager, North Tonawanda Division; R. C. Haimbaugh, Director of engineering; L. E. Hayslett, Chief Electrical Engineer; F. H. Osborne, Chief Mechanical Engineer. 2 physicists, 9 engineers; technical personnel 14; additional personnel 6.

*Research activities:* Electronic remote controls; musical instruments, both electronic and conventional. (Research initiated 1935.)

**2413. Wurster and Sanger, Inc., 5201 South Kenwood Ave., Chicago 15, Ill.**

*President:* O. H. Wurster.

*Research staff:* Several chemists and chemical engineers as required.

*Research activities:* Fats and oils; soaps; glycerin; hydrogenation; edible fats; fatty acids.

*Library:* A library is maintained.

**2414. Wyandotte Chemicals Corporation, Wyandotte, Mich.**

*President:* E. M. Ford.

*Research staff:* Thomas H. Vaughn, Director. 32 chemists, 2 physicists, 2 biologists, 19 engineers, 1 mathematician, 1 patent attorney; additional personnel 31.

*Research activities:* General organic, inorganic, and physical chemistry; bacteriology; spectroscopy. (Research initiated 1932.)

*Library:* 5,000 volumes.

*Cooperative research:* Two fellowships are supported.

**2415. Wyandotte Worsted Company, Waterville, Maine.**

*President:* Nat H. Barrows.

*Research staff:* Kermit S. La Fleur, Director. 2 chemists; additional personnel 1.

*Research activities:* The investigation of the

chemical and physical behavior of wool. (Research initiated 1933.)

**2416. Wyeth, Inc.,** 1600 Arch St., Philadelphia 3, Pa.

*President:* H. S. Howard.

**WYETH INSTITUTE OF APPLIED BIOCHEMISTRY**  
900 North Broad St., Philadelphia 30, Pa.

*Research staff:* Alfred Barol, Director; P. R. Wolfgang, Executive Secretary. 26 chemists, 1 physicist, 2 microbiologists, 1 engineer, 2 physicians, 5 bacteriologists, 1 immunologist, 1 pathologist, 1 botanist, 2 pharmacologists; technical personnel 23; additional personnel 33.

*Research activities:* Pharmaceuticals, nutritional adjuncts, and biologicals. (Research initiated 1944.)

*Library:* 2,100 volumes.

*Cooperative research:* Three fellowships are supported and twenty grants for research are made.

#### BIOLOGICAL DIVISION

Kimberton, West Chester, and Marietta, Pa.

*Research staff:* E. F. Voigt, Managing Director. 3 chemists, 15 bacteriologists, 1 entomologist; technical personnel 17; additional personnel 28.

*Research activities:* Sera, toxins, vaccines, and specific typing sera.

*Library:* 491 volumes.

#### NUTRITIONAL DIVISION

Mason, Mich.; Belle Center and Chagrin Falls, Ohio

*Research staff:* Howard Seibert, Technical Director. 12 chemists, 1 biologist, 2 engineers, 1 veterinarian, 3 bacteriologists; technical personnel 19; additional personnel 4.

*Research activities:* Nutritional and food research.

*Library:* 150 volumes.

#### PHARMACEUTICAL DIVISION

12th and Washington Aves., Philadelphia, Pa.

*Research staff:* J. L. Deuble, Technical Director; William Elias, Chief Bacteriologist. 4 pharmaceutical chemists, 8 bacteriologists, 7 pharmacists; technical personnel 3; additional personnel 8.

*Research activities:* Pharmaceuticals.

**2417. Wyman-Gordon Company,** 105 Madison St., Worcester 1, Mass.

*President:* H. G. Stoddard.

*Research staff:* F. B. Rote, Research Metallurgist. 6 chemists, 10 metallurgists, 1 engineer; technical personnel 16; additional personnel 67.

*Research activities:* Fundamental and investigational work in steel magnesium alloy, and aluminum alloy hammer, press, or upset forgings, chiefly for the aircraft industry. (Research initiated 1900.)

**Wyssmont Company.** See Weisselberg, Arnold.

**2418. Xylos Rubber Company,** Akron 1, Ohio. (Subsidiary of Firestone Tire and Rubber Company.)

*President:* C. R. Shaffer.

*Research staff:* F. L. Kilbourne, Jr., Chief Chemist. 4 chemists; additional personnel 8.

*Research activities:* Reclaimed rubber developments; improved methods of manufacture; acrylonitrile type synthetic rubber development; improved methods of manufacture of synthetic rubber; special synthetic rubbers and chemicals. (Research initiated 1935.)

**2419. Yarnall-Waring Company,** 102 East Mermaid Lane, Chestnut Hill, Philadelphia 18, Pa.

*President:* D. Robert Yarnall.

*Research staff:* Walter Kinderman, Research Supervisor. 1 chemist, 3 engineers, 1 in another scientific profession; technical personnel 1.

*Research activities:* Development of power plant and industrial steam equipment, including valves and control devices. (Research initiated 1928.)

**2420. Yawman and Erbe Manufacturing Company,** 1099 Jay St., Rochester, N. Y.

*Vice President and General Manager:* E. Weter.

*Research staff:* J. R. Clark, Works Manager, in charge of research; G. H. Berl and C. W. Ward. Additional personnel 2.

*Research activities:* Finishing materials and research related to the manufacture of steel cabinets, shelves, office equipment, etc. (Research initiated 1939.)

**2421. York Corporation,** York, Pa.

*President:* S. E. Lauer.

*Research staff:* William Edgar Zieber, Director. 7 chemists, 1 physicist, 1 metallurgist, 27 engineers, 1 bacteriologist; technical personnel 19; additional personnel 39.

*Research activities:* Commercial refrigeration and air conditioning. (Research initiated 1921.)

*Library:* 2,077 volumes.

*Cooperative research:* One fellowship is supported.

**York Manufacturing Company.** See Androscoggin Mills.

**2422. Young Radiator Company, 709 South Marquette St., Racine, Wis.**

*President:* F. M. Young.

*Research staff:* Howard F. Brinen, Research Engineer. 4 engineers; additional personnel 5.

*Research activities:* Heat transfer: cooling and heating of air, oil, water, etc. for internal combustion engines and processing; air conditioning and industrial and residential heating. Surge and temperature control valves for oil cooling systems; corrosion of various metals and alloys on heat transfer application. (Research initiated 1930.)

*Library:* 250 volumes.

*Cooperative research:* Two grants for research are made.

**Zapon Finishes Laboratory of Atlas Powder Company. See Atlas Powder Company.**

**Zapon-Keratol Laboratory of Atlas Powder Company. See Atlas Powder Company.**

**2423. Zemmer Company, Inc., 3943-47 Sennott St., Pittsburgh 13, Pa.**

*President:* H. B. Johnson.

*Research staff:* J. D. Hoskins, Director. 3 chemists; technical personnel 5; additional personnel 72.

*Research activities:* Pharmaceutical products. (Research initiated 1903.)

*Library:* 250 volumes.

*Cooperative research:* Two grants for research are made.

**Zenith Carburetor Division, Bendix Aviation Corporation. See Bendix Aviation Corporation.**

**2424. Zenith Radio Corporation, 6001 West Dickens Ave., Chicago 39, Ill.**

*President:* E. F. McDonald, Jr.

*Research staff:* G. E. Gustafson, Vice President in charge of engineering. 4 physicists, 40 engineers; technical personnel 70; additional personnel 150.

*Research activities:* Radio circuit design for household and automotive receivers; acoustic designs for household and automotive radio receivers and for hearing aids. (Research initiated 1922.)

*Library:* 384 volumes.

**2425. Zinsser and Company, Inc., R. R. Ave., Hastings-on-Hudson, N. Y.**

*President:* James L. Berston.

*Research staff:* Alfred Berger, Director; R. J. Perry. 7 chemists; technical personnel 5; additional personnel 10.

*Research activities:* Dyestuffs; nutgall products (tannic, gallic, and pyrogallic acids);

photographic developers (hydroquinone, metol, etc.); organic lakes and pigments. (Research initiated 1897.)

*Library:* A library is maintained.

**2426. Zonite Products Corporation, 370 Lexington Ave., New York 17, N. Y.**

*President:* John M. Olwyler.

*Laboratory:* New Brunswick, N. J.

*Research staff:* Arthur Locke, Research Director; M. G. Minaeff, Technical Director. 5 chemists, 1 biologist; technical personnel 5; additional personnel 3.

*Research activities:* The development of pharmaceutical products. (Research initiated 1927.)

*Library:* 1,000 volumes.

**2427. Zophar Mills, Inc., 112-130 Twenty-sixth St., Brooklyn 32, N. Y.**

*President:* Harry J. Blank.

*Research staff:* A. Saunders, Director, Waxes and Plastics Department; S. M. Hendrickson, Director, Rustproofing and Metal Cleaners Department; H. Tresouthick, Director, Asphalt and Pitches Department. 1 chemist, 1 engineer, 3 assistant chemists; additional personnel 3.

*Research activities:* Waxes and their application; waterproofing and vaporproofing; electrical applications in electronic fields; metal cleaning and rustproofing; bituminous paint components. (Research initiated 1846.)

## ADDENDA

**2428. American Scientific Laboratories, 105-109 Mason St., Polo, Ill.**

*President:* H. D. White.

*Research staff:* J. M. Severens, Director. 1 biologist; technical personnel 5; additional personnel 4.

*Research activities:* Veterinary biologics. (Research initiated 1921.)

*Library:* A library is maintained.

**2429. Canadian Radium and Uranium Corporation, 630 Fifth Ave., New York 20, N. Y.**

*Pre ident:* Boris Pregel.

*Laboratory:* 43 West 16th St., New York 11, N. Y.

*Research staff:* Marietta Blau, Director. 1 chemist, 3 physicists, 1 metallurgist, 2 engineers, 1 physician, 1 geologist; technical personnel 2; additional personnel 30.

*Research activities:* Physical and physico-chemical investigations of problems bearing on radioactive radiations and their effects; problems solvable by technics using radioactive substances and their transmutations; production of luminous compounds and measurement of

these materials; application of radioactive materials for scientific and industrial purposes. (Research initiated 1942.)

*Library:* 500 volumes.

*Cooperative research:* Two grants for research are made.

**2430. Circo Products Company, 2835 Chester Ave., Cleveland 14, Ohio.**

*President:* John F. Black.

*Research staff:* J. J. Skelly, Director. 1 chemist, 1 metallurgist, 3 engineers; additional personnel 1.

*Research activities:* Metal degreasing and cleaning; solvents. (Research initiated 1936.)

*Library:* A library is maintained.

**2431. Collins Radio Company, 855 Thirty-fifth St., N. E., Cedar Rapids, Iowa.**

*President:* Arthur A. Collins.

*Laboratory:* 321 Third St., S. E., Cedar Rapids, Iowa.

*Research staff:* W. W. Salisbury, Director; J. J. Livingood and W. W. Farley, Assistant Directors. 1 chemist, 4 physicists, 16 engineers; technical personnel 25; additional personnel 2.

*Research activities:* Microwave communications, tube research, and propagation; astronomical studies. (Research initiated 1945.)

*Library:* 650 volumes.

**2432. Denver and Rio Grande Western Railroad, 1531 Stout St., Denver 1, Colo.**

*Trustees:* Wilson McCarthy and Henry Swan.

*Laboratory:* West 8th Ave. and Osage St., Denver 4, Colo.

*Research staff:* Ray McBrian, Engineer of standards and research. 6 chemists, 4 metallurgists, 2 metallographers, 2 chemical engineers, 1 electrical engineer, 2 inspectors; technical personnel 2; additional personnel 1.

*Research activities:* Boiler and firebox steels; compression ignition fuels and lubricating oils for Diesel engines; photoelastic stress analysis; streamlining double refraction fluid flow. (Research initiated 1928.)

*Library:* 100 volumes.

**2433. Emtec Research Associates, 57 Advocate Place, Stamford, Conn.**

*Research staff:* Edwin B. Michaels, Research Director; Sidney Eisenberger, Samuel Machlis, Harold L. Posner, and Ralph Kricker, Associate Directors. 5 chemists, 1 physicist, 3 engineers; technical personnel 5; additional personnel 3.

*Research activities:* The waterproofing, resin impregnation, dyeing, bleaching, finishing, and scouring of textiles, furs, felts, and leather; photosensitive plastics for offset printing and

silk screen paints; plastic films for packaging and sausage casings; detergents. (Research initiated 1945.)

*Library:* 250 volumes.

**2434. Hillyer Engineering Company, 18 East 46th St., New York 17, N. Y.**

*Research staff:* Curtis Hillyer, Director; E. F. Coleman, Chief Physicist. 2 physicists, 4 engineers; technical personnel 5; additional personnel 3.

*Research activities:* The development of optical photoelectronic equipment; infrared radiation and detection apparatus; precision electronic mechanical apparatus and measurements. (Research initiated 1944.)

*Library:* 100 volumes.

**2435. Middlesex Manufacturing Company, Lincoln Blvd., Middlesex, N. J.**

*President:* F. J. McConnell.

*Research staff:* Charles U. Pittman, Director; J. S. Miller, Asphalt Technologist. 2 chemists, 1 engineer; technical personnel 2; additional personnel 2.

*Research activities:* Bituminous products. (Research initiated 1945.)

**2436. National Printing Ink Research Institute, Bethlehem, Pa.**

*Research staff:* I. M. Bernstein, Director; A. C. Zettlemoyer, Research Coordinator. 5 chemists; additional personnel 1.

*Research activities:* The study of the fundamental properties of inks, including rheological ink; the oxidation drying of ink films and coatings, polymerization of drying oil systems, and the chemistry and physics of pigment dispersion; the study of the relation between printing inks and the graphic arts. (Research initiated 1946.)

*Library:* 200 volumes.

*Cooperative research:* Three fellowships are supported.

**2437. National Southern Products Corporation, 12th Ave. at 14th St., Tuscaloosa, Ala.**

*President:* George J. Thomas.

*Research staff:* C. B. F. Young, Director; E. J. Calleton, Director of development and sales. 2 chemists, 4 engineers; technical personnel 1.

*Research activities:* Research on soaps and lignin products derived from the manufacture of tall oil fatty acids. (Research initiated 1943.)

*Cooperative research:* Two fellowships are supported.

**2438. Peterman, Inc., William**, 56 Ferry Street, Newark 5, N. J. (Subsidiary of Bristol-Myers Company.)

*President:* G. L. Herrick.

*Laboratory:* 411 Wilson Ave., Newark 5, N. J.

*Research staff:* Heber C. Donohoe, Director. 3 biologists; technical personnel 2.

*Research activities:* Insecticides for distribution in small-package channels; chemical formulations and compositions for household cleaning and maintenance. (Research initiated 1943.)

*Library:* 200 volumes.

*Cooperative research:* One grant for research is made.

**2439. Pettinos, Inc., George F.**, 1206 Locust St., Philadelphia 7, Pa.

*President:* George F. Pettinos.

*Research staff:* Franklin P. Goettman, Research Manager. 1 mineral technologist; technical personnel 2; additional personnel 1.

*Research activities:* Production and miscellaneous problems; clay technology; refractories. (Research initiated 1923.)

**2440. St. Clair Rubber Company**, Marysville, Mich.

*General Manager:* S. R. Livingstone.

*Research staff:* W. P. Frisco, Director. 5 chemists; technical personnel 2; additional personnel 1.

*Research activities:* Adhesives; cements; coated fabrics. (Research initiated 1923.)

**2441. Scherbatskoy, S. A.**, McBirney Bldg., Tulsa 3, Okla.

*Proprietor:* S. A. Scherbatskoy.

*Research staff:* 3 engineers, 1 geologist; technical personnel 4; additional personnel 3.

*Research activities:* Geophysical prospecting by seismic and radioactive methods. (Research initiated 1943.)

**2442. Square D Company**, 6060 Rivard St., Detroit 11, Mich.

*President:* F. W. Magin.

*Research staff:* J. G. Jackson, Director. 4 engineers; technical personnel 6.

*Research activities:* The development of switching and distribution, and of panel-board equipment at standard commercial voltages, both fusible and circuit breaker types; electric motors; pressure, vacuum, and temperature control equipment; aircraft circuit breakers and switches. (Research initiated 1928.)

**2443. van Ameringen-Haebler, Inc.**, 315 Fourth Ave., New York 10, N. Y.

*President:* A. L. van Ameringen.

*Laboratory:* 417 Rosehill Place, Elizabeth 2, N. J.

*Research staff:* W. F. Reis, Vice President in charge of research; James H. McGlumphy, Director of flavor research. 6 chemists; technical personnel 12; additional personnel 2.

*Research activities:* Organic synthesis; research on flavors and essential oils. (Research initiated 1919.)

*Library:* 743 volumes.





**APPENDIX**  
**UNIVERSITIES AND COLLEGES OFFERING RESEARCH**  
**SERVICE TO INDUSTRY**



## APPENDIX

### UNIVERSITIES AND COLLEGES OFFERING RESEARCH SERVICE TO INDUSTRY

This list includes institutions which offer research service to industry.  
Correspondence should be addressed to the person or department listed.

#### ALABAMA

Alabama Polytechnic Institute, Auburn, Ala.  
Russell S. Poor, Director, Auburn Research Foundation.  
Tuskegee Institute, Tuskegee Institute, Ala.  
R. W. Brown, Director, Carver Foundation.  
University of Alabama, Tuscaloosa, Ala. J. R. Cudworth, Director, Engineering Experiment Station and State Mine Experiment Station.

#### ARIZONA

University of Arizona, Tucson, Ariz. Alfred Atkinson, President.

#### ARKANSAS

Arkansas Baptist College, Little Rock, Ark.  
B. F. Johnson.  
College of the Ozarks, Clarksville, Ark. T. L. Smith, Professor of Biology.  
Philander Smith College, Little Rock, Ark.  
A. T. Scott; B. A. Lloyd.  
University of Arkansas, Fayetteville, Ark.  
C. O. Brannen, Director, Bureau of Research.

#### CALIFORNIA

Armstrong College, Berkeley 4, Calif. J. Evan Armstrong, President.  
California Institute of Technology, Pasadena, Calif. William V. Houston.  
College of the Pacific, Stockton 27, Calif. Barthol Pierce, Food Processors Foundation.  
Loyola University, Los Angeles 45, Calif. Romeo Allard, Head, Department of Chemistry.  
Mills College, Oakland 13, Calif. Howard W. McMinn, Professor of Botany.  
Mount St. Mary's College, Los Angeles 24, Calif. Sister Rose de Lima, Dean.  
Pasadena College, Pasadena 7, Calif. Philip R. Carlson.  
Pomona College, Claremont, Calif. W. Conway Pierce, Professor of Chemistry; A. O. Woodford, Professor of Geology.  
University of California, Berkeley, Calif. Robert G. Sproul, President.  
University of Redlands, Redlands, Calif. F. C. Wilcox, Dean.  
University of San Francisco, San Francisco 17, Calif. Harold A. Harper.

University of Santa Clara, Santa Clara, Calif.  
George L. Sullivan, Dean of Engineering;  
Joseph Deck, Professor, of Chemistry.  
Whittier College, Whittier, Calif. W. Roy Newsom, Head, Chemistry Department.

#### COLORADO

Colorado College, Colorado Springs, Colo.  
Thomas H. Rawles, Acting Treasurer.  
Colorado State College of Agriculture and Mechanic Arts, Ft. Collins, Colo. Wesley E. Pyke, Head of Chemistry Department.  
Loretto Heights College, Loretto, Colo. Sister M. Alonza, Professor of Chemistry.  
University of Colorado, Boulder, Colo. Carl W. Borgmann, Director of Engineering Experiment Station; E. H. Cramer, Director, Bureau of Business Research.  
University of Denver (Colorado Seminary), Denver 10, Colo. Alfred C. Nelson, Dean of Graduate College.

#### CONNECTICUT

Connecticut College, New London, Conn.  
Katharine Blunt, President.  
University of Connecticut, Storrs, Conn. L. J. Ackerman, Dean, School of Business Administration; F. L. Castleman, Acting Dean, School of Engineering.  
Wesleyan University, Middletown, Conn. Victor L. Butterfield.

#### DELAWARE

University of Delaware, Newark, Del. Allan P. Colburn, Chairman, Committee on Research.

#### DISTRICT OF COLUMBIA

American University, Washington 16, D. C. C. E. Lane, Jr., Director, Division of Science.  
George Washington University, Washington 6, D. C. Frederick M. Feiker, Dean, School of Engineering.

#### FLORIDA

Florida Southern College, Lakeland, Fla. J. C. Peel, Dean.  
John B. Stetson University, DeLand, Fla. Charlotte Smith, Librarian.  
Rollins College, Winter Park, Fla. George Saute, Chairman, Science Division.

- University of Florida, Gainesville, Fla. Joseph Weil, Director, Engineering and Experiment Station.
- University of Miami, Coral Gables, Fla. J. H. Clouse, Chairman, Science Research Council.
- GEORGIA**
- Agnes Scott College, Decatur, Ga. J. R. McCain, President.
- Atlanta University, Atlanta, Ga. K. A. Huggins, Chairman, Research Committee.
- Georgia School of Technology, Atlanta, Ga. Gerald A. Rosselot, Director, Engineering Experiment Station.
- Oglethorpe University, Oglethorpe University, Ga. Philip Weltner, President.
- IDAHO**
- University of Idaho, Moscow, Idaho. L. C. Cady.
- ILLINOIS**
- Aurora College, Aurora, Ill. Theodore Pierson Stephens, President.
- Columbia College, 410 South Michigan Blvd., Chicago 5, Ill. Daniel D. Howard, Director of Research and Guidance.
- De Paul University, 2235 Sheffield Ave., Chicago, Ill. Bernard J. Babler, Chairman, Department of Chemistry.
- George Williams College, 5315 Drexel Ave., Chicago, Ill. Harry D. Edgren.
- Illinois College, Jacksonville, Ill. Edward M. Collins, Professor of Chemistry.
- Illinois Institute of Technology, 3300 South Federal St., Chicago 16, Ill. L. E. Grinter, Dean, Graduate School; J. E. Hobson, Director, Armour Research Foundation; E. S. Pettyjohn, Director, Institute of Gas Technology.
- Knox College, Galesburg, Ill. I. E. Neifert, Department of Chemistry.
- Lake Forest College, Lake Forest, Ill. Edward O. North.
- Loyola University, 6525 Sheridan Road, Chicago 26, Ill. K. B. O'Neil.
- Northwestern University, Evanston, Ill. Paul Klopsteg, Director of Research, Northwestern Technological Institute.
- University of Illinois, Urbana, Ill. M. L. Enger, Director, Engineering Experiment Station.
- INDIANA**
- De Pauw University, Greencastle, Ind. J. M. Fulmer, Head, Department of Chemistry.
- Evansville College, Evansville, Ind. John A. Needy, Director of Technology and Engineering Education.
- Goshen College, Goshen, Ind. Ernest E. Miller, President.
- Indiana University, Bloomington, Ind. H. T. Briscoe, Vice President and Dean of the Faculties.
- Manchester College, North Manchester, Ind. Carl W. Holl, Dean.
- Purdue University, Lafayette, Ind. A. A. Potter, Director, Engineering Experiment Station.
- Rose Polytechnic Institute, Terre Haute, Ind. D. B. Prentice, President.
- St. Francis College, Fort Wayne 8, Ind. Sister M. Amatora, Dean.
- St. Joseph's of Indiana, Collegeville, Ind. J. A. Otte, Director, Business and Industry Department.
- Valparaiso University, Valparaiso, Ind. W. E. Thrun, Head, Department of Chemistry.
- Wabash College, Crawfordsville, Ind. L. B. Howell, Chairman, Department of Chemistry.
- IOWA**
- Coe College, Cedar Rapids, Iowa. Ben H. Peterson, Head, Department of Chemistry.
- Grinnell College, Grinnell, Iowa. Samuel N. Stevens, President.
- Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa. Quincy C. Ayres, Assistant to the President.
- Iowa Wesleyan College, Mt. Pleasant, Iowa. Stanley B. Niles, President.
- Parsons College, Fairfield, Iowa. Herbert C. Mayer, President.
- St. Ambrose College, Davenport, Iowa. Rt. Rev. Ulrich A. Hauber, Chairman, Division of Science and Mathematics.
- State University of Iowa, Iowa City, Iowa. Carl E. Seashore, Dean.
- KANSAS**
- Baker University, Baldwin, Kans. Nelson P. Horn, President.
- Bethel College, North Newton, Kans. L. C. Kreider.
- Kansas State College of Agriculture and Applied Science, Manhattan, Kans. A. L. Pugsley, Chairman, Committee on Industrial Research.
- Marymount College, Salina, Kans. Sister M. Redempta, Rose Waller Research Laboratory.
- University of Kansas, Lawrence, Kans. J. A. Maloney, Director, University of Kansas Research Foundation.
- University of Wichita, Wichita 6, Kans. Waldo B. Burnett, Director, Foundation for Industrial Research.
- Washburn Municipal University, Topeka, Kans. Ruth E. Parker, Head, Department of Home Economics.
- KENTUCKY**
- Centre College of Kentucky, Danville, Ky. R. I. Rush, Professor of Chemistry.
- Transylvania College, Lexington, Ky. Henry Noble Sherwood, Chancellor.

University of Kentucky, Lexington, Ky. Leo Chamberlain, Dean.  
University of Louisville, Louisville 7, Ky. R. C. Ernst, Director, Institute of Industrial Research.

**LOUISIANA**

Centenary College of Louisiana, Shreveport, La. John B. Entrikin, Head, Department of Chemistry.  
Louisiana College, Pineville, La. Edgar Godbold, President.  
Louisiana State University, Baton Rouge, La. A. R. Choppin, Dean, College of Chemistry and Physics.  
Tulane University, New Orleans 15, La. Roger P. McCutcheon, Chairman, University Council on Research.

**MAINE**

Bates College, Lewiston, Maine. W. A. Lawrence, Head, Department of Chemistry.  
Bowdoin College, Brunswick, Maine. Kenneth C. M. Sills, President.  
Colby College, Waterville, Maine. Miriam Beede, Secretary to the President.  
University of Maine, Orono, Maine. Roy P. Whitney, Director of Industrial Research.

**MARYLAND**

Johns Hopkins University, Baltimore 18, Md. P. Stewart Macaulay, Provost.  
University of Maryland, College Park, Md. H. C. Byrd, President.

**MASSACHUSETTS**

Boston University, Boston, Mass. Chester M. Alter, Dean.  
Clark University, Worcester, Mass. Jesse L. Bullock, Chairman, Department of Chemistry.  
Eastern Nazarene College, Wollaston 70, Mass. J. H. Shrader, Head, Division of Science.  
Holy Cross College, Worcester 3, Mass. Rev. Bernard A. Fiekers, Chairman, Department of Chemistry.  
Massachusetts College of Pharmacy, Boston 15, Mass. Howard C. Newton, Dean.  
Massachusetts Institute of Technology, Cambridge, Mass. N. M. Sage, Director, Division of Industrial Cooperation.  
Massachusetts State College, Amherst, Mass. Walter S. Ritchie, Head, Department of Chemistry.  
Northeastern University, Boston 15, Mass. William C. White, Director of Day Division.  
Regis College, Weston 93, Mass. Sister Honora, President.  
Smith College, Northampton, Mass. Gladys A. Anslow, Director of Graduate Study.  
Springfield College, Springfield, Mass. Paul M. Lambert, President.

Tufts College, Medford 55, Mass. Leonard Carmichael, President; H. P. Burden, Dean, Engineering School.  
Worcester Polytechnic Institute, Worcester, Mass. W. T. Cluverius, President.

**MICHIGAN**

Albion College, Albion, Mich. Emil Leffler, Dean.  
Alma College, Alma, Mich. Roy W. Hamilton, President.  
Calvin College, Grand Rapids, Mich. H. G. Dekker.  
Ferris Institute, Big Rapids, Mich. James A. Fraser.  
Hope College, Holland, Mich. Gerret Van Zyl.  
Marygrove College, Detroit 21, Mich. George E. F. Brewer, Professor of Chemistry.  
Michigan College of Mining and Technology, Houghton, Mich. Grover C. Dillman, President and Director of Research.  
Michigan State College, East Lansing, Mich. Ernest L. Anthony, Chairman of All-College Research Committee.  
University of Detroit, Detroit 21, Mich. A. H. Poetker.  
University of Michigan, Ann Arbor, Mich. Albert E. White, Director, Department of Engineering Research.  
Wayne University, Detroit 1, Mich. David D. Henry, Office of the President; Raymond Hussey, Dean, School of Occupational Health; A. R. Carr, Dean, School of Engineering.

**MINNESOTA**

Carleton College, Northfield, Minn. L. M. Gould, President.  
College of St. Thomas, St. Paul, Minn. William J. Tomsicek, Chemistry Department.  
Macalester College, St. Paul 5, Minn. O. T. Walter, Chairman, Science Division.  
University of Minnesota, Minneapolis 14, Minn. J. L. Morrill, President.

**MISSISSIPPI**

Mississippi State College, State College, Miss. Frank J. Welch, Head, Department of Economics.  
Mississippi State College for Women, Columbus, Miss.

**MISSOURI**

Missouri Valley College, Marshall, Mo. J. Ray Cable, President.  
St. Louis College of Pharmacy and Allied Sciences, St. Louis, Mo. A. F. Schlichting, Dean.  
St. Louis University, St. Louis 3, Mo. Rev. P. J. Holloran.  
University of Kansas City, Kansas City 4, Mo. R. R. Haun, Chairman, Department of Physics.

- University of Missouri, Columbia, Mo. H. A. Curtis, Dean, College of Engineering.  
Washington University, St. Louis 5, Mo. T. E. Blackwell, Treasurer.
- MONTANA**  
Montana State College, Bozeman, Mont. J. H. Pepper, Chairman, Research Committee.  
Montana State University, Missoula, Mont. Charles W. Waters, Chairman, Committee on Research and Graduate Study.
- NEBRASKA**  
Nebraska Wesleyan University, Lincoln 4, Nebr. Benjamin F. Schwartz, Chancellor.  
Union College, Lincoln 6, Nebr. R. Woods, Dean.  
University of Nebraska, Lincoln 8, Nebr. Robert W. Goss, Dean, Graduate College.
- NEVADA**  
University of Nevada, Reno, Nev. W. D. Billings, Chairman, Research Committee.
- NEW HAMPSHIRE**  
Dartmouth College, Hanover, N. H. William P. Kimball, Dean, Thayer School of Engineering; Herluf V. Olsen, Dean, Amos Tuck School of Business Administration.  
University of New Hampshire, Durham, N. H. Lauren E. Seeley, Dean, College of Technology.
- NEW JERSEY**  
Newark College of Engineering, Newark, N. J. James A. Bradley, Dean in charge of Graduate Courses.  
Princeton University, Princeton, N. J. J. Douglas Brown, Director, Industrial Relations Section.  
Rutgers University, New Brunswick, N. J. William H. Cole, Director, Research Council.  
Saint Peter's College, Jersey City 6, N. J. Joseph Gierut, Head, Department of Chemistry.  
Stevens Institute of Technology, Hoboken, N. J. Edwin G. Schneider, Assistant to the President for Research.
- NEW MEXICO**  
University of New Mexico, Albuquerque, N. Mex. M. E. Farris, Dean, College of Engineering.
- NEW YORK**  
Alfred University, Alfred, N. Y. J. E. Walters, President.  
Clarkson College of Technology, Potsdam, N. Y. John A. Ross, Jr., President.  
Colgate University, Hamilton, N. Y. Sidney J. French, Dean.  
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