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A GUIDE TO THE LITERATURE ON RUBBER

Prefatory Abstract

The literature on rubber is made up of books and monographs, reviews, periodicals devoted primarily to rubber, general scientific periodicals, abstract journals, and special publications such as those of government and private institutions, testing societies, and commercial organizations. This letter circular is primarily designed to acquaint the reader who may be unfamiliar with rubber technology with those publications which may be the most useful as sources of information and the most readily accessible.



# A Guide to the Literature on Rubber

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# A GUIDE TO THE LITERATURE ON RUBBER

## I. INTRODUCTION

This memorandum has been prepared in response to inquiries about sources of information on rubber. It is intended to assist the reader who may be unfamiliar with rubber technology in obtaining recent and authentic information relating to the production, manufacture and properties of rubber and rubber products. There has been no attempt to make a complete or exhaustive survey of the field of rubber literature, but rather the aim has been to point out those recent books, current periodicals and other publications which are likely to be the more readily accessible and the more useful to American readers. Only casual reference is made to the patent literature since patents are seldom useful as sources of information.

The term rubber is here used in a wide sense to refer to the natural gum rubber, to all products made from it, including ebonite, and also to gutta-percha, balata, and other gums related to rubber.

The main classes of publications in which information about rubber is given are, (1) books, (2) journals devoted to rubber, (3) other scientific and technologic periodicals, (4) special publications of government bureaus and other institutions, and (5) sales promotion literature published by manufacturers of rubber products or of materials used in the rubber industry.

Books on rubber, taken alone, are frequently inadequate as sources of information. The books available are relatively few in number and do not cover all topics pertaining to rubber fully or in detail, and furthermore, because of rapid changes in the industry much of the information contained in a book may be out of date in a very few years. For this reason the reader who seeks detailed, exhaustive or recent information will usually find it necessary or desirable to search through periodicals and special publications as well as books.

## II. BOOKS ON RUBBER

Below is a list of books on rubber with the name and address of the publisher, the date of printing, a brief notation of the contents, and other pertinent information. Most of these books may be consulted in the larger public libraries and in many technical libraries throughout the United States. Some of the older books are out of print; the more recent ones are, of course, readily available from the publishers. Where prices are given these are only approximate and are subject to change.



Only one book in the list, "The Reign of Rubber," was written expressly for popular reading. The other books are addressed primarily to the rubber technologist, but the well informed individual not versed in rubber technology will experience relatively little difficulty in consulting them, and will find many chapters both readable and interesting.

There are no books designed for the guidance of the individual who wishes to undertake the manufacture of rubber products on a home-workshop scale. This may be taken not so much as a deficiency in the rubber literature as an indication that the fabrication of rubber involves highly specialized manufacturing processes and equipment and does not readily lend itself to amateur craftsmanship.

None of the books on the list was written as a general interest text book or reference work for use in schools. In the main the teacher directing studies on rubber in connection with commercial geography, economics, or general science will find it both necessary and desirable to select and organize material from a variety of sources rather than to confine attention to a single book.

#### 1. General Books on Rubber

**RUBBER.** By Philip Schidrowitz. Methuen & Co., Ltd., London, 1911. 303 pp. 39 pl. 27 figs.

The contents include a brief description of many types of rubber plants, and a discussion of the preparation and chemistry of raw rubber, and of the vulcanization and testing of rubber products.

**RECENT PROGRESS IN RUBBER CHEMISTRY AND TECHNOLOGY.** By Philip Schidrowitz. Benn Brothers, Ltd., London, 1922. 64 pp. A general summary of value as a supplement to the above text.

**RUBBER: ITS PRODUCTION, CHEMISTRY, AND SYNTHESIS IN THE LIGHT OF REGENT RESEARCH. A PRACTICAL HANDBOOK FOR THE USE OF RUBBER CULTIVATORS, CHEMISTS, ECONOMISTS AND OTHERS.** By A. Dubose and A. Luttringer. Charles Griffin & Co., Ltd., London, 1918. 383 pp.

Section 1 deals with natural rubber, its statistics and costs and with resinous and reclaimed rubbers; section 2, with the production, physical and chemical properties, analysis and constitution of crude rubber; section 3, with synthetic rubber. Many references are given and also a list of patents on reclaimed rubber.

**PLANTATION RUBBER AND TESTING OF RUBBER.** By G. Stafford Whitby. Longmans, Green & Co., London and New York, 1921.

The preparation and examination of rubber are considered from a fundamental standpoint. The author devotes considerable attention to coagulation phenomena in Hevea latex and to the basic mechanical properties of rubber.





RUBBER MANUFACTURE: THE CULTIVATION, CHEMISTRY, TESTING, AND MANUFACTURE OF RUBBER, WITH SECTIONS ON THE RECLAMATION OF RUBBER AND THE MANUFACTURE OF RUBBER SUBSTITUTES. By H.E. Simmons. D. Van Nostrand Co., New York, 1921. 149 pp. Illustrated.

THE REIGN OF RUBBER. By W. C. Geer. Century Co., New York, 1922, 344 pp. Illustrated. Price, \$3.00.

This book was written for the non-technical reader. It gives a short review of the history of the rubber industry and the production of rubber. The major portion of the book is devoted to descriptions of manufacturing processes.

THE CHEMISTRY OF RUBBER. By B.D.W. Luff. Ernest Benn, Ltd., 8 Bouverie Street, E.C. 4, London, 1923. 232 pp. 16 pl. Price in the U.S.A., about \$7.00.

In addition to the chemistry of rubber proper, this book deals with the history and source of crude rubber, and with the vulcanization and properties and testing of rubber.

THE CHEMISTRY OF RUBBER MANUFACTURE. By Lothar E. Weber. Charles Griffin and Co., Ltd., 42 Drury Lane, W.C. 2, London, 1926. 372 pp. 7 figs. Price in the U.S.A. about \$9.00.

This is a revision of the classical treatise, "The Chemistry of India Rubber," by C.O. Weber, which was published in 1902. The contents include the preparation, composition, and properties of crude rubber, a discussion of vulcanization and of compounding ingredients, methods for chemical and physical testing of both crude and vulcanized rubber. There is a brief discussion of synthetic rubber and reclaimed rubber. Numerous references to the literature are given.

ESTATE RUBBER, ITS PREPARATION, PROPERTIES, AND TESTING. By O. DeVries. Drukkerijen, Ruygrok & Co., Batavia, Java, 1920. 649 pp

This book contains a review of the plantation methods for the preparation of rubber in the Dutch East Indies with many experimental data and bibliographical references on the properties and testing of rubber.

SYSTEMATIC SURVEY OF RUBBER CHEMISTRY. By Clayton W. Bedford and Herbert A. Winkelmann. Chemical Catalog Co., Inc., 419 Fourth Ave., New York, 1923. 385 pp. Price \$8.00

This book is primarily a bibliography with abstracts of the entire literature of rubber chemistry and closely allied subjects up to 1923. It is indexed both by authors and by subjects. Chapters on accelerators and the theory of vulcanization are included.

## 2. Books on the Production of Crude Rubber

THE PREPARATION OF PLANTATION RUBBER. By Sidney Morgan and Henry P. Stevens, Second Edition, Constable & Co., Ltd., 10-12 Orange St., London, W.C. 2, England, 1927. 357 pp. Illustrated.

This is a general and comprehensive treatise on the production of Hevea rubber on plantations. It includes the planting, maintenance and thinning of trees, tapping, collecting and coagulation of



latex, preparation and drying, sorting, grading, and packing of sheets and crepe. Sections are also devoted to machinery and buildings, defects in finished rubber, and vulcanization and testing procedure.

HANDBOEK VOOR DE RUBBER CULTUUR IN NEDERLANDSCH- INDIE  
(In Dutch) By Swart and Rutgers. J.H. De Bussy, Amsterdam;  
1921. 777 pages, and numerous illustrations.

An authoritative and detailed account of plantation practices in the production of crude rubber in the East Indies.

GUAYULE, A RUBBER PLANT OF THE CHIHUAHUAN DESERT  
By Francis Ernest Lloyd, Carnegie Institution of Washington,  
Publication No. 139; 1911. 213 pages, 46 plates.

This book was written before the development of methods for cultivating the Guayule shrub.

The books by Whitby and de Vries cited in the previous section are excellent sources of information on crude rubber.

### 3. Books on the Technology of Rubber.

THE MANUFACTURE OF INDIA RUBBER GOODS. By "Factory Manager."  
Maclaren & Sons, Ltd., 37-38, Shoe Lane, E.C. 4, London, England,  
1920. 496 pages, 161 illustrations.

"A practical guide to the manufacture of rubber goods."

CRUDE RUBBER AND COMPOUNDING INGREDIENTS. By Henry C. Pearson.  
The India Rubber Publishing Co., New York; 1920. 422 pp.

A comprehensive description of the grades of rubber and other materials used in making rubber goods. Many formulas are given.

PNEUMATIC TIRES. By H. C. Pearson. India Rubber World  
Publishing Co., New York, 1922.

RUBBER MACHINERY. By H. C. Pearson. India Rubber World  
Publishing Co., New York; 1920. 419 pages. 428 figures.

GOTTLOB'S TECHNOLOGY OF RUBBER, AUTHORIZED ENGLISH EDITION  
By J. H. Rosenbaum. Maclaren & Sons, 37-38 Shoe Lane, E.C. 4,  
London; England, 1926. 350 pages, 117 figures.

This book may be obtained from the India Rubber World, 420  
Lexington Ave., New York. Price \$10.50

The contents include a section on the chemistry of the natural rubber hydrocarbon, the original, preparation, and properties of crude rubber, the analysis of rubber, the mixing or compounding and the vulcanization of rubber goods, and the special technology of nine types of rubber articles.



RUBBER INFORMATION. AN INDUSTRIAL AND COMMERCIAL COMPENDIUM.  
Edited by H.B. Cranshaw. Published by Leonard Hill, Ltd., Tanet  
House, 231-32 Strand, London W.C. 2, England, 1930. 237 pp.

"A Compendium of the Rubber Industry in all its Branches,  
including Plantation and factory Practice, Rubber Chemistry and  
Engineering, Trade Statistics, Machinery and Equipment, Rubber  
Chemicals and Materials, Planters and Manufacturers, Rubber Goods  
and Trade Marks."

ORIGIN AND PROGRESS OF THE INDIA RUBBER MANUFACTURE. By  
Thomas Hancock. First published by Longmans Green and Co., in  
1857. Reprinted by James Lyne Hancock and Co., Ltd., 1920.

This book is of historical interest and importance. It is  
said to contain some helpful information about latex technology

#### 4. Monographs on Rubber

##### UNTERSUCHUNGEN UBER DIE NATURLICHEN UND KUNSTLICHEN KAUTSCHUKARTEN (In German)

By Carl Dietrich Harries, Julius Springer, Berlin; 1919. 258 pages,  
9 figures. This book deals with the chemistry and synthesis of  
rubber.

THE ANALYSIS OF RUBBER. By John B. Tuttle. Chemical Catalog  
Co., New York, 1922. 155 pages.

This book belongs to the American Chemical Society Monograph  
Series. It includes a bibliography of 501 references on the  
analysis of rubber.



SYNTHETIC RUBBER. By S.P. Schotz. Ernest Benn, Ltd., Bouverie House, Fleet St., London, England, 1926. 144 pp. 20 illustrations.

This presents a comprehensive discussion of synthetic rubber, with exhaustive references to the literature, including the patent literature.

LATEX, ITS OCCURRENCE, COLLECTION, PROPERTIES AND TECHNICAL APPLICATIONS. By Ernst A. Hauser. English Translation by W. J. Kelly. The Chemical Catalog Co., Inc., New York, 1930. 200 pp. illustrated. Price, \$4.00.

This book presents a critical study of latex from both a scientific and a technical standpoint. A review of patents is included, and many commercial applications of latex are described. It also deals with recent investigations on latex as a colloid.

THE COLLOID CHEMISTRY OF RUBBER. By Paul Stamberger. Published by the Oxford University Press, London, and 114 Fifth Ave., New York City, 1929, 88 pages. Price \$2.00.

The contents include a brief consideration of colloids in general, a discussion of the colloid properties and industrial applications of latex and solutions of rubber in organic solvents, and recent views on the structure of rubber and vulcanization.

#### 5. Books on Gutta-Percha, Balata, Chicle, and Related Gums.

DIE GUTTAPERCHA (In German). By Eugen Obach. Steinkopf und Springer, Dresden-Blasewitz, Germany, 1899. 114 pp. Illustrated.

This book contains a discussion of the source, preparation, properties, analysis and testing, and technology of gutta-percha. Although out of date in many respects it is still valuable for reference.

DIE HARZE UND DIE HARZBEHALTER (In German) ~~Mit~~ ~~Aeinschluss~~ der Milchsafte. Historisch-Kretische und Experimentelle in Gemeinschaft mit Zohlreichen Mitarbeitern Ausgefuehrte Untersuchungen. By A. Tschirsch, Gebruder Borntraeger, Leipzig, Germany, 1906, 1268 pages, Illustrated.

This book deals with the source, composition, purification and properties of a great number of gums, including those of the rubber family.

LA GOMME DE BALATA (In French) By A.D. Luttringer, A.D. Cillard, Paris. 49 pages. Paper.

This booklet covers the following subjects in relation to balata: Origin, collection, properties, washing and purification, applications, use in rubber articles, reclaiming, analysis, price and world production.





## 6. Books on the Physical Constants of Rubber.

There are no books devoted exclusively to the physical constants of rubber. However, a critical summary of determinations made up to 1923 is given by G. Stafford Whitby in International Critical Tables, Vol. II., pp. 254-296. McGraw-Hill Book Company, Inc., 370 Seventh Ave., New York; 1926.

### III. REVIEW ON RUBBER.

Recent information on general or special topics pertaining to rubber is in many instances effectively summarized in reviews or in papers delivered at symposiums.

Two reviews on rubber of general scope and interest have been written recently by Harry L. Fischer. One, THE CHEMISTRY OF RUBBER was published in Chemical Reviews, Vol. 7, pp. 51-138; March, 1930, and the other, RUBBER: NEWER THEORETICAL AND PRACTICAL DEVELOPMENTS, appeared in the Journal of Chemical Education, Vol. 8, pp. 7-29, January, 1931.

Other reviews of a general character are to be found in the literature, as well as reviews on special subjects such as hard rubber, balata, reclaimed rubber, methods of rubber compounding and the like. No sharp line of demarcation can be drawn between reviews and various papers of more or less comprehensive scope which are published in considerable numbers in rubber trade journals.

The various rubber societies occasionally hold symposiums on topics of general interest. The papers delivered at such symposiums are usually published together and are valuable both from the standpoint of summarizing current information and by reason of the fact that they may present different points of view on unsolved or partially solved problems. The Rubber Section of the American Chemical Society has in recent years held symposiums on Raw Rubber, Reclaimed Rubber, Stearic Acid, and the Aging of Rubber, the papers all being published in Industrial and Engineering Chemistry.

Another type of review is that which is given in annual surveys or reports. The ANNUAL SURVEY OF AMERICAN CHEMISTRY published for the National Research Council by the Chemical Catalog Co., Inc., regularly contains a brief review of the important contributions made to rubber chemistry during the year. This review is prepared by a recognized American authority on rubber. A British review somewhat similar in character but with more emphasis on the growing of rubber is given in ANNUAL REPORTS OF THE SOCIETY OF CHEMICAL INDUSTRY ON THE PROGRESS OF APPLIED CHEMISTRY, published by the Society of Chemical Industry, 46 Finsbury Square, London, E.C. 2., England.



Reviews of patents pertaining to rubber products appear from time to time in trade journals. The India Rubber World publishes one or more patent reviews in practically every issue. These cover a wide variety of products, such as inner tubes, reclaimed rubber, weftless cord fabrics, rubber window channels, water dispersions of rubber and the like.

#### IV. PERIODICALS DEVOTED PRIMARILY TO RUBBER.

Periodicals are published in the interest of the rubber industry in the following countries: United States, Great Britain, Germany, France, The Netherlands (Java), and Spain. Some of these are primarily trade newspapers, and are concerned chiefly with current business news, market quotations, advertisements, and the like. Other of the periodicals emphasize scientific and technical work on rubber by the publication of accounts of original research reviews, and summaries or abstracts of papers appearing elsewhere; considerable publicity may also be given in their columns to meetings and activities of the various rubber societies.

Following is a list of the better known journals, classified according to the country in which they are published.

##### 1. American Rubber Journals.

(1) INDIA RUBBER WORLD. Published monthly by Federated Business Publications, Inc., 420 Lexington Ave., New York. Annual subscription, \$3.00.

The contents of this journal include original papers on rubber, summaries and abstracts of work published elsewhere, book reviews, reviews of literature and patents on products or processes of current interest, editorials, reports of scientific meetings, current trade information, financial news regarding rubber companies, personal items and biography, detailed market quotations, statistics of production and consumption, and a large advertising section with a classified buyers' guide.

Two volumes are published each year, the new volumes beginning with the April and the October issues, respectively. The pages in each issue are numbered separately, not consecutively for the volume.

(2) RUBBER AGE (New York), Published twice monthly by the Palmerton Publishing Co., Inc., 250 West 57th St., New York. Annual subscription, \$2.00.

This journal is somewhat smaller in size, but similar in scope to the India Rubber World.



(3) RUBBER CHEMISTRY AND TECHNOLOGY, published quarterly by the Rubber Division of the American Chemical Society, 20th and Northampton Sts., Easton, Pa. Annual subscription, \$4.00.

In this journal are reprinted all publications on rubber which appear in the Journal of the American Chemical Society, Chemical Abstracts, and Industrial and Engineering Chemistry. The more important scientific papers published abroad are reprinted; those in languages other than English are published in English Translation. The scope of Chemical Abstracts as related to rubber is indicated more fully in a subsequent section.

Detailed reviews are given of new books and other publications on rubber. A brief account is given of activities of the Rubber Division of the American Chemical Society.

(4) INDIA RUBBER AND TIRE REVIEW. Published at Akron, Ohio. This is a trade journal primarily of interest to dealers in tires.

## 2. British Periodicals dealing with Rubber.

(1) INDIA RUBBER JOURNAL, published weekly at 37 & 38 Sho Lane, London, E.C. 4, England. Annual subscription, 20 shillings.

This journal covers much the same scope as the India Rubber World, though it is somewhat different in form and emphasis. A regular feature of each issue is a critical review of one or more recent papers on rubber by Philip Schidrowitz, a recognized authority on rubber.

(2) RUBBER AGE (London). Published monthly at 43 Essex St. Strand, W.C.2, London, England. Annual subscription, 10 shillings.

This is primarily a trade journal; most of the papers presented are reprinted or summarized from other periodicals.

(3) TRANSACTIONS OF THE INSTITUTION OF THE RUBBER INDUSTRY, published bimonthly by the Institution of the Rubber Industry, Faraday House, 10, Charing Cross Road, London, W.C. 2, England.

This journal contains papers presented before the Institution of the Rubber Industry, and is the most important medium for the publication of research on rubber in Great Britain.

(4) BULLETIN OF THE RUBBER GROWERS' ASSOCIATION, published by the Rubber Growers Association, 2, 3 & 4 Idol Lane, Eastcheap, London, E.C. 3, England.

This journal deals with scientific and technical matters pertaining to the planting and cultivation of Hevea trees, and the production of crude rubber therefrom. It also deals with uses of rubber and carries propaganda designed to increase rubber consumption.

(5) RESEARCH ASSOCIATION OF BRITISH RUBBER AND TYRE MANUFACTURERS, INFORMATION BUREAU, SUMMARY OF CURRENT LITERATURE.

Detailed information regarding this periodical is given in Section V, below.



### 3. German Rubber Journals.

(1) GUMMI-ZEITUNG, published at Krausenstrasse, 35/36, Berlin, S.W. 19, Germany. Annual foreign subscription, 8 Marks.

This is a general trade journal in which a small number of original papers are published.

(2) KAUTSCHUK, published at Krausenstrasse, 35/36, Berlin, S.W. 19, Germany. Annual foreign subscription, 14 Marks.

This is the official organ of the German Rubber Society, and is the chief medium for the publication of German scientific and technologic work on rubber.

### 4. French Journals.

(1) LE CAOUTCHOUC ET LA GUTTA-PERCHA, published at Rue des Vinaigriers, Paris, France. Annual foreign subscription, 70 francs.

This is a trade journal which contains some original technical and scientific papers on rubber; considerable space is devoted to reviews, some of which are published serially.

(2) REVUE GENERALE DU CAOUTCHOUC, published at 18 Rue Duphot, Paris, France.

This journal publishes a number of original papers, chiefly on the technologic aspects of the rubber industry.

### 5. Dutch Periodical dealing with Rubber.

(1) ARCHIEF VOOR RUBBERCULTUUR IN NEDERLANDSH INDIE, Drukkerij Ruygrok & Co., Batavia, Java.

### 6. Spanish Rubber Journal.

(1) LA GOMA, by Juan Blanch Guerrero, Calle de Moncada, 4, Barcelona, Spain. Annual foreign subscription 15 pesetas.

## V. ABSTRACTS OF PUBLICATIONS ON RUBBER

While the rubber trade journals usually devote space to summaries or abstracts of work published elsewhere, none of them attempts to cover the whole field of rubber literature. There are only two abstract journals on rubber in English: (1) the Rubber and Allied Substances section of Chemical Abstracts, and (2) the Summary of Current Literature of the British Rubber and Tyre Manufacturers Association.

CHEMICAL ABSTRACTS is published twice monthly by the American Chemical Society, Mills Building, Washington, D.C. The annual subscription is \$7.50. This journal is divided into 30 sections of which one is devoted to rubber and allied substances. Reference is made here to all available scientific and technical papers on rubber, to reviews, and to a few of the more important United States





patents, and occasional foreign patents. The publications related to the chemistry of rubber are abstracted fully, other publications are given by title or are abstracted very briefly. These abstracts are reprinted in Rubber Chemistry and Technology, mentioned above.

RESEARCH ASSOCIATION OF BRITISH RUBBER AND TYRE MANUFACTURERS. INFORMATION BUREAU. SUMMARY OF CURRENT LITERATURE, published monthly by the Association of British Rubber and Tyre Manufacturers Lansdowne Road, Croyden, England.

This journal makes an exhaustive survey of the literature on rubber. The abstracts are classified into the following sections: I. Planting; II. Latex; III. Raw Rubber; III.A. Gutta-Percha, Balata, Chicle, and Jelutong; IV. Compounding Ingredients; V. Fibres and Textiles; VI. Vulcanized Rubber; VII. General Works Processes; VIII. Machinery and Appliances, IX. Organization, Commerce and Statistics; X. Physics and Chemistry; XI. General and Miscellaneous; XII. British Patents. Some of the sections, particularly section VI, are classified into appropriate sub-divisions.

The printing is on one side of the page to facilitate scrap-book or filing use of the abstracts.

#### VI. GENERAL PERIODICALS IN WHICH SOME PAPERS ON RUBBER ARE PUBLISHED.

In the United States the chief medium for the publication of research papers on rubber is Industrial and Engineering Chemistry. This journal is published monthly by the American Chemical Society, Mills Building, Washington, D.C. Annual subscription, \$7.50. While the title might indicate limitation to chemical subjects, such is not the case. Many of the papers published refer to physical properties, to testing, and to various aspects of rubber technology. Since 1929 papers relating to methods of analysis and test have been published quarterly in an Analytical Edition of this journal.

American papers on rubber of a theoretical nature are sometimes published in the Journal of Physical Chemistry, Journal of the American Chemical Society, Journal of the Franklin Institute, Journal of Rheology and proceedings of various learned societies. Occasional papers on rubber designed for the non-technical reader are published in the Journal of Chemical Education. Publications on the testing of rubber are not infrequently found in Proceedings of the A.S.T.M. to which fuller reference will be made subsequently.

In Great Britain most of the original papers on rubber are published in the various rubber journals, but a few appear in the Journal of the Society of Chemical Industry, Journal of the Chemical Society, Malayan Agricultural Journal, and other periodicals.



In Germany before the advent of Kautschuk many of the more serious scientific papers on rubber were published in *Berichte der Deutschen Chemischen Gesellschaft*, *Kolloid-Zeitschrift*, and other general periodicals, but now only infrequent articles are published outside of the rubber journals.

The Swiss chemical journal, *Helvetica Chimica Acta*, (in German) is a periodical in which papers on the organic chemistry and the structure of rubber are not infrequently published.

Much of the Japanese research on rubber is published in *The Journal of the Society of Chemical Industry (Japan)*. This is in Japanese, but a Supplemental Binding is issued in which full abstracts of the papers are given in English.

Occasional papers on rubber are published in practically all industrial journals and journals of chemistry and physics in the World so a complete listing of all periodicals in which reference to rubber might be found is beyond the scope of this letter circular.

## VII SPECIAL PUBLICATIONS ON RUBBER

In this classification are included publications by government bureaus, research institutes, specification writing bodies, firms and commercial organizations.

### 1. Publications by the United States Government.

Most of the investigational work of the government on rubber is conducted by (1) the Office of Rubber, Cotton, and other Tropical Plants of the Bureau of Plant Industry of the Department of Agriculture; (2) the Bureau of Foreign and Domestic Commerce; and (3) the Bureau of Standards of the Department of Commerce.

The Office of Cotton, Rubber, and other Tropical Plants is concerned with all matters which relate to the growing of rubber producing plants, the quality and yield of latex, and the production of crude rubber. Publications of this office relate to the botany, plant physiology, pathology, cultivation and commercial utilization of rubber bearing plants.



The United States Army and the Navy have their own specifications for many rubber products which they purchase. Copies of Army specifications may be obtained from the Quartermaster's Corps, Washington, D. C., and copies of Navy specifications, from the Bureau of Supplies and Accounts, Navy Department, Washington, D.C.

## 2. Publications by British Institutions and Associations

(1) THE RUBBER RESEARCH INSTITUTE OF MALAYA, at Kuala Lumpur, Federated Malay States, began in 1929 the publication of a BULLETIN containing scientific and technical papers dealing with problems related to the production of rubber. The activities of the Institute are described in annual reports.

(2) MINCING LANE TTA AND RUBBER SHARE BROKERS' ASSOCIATION LTD., 14 Mincing Lane, London, issues an annual publication entitled RUBBER PRODUCING COMPANIES, in which exhaustive data is given regarding rubber plantation companies.

(3) THE RUBBER GROWERS' ASSOCIATION, INC., 2 Idol Lane, Eastcheap, London, E.C. 3, England, issues annual reports in addition to the Bulletin mentioned in the section on Periodicals.

## 3. Publications by Institutions in The Netherlands and Possessions.

The Netherlands Government Rubber Institute at Delft formerly maintained its own series of publications, but the results of its investigations are now published in rubber periodicals, chiefly German and English.

The General Experimental Station of the General Association of Rubber Planters of the East Coast of Sumatra at Medan, Sumatra, issues publications in Dutch with summaries and occasional articles in English under the title, Mededeelingen van het Algemeen Proefstation der A.V.R.O.S. (Algemeene vereeniging van rubber-planters ter Oostkust van Sumatra).

Similarly, the Experiment Station for Rubber at Buitenzorg, Java, issues its publications as Mededeelingen Proefstation voor Rubber, which is also in Dutch with summaries and a few papers in English. These papers are also published in Archief voor Rubber-Cultuur, mentioned above.

## 4. Specifications for Rubber Products.

Mention has been made above of specifications promulgated by the Federal Government. In addition to government agencies there are a number of societies and organizations which prepare and issue specifications for rubber products and descriptions of test



The United States Army and the Navy have their own specifications for many rubber products which they purchase. Copies of Army specifications may be obtained from the Quartermaster's Corps, Washington, D. C., and copies of Navy specifications, from the Bureau of Supplies and Accounts, Navy Department, Washington, D.C.

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## 4. Specifications for Rubber Products.

Mention has been made above of specifications promulgated by the Federal Government. In addition to government agencies there are a number of societies and organizations which prepare and issue specifications for rubber products and descriptions of test





methods and procedures. Chief of these bodies so far as rubber is concerned is the American Society for Testing Materials. Publications of this society consist of A.S.T.M. STANDARDS published triennially, and PROCEEDINGS OF THE A.S.T.M., which appears annually and consists of two parts, Part I, Committee Reports and Tentative Standards, and Part II, Technical Papers.

5. Publications for Trade-Promotion Purposes.

Some rubber manufacturers and also several firms which deal in materials used by the rubber industry publish research bulletins, house organs, and occasional separate papers dealing with the properties, characteristics, or uses of their products. Papers of scientific or technical importance are usually reprints from recognized scientific periodicals.

A partial list of firms in the United States which issue or circulate publications relating to rubber is the following:

American Hard Rubber Company  
The Simplex Wire and Cable Company  
The Binney and Smith Company  
The New Jersey Zinc Company  
R. T. Vanderbilt Company  
E. I. duPont de Nemours and Company  
Roessler and Hasslacher Chemical Company  
Rubber Service Laboratories  
Naugatuck Chemical Company  
Godfrey Cabot, Inc..

Bureau of Standards,  
Department of Commerce,  
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