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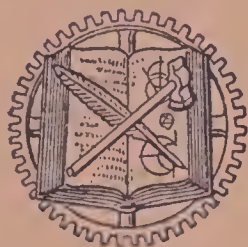




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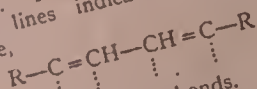
# THE KEY TO CHEMICAL LITERATURE

VAPORIZATION

195

## VALENCE

effected. It is represented thus, the dotted lines indicating the partial valence,



Cf. conjugated double bonds.

Valence, Potential. Residual affinity.

Valence, Primary. See valence, chief.

Valence, Secondary. See valence, auxiliary.

Valence, Supplementary. See valence, auxiliary.

Valency. 1. Valence. 2. The numerical value of the valence. 3. The symbols used to represent valence.

Valency Electrons. (Valency corpuscles. Mobile electrons.) Mobile electrons which are assumed to form a bond between atoms enabling atoms to hold to one another in combinations.

Valency Isomerism. Isomerism due to difference in linkage of primary and auxiliary valencies.

Valency, Sleeping. See valence, free.

Valency Volume. A quantity numerically equal to the sum of the valences of the atoms contained in a molecule.

Vanadic. Compounds of vanadium in which that metal is trivalent, as  $VCl_3$ .

Vanadious. (Vanadous.) Compounds of vanadium in which that metal is divalent, as  $VCl_2$ .

Vanadium. Metallic element. V. At. Wt. 51.0. S. G. 6.025. S. heat 0.1240. M. P. 1680°. Valence 2, 3, and 4. Ore, vanadinite. Oxides,  $V_2O_3$ ,  $V_2O_4$ ,  $V_2O_5$ . The higher oxides exhibit acidic properties.

Vanadous. Vanadious.

Vanadyl. The trivalent radical  $VO$ , as in vanadyl chloride,  $VOCl_2$ .

Vapor. A gas. Sometimes the term is restricted to those gases which may be easily condensed or which exist as liquids or solids at ordinary temperatures.

Vapor Bath. A steam bath.

Vapor Density. The density of a gas referred to hydrogen as unity. If hydrogen is taken as 2 the vapor density is approximately the molecular weight, if it is taken as one the vapor density equals half the molecular weight.

Vaporimeter. An instrument used to determine the vapor tension of a substance, particularly that of alcoholic liquids, whereby their content of alcohol may be estimated.

Vaporization, Heat of. (L.) (Latent heat of vaporization, heat of evaporation.) The amount of heat in calories required to convert one gram of a substance into its vapor without temperature change. The amount of heat required varies with the temperature at which the evaporation is carried on, decreasing as the temperature increases, thus for water,

t.	L.
0.0	596.3 cal.
25.	582.5
75.	553.3
100.	538.0

The heat of vaporization of a solid is termed its heat of sublimation.

Vaporization, Molecular Heat of. (A.) (Molecular heat of evaporation.) The heat of vaporization of one-gram molecule of any substance, numerically equal to the product of the heat of vaporization and the gram-molecular

## PSEUDO-

atalysis. (Catalysis by cyclic action.) A type of reaction in which one of the products unchanged although it takes part in the reaction (disorderly catalysis).

o-Celluloses. (Reserve cellulose.) Hemicelluloses. A term applied to isomerism, dynamism. See isomerism, dynamism.

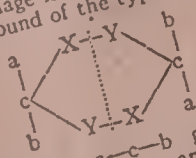
seudomorphism. Tautomerism. See isomerism, dynamic.

seudomorphism. A phenomenon in which a substance exhibits an abnormal crystalline form. Substances which show this are termed pseudomorphous. See pseudo-

seudomorphous. See pseudo-

Pseudo-Solutions. Solutions which do not obey the usual physical laws applying to solutions, as the law of osmotic pressure, raising of the boiling point, and lowering of the freezing point. Colloidal solutions are often spoken of as pseudo-solutions.

Pseudo-Symmetry. (Compound symmetry, indirect symmetry.) 1. The condition of certain inactive invisible types of asymmetric compounds which contain two structurally similar asymmetric carbon atoms and are without a plane of symmetry yet whose reflected image is identical with them, as a compound of the type.



in which the a-c-b groups are assumed to be at right angles to the plane of the ring. One-half of the compound must be rotated through

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44 ill., 6 x 9, 250 pp.

\$2.00

**CONTENTS:** *The Older Chemistry.* Ancient Theories Regarding the Nature of Matter and More Recent Theories as to the Nature of Energy; The Atomic Theory and Atomic Weights; The Periodic Law. *The Newer Chemistry.* The Effects of Electrical Discharges on Gases in High Vacua; Radioactivity; The Question of Inorganic Evolution; Lockyer's Views and Works; The Birth and Death of Worlds; Gravitation and Radiation Pressures; Arrhenius' Views; Continuation of Collie and Patterson's Researches on the Presence of Neon in Hydrogen After the Passage of the Electric Discharge Through the Latter at Low Pressures.

**MARTIN, GEOFFREY.** *Triumphs and Wonders of Modern Chemistry.*

A popular treatise on modern chemistry and its marvels, written in non-technical language for general readers and students. 76 ills.,

6 x 8¼, 378 pp.

\$3.00

**CONTENTS:** The Mystery of Matter. The Underworld of Atoms. Distribution and Evolution of the Elements. The Wonders of Chemical Change. Water The Element Hydrogen. The Air. Oxygen, The Life Supporting Element. The Element Nitrogen. The Element Carbon. Carbon Dioxide. Silicon and its Com-

pounds. Sulphur and its Compounds. The Phosphorous Group of Elements. Fire, Flame and Spectral Analysis.

The author, who is a lecturer in chemistry at the University of London, deals with a variety of subjects in a very interesting manner, covering the whole field of the sciences that are correlated with chemistry or that have any phenomena connected with them that can be explained by chemical reasoning.

**MARTIN, GEOFFREY.** *Modern Chemistry and Its Wonders.* A popular account of some of the more remarkable recent advances in chemical science. 65 ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , 267 pp. **\$3.00**

**CONTENTS:** The Wonderland of Modern Chemistry; The Romance of Some Simple Nitrogen Compounds; The Romance of Explosives; Radium and the New Chemistry; The Mystery of the Periodic Law; The Radio-elements and the Periodic Law; Modern Alchemy; Applications of Electricity to Chemistry; The Romance of Hydrocarbons; The Romance of Sugar; The Romance of Alcohol; The Romance of Common Salt; Metallic Firestones; Artificial Precious Stones. The really wonderful achievements of modern scientific chemistry are popularly explained in this work. The author avoids, as far as possible, all technicalities so that the general reader who is at all familiar with the fundamentals of chemistry may grasp fully the wonders wrought by the chemical manipulation of the processes employed in the manufacture of common objects.

**NORTH, H. B.** *Laboratory Experiments in General Chemistry.* *Second Edition, Revised.* 36 ill.,  $5\frac{1}{2} \times 7\frac{3}{4}$ , 212 pp. **\$1.00**

(Author is professor of chemistry in Rutgers College.)

**CONTENTS:** Causes of Chemical Change; Hydrogen; Oxygen and Ozone; Water and Hydrogen Peroxide; The Halogens; Acids, Bases and Salts; Nitrogen; Oxidation and Reduction; Sulphur; Carbon; Silicon and Boron; Phosphorus, Arsenic, Antimony and Bismuth; The Alkalies and Ammonium; The Alkaline Earths; Magnesium, Zinc, Cadmium and Mercury; Copper, Silver and Gold; Tin and Lead; Aluminum and Chromium; Manganese; Iron, Cobalt and Nickel; Platinum; Appendix; Correction of Gas Volumes; Chemical Arithmetic; Tables.

A manual of five hundred carefully chosen experiments on the most common elements, designed to cover a laboratory course in general chemistry given in connection with a series of experimental lectures and arranged so that it can be used with any good text book.

**PERKIN, F. M., and JAGGERS, E. M.** *Textbook of Elementary Chemistry.* 77 ill.,  $4\frac{3}{4} \times 7$ , 342 pp. **\$1.00**

**CONTENTS:** Introduction; Examination of Water; Metric System; Distillation; Thermometers; Freezing, Boiling and Melting Points; The Atmosphere; Chemical Properties of the Atmosphere; Chemical Properties of Water; Hydrogen and Oxygen; Quantitative Examination of Chalk; Carbon and Its Oxides and Compounds with Hydrogen; Flame and Combustion; Compounds of Nitrogen; Hydrochloric Acid and the Halogens; Sulphur and Its Compounds; Phosphorous and Phosphorous Compounds; The Metals.

A simple course, leading from fact to fact, in an interesting and logical sequence intended to arouse in the student or reader a keen interest in the subject. The making of careful notes of all laboratory work during the progress of the study is greatly encouraged.

**PILCHER, RICHARD B.** *The Profession of Chemistry.*  $5 \times 7\frac{1}{2}$ , 215 pp. *In Press*

**CONTENTS:** Introduction; Preliminary Education; Pharmacists and Chemists; Professional Training; Prospects and Conditions of Practice; Professional Organizations; Public Analysts and Official Agricultural Analysts; Professional Procedure; Industrial Chemistry; Chemistry and the State; Teaching to the State; Women in Professional Chemistry; Chemistry in War.



**PILCHER, RICHARD B., and JONES, FRANK B.** *What Industry Owes to Chemical Science.* With an introduction by Sir George Beilby. 5 x 7½, 150 pp. \$1.50

**CONTENTS:** Minerals and Metals; Heavy Chemicals and Alkali; Coal and Coal Gas; Dyes, Explosives and Cellulose; Oils, Fats and Waxes; Leather; Rubber; Mortar and Cement; Refractory Materials; Glass and Enamels; Pottery and Porcelain; Chemical Products; Photography; Agriculture and Food; Brewing; Alcohol, Wines and Spirits; Tobacco, Inks, Pencils, etc.; Gases; Government Chemistry.

**WADMORE, J. M.** *Elementary Chemical Theory.* Ill., 5 x 7½, 286 pp. \$1.50

**CONTENTS:** Introduction. Gravimetric Laws of Chemical Reaction. Atomic Hypothesis. Law of Reacting Gas Volumes. Avogadro's Hypothesis. Vapor Densities. Molecular Weights. Selection of Atomic Weights. Dulong and Petit's Law. Crystalline Shape. Isomorphism. Periodic Law. Constitution of the Elements. Radioactivity. Formulæ and Equations. Constitution and Configuration of Compounds. Gas Laws and Kinetic Hypothesis. Critical Temperature and Liquefaction of Gases. Properties of Pure Liquids. Solutions. Freezing and Boiling Points of Solutions. Molecular Weights of Dissolved Substances. Liquid Diffusion. Osmotic Pressure. Electrolysis. Ionization. Degree of Ionization. Equilibrium of Electrolytes. Conclusion. Table of Atomic Weights.

**WILSON, F. J., and HEILBRON, I. M.** *Chemical Theory and Calculations.* An elementary textbook. Ill., 3 folding plates, 5 x 7¼, 145 pp. \$1.25

(Authors are lecturers in chemistry in the Royal Technical College, Glasgow.)

**CONTENTS:** The Metric System. Density and Specific Gravity. Thermometry. The Gas Laws. Solubility of Gases in Liquids. The Atomic Theory. Formulæ and Equations. Calculation of Percentage Composition of a Compound from its Formula. Calculation of Empirical Formula from Percentage Composition. Equivalents or Combining Weights. Atomic Weights. Valency. Periodical Classification of the Elements. Law of Mass Action. Determination of Vapor Densities. Osmotic Pressure and Molecular Weight Determination. Dissociation of Gases. Electrolytic Dissociation. Diffusion of Gases. Quantitative Analysis. Thermochemistry.

## INORGANIC CHEMISTRY

**CAVEN, R. M., and LANDER, G. D.** *Systematic Inorganic Chemistry.* A textbook for advanced students. 6 x 8¾, 350 pp. \$2.25

After an introductory chapter on the atomic and molecular theories and valency, an account of the periodic law is given, followed by an examination of the successive groups so as to show the variation of properties in accordance with the provisions of the law; in the description of the groups, the elements and their analogous compounds are dealt with comparatively for the purpose of illustrating the manner of variation. The latest available material has been utilized, and brief accounts are given in appendices of the no-valency elements of the helium group, of views on the origin of elements, and of radioactivity.

**DARLING, ELTON R.** *Inorganic Chemical Synonyms and Other Chemical Data.* 4½ x 7¼, 109 pp. \$1.00

**CONTENTS:** Introduction; The Elements; Specific Gravity and Temperature Comparison; Standards of Weights and Measures; Chemical Synonyms: Aluminum; Antimony; Arsenic; Barium; Bismuth; Cadmium; Calcium; Chromium; Cobalt; Copper; Iron; Lead (Plumbum); Magnesium; Manganese; Mercury (Hydrargyrum); Nickel; Potassium; Silver; Sodium; Zinc; Miscellaneous Synonyms; Hydrogen Compounds; Cross Index of Chemical Terms.



**SEETER, GEORGE.** *A Text-Book of Inorganic Chemistry. Fourth Edition.*  
90 ill., 5 x 7½, 631 pp. \$3.00

**CONTENTS:** Illustrations of Chemical Change; Conservation of Mass and Energy; Chemical Attraction; The Chemical Elements; Hydrogen; General Properties of Gases; Oxygen; Combustion; Water; General Properties of Liquids; Solution; Chlorine and Hydrochloric Acid; Laws of Chemical Combination; The Atomic Theory; Determination of Atomic Weights; Combining Weights and Chemical Equivalents; Formulae and Equations; Valency; Ozone and Hydrogen Peroxide; Thermochemistry; The Halogen and Halogen Acids; Chemical Equilibrium; Thermal Dissociation; Oxides and Oxygen Acids of the Halogens; Osmotic Pressure and Molecular Weight in Solution; Nitrogen, the Atmosphere and the Elements of the Helium Group; Compounds of Nitrogen with Hydrogen and with the Halogens; Oxides and Oxyacids of Nitrogen; Phosphorus; Electrolysis and Electrolytic Dissociation; Sulphur, Selenium and Tellurium; Carbon; Combustion and Flame; Silicon and Boron; Classification of the Elements; The Periodic System; General Properties of the Metals and Their Compounds; The Alkali Metals; Metals of the Copper Group, Alkaline Earths, of the Zinc, Aluminum, Tin, Arsenic, Chromium, Manganese, Iron and Platinum Groups; Radio-Activity.

**SILVERMAN, ALEXANDER, and HARVEY, A. W.** *Laboratory Directions and Study Questions in Inorganic Chemistry.* Ill., 8 x 10½, loose leaf, 110 pp. \$2.00

The directions in this manual have been selected as representative not only of the practical applications of chemistry, but as illustrating modern theories. Wherever possible the apparatus required has been simplified so as to avoid the necessity of having the student use elaborate forms. The directions are arranged in loose leaf form so that they may be detached and submitted from day to day with results obtained in the laboratory. The study questions which form the second part of the book follow closely the treatment of Inorganic Chemistry in the college texts. Recitations may be conducted on the basis of the study sheets, thus obtaining uniformity in all quiz sections. This makes it impossible for the student to feel that he has failed in the course because of the method of quizzing of the instructor being different from that of the professor conducting the course, especially if final examinations are based on the study questions.

### ORGANIC CHEMISTRY

**BARROWCLIFF, M., and CARR, F. H.** *Organic Medicinal Chemicals.*  
5½ x 8¾. (Industrial Chemistry Series.) *In Press*

**BERNTHSEN, A. A.** *Textbook of Organic Chemistry.* Edited and revised to date by J. J. Sudborough. Ill., 5¼ x 7½, 735 pp. \$3.50

**CONTENTS:** ALIPHATIC OR OPEN-CHAIN COMPOUNDS. Hydrocarbons. Haloid Substitution Products of the Hydrocarbons. Monohydratic Alcohols or Alkyl Hydroxides. Derivations of the Alcohols. Aldehydes and Ketones. Monobasic Fatty Acids. Acid Derivatives. Polyhydric Alcohols. Hydroxy Monobasic Acids and Compounds Related to Them. Diabasic Acids. Polybasic Acids. Cyanogen Compounds. Carbonic Acid Derivatives. Carbohydrates. Chemistry of the Cyclic Compounds. CARBOCYCLIC COMPOUNDS. Polymethylene Derivatives. Benzene Derivatives. Benzene Hydrocarbons. Halogen Derivatives. Nitro-Substitution Products of the Aromatic Hydrocarbons. Amino-Derivatives or Arylamines. Diazo and Azo-Compounds. Hydrazines. Aromatic Sulphonic Acids. Phenols. Aromatic Alcohols, Aldehydes, and Ketones. Aromatic Acids. Compounds Containing Two or More Benzene Nuclei. Diphenyl Group. Diphenyl-Methane Group. Dibenzyl Group. Triphenyl-Methane Group. Compounds with Condensed Benzene Nuclei. Anthracene and Phenanthrene Groups. HETEROCYCLIC COMPOUNDS. Furane Group. Compounds Formed by the Condensation of a Benzene Nucleus with a Furane, Triophene, or Pyrrole Ring. Pyrazole Group. Six-Membered Heterocyclic Rings,



Quinoline and Acridine Groups. Six-Membered Heterocyclic Compounds with Four Carbon Atoms in Ring. Alkaloids. Terpenes and Camphors. Resins. Glucosides. Albumins. Physiological Chemistry. Reduction. Oxidation. Stereochemistry of Sulphur, Selenium, Tin, and Nitrogen Compounds. Relationships between Physical Properties and Chemical Constitution. Fermentation and Enzyme Action. Catalytic Action of Finely-Divided Metals and Metallic Oxides. Unsaturation. Aliphatic Diazo- and Triazo-Compounds.

The present edition is on much the same lines as the former ones, but contains two entirely new chapters while a large number of others have been rewritten so as to bring them into accord with the problems that have been brought forth in recent years.

**FISCHER, EMIL.** Introduction to the Preparation of Organic Compounds.

Translated, with the author's sanction, from the *New (Eighth)* German edition by R. V. Stanford. 19 ill., 5 x 7½, 194 pp. **\$1.50**

**CONTENTS:** Part I. Nitrobenzene. Aniline. Acetanilide. Thiocarbonilide. Phenyl Mustard-oil.  $\beta$ -Phenylhydroxylamine. Nitrosobenzene. Ethyl Benzoate. *meta*-Brombenzoic Acid. Benzoyl Chloride. Benzamide. Diazobenzene Nitrate. Diazoamidobenzene. Amidoazobenzene. Sulphanilic Acid. Diazobenzenesulphonic Acid. Helianthin. Phenyl-hydrazine. Benzonitrile. Monoethylaniline. Nitrosodi-methylaniline. Hydrazobenzene and Benzidine. Ethyl iodide. Aldehyde and Aldehyde-ammonia. Ethylene Bromide. Glycol. Methylamine. Benzyl Chloride. Benzaldehyde. Benzyl Alcohol. Benzoin. Benzil. Benzilic Acid. Cinnamic Acid. Hydrocinnamic Acid. Hexahydrobenzene. Acetoacetic Ester. Diacetosuccinic Ester. Diethyl Malonate. Benzylmalonic Ester. Benzylmalonic Acid. Terephthalic Acid. Pyruvic Acid. Epichlorhydrin. Acrolein. *ortho*- and *para*-Nitrophenol. Picric Acid. Anisole. Quinone and Hydroquinone. Salicylic Aldehyde.  $\beta$ -Naphthalene Sulphonic Acid.  $\beta$ -Naphthol. Naphthalene from Naphthol (distillation with zinc-dust). Potassium Cyanate and Urea. Alloxan and Alloxatine. Quinoline. Hydrocollidine and Collidine-dicarboxylic Esters.  $\alpha$ -Methylindol (Methylketol). Diphenyl. Benzoyl-acetone. Benzophenone. Benzophenone oxime. Phenanthrene-quinone. Triphenylmethane. Triphenyl-carbinol. Malachite-green. Fluorescein and Eosin. Anthraquinone. Alizarine. Camphor-oxime. Part II. Furfurol. Grape-sugar. Mannose. Gluconic Acid. Phenylhydrazide of Gluconic Acid. Saccharic Acid. Mucic Acid.  $\alpha$ -Glucoheptonic Acid.  $\alpha$ -Glucoheptose. Dulcitor.  $\alpha$ -Methyl-glucoside. Glucosamine Hydrochloride. Leucine. Phenylalanine. Tyrosine. Cystine.  $\beta$ -Naphthalene-sulphoglycine. Glycocoll-ester and Glycine-anhydride. Leucyl-glycine. *d*-Alanine and Glycocoll-esterhydrochloride. Approximate Concentration of Reagents.

The preparation of 90 compounds are shown, and these have been selected because of their practical nature, such as the cost of materials and apparatus, the easiness, shortness and freedom from danger of the operations.

**LOWY, ALEXANDER.** Organic Type Formulas. Two color chart. 5 x 8. paper leaflet. **\$0.10**

Two charts, one for the aliphatic series and one for the aromatic series, which will be found useful to supplement the ordinary textbook on organic chemistry. Printed in two colors, to emphasize certain endings, type groups, etc., red lettering is used to advantage.

**NEAVE, G. B., and HEILBRON, I. M.** The Identification of Organic Compounds. 5 x 7½, 111 pp. **\$1.50**

**CONTENTS:** Preliminary Tests. Tests for the Elements. Group Reactions. Hydrocarbons. Alcohols. Ethers. Phenols. Aldehydes. Ketones. Acids. Aromatic Sulphonic Acids. Acid Anhydrides. Acid Halides. Acid Amides. Acid Imides. Acid Anilides. Esters. Quinones. Carbohydrates. Glucosides. Amines. Nitro Compounds. Nitroso Compounds. Nitriles and Isonitriles. Isocyanates. Ureas and Ureides. Uric Acid Group. Halogen Compounds. Azo Compounds. Pyridine and Quinoline Group. Alkaloids. Sulphur Compounds. Terpenes and Allied Compounds. Albumens and Proteids. Appendix.



Brings together in convenient form the principal reactions and physical constants of the most important organic substances. The aim is to eliminate guess-work on the part of the student and to provide methods by which the more important groups in the compound may be detected, the compound assigned to its class and completely identified by reference to the section dealing with the class to which it belongs.

**POPE, F. G.** *Modern Research in Organic Chemistry.* 261 diagrams, 5¼ x 7½, 336 pp. \$2.50

**CONTENTS:** The Polymethylenes. The Terpenes and Camphors. The Uric Acid and Purine Group. The Alkaloids. The Relation between the Color and Constitution of Chemical Compounds. Salt Formation. Pseudo-acids and Baess. The Pyrones. Ketens, Ozonides, Triphenylmethyl. The Grignard Reaction.

**REID, E. EMMET.** *Introduction to Research in Organic Chemistry.* *In Press*

(Author is Professor of Organic Chemistry in Johns Hopkins University.)

**CONTENTS:** Introduction; Definition of Research and General Point of View; Literature; How to Find What Has Been Done on a Subject, etc.; The Study of Properties of Known Substances as an Object of Research; Study of Methods of Preparation of Known Substances as an Object of Research; Preparation of New Compounds; Study of Structures; Methods of Determination; Synthesis; Study of Reactions; Limits, Velocities; Intermediate Compounds; Study of Quantitative Methods for Estimation of Organic Compounds; Publication of Results.

**SABATIER, PAUL.** *Catalysis in Organic Chemistry.* Translated from the French by Prof. E. Emmet Reid. *In Press*

**SCUDDER, HEYWARD.** *Electrical Conductivity and Ionization Constants of Organic Compounds.* 6 x 9, 575 pp. \$3.00

Presents a bibliography of all the measurements of the ionization constants and the electrical conductivity of organic compounds that have appeared in the periodical literature between 1889 and 1910, inclusive, together with the values of the ionization constants and certain values of the electrical conductivity measurements, including also qualitative work. The work is divided into a set of tables arranged according to the names of compounds, containing all the data that may be given, with a bibliography of all of the references to each compound; a formula index to the compounds; a bibliography arranged according to names of authors; a subject index to certain subjects, and a journal list giving the names of all journals examined with the number and date of the last volume examined.

**SUDBOROUGH, J. J., and JAMES, J. C.** *Practical Organic Chemistry.* 92 ill., 5 x 7½, 394 pp. \$2.50

**CONTENTS:** Common Methods of Purification. Methods of Testing Purity. Solubility of Solids in Liquids. Detection of the Common Elements which Occur in Carbon Compounds. Estimation of Commonly Occurring Elements. Determination of the Equivalent of an Acid and of a Base. Determination of Molecular Weights by Physical Methods. Hydrocarbons. Alcohol and Ethers. Halogen Derivatives. Carboxylic Acids. Derivatives of Acids. Non-derivatives. Nitration. Sulphonic Acid. Sulphonation. Phenols and Phenolic Ethers. Amines and Quarternary Ammonium Compounds. Acetyl and Benzol Derivatives. Diazonium Salts and their Uses. Aldehydes and Ketones. Oximes, Phenyl-hydrazones and Semi-carbazones. Quinones. Claisen's Condensation. Ethyl Aceton Acetate. Its Reactions and Condensations. Ethyl Malonate and its Use as a Synthetical Reagent. Reduction. Oxidation. Condensation. Grignard's Reagents. Dyes. Iodine Compounds containing a Polyvalent Iodine Atom. Stereoisomeric Acids. Molecular Rearrangement. Quantitative Experiments with Acids, Esters, Amines, etc. Velocities of Typical Organic Reactions. Electrical Conductivity. Examination of Unknown Organic Substances. Preparation of Inorganic Reagents. Tables.



**TITHERLEY, A. W.** Laboratory Course of Organic Chemistry, including Qualitative Organic Analysis. Ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 240 pp. \$2.00

**CONTENTS:** Solubility; Filtration; Separation; Recrystallization; Melting Point; Boiling Point; Preparation and Purification of Organic Compounds; Hydrocarbons; Halogen Derivatives; Alcohols and Phenols; Aldehydes; Ketones and Quinones; Acids; Esters; Glycerides; Carbohydrates; Sulphur Compounds; Amines; Diazo-derivatives; Nitrites; Hetrocyclic Bases; Amides; Ureides; Alkaloids; Determination of Carbon; Hydrogen; Nitrogen; Phosphorus; Sulphur and Halogens in Organic Substances; Investigation of Organic Compounds; Characteristic Qualities of the Main Classes; Tables.

**WALKER, JAMES.** Organic Chemistry for Students of Medicine. 22 ill.,  $6 \times 9$ , 340 pp. \$3.00

The time allotted in the ordinary medical curriculum is usually very short, yet the student, when he takes up physiology, pharmacology and pathology, is expected to possess a knowledge not only of the principles of chemistry, but of numerous substances and processes, many of them very complex. In this book the chemical substances considered in the course are selected not so much for their importance in systematic or synthetic chemistry as for their medical interest, in order that the student study the things that will be of some utility to him in the later portions of his professional education. The work will be found a useful reference volume for the physician.

### PHYSICAL CHEMISTRY

**FIRTH, JAMES B.** Practical Physical Chemistry. 74 ill.,  $5 \times 7\frac{1}{4}$ , 190 pp. \$1.25

(Author is assistant lecturer and demonstrator in chemistry at Armstrong College, Newcastle-on-Tyne.)

**CONTENTS:** Introduction; Thermostats; Density of Gases, Liquids and Vapors; Determination of Viscosity and Surface Tension; Determination of Solubility; Determination of Molecular Weights; Determination of Transition Points; Osmotic Pressure; Refractivity Measurements; Rotation of the Plane of Polarization; Spectrum Analysis; Determination of Partition Coefficients; Thermo-Chemical Measurements; Determination of Transport Numbers; Electrical Conductivity; Electromotive Force; Velocity of Chemical Reaction; Quantitative Electrolytic Determinations; Electrolytic Preparations; Preparation of Colloids. Provides an interesting and well graded course of experimental lessons in the various branches of its subject, supplemented by as much theoretical teaching as enables a student to understand the principles of the well described experiments. A useful working handbook, well illustrated and clearly written.

**JONES, HARRY C.** The Nature of Solution. With a biographical memoir by Prof. E. Emmet Reid and tributes by Professors Arrhenius, Ostwald and Woodward. Ill.,  $6 \times 9$ , 406 pp. \$3.50

**CONTENTS:** Importance of Solution; Earlier Views as to the Nature of Solution; The Osmotic Pressure of Solutions; Relations Between Solutions and Gases Demonstrated by Vant Hoff; The Theory of Electrolytic Dissociation as Announced by Arrhenius; Diffusion in Solution; Depression of the Vapor-tension of a Solvent by Substances Dissolved in It; Depression of Freezing-Point of a Solvent by the Solute; Aqueous Solutions of Acids, Bases and Salts—Electrolytes; Some Electrical Properties of Aqueous Solutions of Electrolytes; Solution in Nonaqueous and in Mixed Solvents; Colloidal Solutions; Solutions in Solids as Solvents; The Newer Hydrate Theory; The Solvate Theory of Solutions. No subject in chemistry has received more attention, especially during the last quarter of a century, than that of solution. This is due primarily to the fundamental significance of solution for chemical science. Solutions in the



broad sense of the term are fundamental not only for chemistry, but for geology and the various branches of biology. Matter in the pure, homogeneous condition is relatively inert. It becomes active when mixed in a certain way with other matter in the same or in a different state of aggregation—when dissolved. Since solution is so fundamental for the natural sciences in general, and for chemistry in particular, we must know what solutions are, if we would ever make these various branches of science exact. Since chemistry has to do largely with the science of solution, it can become an exact science only by the science of solution becoming exact. We must first know what is the real condition of matter in solution. What laws does it obey? Is the dissolved substance combined with the solvent, and if so with how much of it? The present work is a general discussion of some of the more important properties of solutions, true and colloidal. It is therefore written in a non-mathematical, indeed, largely in a semi-popular style. Prof. Jones wrote this book during the last year of his life, and it was left unpublished. It is now issued, with the aid of several friends and by permission of his widow, as a memorial volume, to put into a permanent record his life-work on the solvate theory on which Prof. Jones investigated sixteen lines of evidence.

**KNOX, JOSEPH.** *Physico-chemical Calculations.* 5 x 7½, 190 pp. \$1.50

This book is intended for students of physical chemistry, as a supplement to the theoretical matter of lectures and textbooks. Here the theory is applied to the solution of practical problems. The book contains eleven chapters, dealing with the main subdivisions of physical chemistry. Each chapter consists of a short introduction dealing with the theory required for the solution of the problems, a series of typical problems with complete solutions, and a list of problems for solution with answers. Practically all the problems have been taken from the original literature of the subject, and by a careful study of the solved problems the student should learn much. The large collection of problems for solution should prove useful to teachers.

**PRIDEAUX, E. B. R.** *Problems in Physical Chemistry with Practical Applications.* 13 diagrams, 5½ x 8¾, 323 pp. \$2.00

**CONTENTS:** Mathematical Methods and Formulæ. Table of Logarithm. Units and Standards of Measurement. Thermochemistry. Systems of One Component. Mixtures. Gas Reactions. Reactions in Solution. Electromotive Force. Kinetics of Molecular and Radioactive Changes.

Provides a series of arithmetical examples that illustrate the more important developments of physical chemistry. A previous knowledge of the fundamental chemical laws, as well as the meaning of elementary physical magnitudes and operations, is assumed and the problems are such as possess a particular importance for the physicochemical investigator and technical chemist. The problems are arranged in sections each preceded by a brief introduction giving such summarized information as is necessary for an intelligent working of the problems. The whole work is progressive in character, sufficient knowledge for the solution of each problem being contained in the preceding sections and the choice of problems is such as can be solved by the aid of general principles and elementary mathematics.

**ROTH, W. A.** *Exercises in Physical Chemistry.* Authorized translation by A. T. Cameron. 49 ill., 6 x 8¾, 208 pp. \$2.00

**CONTENTS:** The Determination of Density. Determination of Molecular Weights in Solutions. Thermochemistry. The Determination of Optical Constants. The Thermostat. Chemical Statics and Dynamics. Electrochemistry. Foundations. Electrical Conductivity. Faraday's Law. Transport Numbers. Measurement of Differences of Potential. Electrostatics.

**SENDER, G.** *Outlines of Physical Chemistry. Second Edition, Revised.* 42 ills., 5 x 7½, 401 pp. \$2.50

(Author is lecturer on chemistry at University of London.)

**CONTENTS:** Fundamental Principles of Chemistry; The Atomic Theory; Gases; Liquids; Solutions; Dilute Solutions; Thermo-chemistry; Equilibrium in Homo-



geneous Systems—Law of Mass Action; Heterogeneous Equilibrium; The Phase Rule. Velocity of Reaction—Catalysis; Electrical Conductivity; Equilibrium in Electrolytes; Strength of Acids and Bases; Hydrolysis; Theories of Solution; Electromotive Force.

## BIOCHEMISTRY

**ALEXANDER, JEROME.** *Colloid Chemistry.* An introduction, with some practical applications. Ill., 5 x 7, 96 pp. \$1.00

**CONTENTS:** Introduction; Classification of Colloids; Consequence of Subdivision; The Ultramicroscope; General Properties of Colloids; Practical Applications of Colloid Chemistry.

A condensed discussion, in very readable style, of the many facts and principles concerning colloids. In a very terse chapter there is a general survey of the practical applications of colloid chemistry which are so manifold and widespread that they touch every branch of science and technology.

**BECHHOLD, H.** *Colloids in Biology and Medicine.* Authorized translation from the *Second German Edition*, with notes and emendations by Jesse G. M. Bullowa. 54 illustrations. 6¼ x 9¼, 478 pp. \$5.00

**CONTENTS:** *Introduction to the Study of Colloids.* Introduction; What Are Colloids? Surfaces; Size of Particles, Molecular Weight, Osmotic Pressure, Conductivity; Phenomena of Motion; Consistency of Colloids; Optical and Electrical properties of Colloids; Methods of Colloid Research. *Tre Biocolloids.* Introduction; Carbohydrates; Lipoids; Proteins; Food and Condiments; Enzymes; Immunity Reactions. *The Organism as a Colloid System.* Significance of the Colloidal Condition for the Organism; Metabolism and the Distribution of Material; Growth, Metamorphosis and Development; The Cell; The Movements of Organism; Blood, Respiration, Circulation and Its Disturbances; Absorption; Secretion and Excretion; The Nerves; Toxicology and Pharmacology; Microscopical Technic. An interesting general survey of the methods and the application of the results of colloid research to biology and medicine, indicating what has been accomplished and forecasting the probable trend of future research.

**SPIEGEL, LEOPOLD.** *Chemical Constitution and Physiological Action.* Translated with additions from the German by C. Luedeking and A. C. Boylston. 5¼ x 7¾, 162 pp. \$1.25

**CONTENTS:** General Considerations; Inorganic Compounds; Organic Compounds; Aliphatic Series; Aldehydes and Ketones; Acids and Derivatives; Aromatic Series; Inner Disinfection; Hydroaromatic Compounds; Nitrogen Compounds; Ammonia and Simple Derivatives; Ammonium Bases; Cyclic Bases and Alkaloids; Group Atropine-Cocaine; Opium Alkaloids and Relatives; Veronal Group; Quinine and Relatives; Purin Group; Hydrazin and Hydroxylamin; Hyponitrous Acid Derivatives; Resume.

A serious and successful attempt to collate what is known of the relations between chemical constitution and physiological action, in order to provide a basis for rational scientific medical treatment. The scope and manner of presentation of the subject-matter makes the book of especial service.

## CHEMICAL ANALYSIS

**BLASDALE, WALTER C.** *Principles of Quantitative Analysis.* An introductory course. *Second Edition, Revised and Enlarged.* 70 ill., 5¼ x 7½, 414 pp. (Van Nostrand's Textbooks.) \$2.50

(Author is associate professor of chemistry in the University of California.)

**CONTENTS:** Introductory Statements and Definitions; General Features of Gravimetric Processes; Gravimetric Gas Evolution Processes; Gravimetric Precipita-



tion Processes; Gravimetric Solution and Extraction Processes; Partition Processes; General Features of Volumetric Processes; Volumetric Processes Involving Precipitation; Volumetric Processes Involving Neutralization; Volumetric Processes Involving Oxidation; Physico-Chemical Processes.

This book is broad and general in character. Although it outlines an introductory course in the subject it aims to give the student a brief survey of the whole field by emphasizing a scheme of classification of quantitative processes and elaborating the theoretical and practical features of each type of method, generally, before taking up specific illustrations. The author believes that this method of treatment not only gives the student the best possible foundation for future work in the subject, but also, since it gives him practical experience in dealing with the different types of chemical equilibria, adds to his ability to solve other classes of chemical problems. The illustrations, which are few in number, are elaborated in great detail and with few exceptions represent practical problems chosen from a variety of fields in which the methods of quantitative analysis find use. In each case the facts and theory upon which the process is based are first given, the details of the method of procedure are then outlined and finally a series of questions and problems illustrating the principles used are presented for solution.

**BYERS, HORACE G., and KNIGHT, HENRY G.** *Notes on Qualitative Analysis.* 6 x 9, 192 pp. *New Edition in Press*

(Authors are professor of chemistry at the University of Washington, and director of experiment station of the University of Wyoming respectively).

**CONTENTS:** Introduction. Qualitative Analysis. Basis of Identification. Conditions Producing Reactions. Properties Used in Identification. PART I.—Chemical Principles Involved in Qualitative Analysis. Definition of Solution. Kinds of Solution. Phenomena of Solution. Hydrates in Solution. Hydration of Ions. Osmotic Pressure. Van't Hoff's Hypothesis. Freezing Point and Boiling Point of Solutions. Acids, Bases and Salts in Solution. Electrolysis. Hypothesis of Arrhenius. Physical, Chemical, Ionic Equilibrium Solubility Product. Illustrations. PART II.—Metal Analysis. General Directions. Groups; Hydrochloric Acid; Hydrogen Sulphide; Ammonium Sulphide; Ammonium Carbonate; Soluble. PART III.—Acid Analysis. Introduction. The Five Groups. PART IV.—Systematic Analysis. Preliminary Examination. Preparation of the Sample. Tables of Analysis. PART V.—The Rare Metals. Preliminary Statement. The Five Groups. Appendix.

Considerable space is devoted to a very clear exposition of modern physical principles as applied to qualitative analysis. The various group separations and reactions of the metals are fully explained. More attention than is usual in so small a text is given to the analysis of the acids and the rare metals. The grouping of the acids and the general scheme of acid analysis are in some respects new, while ample suggestions for laboratory work are given. Exercises are also given for class work.

**ELIOT, C. W., and STORER, F. H.** *Compendious Manual of Qualitative Chemical Analysis.* As revised by W. R. Nichols. Newly revised by W. B. Lindsay and F. H. Storer. *Twenty-second Edition.* 5 x 7½, 209 pp. **\$1.25**

**CONTENTS:** Definition and Scope of Qualitative Analysis; Examples of the Separation; Chlorides Insoluble in Water and Acids; Sulphides Insoluble in Water, Dilute Acids and Alkalies; General and Special Tests for Non-Metallic Elements; Treatment of Substances of Unknown Composition; Reagents; Solutions of Known Composition; Utensils.

**OLSEN, J. C.** *Textbook of Quantitative Chemical Analysis* by gravimetric, electrolytic, volumetric and gasometric methods. With 74 laboratory exercises giving the analysis of pure salts, alloys, minerals and technical products. *Fifth Edition, Revised and Enlarged.* Ill., 6½ x 9¼, 576 pp. **\$4.00**



(Author is in charge of the Department of Chemistry in Cooper Union.)

**CONTENTS:** The Balance; General Operations; Determination of Water. *Determination of Metals.* As Oxide; As Sulphate and Sulphide; As Phosphate Chromate and Chloride. *Determination of Acids.* Halogens, Sulphur and Nitrogen; Carbonic, Boric and Phosphoric Acids. *Analysis of Alloys.* Alloys of Silver, Copper, Lead, Bismuth, Cadmium and Tin; Of Alloys Containing Arsenic, Antimony and Tin; Of Alloys Containing Iron, Nickel and Zinc. *Analysis of Minerals.* Minerals Containing Iron, Aluminum and Chromium; Sulphides Containing Manganese, Nickel, Cobalt and Mercury; Carbonates Containing Calcium, Barium, Strontium and Manganese; Silicates; Separation of Sodium and Potassium. *Electrolytic Methods.* The Ionic Theory; Apparatus and Manipulation; Determination of Metals. *Volumetric Methods.* Calibration of Apparatus; Acidimetry; Standard Acids and Alkalies; Titration of Boric and Carbonic Acids. *Oxidation and Reduction Methods.* Potassium Permanganate and Dichromate Solutions; Iodometric Methods. *Precipitation Methods.* Determination of Chlorides, Cyanides and Silver; Phosphoric Acid. *Technical Analysis.* Iron, Steel, Coal; Water; Oils and Fats; Gas; Stoichiometry.

In the preparation of this edition, all atomic and molecular weights as well as factors of weighable precipitates have been recalculated by the 1916 atomic weights. The quantitative methods described have been revised where recent investigations have indicated improvement in the procedure, and where trial in the laboratory has demonstrated the advantage over older methods.

**PRESCOTT, A. B., and JOHNSON, O. C. Qualitative Chemical Analysis.**

A guide in qualitative work, with data for analytical operations, and laboratory methods in inorganic chemistry. *Seventh Edition, Thoroughly Revised* by John C. Olsen, A.M., Ph.D. 6¾ x 9½, cloth, 440 pp. **\$4.00**

**CONTENTS:** *Principles of Analytical Chemistry.* The Chemical Elements and Their Atomic Weights; Periodic System; Classification of the Metals as Bases; Commonly Occurring Acids; Operations of Analysis; Solution and Ionization; Order of Laboratory Study. *The Metals.* The Silver, Tin, Copper, Iron, Zinc, Calcium and Alkali Groups. *The Non-Metals.* Systematic Examination.

This new edition retains all of the excellent features which have given this book such extended use in the past, both as a class room and as a reference text, while adding the results of recent progress in the science. All data and tables have been brought up to date.

**PRESCOTT, A. B., and SULLIVAN, E. C. First Book in Qualitative Chemistry.** For studies of water solution and mass action. *Eleventh Edition, Entirely Rewritten.* 6 x 9, cloth, 148 pp. **\$1.50**

**CONTENTS:** Qualitative Chemistry; Equivalent Weights; Valence; Chemical Notation and Nomenclature; The Equation; Salts; Acids; Bases; Formulas; Reagents; Solutions; Manipulation; The Analytical Groups: Electrolytic Dissociation; Chemical Equilibrium; Methods of Making a Reaction Complete; Solubility; The Solubility Product; Equilibrium Between Substances with a Common Ion; Hydrolysis; The Periodic System of Elements; Tests for the Metals and the Non-Metals.

**SCOTT, WILFRED W. Qualitative Chemical Analysis.** A laboratory guide. *Third Edition, Completely Revised and Enlarged.* Ill., 5 x 7½, 361 pp. **\$3.00**

**CONTENTS:** Introduction; The Metals; Hydrogen Sulphide Group; Ammonium Sulphide Group; Ammonium Carbonate Group; Soluble Basic Group; The Acids; Silver Nitrate Group; Barium Chloride Group; Soluble Acid Group; Organic Acids; Systematic Analysis of a Substance; Preliminary Examination of a Liquid; Analysis of the Acids; Tables of Reactions of the Metals and the Acids; The Less Common Elements; Rarer Elements of the Ammonium Sulphide Group; The Rare Metals of the Alkali Group.

The purpose of this manual, the first editions of which have met with con-

siderable success, is to furnish a practical modern guide in qualitative analysis. Only methods of procedure that have proved themselves of practical value are included. The text is divided into two general divisions; in the first there is a very clear discussion of the ionic hypothesis, the principles of mass action, solution, and those principles of physical chemistry that now find application in qualitative analysis. The second section covers the various tests, together with the tables of reactions. An unusual amount of information is given in this book in condensed form.

**WHITE, GEORGE F.** *A Laboratory and Class-room Guide to Qualitative Chemical Analysis.* 5 x 7, 178 pp. \$1.40

(Author is assistant professor of chemistry in Clark College.)

**CONTENTS:** *Study of Reactions and Analytical Procedures.* Introduction; Theories of Solutions; General Instructions; Reactions of the Base-forming Constituents and Basic Analysis; Reactions of the Acid-forming Constituents. *Systematic Analysis of Unknown Substances.* Preliminary Tests; Analysis of a Solution; Analysis of a Solid Substance for the Base-forming Constituents; Analysis of a Solid Substance for the Acid-forming Constituents. *Appendix* Analytical Tables; Directions for the Preparation of Reagents and Test Solutions; Solubilities of Difficultly Soluble Compounds in Water; Relative Solubilities in Water and Acids; Percentage Ionization of Acids, Bases, and Salts; Table of the Elements Arranged According to the Periodic System; Table of Atomic Weights.

A working manual which presents the essentials of both theory and practice, but which also suggests the possibilities for more extended study and experimentation. In this book a study of reactions has been combined with methods of analysis, the latter being considered as practical applications of previously observed phenomena. Emphasis has been laid in the first part of the course on the reversibility of reactions, equilibrium phenomena, and the laws governing the behavior of electrolytes, while many applications of these principles have been left to the student in his later work.

### CHEMICAL CALCULATIONS

**ASHLEY, R. HARMON.** *Chemical Calculations.* Second Edition, Revised. Ill., 5 x 7 $\frac{1}{4}$ , 286 pp. \$2.50

(Author is assistant professor in chemistry in the University of Maine.)

**CONTENTS:** Ratios; Approximate Numbers; Interpolation; Heat; Specific Gravity; Gas Calculations; Calculation of Atomic Weights and Formulas; Gravimetric Analysis; Volumetric Analysis; Use of Specific Gravity Tables and Acid Calculations.

Aims to meet the needs of the chemist and the student who will later find occupation in chemical laboratory work. The book encourages and explains the proper use of tables in reference books in solving chemical problems. The work is distinctive in that it contains over five hundred problems of varying degrees of difficulty allowing a wide range of selection to meet the varying requirements of different classes when used as a text-book. The solution of typical problems is indicated in the text and the answers to all problems given.

**FOYE, JAMES C.** *Chemical Problems.* With brief statements of the principles involved. Fifth Edition, Revised and Enlarged. 3 $\frac{3}{4}$  x 6, boards, 141 pp. (Van Nostrand Science Series, No. 69.) \$0.75

**CONTENTS:** Weights and Measures; Thermometric Scales; Volume of Gases Under Varying Pressure, Temperature, and Pressure and Temperature; Specific Gravity; Molecular Weight of Gases; To Find Atomic Weights; Calculation of Molecular Weights from the Symbol; Symbol, Weight and Volume; Symbol and Composition; To Find the Symbol of a Compound, Equation, Weight and Volume; Diffusion of Gases; Specific Heat; Latent Heat; Calorific Power and Intensity; Tables.



**HALE, WILLIAM J.** *The Calculations of General Chemistry with Definitions, Explanations, and Problems. Second Edition, Revised.* 275 problems, 5 x 7 $\frac{1}{4}$ , 185 pp. **\$1.50**

**CONTENTS:** Units of Measurement. Density and Specific Gravity. The Effect of Pressure upon Gases. The Effect of Temperature upon Gases. The Combined Effect of Pressure and Temperature on Gases. Partial Pressures. Avogadro's Hypothesis and Some of Its Applications. The Law of Definite Proportions. The Derivation of Chemical Formulæ. Calculations Depending upon Chemical Equations. Normal Solutions. Combinations between Gases by Volume. Complex Equations. Tables.

Incorporates only those methods of calculation which have been found most useful in presenting the elementary principles of chemistry. Examples are given to illustrate every possible condition that may arise from the study of any one principle and serve as a guide to the student in the classification of unknown problems. All references to the more advanced and theoretical considerations have been omitted. The book is well adapted for use in quiz classes, and particularly for those accompanying the laboratory work. Through its use the marked deficiency of first-year students in the subject of arithmetical calculations should be largely remedied. The introduction of a book for the student of general chemistry which treats only of these elementary methods is a departure from well established custom. It is believed, however, that the extreme simplicity of the presentation will dispel any fears which an instructor is likely to entertain toward mathematical data, and, in the end, will strengthen the student in his conception of the fundamental principles of the science.

**PARTINGTON, J. R.** *Higher Mathematics for Chemical Students.* 44 diagrams, 5 x 7 $\frac{3}{4}$ , 272 pp. **\$2.50**

(Author is a Fellow in Manchester University.)

**CONTENTS:** Functions and Limits. Rate of Change of a Function. Differentiation of Algebraic Functions. Maximum and Minimum Values of a Function. Exponential and Logarithmic Functions. Partial Differentiation. Interpolation and Exterpolation. Indefinite Integral. Definite Integrals. Applications of the Definite Integral. Differential Equations. Appendices.

**PARTINGTON, JAMES R.** *A Text-book of Thermodynamics (with special reference to Chemistry.)* 91 diagrams, 6 x 9, 550 pp. **\$4.00**

**CONTENTS:** Thermometry and Calorimetry; The First Law of Thermodynamics and Some Applications; The Second Law of Thermodynamics, Entropy; The Thermodynamic Functions and Equilibrium; Fluids; Ideal and Permanent Gases; Changes of Physical State; Van der Waals' Equation and the Theory of Continuity of States; Thermochemistry; Gas Mixtures; Elementary Theory of Solutions; General Theory of Mixtures and Solutions; Capillarity and Adsorption; Electrochemistry; The Theorem of Nernst; Kinetic Theories in Thermodynamics.

Expounds the principles of thermodynamics and illustrates their applicability to the various problems of physical chemistry. Chemical problems receive the main consideration and other branches are either briefly treated or omitted. The author aims to show that a comprehension of the fundamentals of thermodynamics may be applied advantageously to the solution and interpretation of modern experimental work.

**STEVENS, A. B.** *Arithmetic of Pharmacy. Fourth Edition, Revised and Enlarged* Ill., 5 x 7, 110 pp. **\$1.50**

**CONTENTS:** Weights and Measures; Volumetric Analysis; Specific Gravity of Gases; Volumetric Combination and Decomposition of Gases; Mensuration of volumes; Tables.

## CHEMICAL TECHNOLOGY

INDUSTRIAL CHEMISTRY

## AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. Transactions.

Vol. I., 1908. 41 ill., 5 folding plates,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 212 pp. \$6.00

**CONTENTS:** Steam Power Plant Economics, by William Miller Booth; Testing and Performance of Steam Generating Apparatus, by A. Bement; The Examination of Flue Gases in Boiler Tests, by H. August Hunicke; Heating of Industrial Furnaces with Pulverized Fuel, by Richard K. Meade; Modern Electrical Resistance Pyrometry, by Edwin T. Northrup; Chemical Specifications for Sulphite Pulp, by J. A. DeCew; Purity of Commercial Liquefied Ammonia Gas and Apparatus for Testing It, by F. W. Frerichs; The Sanitary Condition of the Southern End of Lake Michigan, by J. Herbert Brewster; The Ferric Iron Contact Process of Making Sulphuric Acid from Smelter Fumes, by Thorn Smith; Calculations for Dryer Design, by William M. Grosvenor; Charts accompanying this paper (in pocket in back cover): Table Ia, Density, Humid Volume, etc., of Air Under Various Conditions; Table Ic, Rate of Cooling of Water-Saturated Air; Table Iib, Rate of Convection in Pipes; Humidity Chart; Loss of Heat from Pipes.

Vol. II. 1909. 50 ill., 1 folding plate,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 312 pp. \$6.00

**CONTENTS:** The Centering of Great Industries in the New York Metropolitan District, Chas. F. McKenna. Chemical Industries of America, Prof. Chas. E. Munroe. Conservation and the Chemical Engineer, Samuel P. Sadtler. Efficiency Limits in the Power-gas Producer, Prof. Wm. D. Ennis. The Utilization of Low Grade Fuels in the United States, O. K. Zwingberger. Heat Efficiency of Smokeless Combustion and Heat-absorbing Capacity of Boilers, A. Bement. Chemical Composition of Illinois Coal and the Relation of Heating Value to Composition, A. Bement. Creosote Oil from Water-gas Tar, Samuel P. Sadtler. Some Experiments on the Case-hardening of Steel by Gases, John C. Olsen, John F. Wiefenbach, and John R. Brierly. An Automatic Acid Egg, R. K. Meade. A Method of Clay Control for the Manufacture of Cement, John G. Dean. Colloids and the Ultramicroscope, Jerome Alexander. The Utilization of Waste India-rubber, Stephen P. Sharples. On the Permanence and Acidity of Hydrogen Peroxide Solution, Launcelot W. Andrews. Commercial Extraction of Grease and Oils, William M. Booth. Glycerine Refining in Multiple-effect Stills, F. J. Wood. The Advantages of Multiple-effect Distillation of Glycerine and other Products, A. C. Langmuir. Electric Furnace for Smelting of Iron Ore, Edward R. Taylor. Waterways and Water Power, Edward R. Taylor.

Vol. III., 1910. 59 ill., 2 folding plates,  $6\frac{1}{2} \times 9\frac{1}{2}$ , cloth, 411 pp. \$6.00

**CONTENTS:** Evolution of Portland Cement Processes, Chas. F. McKenna. Study of Materials in Chemical Engineering, Chas. F. McKenna. Reports of the Committee on Chemical Engineering Education, F. W. Frerichs. Remarks on Chemical Engineering Education, F. W. Frerichs. Development of the Chemist as an Engineer, F. W. Atkinson. The Training of Chemical Engineers which Meets the Requirements of Manufacturers, M. C. Whitaker. Teaching Industrial Chemistry, A. H. Sabin. Commercial Manipulation of Refractory Elements for Incandescent Lamp Purposes, Ralph E. Myers. The Manufacture and Industrial Applications of Ozone, Oscar Linder. The Changes in Industrial Chemistry Caused by Electricity, E. R. Taylor. Notes on the Corrosion of Iron and Steel and its Prevention, G. W. Thompson. Protal; a New Product for Use in the Arts, F. G. Wiechmann. Chemical Industries of Canada, J. C. De Cew. Underground Waters for Manufacturing Purposes, Wm. M. Booth. Loss in Coal Due to Storage, A. Bement. Nitric and Mixed Acids, Schuyler Frazier. Plant Design, Wm. M. Grosvenor. The Fitzgibbon Boiler, J. Alexander. Manufacture of Hydrated Lime, R. K. Meade. Bleaching Oils with Fuller's Earth, David



Wesson. SYMPOSIUM ON SEWAGE DISPOSAL. Principles of Sewage Disposal, G. C. Whipple. Sewage Disposal in Europe, Rudolph Hering. Sewage Disposal in New York City and Vicinity, G. A. Soper. Sanitary Conditions in Their Relations to Water Supplies in the Vicinity of New York, N. S. Hill, Jr. Unsolved Problems of Sewage Disposal, C.-E. A. Winslow.

Vol. IV., 1911. 78 ill.,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 518 pp. **\$6.00**

**CONTENTS:** Some Problems in Chemical Engineering Practice; Extraction of Bismuth from Carbonaceous Ores. The Classen Lignum Company. The Plant of the Kentucky Soda Ash Company. The Manufacture of Chloroform from Bleaching Powder and Ethyl Alcohol. Construction of Laboratory Apparatus. Manufacture and Testing of Shipping Cylinders for Anhydrous Ammonia, F. W. Frerichs, The Manufacture and Testing of Carbonic Acid Cylinders, John C. Minor, Jr. Report of the Committee on Chemical Engineering Education, Sam'l. P. Sadtler. The Four-Year Course in Chemical Engineering, Jos. H. James. The Question of Five-Year Engineering Courses at Ohio State University, Jas. R. Withrow. A Course in Chemical Engineering Education, J. C. Olsen. Industrial Chemical Calculations, Jos. W. Richards. The Practical Value of Determination of British Thermal Units of Anthracite Coal, S. F. Peckham. Two Methods of Testing Asphalt. S. F. Peckham. Explosives Used in Engineering and Mining Operations, Clarence Hall. Problems in the Manufacture of C. P. Acids, J. T. Baker. Combustion of Pulverized Coal, L. S. Hughes. Distribution of Power in Portland Cement Manufacture, Richard K. Meade. Hardening of Plasters and Cements and a Simple Chronographic Apparatus for Recording Set, Chas. F. McKenna. The Manufacture of Gelatine, Ludwig A. Thiele. The Adoption of the Centrifugal Pump to Chemical Problems, F. G. Wheeler. *Symposium on the United States Patent System.* The Institute and the United States Patent System, Wm. M. Grosvenor. The United States Patent Office, E. B. Moore. Protection of Inventions by Patents. Existing Defects and Remedies, Walter D. Edmonds. The United States Patent System, Robt. N. Kenyon. Report of Committee on Patents.

Vol. V., 1912. 61 ill., 2 folding plates,  $6\frac{1}{4} \times 9\frac{1}{2}$ , 288 pp. **\$6.00**

**CONTENTS:** Phenol-Formaldehyde Condensation Products, L. H. Backeland; Protection of Intellectual Property in Relation to Chemical Industry, L. H. Backeland; Notes on a Study of the Temperature Gradients of Setting Portland Cement, A. S. Cushman; Production of Available Potash from the Natural Silicates, A. W. Cushman and G. W. Coggeshall; Potash, Silica and Alumina from Feldspar, Edward Hart; Chemical Investigation of Asiatic Rice, A. S. Cushman and H. C. Fuller; United States Beehive Coke Oven Industry, A. W. Belden; Action of Disinfectants on Sugar Solutions, G. P. Meade; Linseed Oil Decomposition During Drying, J. C. Olsen and A. E. Ratner; Tests on the Opacity and Hiding Power of Pigments, G. W. Thompson; Initial Setting Time of Portland Cement Control, E. E. Ware; Effect on the Eyesight of "Lime Sulphur" Spray Manufacture, James R. Withrow; Acetylene Solvents, J. H. James; Columbia University's New Chemical Engineering Course and Laboratories, M. C. Whitaker; Need of Standard Specifications in Oils for Paving Block Impregnation, J. H. Campbell; Presence of Oxygen in Petroleums and Asphalts, S. P. Sadtler; Chemical Engineer and Industrial Efficiency, Wm. M. Booth; Water for Industrial Purposes, Wm. M. Booth; Availability of Blast Furnace Slag as a Material for Building Brick, Albert E. White; Technical Accounting and Chemical Control in Sugar Manufacture, David L. Davoll, Jr.; Bituminous Rocks of the U. S. and Their Use for Street Surfaces, S. F. Peckham; Code of Ethics.

Vol. VI., 1913. Ill.,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 272 pp. **\$6.00**

**CONTENTS:** Efficiency in Chemical Industries, The Corn Products Industry, T. B. Wagner; Effect of Legislation upon Chemical Industries, T. B. Wagner; Distribution of Heat in the Operation of Steam Boilers, Perry Barker; General Efficiency in Dye Houses and Bleach Works, L. J. Matos; Depreciation and Obsolescence, R. K. Meade; Legal Control of Dangers to Health in Factories, C. F. McKenna; Low and Mixed Pressure Turbines, J. G. Callan; Import Duties on Chemicals and Their Influence on Chemical Industries, F. W. Frerichs; Drying of Linseed Oil with Red Lead and White Lead, J. C. Olsen and A. H. Callaghan;



A Peculiar Form of Lake Pollution, Wm. P. Mason; Relation of the Manufacturer to the Patent System, Wm. M. Grosvenor; Effect of Climate on Plant Location, Wm. M. Booth; Recent Developments in Commercial Explosives, A. A. LeSueur; Electrolysis, Using Supported Mercury Kathode, E. A. LeSueur; A Self-Dumping Filter Press, E. J. Sweetland; A New Filter Press, A. Burger; Ozone; Its Manufacture and Use, A. Vosmaer; Apparatus for Determining Non-Condensing Gases in Ammonia, F. W. Frerichs; The Present Status of the Wood Turpentine Industry, E. H. French and Jas. R. Withrow; Code of Ethics.

Vol. VII., 1914. Ill.,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 313 pp.

\$6.00

**CONTENTS:** Some Professional Obligations, M. C. Whitaker; Distribution of Industrial Opportunities, Geo. O. Smith; Report of the Committee on Chemical Engineering Education; Present Status of Chemical Engineering Work of the American Institute of Chemical Engineers; The Need of Revised Chemical Statistics, Bernard C. Hesse; Application of Physical Chemistry to Industrial Processes, Walter F. Rittman; Use of Hydrometallurgical Apparatus in Chemical Engineering, John V. N. Dorr; Studies on Filtration, J. W. Bain and A. E. Wigle; Scrubber for Chemical Laboratory Vacuum System, Charles Baskerville; Shoddy and Carbonized Waste, Louis J. Matos; Chemistry of the Bleaching of Cotton Cloth, John C. Hebden; Ozone in Ventilation, J. C. Olsen and Wm. H. Ulrich; The Present Patent Situation, Maximilian Toch; Development of the Rotary Kiln and Its Application to Various Chemical and Metallurgical Processes, Richard K. Meade; A Combination Water Softener and Storage Tank, L. M. Booth; Feldspar as a Possible Source of American Potash, Allerton S. Cushman and George W. Coggeshall; The Hardwood Distillation Industry in America, Edward H. French and James R. Withrow; Painting Defects: Their Causes and Prevention, G. W. Thompson.

Vol. VIII., 1915. 44 ill.,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 312 pp.

\$6.00

**CONTENTS:** Resources and Possibilities of Chemical Industry in the Southwest, Edgar Baruch; The Chemical Evidence of Smelter Smoke Injury to Vegetation, J. P. Mitchell; Cottrell Processes of Electrical Precipitation, Walter A. Schmidt; The Fleming Patent Dust-Collecting System, W. C. Hanna; The Thiogen Process for Removing Sulphur Fumes, S. W. Young; The Manufacture of Cream of Tartar, Otto Best; Engineering Features of Wine Making, Arthur Lachman; The Treatment of Sewage by Aeration in the Presence of Activated Sludge, Edward Bartow; A New Electrolytic Method of Sewage Disposal, J. C. Olsen; Costs as Applied to Professional Business, Ralph A. Gould; The Improvement of High Boiling Petroleum Oils, and the Manufacture of Gasoline as a By-Product Therefrom, by the Action of Aluminum Chloride, A. M. McAfee; Some American Contributions to Industrial Chemistry, Samuel P. Sadtler; The Development in the United States of the Manufacture of Products Derived from Coal, H. W. Jordan; Notes on a New Process of Bleaching, S. F. Peckham; Lutes and Cements, S. S. Sadtler; The Design and Operation of Ozone Water Purification Systems; Sheppard T. Powell; Changes in the Volume and Specific Gravity of Linseed Oil Films on Drying, G. W. Thompson; The Utilization of Wood Waste, Arthur D. Little; The Production of Ammonia from Cyanamid, W. S. Landis.

Vol. IX., 1916. 81 ill., folding plate,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 432 pp.

\$6.00

**CONTENTS:** Unpreparedness, George D. Rosengarten; The Human Side of the Development of Chemical Industry, O. W. Thompson; Report of Committee on Chemical Engineering Education at San Francisco Meeting, Jas. R. Withrow; Report of Committee on Chemical Engineering Education at Baltimore Meeting, Jas. R. Withrow; Report of Committee on Chemical Engineering Education at Cleveland Meeting, Jas. R. Withrow; Report of Committee on Chemical Engineering Education at New York Meeting, Jas. R. Withrow; The Metallurgy of the Rarer Metals, J. W. Richards; Acid Resisting Alloys, W. C. Carnell; A Study of the Effect of Storage on Mixed Paints, E. E. Ware and R. E. Christman; Water Powers of the Western United States, Herman Stabler; The Treatment of Sewage by Aeration in the Presence of Activated Sludge II, Edw. Bartow; The Recovery of Benzol from Gas, F. W. Sperr, Jr.; Development in Chemical Engineering Equipment, H. D. Miles; The Effect of Centrifugal Force on Colloidal Solutions.



Eugene E. Ayres, Jr.; Corrosion of Ingot Iron Containing Cobalt, Nickel or Copper, H. T. Kalmus and K. B. Blake; Nitric Acid Sophistication, Jas. R. Withrow; A New Method for the Control for the Chamber Process for Making Sulphuric Acid, Andrew M. Fairlie; The Fixation of Nitrogen, John E. Bucher.

Vol. X., 1917. Ill.,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 484 pp.

\$6.00

**CONTENTS:** Our Resources, G. W. Thompson; Report of Committee on Chemical Engineering Education at Buffalo Meeting, Jas. R. Withrow; Report of Committee on Chemical Engineering Education at St. Louis Meeting, Jas. R. Withrow; Intensive Preparatory Chemistry, Chas. S. Palmer; The Possibilities of Developing an American Potash Industry, Richard K. Meade; A New Method for the Recovery of Salts of Potassium and Aluminum from Mineral Silicates, J. C. W. Frazer, W. W. Holland, E. Miller; The Recovery of Potash from Beet-sugar House Waste Liquors, H. E. Zitkowski; The Potash Industry of Canada, E. B. Biggar; Some Machinery Employed in the Manufacture of Glue, A. Lowenstein; The Manufacture of Linseed Oil, Glenn H. Pickard; Industrial Wastes Disposal, H. P. Eddy; The Treatment of Sewage by Aeration in the Presence of Activated Sludge, Edward Barlow; Chemical Engineering Aspect of Renovating a Sulphite Mill, Hugh K. Moore; Waste Heat Utilization, H. D. Baylor; Relation Between Efficiency of Refrigerating Plants and the Purity of Their Ammonia Charge, F. W. Frerichs; Distilled Water, Wm. M. Booth; Engineering in Chemical Works, Gaston DuBois; Organization in Chemical Industries, Frank Hemingway; Some General Aspects of Evaporation and Drying, P. B. Sadtler, F. M. deBeers; Drying Chestnut Extract by the Cardem Process, Harry McCormack.

Vol. XI., 1918. Ill.,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 432 pp.

\$6.00

**CONTENTS:** The Human Elements in the Mill, Hugh K. Moore; Maintenance and Construction Organization of Sulphite Mill, W. E. Taft; Manufacture of Alcohol from Sulphite Waste Liquor, Ralph H. McKee; The Manufacture of Fuel Situation, Wm. M. Booth; The Leading Methods of Graining Sugar, H. E. Zitkowski; War Pyrotechnics, G. A. Richter; Some Phases of Chemical Manufacture in Japan, A. Hirsch; Chemical Stoneware, A. Malinovzsky; The Expansion of the Coal Tar Chemical Industry in the United States, F. E. Dodge; Opportunity for Expansion of By-Products Industry of Coal and Water Gas Plants, Walter M. Russell; Synthetic Phenol A. G. Peterkin; The Multiple Tangent System for the Manufacture of Sulphuric Acid, L. A. Thiele; Fused Silica, Its Properties and a Few of Its Uses, Stephen L. Tyler; Storage Tanks Made of Reinforced Concrete, F. F. Frerichs; Concrete as a Chemical Engineering Material, Maximilian Toch; Report of the Committee on Chemical Engineering Education; Some Wild Engineering I Have Known, David Wesson; Belting for Power Transmission, Ernest D. Wilson; Symposium on Maintenance and Preservation of Our Chemical Industry, Maximilian Toch; Recommendation of the Tariff Commission in Regard to Dyes and Coal Tar Chemistry, Grinnell Jones, U. S. Tariff; The Maintenance and Preservation of Our Chemical Industry, Robert Hilton; Development in the Production of Dyes and Intermediates, Edward Holton; The Importance of the Research Chemist and Team Work in Developing Our Chemical Industry, Colby Dill; The Enameled Steel Industry, Wm. Zimerli; Future of the Barium Industry, Hugh Hollin; Reconstruction Aspects of Some Chemical Industries in the United States To-day, Edward Gudeman; The Present Status of Nitrogen Fixation, Lt. Col. Alfred H. White; Synthetic Pharmaceuticals and the Patent Law, Julius Stieglitz.

Most of the papers describe improvements in the manufacture of staple chemical products, such as glycerine, iron, fuels, etc. In most cases full details of processes with diagrams of apparatus are given.

Annual Reports on the Progress of Chemistry for 1918. Vol. XV. Issued by the Chemical Society.  $6 \times 8\frac{1}{2}$ , 249 pp.

\$2.00

**CONTENTS:** General and Physical Chemistry, by H. M. Dawson; Inorganic Chemistry, by E. C. C. Baly; Organic Chemistry: Part I., Aliphatic Division, by J. C. Irvine; Part II., Homocyclic Division, by F. L. Pyman; Part III., Heterocyclic Division, by A. W. Stewart; Analytical Chemistry, by C. A. Mitchell;

Physiological Chemistry, by F. G. Hopkins; Agricultural Chemistry and Vegetable Physiology, by E. J. Russell; Radioactivity, by F. Soddy.

Since 1904 these "Reports" have given systematic data on the advances made each year in the various departments of chemistry for the benefit of all workers, students or teachers or those chemists who are engaged in technical or manufacturing applications of chemistry.

Vols. I., 1904, to XV., 1918, inclusive.

Each, \$2.00

**DYSON, S. S.** **A Manual of Chemical Plant.** Ill., 7 x 10. In twelve parts. (Not sold separately.) paper, \$7.50

A record of the practical outcome of research and experiment as embodied in the range of plant which is actually available for the carrying out of the operations and processes of industrial chemistry. The work therefore places in the hands of the chemical engineer, the chemical manufacturer, the chemical works manager, and the student of chemical technology the results of a long and patient examination of the claims of almost every new piece of chemical plant that has been introduced during the last twenty-five years, together with an exhaustive analysis of the patent literature of the same

**DYSON, S. S., and CLARKSON, S. S.** **Chemical Works, Their Design, Erection, and Equipment.** 80 ill., 9 folding plates, 6½ x 10, 220 pp. \$9.00

**CONTENTS:** Choice of Site. Notes on Materials Used in Construction. First Principles in Laying Out a Works: Arrangement of Buildings; Stores; Workshop; The Drainage System; Foundations; Retaining Walls; Fire Prevention; Ambulance Arrangements. The Power House: Boilers; Coal Store; Automatic Weighing Machines; Chimney; Economizers; Steam Engines; Steam Turbines. Sulphuric Acid Plant: General Design; Chambers; Glover Tower; Gay-Lussac Tower; Notes on Vitriol Manufacture; Recent Developments in Vitriol Plant Design and Working. Hydrochloric Acid Plant. Nitric Acid Plant. Notes on High Explosives Plant. Sulphate of Ammonia Plant. Notes on Artificial Manure Plant. General Plant. **APPENDIX.**—On the Chemical Engineer. The Saw-Mill and Box-Making Department. The Alkali, etc., Works Regulation Act: (a) Alkali Works and Alkali Waste; (b) Sulphuric Acid, Muriatic Acid and Other Specified Works; (c) Regulation of Works: Inspection; Special Rules; Procedure. "Welfare Work" or "Prosperity Sharing."

**ELLIS, C.** **Ultraviolet Light, Its Application in Chemical Arts.** Ill., 5 x 7½. *In Press*

**GRAY, H. H.** **Gas-Works Products.** 5½ x 8¾. (Industrial Chemistry Series.) *In Press*

**GREENWOOD, H. C.** **The Industrial Gases.** 5½ x 8¾. (Industrial Chemistry Series.) *In Press*

**McNAIR, JAMES B.** **Citrus By-Products.** *In Press*

**CONTENTS:** Necessity for the Industry; By-Products from the Rind, Pulp, Seeds, and Where the Whole Fruit is Used; By-Products from the Flowers, Leaves and Stems; Cost of By-Products and Market Conditions; The Industry in North America, South America, Europe, Asia, Africa and Australia; Appendix.

**KREMANN, R.** **The Application of Physico-chemical Theory to Technical Processes and Manufacturing Methods.** Authorized translation by Harold E. Potts, M.Sc. 35 diagrams, 6 x 9, 215 pp. \$3.00

**CONTENTS:** The Two Fundamental Laws of the Mechanical Theory of Heat. Reaction Velocity and Catalytes. Other Special Applications of the Law of Mass Action. The Influence of Temperature on the Equilibrium Constant. Dissociation Pressure. Application of the Phase Rule. Application of the Phase Rule to Solid Liquid Systems. Transformation Phenomena in Hydraulic Binding Agents. Other Applications of the Phase Rule. The Distribution Law. Reciprocal Pairs of Salts.



**ROGERS, ALLEN (Editor).** *Industrial Chemistry.* A manual for the student and manufacturer. Written by a staff of forty-two eminent specialists. *Third Edition, Thoroughly Revised and Enlarged.* 377 ill., 6½ x 9¾, 1255 pp. **\$7.50**

**CONTENTS:** General Processes by Allen Rogers; Water for Industrial Purposes by H. Stabler and A. A. Chambers; Fuels by J. C. W. Frazer; Sulphuric Acid by W. M. Grosvenor; Nitric Acid by W. M. Grosvenor; Salt and Hydrochloric Acid by O. L. Shinn; Elements and Compounds by Allen Rogers; Chlorine and Allied Products by W. F. Doerflinger; Electrochemical Industries by W. L. Landis; Lime, Cement and Plaster by Richard K. Meade; Clay, Bricks and Pottery by Allen Rogers; Glass by James Gillinder; White Lead by G. W. Thompson; Zinc Oxide by George B. Heckel; Pigments and Paint Oils by Maximilian Toch; Mixed Paints by Henry A. Gardner; The Metallurgy of Iron and Steel by Bradley Stoughton; Fertilizers by A. G. Stillwell; Commercial Organic Chemicals by Allen Rogers; Illuminating Gas by W. H. Fulweiler; Coal Tar and its Distillation Products by F. E. Dodge; The Petroleum Industry by Thomas T. Gray; The Destructive Distillation of Wood by W. B. Harper; Oils, Fats and Waxes by Carleton Ellis; Linseed Oil by G. W. Thompson; Hydrogenation of Oils by Carleton Ellis; Lubricating Oils by Augustus H. Gill; Soaps and Soap Powder by Lincoln Burrows; Glycerine by A. C. Langmuir; Laundering by W. F. Faragher; Essential Oils, Synthetic Perfumes and Flavoring Materials by Alois von Isakovics; Turpentine and Rosin by Charles H. Herty; Resins, Oleo-Resins, Gum Resins and Gums by Allen Rogers; Shellac by A. C. Langmuir; Rubber and Allied Gums by Frederic Dannerth; Varnish by A. H. Sabin; Sugar by Guilford L. Spencer; Starch, Glucose, Dextrin and Gluten by G. W. Rolfe; Brewing and Malting by Robert Wahl; Wine Making by L. W. Haas; Distilled Liquors by Gustave L. Goob; Textiles by J. Merritt Matthews; Dyestuffs and their Application by L. A. Olney; The Art of Paper Making by G. F. Lull; Cellulose Industries by Jasper E. Crane; Explosives by O. W. Willcox; Leather by Allen Rogers; Glue and Gelatine by Jerome Alexander; Casein by E. L. Tague; Practical Applications of Colloid Chemical Principles by Jerome Alexander; Dehydrated, Dried and Evaporated Foods, Condensed Foods by Clarence V. Ekroth; Baking by Arnold Wahl.

Aims to furnish a complete text on industrial chemistry that shall be recognized as a standard of modern methods and processes. The subject matter is essentially descriptive without omitting the necessary theoretical considerations, and each chapter follows as far as possible this general plan. The raw material, the treatment of raw material preparatory to manufacture and manufacturing processes, its chemical theory and reactions involved. The illustrations are numerous and wherever possible references are cited.

**ROGERS, ALLEN.** *Laboratory Guide of Industrial Chemistry.* *Second Edition, Entirely Rewritten and Enlarged.* 33 ill., 5½ x 8¼, 219 pp. **\$2.00**

**CONTENTS:** General Process; Inorganic Preparations; Organic Preparations; Dyeing of Textile Fibers; Pigments and Lakes; Driers, Varnishes, Paints and Stains; Soap and Allied Products; Leather Manufacture; Wood Fiber, Pulp and Paper; Useful Data.

The object of this elementary laboratory guide is to acquaint students of chemistry with actual commercial problems by bringing to their experience practical methods of handling materials on a large scale; the care and use of machinery; the cost of raw materials; transportation, wage system, handling of men and shop discipline. The processes described for application on a small scale are adaptable to the larger commercial bases, and in many instances the methods are those commonly used at present, and actual factory practice is carried out.

**ROGERS, ALLEN.** *Elements of Industrial Chemistry.* An abridgement of "Manual of Industrial Chemistry," written by forty specialists and



edited by Dr. Rogers. 117 ill., 1 folding plate, 5½ x 8, 521 pp. \$3.00

(Author is in charge of industrial chemistry at Pratt Institute.)

**CONTENTS:** General Processes; Water for Industrial Purposes; Fuels; Sulphuric Acid; Nitric Acid; Hydrochloric Acid; Elements and Compounds; Electrochemical Industries; Lime, Cement and Plaster; Ceramic Industries; Pigments and Paints; Iron and Steel; Fertilizers; Organic Chemicals; Illuminating Gas; Coal Tar and Distillation Products; Petroleum; Distillation of Wood; Oils, Fats and Waxes; Soap and Glycerine; Essential Oils; Gums and Resins; Sugars, Starch and Glucose; Brewing; Wine Making, and Distilling; Textiles; Dyestuffs; Paper and Cellulose Industries; Explosives; Leather.

The manufacturing processes employed in the various chemical industries are usually not merely a matter of complicated machinery, but depend largely on the employment of chemical formulas that have been evolved after many years of research and experiment. This book, written especially for the student and the general reader, aims to give in concise, clear terms the fundamental principles which govern the methods and operations of these complicated industries. Much care has been exercised in making the subject matter explicitly descriptive, and a certain amount of theoretical consideration has been included where it was necessary for the proper understanding of the context. Stress is laid on the fact that while proper machinery is an important factor in the various industries, chemical science is the foundation and machines and processes must be employed that conform to the principles of that science. Good pictures of machinery are given throughout the work.

**ROHLAND, PAUL.** *The Colloidal and Crystalloidal State of Matter.*

Translated by W. J. Britland and H. E. Potts. 5 x 7½, 54 pp.

*Reprinting*

**CONTENTS:** History of Colloids. List. Formation of Colloids in Nature Colloids and Crystalloids. Diffusion. Osmotic Pressure. Freezing Point and Boiling Point. Molecular Weight. Optical Behavior. Coagulation and Crystallization. Electrical Behavior. Colloidally Composed Substances. Permeability. Toxicity. Water of Gelatinization. Viscosity. Adsorption and Failure to React. Adhesion. Colloids in Technology and Industry. Colloids in Nature. Autogeny and Plasmogeny. Monistic and Dualistic Conception of the Universe.

**SCHEELE, C. W.** *A Re-issue of the Chemical Essays.* Translated from the Transactions of the Academy of Sciences at Stockholm. With additions. First published in 1786. 5½ x 8, 300 pp. \$2.50

**VAN NOSTRAND'S Chemical Annual.** A handbook of useful data for analytical, manufacturing, and investigating chemists, chemical engineers and students. Edited by John C. Olsen and M. P. Matthias. *Fourth Issue, 1918, Thoroughly Revised and Enlarged.* 5 x 7½, flexible fabrikoid, 796 pp. \$3.00

**CONTENTS:** General (14 tables); Calculation of Volumetric Analyses (33 tables); Specific Gravity Tables (25 tables); Alcohol Tables of the Bureau of Standards (11 tables); Specific Gravity Tables (35 tables); Vapor Tension Tables (11 tables); Equivalents of Weights and Measures (11 tables); Thermochemistry (23 tables); Stoichiometry; New Books.

This book supplies chemist, chemical engineer, physicist, and research metallurgist with a mass of reliable data, gathered and edited in such form as to enable ready reference. In the preparation of this issue a very thorough revision of all tables has been made. Molecular weights and factors have been recalculated in accordance with the 1917 table of atomic weights. All physical constants of the elements have been revised in accordance with new data which have been published. New compounds have been added to the tables in the endeavor to include substances which have come into common use. In many cases this has not been possible because the properties of such compounds have not been studied or the results of such studies published. About 48 new



tables have been added. Some of these replace tables previously published as the new tables are considered more accurate or reliable. The new tables include tables on the properties of the elements, tables bearing on calibration and the true volume of glass vessels, the use of indicators, the properties of oils, alloys, glass, etc., specific-gravity tables, vapor pressure, units of weights and measures, the capacity of tanks, conversion of units of heat, electricity, temperature, etc., freezing-point mixtures, etc.

### TECHNICAL ANALYSIS

**LUNGE, GEORGE.** *Technical Chemists' Handbook.* Tables and methods of analysis for manufacturers of inorganic chemical products. *Second Edition, Revised.* 5 x 7, leather, 280 pp. \$4.00

**CONTENTS:** General Tables; Fuel and Furnaces, Sulphuric Acid Manufacture, Saltcake and Hydrochloric Acid; Bleaching Powder and Chlorate of Potash Manufacture; Soda Ash Manufacture by the Leblanc Process; Manufacture of Soda by the Ammonia Process; Caustic Soda; Electrolytic Alkaline Liquors; Nitric Acid Manufacture; Potassium Salts; Ammonia Manufacture; Coal-Gas Manufacture; Calcium Carbide and Acetylene; Examination of the Raw Materials and Products of the Manufacture of Fertilizers; Alumina Preparations; Cement Industry; Preparation of Standard Solutions; Rules for Sampling; Comparison of the Hydrometer Degrees According to Baumé and Twaddell, with the Specific Gravities; Value of Alkali per ton.

In this edition all analytical factors have been recalculated on the basis of the atomic weights published by the International Committee for 1916. This has involved numerous changes, many of them of importance even for merely practical purposes. The tables of specific gravities and other tables have been selected from among the most recent reliable determinations.

**LUNGE, GEORGE.** *Technical Methods of Chemical Analysis.* English translation from the latest German edition, edited by Charles Alexander Keane, with the collaboration of eminent specialists. In three volumes. *New Edition in Press*

#### Vol. I.

**CONTENTS:** Technical Gas Analysis; Fuel Analysis; Sulphurous Acid, Nitric Acid and Sulphuric Acid; Saltcake and Hydrochloric Acid; Sodium Carbonate; The Chlorine Industry; Potassium Salts; Cyanogen Compounds; Clay; Clay Wares, Earthenware and Glazes; Aluminum Salts and Alumina; Glass; Calcareous Cements; Drinking Water and Water Supplies; Feed Water for Boilers and Water for other Technical Purposes; Sewage and Effluents; Soils; Air.

#### Vol. II.

**CONTENTS:** Iron. Metals other than Iron, and Metallic Salts. Artificial Manures-Feeding Stuffs. Explosives. Matches and Fireworks. Calcium Carbide and Acetylene. Illuminating Gas and Ammonia. Coal Tar. Organic Dyes.

#### Vol. III.

**CONTENTS:** Mineral Oils; Lubricants; Oils, Fats and Waxes; Special Methods of Analysis Employed in the Oil and Fat Industries; Resins, Balsams, and Gum-Resins; Drugs and Galenical Preparations; Essential Oils; Tartaric Acid; Citric Acid; Organic Preparations; India Rubber and Rubber Goods; Vegetable Tanning Materials; Leather; Ink; Sugar; Starch and Dextrin; Alcohol, Potable Spirits, and Liquors; Vinegar; Wine; Brewing Materials and Beer; Paper; Textile Fibres; Inorganic Colors.

**RICHARDS, W. A., and NORTH, H. B.** *A Manual of Cement Testing.* For the use of engineers and chemists in colleges and in the field. 56 ill., 5¾ x 8, 147 pp. \$1.50

**CONTENTS:** Classification, Composition, Manufacture. Sampling. Fineness.

Specific Gravity. Normal Consistency. Constancy of Volume. Tensile Strength. Compressive Strength and Transverse Tests. Sand and Stone. Laboratory Equipment. Part Played by Chemical Analysis. Preparation of Sample for Analysis. Analysis of Cement, Limestone, Marl, Slag and Clay. Standard Specifications for Portland Cement.

**SCOTT, WILFRED W. (Editor).** **Standard Methods of Chemical Analysis.**

A manual of analytical methods and general reference for the analytical chemist and for the advanced student. *Second Edition, Revised.* 143 ill., 3 colored plates, 6 x 9, 929 pp. **\$6.00**

(The following specialists have written chapters for this book: H. A. Baker, L. C. Barton, F. G. Breyer, B. S. Clark, Wallace G. Derby, Wm. F. Doerflinger, D. K. French, H. A. Gardner, A. H. Gill, F. E. Hale, R. E. Hickman, W. B. Hicks, R. K. Meade, J. C. Olsen, R. S. Owens, W. L. Savell, J. A. Schaefer and W. W. Scott.)

**CONTENTS:** Aluminum; Antimony; Arsenic; Barium; Bismuth; Boron; Bromine; Cadmium; Calcium; Carbon; Cerium and Other Rare Earths; Chlorine; Chromium; Cobalt; Copper; Fluorine; Glucinum (Beryllium); Gold; Iodine; Iron; Lead; Magnesium; Manganese; Mercury; Molybdenum; Nickel; Nitrogen; Phosphorus; Platinum; Rarer Elements of the Allied Platinum Metals; Potassium; Sodium and Other Alkalies; Selenium and Tellurium; Silicon; Silver; Strontium; Sulphur; Thorium; Tin; Titanium; Tungsten; Tantalum and Columbium; Uranium; Vanadium; Zinc; Zirconium; Acids; Water Analysis; Oils, Fats and Waxes; Paints; Cement; Special Alloys; Coal; Gas; Assaying of Gold, Silver, etc. Useful Data; Conversion Tables; Table of Melting Points; Acid Tables; Books of Reference.

A compilation of carefully selected methods that have proven of practical value to the professional chemist. The subjects have been presented with sufficient detail to enable one with an elementary knowledge of analytical processes to follow the directions; on the other hand, lengthy exposition, theoretical dissertation and experimental data are purposely avoided, in order to include a large amount of information in a compact accessible form.

**SNELL, F. D. Colorimetric Analysis.** Ill., 5 x 7. *In Press*

**CONTENTS:** Conditions of Use of Colorimetric Methods; Apparatus Used and Methods of Using It; Figuring of Results; The Determination of Iron; Determination of Copper; Lead, Bismuth and Arsenic; Aluminum and Chromium; Nickel, Cobalt, Manganese and Zinc; Potassium and Magnesium; Gold; Titanium, Vanadium, and Tungsten; Fluorine, Chlorine and Perchlorates; Nitric and Nitrous Acids and Ammonia; Phosphorus, Silica and Boron; Oxygen and Hydrogen Peroxide; Sulphur, Hydrogen Sulphid and Selenious Acid; Color of Water, Oils and Dyes; Nephelometry.

ACIDS, BASES, CHEMICALS

**CALVERT, G. T. The Manufacture of Sulphate of Ammonia and Crude Ammonia.** *Second Edition, Revised and Enlarged.* 128 ill., 5½ x 8¾, 165 pp. **\$4.00**

**CONTENTS:** Sulphate of Ammonia, Its Composition and Analysis; The Raw Materials, Ammoniacal Liquor, Sulphuric Acid and Lime; Plant Required for the Manufacture of Sulphate of Ammonia; A Detailed Description of the Apparatus and Processes Used; Starting, Working and Stopping the Plant, Difficulties and Their Remedies; Cost of Manufacture of Sulphate of Ammonia; Manufacture of Crude Ammonia or Concentrated Ammoniacal Liquor; Manufacture of Sulphate of Ammonia in Small Works; Design of a Sulphate of Ammonia House—Comparisons of Ammoniacal Liquors—Sulphuric Acid Table.

**DIETERICH, K. Analysis of Resins, Balsams, and Gum Resins: Their Chemistry and Pharmacognosis.** With a Bibliography. Translated



from the German by Chas. Salter.  $5\frac{3}{4} \times 8\frac{1}{2}$ , 340 pp. **\$3.50**

**CONTENTS:** General Discussion and Exposition; Origin, Habitat, General Properties, Commercial Varieties, Adulterants, Analysis and Bibliography of All Balsams, Resins and Gum Resins.

**FALK, K. G. Chemical Reactions: Their Theory and Mechanism.** *In Press*

**CONTENTS:** Introduction; Valence; Co-ordination Number; Acids and Bases; Catalysis; Chemical Reactions; General Considerations; Some Chemical Reactions; Olefins and Their Reaction Products; Oxidation—Reduction; Some Oxidation—Reduction Reactions.

**FINDLAY, ALEXANDER. The Treasures of Coal Tar. Illustrated.**  $5 \times 7\frac{1}{2}$ , 137 pp. **\$2.00**

**CONTENTS:** The Production of Coal Tar; The Distillation of Coal Tar; The Constituents of Coal Tar and Their Applications in the Raw State; Molecular Architecture; The Production of Dyes from Coal Tar; Azo-Dyes; Anthracene Dyes and Vat Dyes; Indigo and Its Derivatives; Drugs, Perfumes, and Photographic Developers; Explosives.

**GESCHWIND, L. Manufacture of Alum and Sulphates, and the Sulphates and Other Salts of Alumina and Iron.** Trans. by Chas. Salter. 195 ill.,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 390 pp. **\$5.00**

**CONTENTS:** Theoretical Study of Aluminum, Iron, and Compounds of These Metals; Manufacture of Aluminum Sulphates and Sulphates of Iron; Uses of the Sulphates of Aluminum and Iron; Uses and Applications of Ferrous Sulphate and Ferric Sulphates; Chemical Characteristics of Iron and Aluminum; Analysis of Various Aluminous or Ferruginous Products; Analysing of Aluminum Products.

**GROSSMANN, J. Ammonia and Its Compounds.** Ill.,  $5 \times 7$ , 151 pp. **\$1.50**

**CONTENTS:** Ammonia; Concentrated Gas-liquor; Liquor Ammoniae; Liquid Ammonia; The Carbonates, Sulphate, Chloride, Nitrate, Phosphate, Sulphides, Fluorides, Sulphocyanide, and Ferrocyanide of Ammonia; Waste Gases and Liquors from the Manufacture of the Sulphate; Ammonia Recovery from Spent Oxide; Tables.

**HALE, ARTHUR J. The Manufacture of Chemicals by Electrolysis.**  $5\frac{1}{2} \times 8\frac{1}{2}$ . *In Press*

**KNOX, JOSEPH. The Fixation of Atmospheric Nitrogen.** pp. (Van Nostrand's Chemical Monographs.) **\$1.00**

**CONTENTS:** Fixation of Atmospheric Nitrogen as Nitric and Nitrous Acids, or as Their Salts; Synthesis of Ammonia and Ammonium Compounds from Atmospheric Nitrogen; Conversion of Atmospheric Nitrogen into Compounds Which Readily Yield Ammonia; Bibliography.

**KOPPE, S. W. Glycerine.** Its introduction, uses and examination. For chemists, perfumers, soapmakers, pharmacists, and explosives technologists. 7 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 260 pp. **\$3.50**

**CONTENTS:** Chemical Properties of Glycerine; Compounds and Decomposition Products of Glycerine; Products and Properties of Glycerine; Nitro-Glycerine; Properties of Nitro-Glycerine; Dynamite; Lead Glyceride (Glycerine Cement); Glycerine as a Softening Substance; Preparations of Glycerine and Glue; Glycerine Applied to the Manufacture of Inks; Glycerine as a Solvent; Various Applications of Glycerine; Chemical Analysis of Glycerine; Investigation of Nitro-Glycerine and Dynamite.

**KRAUCH, C. Chemical Reagents, Their Uses, Methods of Testing for Purity and Commercial Varieties.** Translated from the German. *Second Edi-*

*tion, Revised and Enlarged*, by H. B. Stocks.  $5\frac{1}{2} \times 8\frac{1}{2}$ . 375 pp. \$7.00  
 In this edition all the new reagents, such dimethylglyoxime, nitron, benzidine, etc., have been introduced and their uses described. Much new matter has been added in connection with the order reagents. Temperatures are given in all cases in degrees centigrade, while the whole of the molecular weights have been recalculated from the International Atomic Weights for 1918.

**LUNGE, GEORGE.** *Coal-Tar and Ammonia. Fifth Thoroughly Revised and Enlarged Edition.* In three volumes, not sold separately. Ill.,  $5\frac{1}{2} \times 9$ . 1600 pp. **\$25.00**

**ABRIDGED CONTENTS:** *Coal Tar.* Introductory; Processes for Obtaining Coal Tar; The Properties of Coal-Tar and Its Constituents; The Applications of Coal-Tar Without Distillation; The First Distillation of Coal-Tar; Pitch; Anthracene Oil; Creosote Oil; Carbofic Oil (Middle Oil); Light Oil; Working-Up the Light Naphtha into Final Products. *Ammonia.* Historical Notes on Ammonia; Sources from Which Ammonia is Obtained; The Composition and Analysis of Ammoniacal Liquor, and Properties of Its Constituents; The Working-Up of Ammoniacal Liquor into Concentrated Liquor and Liquid Ammonia; Manufacture of Sulphate of Ammonia; Other Technically Important Ammonium Salts.

This new edition will be of great importance, as six years have elapsed since the publication of the fourth edition, which has been out of print for some time. In preparing the revised issue the author is not only embodying in it all the new matter collected by himself on visits to factories and through communications with private sources, but also that which he has found in the books and periodicals published in the various industrial countries, and in the extremely numerous specifications of those countries.

**LUNGE, GEORGE.** *The Manufacture of Sulphuric Acid and Alkali.* With the collateral branches. A theoretical and practical treatise. In four volumes. (Three now ready.)

Vol. I., Sulphuric Acid. In three parts. Not sold separately. *Fourth Edition.* 543 ill., 11 folding plates,  $6\frac{3}{4} \times 9$ , 1665 pp.

*Reprinting*

**CONTENTS:** Historical and General Notes on the Manufacture of Sulphuric Acid. Raw Materials of the Sulphuric Acid Manufacture, Including Nitric Acid. Properties and Analysis of the Technically Employed Oxides and Acids of Sulphur. Production of Sulphur Dioxide. Construction of the Lead Chambers. Recovery of the Nitrogen Compounds. Chamber-Process. Purification of Sulphuric Acid. Concentration of Sulphuric Acid. Sulphuric Acid Works Arrangement on the Chamber Process. Yields and Costs. Manufacture of Nordhausen or Fuming Oil of Vitriol, and of Sulphuric Anhydride. Other Processes for Manufacturing Sulphuric Acid. By-Products of the Manufacture of Sulphuric Acid. Application of Sulphuric Acid and Statistics. Addenda.

Sulphuric and Nitric Acid. Supplement to Vol. I. *Reprinting*  
 Ill.,  $6 \times 9$ . 347 pp.

Since the issue of the fourth edition very numerous contributions have been made to the industries described, and in response to numerous requests this material has been compiled and brought up to date in this supplemental volume. The text arrangement is in the form of references to the large book, giving the number of the page in the subject matter of which needed changing or amplification.

Vol. II., Sulphate of Soda, Hydrochloric Acid, Leblanc Soda. *Third Edition, Much Enlarged.* In two parts, not sold separately. 335 ill.,  $6\frac{1}{4} \times 9$ , 1044 pp. *Reprinting*

**CONTENTS:** Properties and Occurrences in Nature of the Raw Materials and Products of the Alkali Industry and their Analysis; Manufacture of Sulphate



of Soda; from Salt and Sulphuric Acid by the process of Hargreaves and Robinson; Other Methods; Purification of Sodium Sulphate; The Condensation of the Hydrochloric Acid Produced in the Manufacture of Sulphates of Soda; Manufacture of Hydrochloric Acid by Other than Ordinary Methods; Weak Acid; Control of Condensation; Yields, Costs, Purification, Pumping and Conveyance of Hydrochloric Acid; Notes on Alkali; Manufacture Theory of the Leblanc Process; The Manufacture of Black-Ash; Black-ash and Tank Liquor; Manufacture of Finished Soda and Bicarbonate; Yield and Costs; Caustic Soda; Tank Waste.

Vol. III., Ammonia-Soda, Various Processes of Alkali Making and the Chlorine Industry. *Third Edition, Much Enlarged.* Ill., 784 pp.  
*Reprinting*

**CONTENTS:** THE AMMONIA-SODA PROCESS, HISTORICAL AND GENERAL.—The Ammoniacal Solution of Salt. Production of Carbonic Acid for the Ammonia-Soda Process. Precipitation of Sodium Bicarbonate by the Carbonating Process. Filtering, Drying and Calcining the Bicarbonate. Recovery of the Ammonia. Combination of the Apparatus, Final Products, Costs, Statistics. Other Forms of the Ammonia-Soda Process. Manufacture of Commercial Bicarbonate by the Ammonia-Soda Process. VARIOUS PROCESSES OF THE ALKALI MANUFACTURE. Manufacture of Soda from Cryolite; Directly from Sodium Chloride; from Sodium Sulphate without Previous Reductions to Sulphide; from Sodium Sulphate, after Reduction to Sulphide; from Nitrate of Soda and Feldspar. THE CHLORINE INDUSTRY.—General Notes on Chlorine. Manufacture of Chlorine by Manganese Ore. Utilization of Still-Liquor. Original Weldon Process. The Deacon Process. Other Processes for the Manufacture of Chlorine. Properties and Behavior of the Hypochlorites and of Bleaching-Powder. Manufacture of Bleaching-Powder. Bleach-Liquors and Other Bleaching Compounds. The Chlorates. Appendix of Statistical Data.

Vol. IV. Electrolytic Methods. Edited by Professors Askenasy and Haber.  
*In Preparation.*

**McINTOSH, J. G.** *Industrial Alcohol.* The production and use of alcohol for industrial purposes, and as a source of motive power. 75 ill., 25 tables, 6 x 9, 260 pp. **\$3.50**

**CONTENTS:** Alcohol and Its Properties; Continuous Aseptic and Antiseptic Fermentation and Sterilization in Industrial Alcohol Manufacture; Manufacture of Industrial Alcohol from: Beets, Grain, Potatoes; Wine, Spoilt Wine, Wine Marcs and Fruits; Sugar Cane and Sugar Cane Molasses; Plant for Manufacturing Alcohol; Uses of Alcohol in Industries; Manufacture and Uses of Various Alcohol Derivatives; Alcohol for Lighting, Heating and Motive Power.

**MURRAY, B. L.** *Standards and Tests for Reagent Chemicals.* 6 x 9, about 300 pp. **\$2.00**

A next text filled with the latest and most trustworthy standards of purity for chemicals used in research, analytical, and control laboratories. The following points are covered quite systematically: Name and Common Synonyms; Chemical Formulas; Molecular Weight; Physical Properties, such as Color, Odor, Form, Melting Point, Boiling Point, Congealing Point, Specific Gravity, Solubility and Reaction; Standard of Purity; Uses as a Reagent; Storage and Precautions; Tabular Statement of Maximum of Allowable Impurities; Methods of Testing; Quantitative Methods; References to Literature.

**PARTINGTON, J. R.** *The Alkali Industry.* 63 ill., 5½ x 8¾, 318 pp. (Industrial Chemistry Series.) **\$3.00**

**CONTENTS:** Introduction; The Salt Industry; Sulphuric Acid; Natural Soda and the Leblanc Process; The Ammonia-Soda Process; Electrolytic Processes; Chlorine and Derived Products; Nitric Acid; Ammonia and Ammonium Salts;

The Oxidation of Ammonia; Utilization and Economy of Sulphuric Acid; The Potassium Salts, Iodine, Magnesium.

The chief points which the author has kept in view have been to give a concise and connected sketch of the whole subject, and always if possible to give some explanation for the mode of procedure adopted in each case. In this way the book may be regarded as an introduction to, and also as supplementing, the larger and more technical treatises, and that it may also be of some interest to the technical expert who wishes to keep in touch with the recent applications of pure science to the industry.

**PRIDEAUX, E. B. R.** *The Theory and Use of Indicators.* An account of the chemical equilibria of acids, alkalies and indicators in aqueous solutions, with applications.  $5\frac{1}{2} \times 8\frac{1}{2}$ , 382 pp. **\$5.00**

**CONTENTS:** Equilibria of Acids, Bases and Salts, and the Physical Methods of Determining Acidity and Alkalinity; Light Absorption in the Visible Spectrum and Calorimetry; Theories of Color in Their Relation to the Ionic Theory; Chemical Constitution and the Formation of Salts; Color of Indicators as a Function of Hydrion Concentration; Determination and Use of Indicator Constants; Preparation and Use of Solutions of Standard Hydrion Concentration Applications; Course of Neutralization and the Theory of Titration; Solution Equilibrium and Titration of Some Acids; List of Principal Indicators, with Absorption Spectra.

**SEIDELL, ATHERTON.** *Solubilities of Inorganic and Organic Compounds.* A compilation of quantitative solubility data from the periodical literature. *Second Edition, Enlarged and Thoroughly Revised.*  $6\frac{1}{4} \times 9\frac{1}{4}$ , 867 pp. **\$7.50**

The material has been collected in all cases where possible directly from the original sources, and all available quantitative solubility data upon inorganic and organic compounds included. Wherever possible all solubility determinations have been calculated to the weight percentage basis and the interpolated values for regular intervals of temperature given. When determinations of the solubility of the same substance are reported differently by two or more investigators, the results are calculated to a common basis, and if a reasonable degree of concordance is found, the average results alone are given, otherwise both or all determinations are included and a note made of the reason therefor. The arrangement of the material is alphabetical according to the customary English name by which the substance is known. An index is provided for those cases where a doubt appears as to which name is preferable, and also to furnish cross references to the tables containing results upon more than one substance. For the benefit of those who need quantitative solubility data only rarely and are more or less unfamiliar with the usual methods of expressing such data, a detailed description is given of the various forms of stating solubilities and of the methods of calculating results from one form to another. The principles followed in constructing the tables are described and the exact meaning of the results contained in a number of typical tables explained. Finally, there is given a chapter on methods for the quantitative determination of solubility.

**VINCENT, C.** *Ammonia and Its Compounds: their Manufacture and Uses:* Translated by M. J. Salter. 32 ill.,  $6\frac{1}{2} \times 10$ , 122 pp. **\$2.50**

**CONTENTS:** General Considerations; Extraction of Ammoniacal Products from Sewage; Extraction of Ammonia from Gas Liquor; Manufacture of Ammoniacal Compounds from Bones, Nitrogenous Waste, Beetroot Wash and Peat; Manufacture of Caustic Ammonia and Ammonium Chloride, Phosphate and Carbonate; Recovery of Ammonia from Ammonia-Soda Mother Liquor.

**WARNES, ARTHUR R.** *Coal Tar Distillation and Working Up of Tar Products.* *Second Edition, Revised and Enlarged.* 78 ill., 2 folding plates,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 315 pp. **\$5.00**



**CONTENTS:** Coal Tar and Its Composition; Effect of Nature of Raw Material and Heat of Carbonisation of Physical Properties and Chemical Composition of Tar; Results of Practical Distillations; Coalite Tar; Vertical Retort Tar; Increasing Toluene in Tar; "Free Carbon" of Tar; How Tar is Received from Gasworks; Tar Tips; Storage of Tar; Construction of Storage Tanks; Pumps; Tar Mains; Plant Used in the Distillation of Tar; Distillation of Coal Tar; Plant for Recovering Cresylic and Carbolic Acids from Oils; The Recovery of Carbolic and Cresylic Acids; Plant for the Recovery of Benzols, Naphthas; The Recovery of Benzols and Naphthas; First Distillation and Washing; The Rectification of Benzols and Naphthas; Plant for the Working Up of Pyridine from Pyridine Acid; The Recovery and Rectification of Pyridine Bases; Plant for the Manufacture of Crude Naphthalene and Anthracene; The Manufacture of Crude Naphthalene and Anthracene; Pitch and Pitch "Getting"; Creosote; Gas Stripping; Tarworks' Tests; Appendix.

**WREN, HENRY.** *The Organometallic Compounds of Zinc and Magnesium.* 5¼ x 7½, 108 pp. (Van Nostrand's Chemical Monographs.) \$1.00

**CONTENTS:** General Notes on Grignard's Reaction; Products Formed by the Aid of Grignard's Reagents; Theoretical; Zinc Organometallic Compounds; Bibliography.

### CERAMICS AND GLASS

**ASCH, W., and ASCH, D.** *The Silicates in Chemistry and Commerce.* Including the exposition of a hexite and pentite theory and of a stereochemical theory of general application. Translated, with critical notes and additions, by Alfred B. Searle. Ill., 6¾ x 10, 476 pp. \$7.50

**CONTENTS:** Chemistry of Carbon and Silicon; Historical Review of Existing Theories Concerning the Constitution of the Alumino-Silicates and Other Silicates; Critical Examination of Existing Theories Concerning Alumino-Silicates; Hypothesis Concerning the Bonding of the Atoms in Alumino-Silicates and Allied Compounds. *Consequences of the "Hexite-Pentite Theory" and the Facts.* Reactions During Double Decomposition; Genetic Relationship Between Various Aluminosilicates; Possibility of a Chemical System of Aluminosilicates; Variable Chemical Behaviour of Part of the Aluminum in Kaolin, Nepheline, and in the Epidotes; Minimum Molecular Weight of Aluminosilicates; Constitution of Andesite; Possibility of Isomerism; Water of Crystallisation and of Constitution; Basic and Acid Water; Prognoses; Constitution of the Complexes of Molybdenum and Tungsten; Constitution of Clays; Ultramarines; New Theory of Hydraulic Binding Materials and Particularly of Portland Cements; Of the Porcelain Cements as Used for Dental Fillings; Of Glass, Glazes and Porcelain; Hexite-Pentite Theory as a General Theory of Chemical Compounds; Conversion of the H.-P. Theory Into a Stereochemical Theory and the Combination of the Latter with the Modern Theory of the Structure of Crystals; Summary and Conclusions; Bibliography; Appendix Formulas and Analyses.

**AUDLEY, J. A.** *Silica and the Silicates.* 5½ x 8¾. (Industrial Chemistry Series.) *In Press*

**BECKWITH, A.** *Pottery,* Observations on the materials and manufacture of terra-cotta, stoneware, firebrick, porcelain, earthenware, brick, majolica, and encaustic tiles. 5¾ x 9, 101 pp. \$0.60

**CONTENTS:** Porcelain; Parian; Earthenware; Decorative Tiles; Terra Cotta; Stoneware; Terro-Metallic Ware; Blue Bricks; Fire-Clay Wares; Bricks; Drain Pipes; Roofing Tiles; Ancient Architectural Pottery.

**BINNS, C. F.** *Manual of Practical Potting.* Compiled by experts. *Third Edition, Revised and Enlarged.* 5¾ x 8¾, 304 pp. \$8.00

**CONTENTS:** Bodies; Glazes; Gold and Gold Colors; Means and Methods; Classification and Analysis; Forms and Tables.

**BOURRY, EMILE.** *A Treatise on Ceramic Industries.* A complete manual for pottery, tile, and brick manufacturers. A revised translation from the French by Albert B. Searle. *New Edition in Press*

**CONTENTS:** Definition and Classification of Ceramic Ware; Brief History of Ceramics; Raw Materials of Bodies; Plastic Bodies—Properties and Composition, Preparation, Purification; Processes of Formation: Throwing, Expression, Moulding, Pressing, Casting, Slipping; Drying: Evaporation, Aeration, Heat, Absorption; Glazes: Manufacture and Application; Firing: Properties of Bodies and Glazes During Firing—Kilns; Decoration: Materials and Methods; Terra-cottas: Bricks, Hollow Blocks, Roofing, Tiles, Paving Bricks, Pipes, Architectural and Decorative Terra-Cotta, Common Pottery, Tobacco Pipes, Lustre Ware, Tests; Fireclay Goods: Varieties, Methods of Manufacture, Tests; Faiences: Classification, Composition, Methods of Manufacture and Decoration; Stoneware: Paving Tiles, Sanitary Ware, For Domestic Purposes, For Chemical Products, Decorative Objects; Porcelain: Classification, Composition, Manufacture, Decoration.

**DUTHIE, ARTHUR LOUIS.** *Decorative Glass Processes.* 38 ill., 6 x 9, 279 pp. (Van Nostrand's Westminster Series.) **\$2.50**

**CONTENTS:** Preface; Introduction; Various Kinds of Glass in Use: Their Characteristics, Comparative Price, etc.; Leaded Lights; Stained Glass; Embossed Glass: Brilliant Cutting and Bevelling; Sand-Blast and Crystalline Glass; Gilding, Silvering, and Mosaic; Proprietary Processes; Patents; Glossary; Index.

**FAIRIE, J.** *Notes on Pottery Clays.* The distribution, properties, uses and analysis of ball clays, china clays and china stone. With tables and formulæ. 5¼ x 7½, 135 pp. **\$2.00**

**CONTENTS:** Properties of Clays; Brick; Fire; Pottery; Pipe; Dorsetshire and Devonshire; Koehn or China; Cornish China; Analysis of Clays; Preparation of Clays; Sources of Irish Porcelain Clays; China Stone, Its Discovery, Use, Composition, Occurrence and Analysis.

**MALINOVZSKY, A.** *Analysis of Ceramic Materials and Methods of Calculation.* *In Press*

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**RHEAD, G. W.** *British Pottery Marks.* Ill., 5½ x 8½, 307 pp. **\$3.50**

Of assistance to the collector, connoisseur, student, and general reader in the identification of the various British pottery wares. Illustrated with fourteen half-tones and more than twelve hundred pottery marks in the text.

**ROSENHAIN, WALTER.** *Glass Manufacture.* Ill., 6 x 8½, 264 pp. **\$5.00**

**CONTENTS:** Physical and Chemical Properties; The Raw Materials of Glass Manufacture; Crucibles; Furnaces for the Fusion of Glass; Process of Fusion; Processes Used in the Working of Glass; Bottle Glass; Blown and Pressed; Rolled or Plate; Sheet and Crown; Colored; Optical; Miscellaneous Products; Appendix.

**SANDEMAN, ERNEST A.** *Notes on the Manufacture of Earthenware.* Ill., 5 x 7½, 390 pp. **\$3.50**

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facture; Materials Used in the Composition of the Body; Mixture of the Materials for the Body in the Slip House; Materials and Their Preparation for the Glaze; Models and Moulds; Processes and Materials Used in Their Manufacture; Manufacture of Articles from Clay and Various Methods Employed; Pressing, Casting, Handling, Sticking-up Dishmaking; Application of Machinery to Potting; Auxiliary Plant and Appliances Required by Machine Jiggerers; Manufacture of Clay Ware by Machinery; Decoration of Ware in the Clay State; General Remarks on Clay Ware; Ovens and Their Construction; Saggars and Sagger-making; Biscuit Placing; Firing; Drawing Biscuit Ovens and Biscuit Warehouse; Dipping, or the Application of the Glaze; Spurs, Thimbles, Stilts, and Their Manufacture; Glost Placing or the Arrangement of Glazed Ware in Saggars; Glost Firing; Drawing Glost and Sorting Warehouse; Printing Underglaze; Painting and Decorating Underglaze; Hardening-on Kilns; Printing, Painting and Decorating Overglaze; Enamel Kilns and Firing; Glost Warehouses and Getting up Orders; The Packing Shed; Arrangement of a Pottery; General Remarks; Cost of Production.

**SEARLE, ALFRED B.** *Modern Brickmaking.* 260 ill.,  $6\frac{1}{4} \times 10$ , 449 pp.  
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A complete treatise on the whole industry, in which is condensed into convenient limits the results of a wide practical experience with all the better known processes, machines and kilns now in use.

**SEARLE, A. B.** *Cement, Concrete and Bricks.* 113 illus.,  $5\frac{1}{2} \times 8\frac{1}{4}$ , 415 pp.  
**\$3.00**

**CONTENTS:** The Raw Materials for Cements; Methods of Cement Manufacture; Chemical and Physical Changes in Cements; Changes That Occur in Setting and Hardening; Testing the Properties of Cements; The Components of Concrete and Their Properties; Preparation of Concrete; Reinforced Concrete; Special Properties of Concrete; Testing Concrete; Raw Materials for Bricks; Methods of Brickmaking; The Chemical and Other Changes in Drying and Burning Bricks; Basic and Neutral Bricks.

Attempts to show the intimate relationships which exist between cement and bricks (with concrete as a relative of both), and at the same time to indicate some of the directions in which a further study of these materials will be likely to prove of value.

**SHAW, S.** *Chemistry of the Several Natural and Artificial Heterogeneous Compounds Used in Manufacturing Porcelain, Glass and Pottery.* Re-issued in its original form as published in 1837.  $6\frac{1}{2} \times 10$ , 769 pp. **\$6.00**

**CONTENTS:** *Analysis and Materials.* Elements; Temperature; Acids and Alkalies; The Earths; Metals. *Synthesis and Compounds.* Origin and Progress of the Art; Science of Mixing; Various Bodies; Glazes; Glasses; Colors; Tables of the Characteristics of Chemical Substances.

**SHAW, S.** *History of the Staffordshire Potteries and the Rise and Progress of the Manufacture of Pottery and Porcelain.* With references to genuine specimens, and notices of eminent potters.  $6 \times 8\frac{3}{4}$ , 269 pp. **\$2.50**

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of Fluid Glaze; Introduction of Porcelain; Blue Printed Pottery; Introduction of Lustre Pottery.

**SUFFLING, E. R.** *Treatise on the Art of Glass Painting.* Prefaced with a review of ancient glass. Ill., colored plates, cloth, 150 pp. **\$3.50**

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### OILS, FATS AND WAXES

**ANDES, L. E.** *Animal Fats and Oils.* Their practical production, purification and uses for a great variety of purposes; their properties, falsification and examination. Translated from the German by Charles Salter. *Second Edition, Enlarged.* 62 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 259 pp. **\$5.00**

**CONTENTS:** Introduction; Occurrence, Origin, Properties, and Chemical Constitution of Animal Fats; Preparation of Animal Fats and Oils; Machinery for Breaking Down Fats; Pans and Apparatus for Fat Melting; Tallow-Melting Plants; Presses; Filtering Apparatus; Animal Fats and Oils; Raw Materials, Preparation, Properties and Uses; Butter, Raw Material and Preparation; Artificial Butter: Oleomargarin; Hog's Lard: Raw Material; Lard Oil; Beef Marrow; Tallow; Beef Tallow, Raw Material; Bone Fat; Bone Oil; Neatsfoot Oil; Horse Fat; Animal Oil; Keppel's Oil; Fish Oils; Seal Oils; Liver Oils; Artificial Train Oil; Turtle, Candle-Fish, Crocodile, and Alligator Oils; Hare, Goose and Human Fat; Degras; Tanner's Grease; Wool Fat; Examination of Fats and Oils in General.

**ANDES, LOUIS E.** *Vegetable Fats and Oils.* Their practical preparation, purification, properties, adulteration and examination. Translated from the German by Chas. Salter. *Third Edition, Revised and Enlarged,* by H. B. Stocks. 93 ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 362 pp. **\$6.00**

**CONTENTS:** Introduction; General Properties and Composition of the Vegetable Fats and Oils; Estimation of the Amount of Oils in Seeds; Non-Drying Vegetable Oils; Semi-Drying Vegetable Oils; Vegetable Drying Oils; Solid Vegetable Fats; The Preparation of Vegetable Fats and Oils; Installation of Oil and Fat Works, and the Apparatus Used for Grinding, Pressing and Extracting; Treatment of the Oil After Leaving the Press; Refining with Sulphuric Acid, Zinc, Lead, Oxides, Alkalies and Tannin; Ekenberg and Aspinall's Method of Refining Oils; Purifying Oils and Mechanical Appliances for Refining; Deodorising Oils and Fats; Bleaching Fats and Oils; Practical Experiments on the Treatment of Oils, with Regard to Refining and Bleaching; Oils Specially Prepared for Industrial Purposes; The Hydrogenation of Oils for Conversion into Solid Fats; Oil-Cake and Meal; Physical and Chemical Examination of Oils and Fats.

**ANDES, L. E.** *Drying Oils, Boiled Oil, and Solid and Liquid Driers.* A practical work for manufacturers of oils, varnishes, printing inks, oil cloth and linoleum, oil cakes, paints, etc. *Second Edition.* Revised by H. B. Stocks. 43 ill. and diagrams,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 352 pp. **\$6.00**

**CONTENTS:** General Chemical and Physical Properties of the Drying Oils—Cause of the Drying Property—Absorption of Oxygen—Behaviour Towards Metallic Oxides, etc.; The Properties of and Methods for Obtaining the Drying Oils; Production of the Drying Oils by Expression and Extraction, Refining and Bleaching; Manufacture of Boiled Oil; The Preparation of Drying Oils for Use in the Grinding of Paints and Artists' Colours and in the Manufacture of Varnishes, by Heating (Boiling) Over a Fire or by Steam by the Cold Process, by the Action of Air, and by Means of the Electric Current; Preparation of Varnishes for



Letterpress Lithographic, and Copper-Plate Printing; For Oilcloth and Waterproof Fabrics; Behaviour of the Drying Oils and Boiled Oils Towards Atmospheric Influences, Water Acids, and Alkalis; Boiled Oil Substitutes; Manufacture of Solid and Liquid Driers from Linseed Oil and Rosin; Examination of the Drying Oils and Boiled Oils and Driers for Adulteration.

**ANDES, L. E.** *Oil Colors and Printers' Ink.* A practical handbook treating of linseed-oil, boiled oil, paints, artists' colors, lampblack, and printers' inks (black or colored). Translated from the German. *Second Edition, Revised and Enlarged*, by H. B. Stocks. 57 ill., 6 x 9, 235 pp. **\$4.00**

**CONTENTS:** Linseed Oil; Poppy Oil and Walnut Oil; Mechanical Purification of Linseed Oil; Chemical Purification of Linseed Oil; Bleaching Linseed Oil; Oxidising Agents for Boiling Linseed Oil; Theory of Oil Boiling and Drying; Manufacture of Boiled Oil; Adulterations of Boiled Oil; Chinese Drying Oil and Other Specialties; Pigments for House and Artistic Painting and Inks; Pigments for Printers' Black Inks; Substitutes for Lampblack; Machinery for Color Grinding and Rubbing; Machines for Mixing Pigments with the Vehicle; Paint Mills; Manufacture of Ordinary Oil Paints; Examination of Pigments and Paint; Ship Paints; Luminous Paint; Artists' Colors; Printers' Inks; Vehicles; Pigments and Manufacture.

**BRUNNER, R.** *Manufacture of Lubricants, Shoe Polishes and Leather Dressings.* Such as axle and machinery greases, oils, machinery oils, clockmakers' oils, as well as shoe polishes. Translated from the *Sixth* German edition by Charles Salter. Ill., 5 x 7½, 170 pp. **\$3.50**

**CONTENTS:** Properties of Lubricants; Raw Materials; Lubricants of: Tallow, Palm Oil, Lead Soap, True Soap, Caoutchouc; Oils for Lubricating Made of Fat and Resin, Neatsfoot Oil, Bone Fat; Mineral Oils; Clockmakers' and Sewing Machine Oils; Use of Lubricants; Shoe Polishes; Leather Varnishing and Softening Preparations; Bone Black; Dégras.

**CHALMERS, T. W.** *The Production and Treatment of Vegetable Oils.* Including chapters on the refining of oils, the hydrogenation of oils, the generation of hydrogen, soap making, the recovery and refining of glycerine, and the splitting of oils. 95 illustrations, 9 folding plates. 7 x 10, 163 pp. **\$7.50**

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**ELLIS, CARLETON.** *The Hydrogenation of Oils, Catalyzers and Catalysis, and the Generation of Hydrogen and Oxygen.* *Second Edition, Thoroughly Revised and Enlarged:* 240 ill., 6 x 9, 767 pp. **\$7.50**

**CONTENTS:** Methods of Hydrogenation; Catalyzers and Their Role in Hydrogenation Processes; The Base Metals as Catalyzers; The Occlusion of Hydrogen and the Mechanism of Hydrogen Addition; The Analytical Constants of Hydrogenated Oils; Edible Hydrogenated Oils; Use of Hydrogenated Oils and Their Utilization in Soap Making; Uses of Hydrogenated Oils and Properties of Certain Hardened Products; Hydrogenation Practice; The Hydrogenation of Petroleum; The Hydrogen Problem in Oil-Hardening; Water Gas as a Source of Hydrogen and the Replacement of Carbon Monoxide by Hydrogen; Liquefaction and Other Methods for the Removal of Carbon Monoxide; Hydrogen by the



Decomposition of Hydrocarbons; Hydrogen by the Action of Steam on Heated Metals; Action of Acids on Metals; Miscellaneous Methods of Hydrogen Generation; Hydrogen and Oxygen by Electrolysis of Water; Precautions in Handling Hydrogen; Appendices.

Heretofore, the literature on hydrogenation has been scattered through many periodicals, and except for a few condensed briefs, has not found its way into book form. In this work the author has collected and arranged in logical order all the known facts and figures of this important new branch of chemistry. The treatise describes the numerous processes proposed for the treatment of various oils with hydrogen, and gives many details of operation on the large scale. The catalytic materials employed and the manner of preparation are discussed fully, and all useful methods of generating hydrogen gas are detailed. The publication is one which should be of great interest to workers in fatty and petroleum oils, and in fact in all arts where the treatment of unsaturated organic compounds is involved. While entering into the scientific side of the process in a thorough manner, the treatment of the subject from the standpoint of the practical operator is exceptionally well considered.

**ENNIS, WILLIAM D.** *Linseed Oil and Other Seed Oils.* An industrial manual. 88 ill.,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 330 pp. **\$5.00**

**CONTENTS:** Introductory. The Handling of Seed and the Disposition of Its Impurities; Grinding. Tempering the Ground Seed and Moulding the Press Cake. Pressing and Trimming the Cakes. Hydraulic Operative Equipment. The Treatment of the Oil from the Press to the Consumer. Preparation of the Cake for the Market. Oil Yield and Output. Shrinkage in Production Cost of Production. Operation and Equipment of Typical Mills. Other Methods of Manufacturing. The Seed Crop. The Seed Trade. Chemical Characteristics of Linseed Oil. Boiled Oil. Refined and Special Oils. The Linseed Oil Market. The Feeding of Oil Cake. Miscellaneous Seed Oils. The Cotton-seed Industry; Glossary.

The book is clearly written, and is noticeable for the free use of simple mathematical formulæ to exactly express the working of operations and conditions. Precise figures are almost everywhere given, and the treatise is the most complete and exhaustive on the subject which has yet appeared.

**FRIEND, J. NEWTON.** *The Chemistry of Linseed Oil.* 86  $\frac{2}{1} \times 5$  (Van Nostrand's Chemical Monographs.) **\$1.00**

**CONTENTS:** Introduction; The Manufacture of Linseed Oil; The Chief Constituents of Linseed Oil; Properties and Reactions of Linseed Oil; The Chemistry of Linseed Oil and Linoxyn; Polymerised and Oxidised Oils; Bibliography and Notes.

explained. 58 ill.,  $5\frac{3}{4} \times 8\frac{1}{4}$ , 324 pp. **\$2.00**

**GREGORIUS, R.** *Mineral Waxes, Their Preparation and Uses.* Trans. by C. Salter. 32 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 247 pp. **\$3.00**

**CONTENTS:** Ozokerite and Ceresine; Paraffin; Mineral (Montan) Wax; Various Appliances for Extracting, Distilling, and Refining Ozokerite, Etc.; Uses of Ceresine, Paraffin, and Mineral Wax.

**HURST, GEORGE H.** *Lubricating Oils, Fats and Greases.* Their origin, preparation, properties, uses, and analysis. *Third Edition, Revised and Enlarged*, by Henry Leask. 74 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 405 pp. **\$5.00**

**CONTENTS:** Introduction. Hydrocarbon Oils. Scotch Shale Oils. Petroleum Vegetable and Animal Oils. Testing and Adulteration of Oils. Lubricating Greases. Lubrication: Under Ordinary Atmospheric Conditions; at High Temperatures; of Internal Explosion Engines. Tables and Recipes.

**HYDE, FREDERIC S.** *Solvents, Oils, Gums, Waxes and Allied Substances.*  $5\frac{1}{4} \times 8\frac{1}{2}$ , 182 pp. **\$2.00**



**CONTENTS:** Various Solvents and Fluids. Camphors, Essential Oils and Balsams. True Gums, Gum Resins and Bitumens. Carbohydrates. Albuminoids and Proteids. Oils and Fats. Comparisons of Oils and Fats. Linseed Oil. Insoluble Soaps. Fatty Acids. Waxes. Alkaloidal Substances. Bitter Principles. Miscellaneous Substances.

These notes are intended for the use of factory chemists and others who may desire a short reference book on commercial organic products. The subject-matter has been compiled from various sources and purposely condensed to render it the more accessible. Reference is made to well-known authorities throughout the text. Only those methods and tests which seemed reliable in the hands of the writer have been selected, limiting the descriptions to the salient features in each case.

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**SCHEITHAUER, W. Shale Oils and Tars and Their Products.** Translated from the German by Chas. Salter. 74 ill., 5¾ x 8¾, 190 pp. **\$4.00**

**CONTENTS:** History of the Shale and Lignite-Tar Industry; Bituminous Raw Materials; Production of Distillation Tar; Distillation Products; Distillation of the Tar and Tar Oils; Chemical Treatment of the Tar and Its Distillates; Utilization of Refinery Waste; Manufacture of Paraffin; Products Furnished by Shale Oil and Lignite Tar; Candlemaking; Chemical Composition of the Tars and Their Distillates; Laboratory Work; Statistics.

**SHERRIFF, FRANK F. The Oil Merchants' Manual and Oil Trade Ready Reckoner.** *Second Edition, Revised and Enlarged.* 5½ x 8½, 215 pp. **\$3.50**

**SIMMONS, W. H. Fats, Waxes and Essential Oils.** 5½ x 8¾. (Industrial Chemistry Series.) *In Press*

**SIMMONS, W. H., and MITCHELL, C. A. Edible Fats and Oils.** Their composition, manufacture and analysis. Ill., 5¾ x 8¾, 164 pp. **\$3.50**  
(Mr. Simmons is lecturer on soap manufacture at the Battersea Polytechnic.)

**CONTENTS:** Raw Materials Used in the Manufacture, Refining, Bleaching and Deodorizing; Butter; Lard; Margarine and Other Butter Substitutes; Salad Oils; Analysis of Raw Materials and Finished Products; Statistics of the Trade in Edible Oils.

**SOUTHCOMBE, J. E. Chemistry of the Oil Industries.** Ill., 6 x 9, cloth, 209 pp. (Outlines of Industrial Chemistry.) **\$3.50**

**CONTENTS:** Introductory Organic Chemistry. Mineral Oils. Petroleum and Shale-Mineral Oil Refining. Natural Sources and Methods of Preparation of Saponifiable Oils and Fats. Impurities Occurring in Crude Oils and Fats and the Technical Methods of Removing Them. Composition and Properties of the Saponifiable Oils and Fats in General. Composition and Properties of the Individual Oils and Fats of Commercial Importance. The Natural Waxes, Their Composition and Properties. Analytical Methods. Industrial Applications of Fats and Oils. Burning Oils. Edible Oils and Margarines. Polymerised, Boiled and Blown Oils. Turkey-Red Oils. Saponification of Fats and Oils on a Technical Scale. The Distillation of Fatty Acids. Oleines and Stearines. Candle Manufacture. Soap-Making. Glycerine. Conclusion. Scientific and Technical Research on Problems in the Oil and Related Industries. Literature.



PAINTS, COLORS, VARNISHES

**ANDES, LOUIS E.** Iron Corrosion, Anti-Fouling and Anti-Corrosive Paints.

Translated from the German by Charles Salter. *Second Edition*, revised and enlarged by H. B. Stocks. 62 ill., 5½ x 8¾, 308 pp. \$6.00

**CONTENTS:** See page 131.

**BERSCH, J.** Manufacture of Mineral and Lake Pigments. Containing directions for the manufacture of all artificial artists' and painters' colors, enamel colors, soot and metallic pigments. Translated from the *Second Revised Edition* by Arthur C. Wright. 43 ill., 476 pp. \$6.00

**CONTENTS:** Physico-chemical Behavior of Pigments; Raw Materials Used in the Manufacture of Pigments; Assistant Materials; Metallic Compounds; The Manufacture of Various Mineral Pigments; Manufacture of Pigments of Organic Origin; Water Colors; Crayons; Confectionery Colors; Preparation of Pigments for Painting; Examination of Mineral Pigments; Examination of Lakes; Testing Dye Woods; Design of a Color Works; Commercial Names of Pigments.

**FLEURY, P.** The Preparation and Uses of White Zinc Paints. Translated from the French by Donald Grant. 32 tables, 5 x 7½, 179 pp. \$3.00

**CONTENTS:** Painting on Woodwork. Better Class Painting on Woodwork Painting on Plaster, on Mortar, and on Soft and Porous Ceilings; Hints on Painting with White Zinc; Testing Commercial Zinc Whites; The Experiments on the Dutch Commission Officially Entrusted to Make Comparative Trials between White Lead and White Zinc; Results and Criticisms of the Experiments of the Dutch Commission; Final Report of October 5, 1909; Manufacture and Different Treatments of White Zinc—Its Modifications and Improvements; The Legislative History of White Zinc Paint; Legislation. *Methods of Qualitative Analysis.* Examination of Paints; Fixed and Essential; Oils; Waxes; Formula for Encaustic and Waterproof Paints; Analysis of Paints; White Paints; White Lead and White Zinc; Blacks; Red Pigments; Carmine and Lakes; Yellow Colors; Green and Blue Pigments; Brown Colors; Binders or Liquids; Testing Preservation and Improvement of Varnishes by Aging; Analysis of Yellow and White Wax; Selected Furniture Polish Recipe. Normal Polish for Floors, Parquets and Woodwork; Virgin Wax Polish for Flattening of Paints or Polishing of Varnishes; Formula for a Waterproof Composition for Plaster and Stone and Damp Walls; Special and More Economical Formula for Waterproofing Plaster.

**FURNELL, J.** Students' Handbook of Paints, Colors, Oils and Varnishes.

Ill., 5¼ x 7¾, 94 pp.

*Reprinting*

**CONTENTS:** Plant Necessary for Making Lemon and Middle Chromes; Chromes; The Making of Chinese, Prussian, and Other Blue Pigments; The Making of Emerald Green and Its Substitutes; Earth Colors or Pigments; Brown and Black Pigments; Reds; Lakes; Lead Compounds; White Pigments; Barytes and Whitening; Painter's Oils; Turpentine; Oil Varnishes; Spirit Varnishes, Polishes and Stains; Liquid Paints; Enamel Paints; Questions.

**GARDNER, HENRY A.** Paint Researches and Their Practical Applications.

155 ill., 6 x 9, 363 pp.

\$5.00

(Author is Director Scientific Section, Paint Manufacturers Association of the U. S., Assistant Director the Institute of Industrial Research, Washington, D. C.)

**CONTENTS:** Growth of the Prepared Paint Industry and Its Relation to the Work of the Painter; White Pigment Industry; Physical Characteristics of Pigments and Paints; Tests of Lithopone; Washington Paint Oil Tests; Paint Protection for Portland-Cement Surfaces; Paints to Prevent Electrolysis in Concrete Structures; Paints for Metal; Marine Paints; Arlington Paint Tests; Observations on Painted Lumber; Impregnated Panel Tests; Fire Retardant Paints for Shingles and Other Wooden Structures; Composition of Paint Vapors; Toxic and



Antiseptic Properties of Paints; Light-Reflecting Values of White and Colored Paints; Formation and Inhibition of Mildew in Paints; Fungi on Painted Surfaces; Changes Occurring in Oils and Paste Paints, Due to Autohydrolysis of the Glycerides; Effect of Pigments Upon the Constants of Linseed Oil; Storage Changes in Vegetable and Animal Oils; Paint Dryers and Their Application; Miscellaneous Oil Investigations; Application of Paints and Finishes to Wood. This collected information represents the results of many years of careful investigation to determine the usefulness of various materials which find employment in the manufacture of paint and will serve as a guide to those desiring to be abreast of the work on the technology of paint.

**HALL, C. H.** *Chemistry of Paints and Paint Vehicles.* Ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 140 pp. \$2.00

**CONTENTS:** Determination of the Elementary Constituents of Paints; Raw Materials; Properties, Tests, and Methods of Analysis; Analysis of Dry Colors, Pastes, and Liquid Paints; Matching of Samples; *Paint Vehicles.* Oils, Varnishes, Japans and Driers; Thinners.

The author has attempted to sift from the great mass of analytical chemistry those methods which apply particularly to the analysis of paints, at the same time calling attention to the most important physical characteristics of the raw materials. This book, being written from the standpoint of a chemist, employed in the manufacture of paints and colors, the chapter on Matching Samples has been included in an attempt to bridge the space between the laboratory and the factory. It is here that so often the results of previous analysis are rendered worthless by being placed in the hands of one who does not understand their interpretation nor the composition of the raw materials which he is using.

**HOFF, J. N.** *Paint and Varnish Facts and Formulas.* A handbook for the maker, dealer, and user of paints and varnishes. Containing over 600 recipes.  $6 \times 9$ , cloth, 179 pp. \$2.00

**CONTENTS:** White Paints and Pigments; The Oxides of Iron; The Chemical Colors; Classification of Pigments; Colors in Oil, Japan and Water; Oils and Solvents; Varnishes; Ready Mixed Paints; Kalsomines; Paint and Varnish Troubles and Their Remedies; Painting and Decorating; Formulas.

**HURST, G. H.** *Dictionary of Chemicals and Raw Products Used in the Manufacture of Paints, Colors, Varnishes and Allied Preparations.* *Second Edition, Revised and Enlarged,* by H. B. Stocks.  $6 \times 8\frac{3}{4}$ , 378 pp. \$5.00

**JENNINGS, ARTHUR S.** *Commercial Paints and Painting.* A handbook for architects, engineers, property owners, painters and decorators, etc.  $5\frac{3}{4} \times 8\frac{1}{2}$ , 236 pp. (Van Nostrand's Westminster Series.) \$2.50

**CONTENTS:** Object of Painting; Durability of Paint; Cost of Cheap and Superior Paints Compared; Cost of Keeping Property Painted; Specifying Paints; The Materials Used in Painting; Conditions which Determine the Economic Value of the Paint; Simple Tests for Painters' Materials; The Paint Most Suitable for Different Surfaces; How Paint and Varnish Should be Applied; Paint and Color Mixing; Tools and Plant; Defects in Painters' Work; Specifications for Painters' and Decorators' Work; Painting by Mechanical Means.

**JENNISON, F. H.** *The Manufacture of Lake Pigments from Artificial Colors.* A useful handbook for color manufacturers, dyers, color chemists, paint manufacturers, dyesalters, wallpaper-makers, enamel and surface-paper makers. *New Edition in Press*

**CONTENTS:** The Groups of the Artificial Coloring Matters; Nature and Manipulation of Artificial Colors; Lake Forming Bodies for Acid Colors; Lake Forming Bodies' Basic Colors; Lake Bases; Principles of Lake Formation;

Red, Orange, Yellow, Green, Blue, Violet and Black Lakes; Insoluble Azo Colors; Washing, Filtering and Finishing; Matching and Testing.

**JONES, M. W.** *The Testing and Valuation of Raw Materials Used in Paint and Color Manufacture.* 5 x 7½, cloth, 88 pp. \$2.50

**CONTENTS:** Compounds of: Aluminum; Iron; Potassium; Chromium; Tin; Copper; Lead; Zinc; Arsenic; Antimony; Calcium; Barium; Cadmium; Mercury; Cobalt; Carbon; China Clay; Ultramarine; Oils.

**McINTOSH, J. G.** *Manufacture of Varnishes and Kindred Industries.* Based on and including the "Drying Oils and Varnishes," of Ach. Livache. (In Three Volumes.)

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Vol. II., *Varnish Materials and Oil Varnish Making.* Ill., 5¾ x 8¾, cloth, 216 pp. *Reprinting*

**CONTENTS:** Amber and Amber Oil Varnishes; Asphaltum; Coal Tar, Bone and Stearine Pitch; India Rubber; Gutta Percha; Paraffin Wax; Cleaning, Assorting and Fusing Resins; Oil Varnish Making; Copal Oil Varnishes; Kauri Copal Varnishes; Brunswick Black; Super Black Japan; Testing Varnish; Utilization of Residues; Utilization of Varnish Makers' Waste Products.

Vol. III., *Spirit Varnishes and Spirit Varnish Materials.* 64 ill., 5½ x 8¾, 492 pp. *Reprinting*

**CONTENTS:** Solvents. Characteristics of Spirit Varnish Solvents. Sources Preparation, and use of Various Solvents. Alcohol, Ether, and Ethereal Salts, OLEO-RESINOUS PINE PRODUCTS—TERPENES—CAMPHORS. The Oleo-Resiniferous Conifers. Sources and Methods of Obtaining Turpentine. Distillation of Turpentine. Testing and Substitutes, Distillation and Chemistry of Resin. Rosin Spirit—Rosin Oil. Chemistry of the Terpenes. Wood Tar, Wood Turpentine, Wood Creosote, etc. SPIRIT VARNISH. RESINS AND COLORING MATTERS. Benzoin; Dammar, Kauri, etc. Dragons' Blood. Japanese, Chinese and Burmese Lacquers. Manilla Copal. Shellac. Colors and Stains. METHODS OF MANUFACTURE. Principles of Spirit Varnish Manufacture. Amber and Asphaltum, Collodion, and Celluloid Spirit Varnishes. Copal Spirit Varnishes, Dammar Spirit Varnishes. India-Rubber Insulating, Mastic, and Matter Spirit Varnishes. Rosin Spirit Varnishes. SPIRIT VARNISHES, ANALYSIS AND TESTING. Technical Valuation. The Determination of the Resins and Solvents in Spirit Varnishes.

**PARRY, E. J., and COSTE, J. H.** *Chemistry of Pigments.* Ill., 6 x 8½, 288 pp. \$5.00

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Merits and Defects of White Lead Paints; Toxicology of White Lead; Zinc White, Its History and Preparation; Grinding of Zinc White to a Stiff Paste in Oil; Livache's Law as to Ratio of Oil to Pigment; Packing and Packages and Storage, Gross and Net Weights; Zinc White Paint and Zinc White Coatings; Their Merits and Defects.

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**SMITH, J. C.** *The Manufacture of Paint.* A practical handbook for paint manufacturers, merchants and painters. *Second Revised and Enlarged Edition.* 80 ill., 5 $\frac{1}{2}$  x 8 $\frac{3}{4}$ , 285 pp. **\$5.00**

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bonate, Silicia, Infusorial Earth, Kieselguhr, Fuller's Earth, Clay, Asbestine, Asbestos, Calcium Carbonate, White Mineral Primer, Marble Dust, Spanish White, Artificial Calcium Carbonate, Gypsum. *Mixed Paints*: Anti-fouling and Ship's Bottom Paints, Concrete or Portland Cement Paints, Paint Containing Portland Cement, Damp Resisting Paints, Enamel Paints, Flat Wall Paints, Floor Paints, Shingle Stain and Shingle Paint. *Linseed Oil*: Linseed Oil, Standard Specifications, American Society for Testing Materials for Linseed Oil, U. S. Navy Department Specifications for Linseed Oil, Stand Oil, Japanner's Prussian Brown Oil. *Chinese Wood Oil*: Chinese Wood Oil, A Method for the Detection of Adulteration of China Wood Oils, Standard Specifications American Society for Testing Materials for Purity of Raw Chinese Wood Oil. *Soya Bean Oil*. *Fish Oil*. *Miscellaneous Oils*: Herring Oil, Corn Oil. *Turpentine*: Turpentine, Wood Turpentine, Standard Specifications American Society for Testing Materials for Turpentine, U. S. Navy Department Specifications for Turpentine. *Pine Oil*. *Benzine*. *Turpentine Substitutes*: Benzol, Toluol, Xylol, Solvent Naphthia. *Cobalt Driers*. *Combining Mediums and Water*: Combining Mediums, Water in the Composition of Mixed Paints. *Fine Grinding*. *The Influence of Sunlight on Paints and Varnishes*. *Paint Vehicles as Protective Agents Against Corrosion*. *The Electrolytic Corrosion of Structural Steel*. *Painters' Hygiene*. *The Growth of Fungi on Paint*. *Analysis of Paint Materials*: White Lead, Basic Lead Sulphate, Zinc Lead, Zinc Oxid, Lithopone, Red Lead and Orange Mineral, Iron Oxids, Umbers and Siennas, Mercury Vermilion, Chrome Yellows and Oranges, Chrome Greens, Prussian Blue, Ultra-marine, Black Pigments, Graphite, Blanc Fixe, Whiting, Gypsum or Calcium Sulphate, Silica, Asbestine, Clay, Barytes, Barium Carbonate, Mixed White Paints, White Pigments, Paints Rosin, Rosin Oils, Oils, Appendix.

**TOCH, MAXIMILIAN.** *Materials for Permanent Painting.* A manual for manufacturers, art dealers, artists, and collectors. 8 plates, one colored, 5 x 7 $\frac{1}{4}$ , 208 pp. \$2.00

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An effort to show in plain language what the painter shall do with reference to his colors and materials upon which he paints to produce paintings that will not deteriorate with age or exposure to light. The author shows, popular belief notwithstanding, that the science of making colors is not lost and that the ancient painters and great masters were so successful not because their materials were superior to those used and made to-day, but because they knew how to use their inferior materials properly. This is a simple exposition of the chemistry of colors for the non-chemist.

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**UNDERWOOD, NORMAN, and SULLIVAN, THOMAS V.** *The Chemistry and Technology of Printing Inks.* 9 ill.,  $6 \times 9$ , 145 pp. **\$3.00**

(Authors are chief and assistant chief, respectively, of the ink making division of the Bureau of Engraving and Printing, United States Treasury Department.)

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A brief and practical, yet scientifically correct exposition of the many facts concerning the raw materials and finished products used in the industry. Only the most recent methods of manufacture are presented, and descriptions of the materials that have been found useful in the art are clearly and concisely described.

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**CONTENTS:** *Textile Soaps.* Introductory; Methods of Making Soaps; Special Textile Soaps; Relation of Soap to Water for Industrial Purposes; Treating Waste Soap Liquors; Soap Analysis. *Animal and Vegetable Oils and Fats.* Tallow, Lard, Bone Grease, Tallow Oil, Lard Oil, Whale Oil or Train Oil; Palm Oil, Palm-Nut or Palm-Kernel Oil, Cocoa-Nut Oil, Olive Oil, Arachis Oil, Cotton-Seed Oil, Soya-Bean Oil, Linseed Oil, Castor Oil, Maize (Corn) Oil, Rape Oil. *Glycerine.* *Textile Oils.* Wool Oils, Oleines, Wool Oils, Oleic Acid, Blended Wool Oils, Oils for Cotton-Dyeing, Printing and Finishing, Color Oil, Turkey-Red Oils, Turkey-Red Oil, Alizarine Oil, Oleine, Oxy-Turkey-Red Oils, Soluble Oil, Analysis of Turkey-Red Oil; Finishers' Soluble Oil, Finishers' Soap Softeners, Oil and Fat Analysis.

The work that soap has to do, and the objects for which it is employed in



the textile industries vary greatly, and this work describes not only the preparation of the various soaps but also the special features of the most suitable soaps for each of these purposes.

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**CONTENTS:** The Soap Industry; Raw Materials of Soap Making;; Bleaching and Purification of Soap Stock; Chemical Characteristics; Mechanical Equipment of a Factory; Cold-Process and Semi-Boiled Soap; Grained Soap; Settled Rosined Soap; Milled Soap Base; Floating Soap; Shaving Soaps; Medicated Soap; Essential Oils and Soap Perfumery; Milled Soap; Candles; Glycerin; Examination of Raw Materials and Factory Products.

**SIMMONS, W. H., and APPLETON, H. A.** *Handbook of Soap Manufacture.* 27 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 167 pp. **4.00**

**CONTENTS:** Definition of Soap; Properties; Hydrolysis; Detergent Action; Constitution of Oils and Fats, and Their Saponification; Raw Materials Used in Soap-Making; Bleaching and Treatment of Raw Materials Intended for Soap-Making; Soap-Making; Treatment of Settled Soap; Toilet, Textile, and Miscellaneous Soaps; Soap Perfumes; Glycerine Manufacture and Purification; Analysis of Raw Materials, Soap, and Glycerine; Statistics of the Soap Industry; Comparison of Degrees, Twaddell and Baume, with Actual Densities; Comparison of Different Thermometric Scales; Table of the Specific Gravities of Solutions of Caustic Soda; Table of Strength of Caustic Potash Solution to 60° F.

**WATT, A.** *Art of Soapmaking.* A practical handbook of the manufacture of hard and soft soaps, toilet soaps, etc. *Seventh Edition, Revised and Enlarged.* 43 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 323 pp. **\$4.00**

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### COSMETICS, PERFUMES

**KOLLER, T.** *Cosmetics.* A handbook of the manufacture, employment and testing of all cosmetic materials and cosmetic specialties. Translated from the German by Charles Salter.  $5\frac{1}{4} \times 7\frac{1}{2}$ , 269 pp. **\$2.50**

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**PARRY, ERNEST J.** *The Chemistry of Essential Oils and Artificial Perfumes.* In two volumes. Ill.,  $6\frac{1}{2} \times 10$ .

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**WORDEN, EDWARD C.** Nitrocellulose Industry. A compendium of the history, chemistry, manufacture, commercial application, and analysis



of the nitrates, acetates, and xanthates of cellulose as applied to the peaceful arts, with a chapter on gun cotton, smokeless powder, and explosive nitrates. Two volumes. 324 ill., 3 plates, 6½ x 9½, 1239 pp.  
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The most complete and comprehensive work on the general technology of nitro-cellulose ever issued in any language, and adequately covers the entire field in detail. It contains over 8000 patent and literature references of over 2900 different investigators, representing the work of everyone in the field from the earliest days to the present.

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**Carbohydrate Carboxylates (Cellulose Acetate),** being Vol. VIII. Ill., 6½ x 9½, 611 pp. \$5.00

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Acetate; Cellulose Acetate Imitation Leather; Cellulose Acetate Compound Fabrics; Coating of Skins with Cellulose Acetate; Artificial Bristles; Preservation of Documents with Acetate Lacquers; Artificial Filaments from Cellulose Acetate; Bayko Yarn; Artificial Horsehair; Microscopy of Acetate Silk; Strengthening Artificial Filaments; Artificial Sponge; Dyeing Cellulose Acetate; Carbon Filaments from Cellulose Acetate; Acetylated Cellulose in the Explosives Industry; Cellulose Acetate as Insulating Material; Cellulose Acetate for Toughening Incandescent Mantles; Acetic Collodion; Cellulose Acetate Photographic Emulsions; Acetylcellulose Sheets; Continuous Photographic Films; Waterproofing Acetate Films; Automobile Wind Shields; Testing Acetate Films; Utilization of Waste Acetate Films; Chronophotography, Motography; Cellulose Acetate Window Panes; Cellulose Acetate Phonograph Records; Capping Bottles with Cellulose Acetate; Cellulose Acetate in Air-craft Manufacture; Coating Cigar Tips; Cellulose Acetate in Pharmacy; Solidified Alcohol; Feculose. *Analysis of Uninflammable Cellulose Esters.* Estimation of Formic Acid; Acetic Acid; Congealing Points of Acetic Acid; Acetic Anhydride; Acidity of Mixtures of Acetic Acid and Anhydride; Calculation of Acetic Anhydride by Titration; Index of Refraction; Density of Acetic Acid; Refractometric Determination of Acetic Anhydride; Method of Menschutkin and Wasiljeff; Analysis of the Cellulose Acetates, Moisture, Ash, Solubility; Viscosity; Tensile Strength; Stability Tests; Determination of the Copper Number; Determination of Acid Radicals; Method of Green and Perkin; Method of Ost; Sodium Ethylate Method; Method of Barthelemy; Modification of Eberstadt; Determination of Combined Sulfuric Acid; Work of Stein; Patent, Name and Subject Indices.

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A complete account of the most advantageous methods of working up wood-refuse, especially sawdust, exhausted dye-woods and tan, as fuel, as a source of chemical products, for artificial wood-compositions, explosives, manures, and many other technical purposes.

**KOLLER, T.** *The Utilization of Waste Products.* A treatise on the rational utilization, recovery and treatment of waste products of all kinds. *Third Edition, Revised and Enlarged*, by H. B. Stocks. 22 ill., 6 x 9, 346 pp. **\$5.00**

**CONTENTS:** The Waste of Towns; Blood and Slaughter-House Refuse; Fat from Waste; Tannery Waste; Leather Waste; Fur and Feather Waste; Waste Horn; Fish Waste; Mother-of-Pearl Waste; Vegetable Ivory Waste; Waste Wood; Cork Waste; Waste Paper and Bookbinders' Waste; By-Products of Paper and Paper Pulp Works; Waste Produced in the Manufacture of Parchment Paper; Wool Waste; Silk Waste; Waste Waters of Cloth Factories; Cotton Spinners' Waste; Jute Waste; Utilization of Rags; Coloring Matters from Waste; Residues in the Manufacture of Aniline Dye; Dyers' Waste Waters; Waste Produced in Butter Making; Molasses; Waste Liquids from Sugar Works; Fruit; Waste Products of the Manufacture of Starch; Brewers' Waste; Wine Residues; India Rubber and Caoutchouc Waste; Amber Waste; Utilization of Turf or Peat; Manufactured Fuels; Illuminating Gas from Wastes and the By-Products of the Manufacture of Coal-Gas; By-Products in the Treatment of Coal-Tar Oils; Ammonia Recovery; Petroleum Residues; By-Products in the Manufacture of Rosin Oil; Soap-Makers' Waste; Alkali Waste and the Recovery of Soda; Recovery of Potash Salts; Sulphur; Salt Waste; Gold and Silver Waste; Platinum Residues; Iridium from Goldsmiths' Sweepings; Metal Waste; Tinplate Waste; Calamine Slimes; Waste Iron; By-Products of the Manufacture of Mineral Waters; Infusorial Earth; Meerschauum; Mica Waste; Slate Waste; Broken Porcelain; Earthenware and Glass; Utilization of Waste Glass.

**LAMBORN, L. L.** *Cottonseed Products.* A manual of the treatment of cottonseed for its products and their utilization in the arts. 79 ill., 1 folding plate, 6½ x 9½, 253 pp. **\$4.00**

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An outline of the early methods of making artificial mineral waters leading up to a description of the apparatus of the modern carbonating plant. Gives much information concerning many of the European Spas and their springs, together with analyses of their waters.

# TEXTILES

**Art of DYEING WOOL, SILK AND COTTON.** Translated from the French of M. Hellot, M. Macquer and M. Le Pileur D'Apligny. First published in English in 1789. Ill., 6 x 8 $\frac{3}{4}$ , 466 pp. **\$2.00**

This volume describes methods used by the pioneer French and English dyers in dyeing wool and woolen cloths, stuffs yarn, worsted, silk, cotton and linen thread, giving formulas for mixing colors and applying them, together with methods for stamping silks and cottons.

**BARKER, ALFRED F. Textiles.** With additional chapters by W. M. Gardner, R. Snow, W. H. Cook and F. Radbury. 86 ill., 5 $\frac{3}{4}$  x 8 $\frac{1}{2}$ , 387 pp. (Van Nostrand's Westminster Series.) **\$2.50**

**CONTENTS:** History of the Textile Industries. Textile Inventions and Inventors. Wool, Silk, Cotton, Flax, etc., Growing Industries. The Mercerized and Artificial Fibres Employed in the Textile Industries. Dyeing of Textile Materials. Principles of Spinning. Processes Preparatory to Spinning. Principles of Weaving. Principles of Designing and Coloring. Principles of Finishing. Textile Calculations. The Woolen, Worsted, Dress Goods, Stuff and Linings, and Tapestry and Carpet Industries. Silk Throwing and Spinning. The Cotton Industry. The Linen Industry Historically and Commercially Considered. Recent Developments and the Future of the Textile Industries.

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A practical book explaining the procedure, as well as the theory, of analyzing finished fabrics to determine their loom particulars. It explains how to control the various qualities of the finished product by pre-determining the varieties and qualities of the materials to be employed in its production. A special and important chapter giving cost data should be helpful in the determination of the price of the cloth. It answers the superintendent's and the designer's everyday questions in a practical way.

**BEAUMONT, ROBERTS. The Finishing of Textile Fabrics.** (Woolen, Worsted, Union and other Cloths.) 151 ill., 5 $\frac{1}{2}$  x 8 $\frac{3}{4}$ , 279 pp. **\$5.00**

**CONTENTS:** Woollen, Worsted and Union Fabrics. Processes of Finishing and their Efferts. The Process of Scouring. Scouring Machines. Theory of Felting. Fabric Structure, Compound Fabrics. Fulling and Milling Machinery. The Theory of Raising. Raising Machinery and Raising Process. Cutting, Cropping or Shearing. Lustring Process and Machinery. Methods of Finishing.

**BEAUMONT, R. Color in Woven Design.** A treatise on the science and technology of textile coloring (woolen, worsted, cotton and silk materials). *New Edition, Rewritten and Enlarged.* 39 colored plates, 367 ill., 6 $\frac{1}{2}$  x 9, 396 pp. **\$6.00**

(Author is professor of textile industries, The University of Leeds.)

**CONTENTS:** Theories of Color. Attributes of Colors. Contrast and Harmony. Color Standardization. Mixtures. Elements of Textile Coloring—stripes. Check Patterns. Simple Colorings. Compound Colorings. Fancy Shades Applied to



Special Designs. Coloring of Combination Designs. Spotted Effects. Coloring of Double Weaves and Reversibles. Figured Textiles. Colored in the Warp. Weft-colored Figured Fabrics—Curl Textures.

**BEAUMONT, R.** *Standard Cloths, Structure and Manufacture.* (General Military and Naval.) 150 ill., 16 plates,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 342 pp. **\$6.00**

**CONTENTS:** Microscopic Features; Fabric Quality; Synopsis of Cloths; Standard Grades of Manufacture; Weaves Types; Fabrics Light in Weight and Structure; Medium-Weight Woollens; Medium-Weight Worsteds; Overcoating Group of Fabrics; Army and Navy Cloths; Fibrous-Faced Fabrics; Felt Manufactures; Appendix.

**BEECH, FRANKLIN.** *The Dyeing of Cotton Fabrics.* A practical handbook for the dyer and student. *Second Revised Edition.* 44 ill.,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 275 pp. **\$5.00**

**CONTENTS:** Structure of the Cotton Fibre; Bleaching of Cotton Fabrics Prior to Dyeing; Dyeing Machinery and Dyeing Manipulations; The Principles and Practice of Cotton Dyeing; Dyeing Union (Mixed Cotton and Wool) Fabrics; Dyeing Half Silk (Cotton-Silk, Satin) Fabrics; Operations Following Dyeing; Testing the Color of Dyed Fabrics; Experimental Dyeing and Comparative Dye Testing.

**BEECH, F.** *Dyeing of Woolen Fabrics.* With diagrams and figures. 33 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 243 pp. **\$3.50**

**CONTENTS:** Wool Fibre; Processes Preparatory to Dyeing; Dyeing Machinery and Manipulations; Principles and Practice of Wool, Mixed Cotton and Wool, Gloria Dyeing; Operations Following Dyeing; Experimental Dyeing and Comparative Dye Testing; Testing the Color of Dyed Fabrics.

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**BOTTLER, M.** *Modern Bleaching Agents and Detergents.* Translated by C. Salter. 16 ill.,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 160 pp. **\$2.50**

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**CARTER, HERBERT A.** *Ramie (Rhea), China Grass.* The new textile fibre and all about it. A book for planters, manufacturers, and merchants. Ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 140 pp. **\$3.00**

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of America, and in South Africa. Uses to which Ramie, Rhea, and China Grass Yarns can be put in Trade. How to Manufacture it Profitably. Ramie Cultivation in China and the Chinese Grass Cloth Industry.

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**CARTER, H. R. Bleaching, Dyeing and Finishing of Flax, Hemp and Jute Yarns and Fabrics.** 20 ill., 5 $\frac{1}{2}$  x 8 $\frac{3}{4}$ , 172 pp. **\$1.25**

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**GRUNER, A. Power-loom Weaving and Yarn Numbering,** according to various systems, with conversion tables. An auxiliary and text-book for pupils of weaving schools, as well as for self-instruction, and for general use by those engaged in the weaving industry. Ill., colored diagrams, 5 x 7 $\frac{1}{2}$ , 162 pp. **\$3.50**

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**HEERMANN, P. Dyers' Materials.** An introduction to the examination, valuation, and application of the most important substances used in dyeing, printing, bleaching and finishing. Translated by Arthur C. Wright. *Second Edition, Revised and Enlarged*, by H. B. Stocks. Ill., 5 $\frac{1}{4}$  x 7 $\frac{3}{4}$ , cloth, 158 pp. **\$3.00**

**CONTENTS:** Indicators; Standard Solutions and Reagents; Water; Textile Fibres; Hydrochloric Acid and the Chlorides; Fluorides and Bifluorides; Sulphuric Acid and Sulphates; Nitric Acids and Nitrates; Chlorine; Oxygen Compounds; Sulphites; Alkalies; Peroxides; Zinc Dust; Fatty Acids and Their Salts; Cyanogen Compounds; Derivatives of Fats; Aniline and Aniline Salts; Thickening Material Dyes.

**HERZFELD, J. The Technical Testing of Yarns and Textile Fabrics.** With reference to official specifications. Translated by Charles Salter. *New Edition, In Press*

**CONTENTS:** Microscopical Examination of Fibres; Chemical Examination; Yarn Number Determination; Testing the Length of Yarns; External Appearance of Yarn; Twist of Yarn and Twist; Tensile Strength and Elasticity; Per-



centage of Fat; Moisture; Mode of Weaving; Warp and Weft Threads; Shrinkage; Constituents of Warp and Weft; Dressing; Waterproof Properties of Cloth; Hygroscopicity; Fastness of Dye Test; Length Determinations; Mordants and Dyes; Arsenico.

**HÜBNER, JULIUS.** *Bleaching and Dyeing of Vegetable Fibrous Materials.* 95 ill. (many in two colors),  $6\frac{1}{4} \times 9$ , 457 pp. (Outlines of Industrial Chemistry.) *Reprinting*

**CONTENTS:** The Vegetable Fibres. Water. Chemicals and Mordants. Bleaching. Mercerising. Mineral Colours. The Natural Colouring Matters. Basic Cotton Dyestuffs. Substantive Cotton Dyestuffs. Sulphur Dyestuffs. Acid and Resorcine Dyestuffs. Insoluble Azo-Colours, Produced on the Fibre. The Vat Dyestuffs. Mordant Dyestuffs. Colours Produced on the Fibre by Oxidation. Dyeing Machinery. Estimation of the Value of Dyestuffs. Appendix.

**HURST, GEORGE H., and SIMMONS, W. H.** *Textile Soaps and Oils.* A handbook on the preparation, properties, and analyses of the soaps and oils used in textile manufacturing, dyeing and printing. *Second Edition, Revised and Partly Rewritten.* 11 ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 204 pp. **\$3.50**  
(For contents see page 35.)

**KINZER, H., and WALTER, K.** *Theory and Practice of Damask Weaving.* Translated from the German by Arthur Morris and Herbert Robson. 6 ill., 18 folding plates,  $6\frac{1}{4} \times 9\frac{3}{4}$ , 110 pp. **\$4.00**

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**LOMAX, J. W.** *Fine Cotton Spinning.* A practical manual. Ill.,  $5 \times 7\frac{3}{4}$ , 131 pp. **\$1.50**

**CONTENTS:** Terms on Which Cotton is Bought; Testing Raw Cottons; Egyptian Cottons; Opening and Scutching Machinery; Carding Engines; Combing; Drawing; Production of Good Roving; The Flyer Throstle, Ring Frame and Mule; Modern Mill Planning; Specifications for Machines; Systematic Cleaning and Overhauling of Machinery.

**LORD, R. T.** *Decorative and Fancy Textile Fabrics.* A valuable book with designs and illustrations for manufacturers and designers of carpets, damask, dress and all textile fabrics. 132 ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , cloth. 210 pp. **\$3.50**

**CONTENTS:** Hints on Design; Hints for Ruled Paper Draughtsmen; The Jacquard Machine; Brussels and Wilton Carpets; Tapestry Carpets; Ingrain Carpets; Axminster Carpets; Damask and Tapestry Fabrics; Scarf Silks and Ribbons; Silk Handkerchiefs; Dress Fabrics; Mantle Cloths; Figured Plush; Bed Quilts; Calico Printing.

**MACKIE, J.** *How to Make a Woollen Mill Pay.*  $5\frac{1}{4} \times 7\frac{3}{4}$ , 77 pp. **\$2.00**

**CONTENTS:** Blends, Piles, or Mixtures of Clean Scoured Wools; Dyed Wool Book; The Order Book; Pattern Duplicate Book; Management and Oversight; Constant Inspection of Mill Departments; Importance of Delivering Goods to Time, Shade, Strength, etc.; Plums.

**MIERZINSKI, S.** *The Waterproofing of Fabrics.* Translated from the German by Arthur Morris and Herbert Robson. *Second Edition, Revised and Enlarged.* 29 ill., 5 x 7½, 140 pp. **\$2.50**

**CONTENTS:** Definition; Preliminary Treatment of the Fabric; Waterproofing with Acetate of Alumina; Impregnation of the Fabric; Drying; Waterproofing with Paraffin Wax, Ammonium Cuprate and Insoluble Soaps of Metallic Oxides; Dyeing Waterproof Fabrics; Waterproofing with Gelatine, Tannin, Caseinate of Lime and Other Bodies; Manufacture of Tarpaulin; British Waterproofing Patents.

**MITCHELL, C. A., and PRIDEAUX, R. M.** *Fibres Used in Textile and Allied Industries.* 66 ill., 5¾ x 8¾, 208 pp. **\$3.50**

**CONTENTS:** Introduction. Wool. Vicuna. Camel Hair. Alpaca. Llama Hair. Mohair. Cashmere. Goats' Hair. Cow Hair. Horse Hair. Deer Hair. Reindeer Hair. Rabbits' Hair. Cats' Hair. Dogs' Hair. Kangaroo's Hair. Human Hair. Silk. Cotton. Mercerized Cotton. Artificial Silks. Linen. Flax. Ramie. Jute. Hemp. Sisal Hemp. Pita Fibre. Manila Hemp. Musa Paradisiaca Fibre. Banana Fibre. Andersonia Fibre. Sansevieria Fibre. Sunn Hemp. Gambo Hemp. New Zealand Flax. Mauritius Hemp. Yercum Fibre. Pine Apple Fibre. Brush Fibres. Vegetable Down and Upholstery Fibres.

Brings together in a form convenient for use in the laboratory both the microscopical and chemical technical methods of examining fibres. It includes fibres used in a more or less dissociated condition in spinning, weaving, cordage, brush-making and upholstery, but does not include furriery or paper making. Practically all of the illustrations are drawn to the same scale (a magnification of 104 diameters) as an aid to rapid comparison, and were all made especially for the book.

**NASMITH, J.** *The Students' Cotton Spinning, Sixteenth Edition, Revised and Enlarged.* 250 ill., cloth, 622 pp. **\$4.50**

**CONTENTS:** Evolution of Cotton Spinning; Distribution of Varieties of Cotton; Mixing, Opening and Scutching; Carding; Card Clothing and Grinding; Combing and Drawing; Slubbing and Roving; Theory of Spinning; Mule and Ring Spinning; Reeling, Winding and Manufacture of Thread; Waste Spinning; Arrangement of Drafts and Production.

**NASMITH, J.** *Recent Cotton Mill Construction and Engineering.* *Third Edition.* 124 ill., 5 x 7¼, 277 pp. **\$3.00**

**CONTENTS:** Constructional Details; Slow Burning and One Storyed Buildings; Cost Strength and Fire Resistance of Floors; Fire Appliances; Sprinklers; Lighting; Heating, Ventilation and Humidity; Calculation of Machines in Mill; Steam Boilers and Appliances; Steam Engines; Lighting Engines and Other Accessories; Turbines; Gearing; Shafting and Bearings.

**NISBET, H.** *Grammar of Textile Design.* *Second Edition, Revised and Enlarged.* 635 ill., 5½ x 8½, 515 pp. **\$7.50**

**CONTENTS:** Introduction; The Plain Weave and Its Modifications; Twill and Kindred Weaves; Diamond Weaves; Diamond and Kindred Weaves; Bedford Cords; Backed Fabrics; Fustians; Terry and Loop Pile Fabrics; Gauze and Net Leno Fabrics; Leno Brocade Fabrics; Tissue, Lappet, and Swivel Figured Fabrics, also Ondule Fabrics; Brocade Fabrics; Damask Fabrics; Alhambra and Kindred Fabrics; Piques or Toilet Welts, also Matelasse Fabrics; Toilet Quilting Fabrics; Patent Satin or Mitcheline Fabrics; Tapestry Fabrics, also Kidderminster or Scotch Carpet Fabrics.

**PATTERSON, D.** *Textile Color Mixing.* A manual intended for the use of dyers, calico printers, and color chemists. *Second Edition, Revised.* 41 ill., 5 plates, 5½ x 8¾, 140 pp. **\$3.50**

**CONTENTS:** Color a Sensation; Light Waves; Objects Luminous and Illum-



inated; Colors of Illuminated Bodies; Production of Color by Absorption; Diffraction; Dispersion; Fluorescence; Colors of Opaque and Transparent Bodies; Surface Color; Analysis of Light; Spectrum; Homogeneous Colors; Ready Method of Obtaining a Spectrum; Simple Absorption Spectra; Aid of Spectroscope; Examination of Solar Spectrum; Dark Lines; Locality of the Colors; The Spectroscope: Its Construction; Absorption Spectra; Colorists' Use of the Spectroscope. *Color by Absorption.* Absorption of Color Produced by Admixture; Absorption Spectra; Solutions and Dyed Fabrics; Luminosity Curves; Absorption Curves; Dichroism; Dichroic Colored Fabrics in Gaslight; Color Primaries of the Scientist *Versus* the Dyer and Artist; Color Mixing by Rotation and by Dyeing; Secondary and Tertiary Colors; Constants; Hue, Purity, Brightness; Tints, Shades, Scales, Tones, Sad and Sombre Colors; Complementary Colors. *Color Mixing.* Mixing Qualities of Colors; Pure and Impure Green, Orange and Violet; Large Variety of Shades from Few Colors; Consideration of the Practical Primaries, Red, Yellow and Blue; Secondary Colors; Orange; Green; Violet; Nomenclature of Violet and Purple Group; Violet from Rhodamine Pink and Wool Green; Purple; Tints and Shades of Violet; Changes in Artificial Light. *Tertiary Shades.* Broken Hues; Maroons; Browns; Citrines and Olives; Absorption Spectra of Tertiary Shades; Dyed Patterns; Appendix; Four Plates with Dyed Specimens illustrating text.

**PATTERSON, D. Color Matching on Textiles.** A manual intended for the use of dyers, calico printers, and textile color chemists. 29 ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 140 pp. **\$3.50**

**CONTENTS:** Light and Color; Structure and Function of the Eye; Daylight for Color Matching; Color Constants; Difficulties in Matching; Reflected Light Examination; Transmitted Light Matching; Color Modifying Influences in Dyed Textiles; Use of Tinted Films; Color Blindness; Matching Dyed Silks and Old Fabrics; Aspect of Shades Under Artificial Lights.

**PATTERSON, D. Color Printing of Carpet Yarns.** A useful manual for color chemists and textile printers. Ill.,  $6 \times 8\frac{3}{4}$ , 148 pp. **\$3.50**

**CONTENTS:** Wool Fibre; Yarn Scouring; Scouring Materials; Water; Purification of Lime; Bleaching Carpet Yarns; Colors, Dyes and Color Making; Color Printing Pastes; "Hank" Printing; Yarn Printing; Steaming; Washing; Aniline Colors; Glossary of Drugs and Dye Wares Used in Wool Yarn Printing; Tables.

**POLLEYN, F. Dressings and Finishings for Textile Fabrics and Their Application.** Translated from the third German edition by Charles Salter. 60 ill.,  $5\frac{3}{4} \times 8\frac{1}{2}$ , 279 pp. **\$3.50**

**CONTENTS:** The Dressing Process and Materials for Same; Stiffenings and Glazes; Adhesive Dressings; Materials for Soft Dressings; Dressings for Filling and Loading; Antiseptic Dressing Ingredients; Dyeing and Blueing Agents; Various Dressings; The Preparation of Dressing; Recipes for Dressings; Dressings for Linens; Yarn Dressings; Laundry Glazes; Yarn Sizing; Finishing Woolen Goods; Finishing Silk Fabrics; Waterproof Dressings; Fireproof Dressings; Special Finishing Process; the Application of Dressing Preparations; Testing Dressings.

**RAYNER, H. Silk Throwing and Waste Silk Spinning.**

*New Edition in Press*

**CONTENTS:** Raw Silk; The Silkworm; Egg Hatching; Cocoon Reeling and Qualities of Silk; Throwing; Waste Spinning; Wastes; Preparation of Waste for Degumming; Waste Degumming; Opening and Dressing of Wastes; Waste Drawing and Preparing Machinery; Short Spinning Machinery; Spinning and Finishing Processes; Utilization of Waste Products.

**REISER, N. Spinning and Weaving Calculations.** With special reference to woolen fabrics. Translated from the German by Charles Salter. 34 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 172 pp. **\$5.00**

**CONTENTS:** Calculating the Raw Material; The Yarn; Reed Calculations;

Calculations for Weaving; Harness Calculations; Finishing and Estimating from Cuttings. *Calculating Full Cost of Goods*. Preliminary Remarks; Various Methods; Special Methods; Calculation of Fabrics Beforehand to Match Samples.

**REISER, N.** *Faults in the Manufacture of Woolen Goods and Their Prevention.* Translated from the *Second German Edition* by Arthur Morris and Herbert Robson. Ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 186 pp. **\$2.50**

**CONTENTS:** Improper Raw Material; Wrong Treatment of Material; Improper Setting of Goods in the Loom; Wrong Placing of Colors; Wrong Weight or Width of the Goods; Breaking of Warp and Weft Threads; Errors in Woven Structure; Inequalities, Bands and Stripes; Faulty Borders; Defective Selvedges; Holes and Balloons; Rubbed Places; Creases; Spots; Loose and Bad Colors; Badly Dyed Selvedges; Hard Goods; Brittle Goods; Uneven Goods; Removal of Bands, Stripes, Creases and Spots.

**SMITH, W.** *Chemistry of Hat Manufacturing.* Lectures delivered before the hat manufacturers' association. Revised and edited by Albert Shonk. Ill.,  $5 \times 7\frac{1}{4}$ , cloth, 131 pp. **\$3.50**

**CONTENTS:** Textile Fibres, Principally Wool, Fur and Hair; Water, Its Impurities and Their Action; Acids and Alkalis; Boric Acid; Borax; Soap; Shellac; Wood Spirit; Stiffening and Proofing Process; Mordants; Dyestuffs and Colors; Dyeing of Wool and Fur; Optical Properties of Colors.

**TAILFER, L.** *Practical Treatise on the Bleaching of Linen and Cotton Yarn and Fabrics.* Translated from the French by John G. McIntosh. Ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 318 pp. **\$7.00**

**CONTENTS:** General Considerations of Bleaching, Steeping, Washing, Lye Boiling, Mather and Platt's Keir; Soap; Bleaching on Grass or on the Bleaching Green or Lawn; Sours; Drying; Damages to Fabrics in Bleaching; Valuation of Caustic and Carbonated Alkali; Chlorometry or Filtration of Decolorizing Chlorides; Chlorine and Decolorizing Chlorides; Water; Bleaching of Yarn; Installation of a Bleaching Works; Energy of Decolorizing Chlorides; Production of Chlorine and Hypochlorites by Electrolysis Bleaching by Ozone.

**THORNLEY, T.** *Cotton Combing Machines.* 121 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 358 pp. **\$3.50**

**CONTENTS:** Silver Lap Machine, Ribbon Lap Machine and Draw Frame; Description of Heilmann Comber; Cam Shaft; Detaching and Attaching Mechanism of Comber; Duplex Comber; Resetting of Combers; Erection of a Heilmann Comber; Stop Motions; Various Calculations; Various Notes and Discussions; Cotton Combing Machines of Continental Make.

**THORNLEY, T.** *Cotton Waste.* Its production, manipulation and uses. 60 ill.,  $6 \times 8\frac{3}{4}$ , 292 pp. **\$3.50**

**CONTENTS:** Production, Characteristics, and Regulation of Cotton Waste; Treatment of Best Cotton Wastes in Cotton-Spinning Mills, with other notes; Opening and Cleaning of Cotton Waste; Carding of Cotton Waste; Final Spinning Machines for Cotton Wastes; Use of Cotton Waste Yarns in Weaving; Various Notes.

**THORNLEY, THOMAS.** *Cotton Spinning.* In three volumes. Ill.,  $5 \times 7\frac{1}{4}$ . First Year. 84 ill., 170 pp. **\$1.50**

**CONTENTS:** Cultivation, Classification, Ginning, Baling and Mixing of the Raw Cotton; Bale-Breakers, Mixing Lattices and Hopper Feeders; Opening and Scutching; Carding.

Second Year. *Third Edition, Revised and Greatly Enlarged.* 112 ill., 315 pp. **\$3.50**

**CONTENTS:** The Combing Process; The Drawing Frame; Bobbin and Fly Frames; Mule Spinning; Ring Spinning.



Third Year. *Second Edition.* 75 ill., 225 pp.

\$2.50

**CONTENTS:** Cotton; The Practical Manipulation of Cotton Spinning Machinery; Doubling and Winding; Reeling, Bundling and Gassing; Warping, Testing, Commerce and Uses of Yarns; Production and Costs; Main Driving; Arrangement of Machinery and Mill Planning; Waste and Waste Spinning.

**TURNER, H.** *Worsted Spinners' Practical Handbook.* 54 ill., 5 x 7½, 145 pp. \$3.00

**CONTENTS:** *Preparing.* Objects; Suitability; Machinery; Points to be Observed; Particulars for Calculating; Turn Off from Preparing Gill Boxes. *Carding.* Worsted Carding; Particulars of Machine; Advantages; Points Requiring Attention; Card Feeding; Action of Hopper Feed; Worsted Card; Driving of Parts; Card Clothing; Foundation; Wire; Character and Shape of Wire; The Setting of Wire into the Foundation; Form of Finished Clothing; Method of Counting Card Clothing. *Combing.* The Balling Punch; Noble's Comb. *Open Drawing.* Particulars of Drawing; Points Influencing Number of Operations; Hints on Gilling and Drawing; Feeding; Levelling up in Drawing; The Turn-off of Machines. *Cone Drawing.* Drafting, Spindle Driving; Bobbin Driving; Lifter Driving; Cone Drawing and Roving. *Spinning.* Counts of Yarn, Draft and Twist; Ratch and Carriers; Twist; Flyer Spinning; Lifter Motion; Calculations for Lifter.

A practicable book, small enough for the pocket, on the daily routine of the worsted spinner's work, so concise and accurate as to be an invaluable companion.

**VON GEORGIEVICS, G.** *The Chemical Technology of Textile Fibres.*

Their origin, structure, preparation, washing, bleaching, dyeing, printing and dressing. Translated from the German by Charles Salter.

*New Edition in Press*

**CONTENTS:** *The Textile Fibres.* Washing, Bleaching, Carbonising. *Mordants and Mordanting.* Dyeing. Theory of Color; Theory of Dyeing; Classification of Dyestuffs; Dyeing on a Manufacturing Scale; Sample Dyeings. *Printing.* Reproductions of Patterns by Direct Printing; Combined Printing and Dyeing; Discharge Style Printing; Reserve Style Printing; Topping Printing. *Dressing and Finishing.* Starch, Gum, Fatty Substances; Hygroscopic Materials; Loading Ingredients; Coloring for the Dressing Preparations; Metals or Their Sulphites; Waterproofing; Fireproofing Antiseptics for Prevention of Mould.

**ZIPSER, J.** *Textile Raw Materials, and Their Conversion into Yarns.*

Translated from the German by Charles Salter. 302 ill., 6¼ x 8¾, 500 pp. \$5.00

**CONTENTS:** Raw Materials Used in Textile Industry; Mineral, Vegetable and Animal Raw Materials; Technology of Spinning or Conversion of Textile Raw Material into Yarn; General Review of Various Branches of the Spinning Process; Spinning Vegetable and Animal Raw Materials.

### DYES AND DYEING

**BARNETT, E. DeB.** *Coal Tar Dyes and Intermediates.* 5½ x 8¾, 229 pp. (Industrial Chemistry Series.) \$3.50

**CONTENTS:** Introduction. *The Intermediate Compounds.* Nitration; Amidation; Sulphonation; Hydroxylation; Miscellaneous Intermediates. *The Dyestuffs.* The Nitroso-Dyes The Nitro-Dyes; The Azo-Dyes; The Diphenylmethane Dyes; The Triphenylmethane Dyes; The Indamines and Indophenols; The Azines; The Oxazines; The Thiazines; The Indigold Dyestuffs; The Anthraquinone Dyes; The Quinoline Dyes; The Acridine Dyes; The Sulphur or Sulphide Dyes. Gives a clear account of the most important synthetic dyes and the intermediate compounds from which they are derived. Being essentially a book on industrial chemistry, information of purely academic interest has been largely omitted.



**BARNETT, E. DeB.** *Synthetic Dyes.* 5½ x 8¾. (Industrial Chemistry Series.) *In Press*

**FAY, IRVING W.** *The Chemistry of Coal-Tar Dyes. Second Edition, Revised and Enlarged.* 6 x 9, 500 pp. \$5.00

(Author is professor of chemistry at Polytechnic Institute, Brooklyn.)

**CONTENTS:** Coal-Tar and its Products. The Hydrocarbons and their Derivatives. The Nitro and Nitroso Dyes. The Triphenylmethane Dyes. Classification of the Coal-Tar Dyes. Azo Dyes. Seven Food Colors. Pyronines. Indomines, Indophenols, Thiazines, Oxazines. Eurhodines and Safranines. Quinoxiline, Quinoline and Acridine Dyes. Aniline Black. Alizarin Dyestuffs. Indigo. Sulphur Dyes. Mordants; Vat Dyes; Thiazol Dyes; Experimental Work.

Intended for those students and dyers who have a good knowledge of general chemistry, and some knowledge of organic chemistry. The object is to present, briefly, the origin and history of coal-tar production, and a discussion of the intermediate products between the coal-tar and the dyes themselves. The methods of making the dyes are taken up, followed by a study of the relations of the great classes of dyes, and also the individual dyes themselves, to one another in the same class. The development of one color from another by a change in its composition is explained, and tables showing the variation of color accompanying change of composition are included. The proof of constitution is in many places given in such detail as to allow the student to comprehend the bases for the structure of the complex molecules of the dyes. The use of mordants and the character of the union between the dyes and animal and vegetable fibres are also included. A few manufacturing processes are introduced here and there in detail, to give clear conceptions of this phase of the subject. Some practical experience to assist in comprehending the theory of the subject is made possible by a course of experiments, the performance of which aids in vivifying this difficult and interesting subject.

**SOXHLET, D. H.** *Art of Dyeing and Staining Marble, Artificial Stone, Bone, Horn, Ivory and Wood.* Translated from the German by Arthur Morris and Herbert Robson. 5¼ x 7½, 176 pp. \$2.50

**CONTENTS:** Mordants and Stains; Natural Dyes; Artificial Pigments; Coal Tar Dyes; Staining Marble and Artificial Stone; Dyeing, Bleaching and Imitation of Bone, Horn and Ivory; Wood Dyeing; Varnishes and Polishes.

**VON GEORGIEVICS, G.** *Chemistry of Dyestuffs.* Translated from the *Second German Edition* by Charles Salter. 6 x 8¾, cloth, 412 pp.

*Revised Edition in Press*

**CONTENTS:** Coal Tar; Intermediate Products in the Manufacture of Dyestuffs. *The Artificial Dyestuffs.* Nitroso; Nitro; Azo; Substantive Cotton; Azoxystilbene; Hydrazones; Ketonimides; Triphenylmethane; Rosolic Acid; Xanthene; Xanthone; Flarones; Oxyketone; Quinoline and Acridine; Quinonimide; The Azine Group; Eurhodines; Safranines; Quinoxalines; Indigo; Dyestuffs of Unknown Constitution; Sulphur or Sulphine Dyestuffs; Development of the Artificial Dyestuff Industry; Natural Dyestuffs; Mineral Colors.

**WHITTAKER, C M.** *The Application of the Coal Tar Dyestuffs.* The principles involved and the methods employed. 5½ x 8¾, 252 pp. (Industrial Chemistry Series.) \$3.00

**CONTENTS:** General Survey of Dyeing; The Varied Uses of the Basic Dyestuffs; The Application of the Acid Dyestuffs; The Turkey-Red Industry, and Other Uses of the Alizarine Dyestuffs; The Application of the Direct Cotton Dyestuffs, Including Those Which Develop on the Fibre; The Azo-coloring Matters and Their Special Use in Dyeing; The Properties of the Resorcine Dyestuffs; The Application of the Sulphur Dyestuffs; The Application of the Vat Dyestuffs; The Dyeing of Union Materials, Including Garments; Colors Pro-



duced on the Fibre by the Oxidation of Coal Tar Products; Other Uses of Coal Tar Dyestuffs Still in Use; The Valuation and Detection of Dyestuffs.

This book has been written with a view to giving the reader a firm grasp of the chemical principles involved, and the methods used in the application of the coal tar dyestuffs, so that when he commences to carry out dyeing under actual commercial conditions he will know the why and the wherefore of the methods employed.

**WOOD, JOHN K.** *The Chemistry of Dyeing.* 5¼ x 7½. 90 pp. (Van Nostrand's Chemical Monographs.) \$1.00

**CONTENTS:** The Chemical Composition and Properties of the Textile Fibers; Dyes and Their Properties; The Nature of the Dyeing Process; Bibliography. A concise and connected account of the work which has been carried out, particularly during the last thirty years, with the object of throwing light on the nature of the dyeing processes.

### CANNING AND PRESERVING

**HAUSNER, A.** *Manufacture of Preserved Foods and Sweetmeats.* A handbook of all the processes for the preservation of flesh, fruit, and vegetables, and for the preparation of dried fruit, dried vegetables, marmalades, fruit-syrups, and fermented beverages, and of all kinds of candies, candied fruit, sweetmeats, rocks, drops, dragees, pralines, etc. Translated from the *Third Enlarged German Edition* by Arthur Morris and Herbert Robson, B.Sc. 28 ill., 5 x 7¾, 231 pp. \$3.50

**CONTENTS:** Causes of Putrefaction of Food; Composition of Food; Decomposition; Various Methods of Preserving; Meats; Eggs; Milk; Fat; Vegetable Foods; Fruits; Manufacture of Jam and Jellies; Manufacture of Candied Fruit; Carmelized Fruit; Bonbon Making; Fruit Drops; Machinery and Appliances for Candy Making; Oils in Candy Making; Recipes, etc.

**WAGNER, E.** *Recipes for the Preserving of Fruit, Vegetables and Meat.* Translated from the German. 14 ill., 6 x 9, 125 pp. \$2.50

**CONTENTS:** *Preserved Fruits.* Canned Fruits; Glazed and Candied Fruits; Marmalades, Jams, and Fruit Juices; Fruit Jellies; Fruit Pulp for Ices; Preserved Vegetables; Preserved Meats.

### FOOD INSPECTION—DRUGS

**BENNETT, H. G.** *Animal Proteids.* 5½ x 8¾. (Industrial Chemistry Series.) *In Press*

**BLYTH, A. W., and BLYTH, M. W.** *Poisons: Their Effects and Detection.* *Fourth Edition, Thoroughly Revised, Enlarged and Rewritten.* Ill., 7 x 9¼, 804 pp. \$8.50

**CONTENTS:** Introductory; Classification; Poisonous Gases; Carbon Monoxide; Chlorine; Hydric Sulphide; Acids and Alkalies; Volatile Poisonous Substances Separable by Distillation from Neutral or Acid Liquids; Alkaloids and Poisonous Vegetable Principles Separated by Alcoholic Solvents; Poisons Derived from Living or Dead Animal Substances; Oxalic Acid Groups of Poisons; Inorganic Poisons; Appendix.

**BLYTH, A. W., and BLYTH, M. W.** *Foods: Their Composition and Analysis.* A manual for the use of analytical chemists and others. With an introductory essay on the history of adulteration. *Sixth Edition, Thoroughly Revised, Enlarged and Rewritten.* Ill., 6¾ x 9¼, 645 pp. \$8.50

**CONTENTS:** History of Adulteration in Various Countries; Introductory;

Carbo-Hydrates; Milk, Cream, Butter, Cheese; Tea, Coffee, Cocoa; Alcohol, Spirits, Fermented Liquors, Wine; Vinegar; Mustard, Pepper, Spices, Condiments; Examination and Water Analysis.

**BRUCE, EDWIN M.** *Detection of the Common Food Adulterants. Third Edition, Revised and Enlarged.* 5¼ x 7½, 95 pp. \$1.40

**CONTENTS:** Dairy Products; Meat and Eggs; Cereal Products; Leavening Material; Canned and Bottled Vegetables; Fruits and Fruit Products; Flavoring Extracts; Saccharine Products; Spices; Vinegar; Fats and Oils; Beverages.

For this *Third Edition* the book has been greatly enlarged and added to, so that it now contains the latest and most approved tests for the common food adulterants. It aims to give the qualitative tests for the purity of various foods, and includes a list of the more common adulterants. It will prove, as before, of great help to health officers, food inspectors, chemistry teachers, and all others called upon to test the purity of various foods and food products.

**CHRISTIAN, M.** *Disinfection and Disinfectants.* Translated from the German by Chas. Salter. 18 ill., 5¼ x 7¾, 112 pp. \$2.50

**CONTENTS:** *Physical Disinfection.* Heat, Light and Other Rays; Electric Currents and Mechanical Influences. *Chemical Disinfection.* Liquid Disinfectants; Tablets; Gaseous Disinfectants; Combined Systems of Disinfection; Gartner's Method of Disinfecting Books; Formalin Vapor Method.

**MACEWEN, HUGH A.** *Food Inspection.* A practical handbook. Illus. 6¼ x 9, 264 pp. \$2.50

**CONTENTS:** The Inspection of Meat, and the Diseases Commonly Met with in the Abattoir, The Construction and Management of Slaughter Houses and Public Abattoirs, and the Law Relating to Slaughter Houses and Markets; The Inspection of Fish, Poultry, Game, Vegetables, Fruit, etc., Considered from a Hygienic Standpoint, and the Law Relating to Unsound Foods; Preservation and Storage of Meat and other Foods, and the Causes of Unwholesomeness in Food.

**PAKES, W. C. G., and NANKIVELL, A. T.** *The Science of Hygiene.* A text-book of laboratory practice. 80 ill., 5 x 7¾, 175 pp. \$1.75

**CONTENTS:** Water Analysis. Interpretation of Results. Standard Solutions. Analysis of: Milk; Butter; Flour; Bread; Coffee; Spirits; Wines; Beer; Vinegar; Air; Soils; Disinfectants. Microscopy. Meat Inspection. Appendix.

This new edition of Dr. Pakes' work aims to maintain the standard of excellence set by its predecessor in furnishing a concise and simple laboratory manual, apart from bacteriological methods, for those who work in public health laboratories.

**PARRY, ERNEST J.** *The Analysis of Food and Drugs.* In two volumes. Ill., 6¼ x 9¾.

Vol. I. *The Analysis of Food and Drugs (Chemical and Microscopical).* 59 ill., 752 pp. \$9.50

**CONTENTS:** *Foods* Tea, Cocoa, and Chocolate, Cocoa Butter, Coffee; Milk, Cheese, Butter, Lard, Suet, Olive Oil; The Carbohydrate Foods; Spices, Flavoring Essences, etc.; Alcoholic Beverages; Flesh Foods, Extract of Meat, Gelatine; Microscopical Analysis. *Drugs.* Crude Drugs and Certain Galenicals; Drugs Containing Alkaloids, Capable of Approximate Determination; The Essential Oils of the British Pharmacopoeia; The Fixed Oils, Fats, and Waxes of the British Pharmacopoeia; The Chemicals of the Pharmacopoeia; Table of Chemicals.

Vol. II. *The Sale of Food and Drugs Acts, 1875-1907.* 181 pp. \$3.50

**CONTENTS:** Introduction; The Sale of Food and Drugs Act, 1875; The Sale of Food and Drugs Act Amendment Act, 1879; The Sale of Food and Drugs Act, 1899; The Margarine Act, 1887; The Butter and Margarine Act, 1907.



**RIDEAL, S.** *The Carbohydrates.* 5½ x 8¾. (Industrial Chemistry Series.)

*In Press*

**VACHER, FRANCIS.** *The Food Inspector's Handbook.* A practical guide for medical officers of health, meat inspectors, army officers, students, and others. *Sixth Edition, Thoroughly Revised and Greatly Enlarged.* 98 ill., colored plates, 5¼ x 7¾, 340 pp.

**CONTENTS:** The Food Inspector; His Qualifications and Obligations; Statutory Powers; Animals, Carcasses and Butchers' Meats; Diseases of Animals which Render Meat Unfit for Human Food; Diseases of Animals which Depreciate the Quality of the Meat; Mode of Cutting up Meat; Poultry and Game; Fish; Fruits and Vegetables; Corn, Bread and Flour; Milk; Arrowroot and Similar Preparations; Butter and Its Substitutes; Cheese, Lard and Eggs; Tea, Coffee, Cocoa and Sugar; Condiments, Spices, etc.

AGRICULTURAL CHEMISTRY

(Soils and Fertilizers)

**AIKMAN, C. M.** *Manures and the Principles of Manuring.* Third Edition.

5 x 7½, 623 pp.

*Reprinting*

**CONTENTS:** Introduction; Fertility of the Soil; Functions Performed by Manures; Nitrogen; Nitrification; Phosphoric Acid; Potash; Farmyard Manure; Guano; Nitrate of Soda; Sulphate of Ammonia; Bones; Mineral Phosphates; Superphosphates; Thomas-Phosphate or Basic Slag; Potassic Manures; Minor Artificial Manures; Sewage as Manure; Composts; Indirect Manures; Gypsum; Salt; Application of Manures; Manuring of the Common Farm Crops; Methods of Application and Mixing Manures; Valuation and Analysis; The Rothmansted Experiments.

**BOURCART, E.** *Insecticides, Fungicides and Weedkillers.* A practical manual on the diseases of plants and their remedies, for the use of manufacturing chemists, agriculturists, aboriculturists and horticulturists.

Translated from the French and revised by Donald Grant. 83 tables, 12 ill., 6 x 8¾, 450 pp.

**\$6.00**

**CONTENTS:** Plant Pathology; Etiology; Animal Parasites; Vegetable Parasites; Microbe Parasites; Balanced Disinfection; Therapeutics; Vegetable Surgery; Prophylaxy; Insecticides, Fungicides, and Weed Killers; Dictionary of Insects Injurious to Plants; Dictionary of Fungoid Diseases of Plants.

**CHURCH'S Laboratory Guide.** A manual of practical chemistry for colleges and schools, specially arranged for agricultural students. *Ninth Edition, Revised and Largely Rewritten,* by Edward Kinch. Ill., 5 x 7½,

384 pp.

**\$2.50**

**CONTENTS:** *Chemical Manipulations. Qualitative Analysis.* Method; Solutions; Analytical Schemes; Table of Solubilities; Example. *Quantitative Analysis.* Sampling and Analysis of Manures; Analysis of Soils, Water and Foods; Apparatus.

**COLLINS, S. H.** *Plant Products and Chemical Fertilizers.* 5½ x 8¾ 252 pp. (Industrial Chemistry Series.)

**\$3.00**

**CONTENTS:** Introduction. *Fertilizers:* Nitrogen Group of Fertilizers; The Phosphorus Group of Fertilizers; Potassium Group of Manures; Mixed Fertilizers. *Soils.* Soils and Their Properties; Special Soil Improvers; Soil Reclamation. *Crops.* Photosynthesis; The Carbohydrates Produced in Crops; The Oil-Bearing Plants; The Nitrogen Compounds in Plants; Miscellaneous Plant



Products; Produce Variability. *The Production of Meat.* The Foods Fed to Beasts; Calorific Value of Foods; Dairy Products; Future Developments. The raw materials of agriculture are often the waste products of the other industries, and the produce of agriculture again forms the raw material for other industries. This book picks up the story of those industrial waste products which are useful as fertilizers, and carry it on through the soil and crops, until new products are available for industrial uses. The volume covers the cycle from factory to fertilizer, from fertilizer to field, and from field to factory once more.

**FRITSCH, J.** *The Manufacture of Chemical Manures.* Translated from the French, with numerous notes, by Donald Grant. 69 ill., 108 tables, 6 x 8¾, 355 pp. **\$5.00**

**CONTENTS:** Phosphoric Acid. Principal Phosphate Deposits. Drying and Enrichment of Phosphates. Historical Review of Superphosphate Manufacture. Theory of Manufacture of Soluble Phosphate. Superphosphate Manufacture. Crushing, Sifting, Drying, and Storing of Superphosphate. Retrogradation. Compound Manures. Manufacture of Phosphoric Acid. Double Superphosphates and Various Products. Manufacture of Bone Dust and of Bone Superphosphate (Vitriolized Bones.) Manufacture of Basic Slag. Nitrogenous Manures. Manufacture of Manure from Animal Waste. Recovery of Nitrogen from Distillery Spent Wash. Manufacture of Cyanamide and of Nitrate of Lime. Nitrogenized Phosphatic Manures. Potassic Manures. Transference and Handling of Raw Materials and Finished Products.

**GRIFFITHS, A. B.** *A Treatise on Manures, or the Philosophy of Manuring.* A practical handbook for the agriculturist, manufacturer, and student. Ill., 5¼ x 7¾, 469 pp. *Reprinting*

**CONTENTS:** The Constituents of Plants; Vegetable Physiology; Natural Manures; Artificial Manures; Phosphatic Manures; The Manure Works; Artificial Nitrogenous Manures; Various Mineral Manures; Iron Sulphate as a Manure; Ville's System of Manuring; Application of Manures.

**GROSS, E.** *Hops, in Their Botanical, Agricultural and Technical Aspect, and as an Article of Commerce.* Translated from the German by Charles Salter. With tables and diagrams. 78 ill., 6¼ x 9, 353 pp. **\$5.00**

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**MURRAY, J. A. Soils and Manures.** 33 ill.,  $5\frac{3}{4} \times 8\frac{1}{4}$ , 367 pp. (Van Nostrand's Westminster Series.) **\$2.00**

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## DAIRY CHEMISTRY

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# PHYSICAL SCIENCES

## PHYSICS

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carded; Atoms of Oxygen, Sulphur, Chlorine and Bromine Not All Alike in Different Crystals, Though They Have the Same Atomic Weight; Why Crystals Are Almost Incompressible; Calculation of the Bulk Modulus; Comparison with Experimental Values; Departure from the *Steady State* Introduces an Entirely New Set of Phenomena; Energy Transfer; The Nature of Heat; Theory Leads Us to Expect That the Same Bodies When Hot Attract Each Other Gravitationally with Greater Force Than When Cold; Shaw Has Detected a Temperature Coefficient Experimentally; Effects That Produce Changes in the Atoms Themselves; Magnetization; Conduction in Metals; Speculation as to the Kind of Chemical Elements in the Interior of the Earth, Based upon the Gravitational Theory; Probably Hydrogen; Formation of Molecules with Atoms; Planck's Theory; The Constant "h"; Attempt to Throw Some Light upon This Constant by the Use of Electromagnetic Theory; Possible Classification of the Phenomena Based upon a Distinction Between the *Steady State* and the State When There is a Transfer of Energy; Thermo-chemistry; Energy Transfer the Principal Subject Before Us.

**CREHORE, A. C.** *New Theory of the Atom.* 5 x 7½. *In Press*

**ERWIN, MARION.** *The Universe and the Atom.* The ether constitution, creation and structure of atoms, gravitation, and electricity, kinetically explained. 58 ill., 5¾ x 8¼, 324 pp. *Reprinting*

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(Author is Dean Emeritus of the Faculty of the graduate school and Professor of Physics in New York University.)

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(Authors are Professor and Associate Professor of Physics and Electrical Engineering at the Polytechnic Institute of Brooklyn.)

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(Author is professor of physics in the University of Maine.)

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(Author is physicist with the Nela Research Laboratory National Lamp Works of the General Electric Co.)

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**CONTENTS:** *Introduction.* Purpose of the Book; Analysis of Present Conditions; Character of Photographic Emulsions. *Actinism.* Time. *Diaphragm Systems.* A New Physical Quantity; The Element of Time; Plane and Solid Angles; The *f* System; Derivation of the Unit Cone; The U. S. or Uniform System; The Unit Diaphragm Scale; Unit Actinometry; The *f/1* Actinometer; Actinic Measurements of and at Surfaces; The Least Visible Tint and the First Appearance Time; The Absolute Actinic Unit; The "Actino"; The Standard Tinting Medium; Tinting Mediums Other Than the Standard. *Problems in Unit Actinometry.* *Unit Sensitometry:* The Speed of Emulsions; The Method as Practiced; The Latitude of Emulsions. *Actinic Contrasts.* Comparison of Different Actinities; The Relation of Actinic Graduation to the Tone Steps of the Picture. *Classification of Subjects as to Their Actinic Contrasts:* Subjects of Minimum, Under-Normal, Normal and Over-Normal Contrast. *The Hurter and Driffield System:* Introduction; A Perfect Negative; The Characteristic Curve; Law of Constant Density Ratios; Measurement of Opacity. *Negative Making:* Development and Fixing; Reduction and Intensification. *Practice:* Actinicity of the Subject; A Practical Analysis of Subjects; Classification of Subjects; The Unit Method of Exposing for Exterior Subjects; The Character of Sun Light in Clear Weather; An Exposure Recompense; The Speed of Plates and Films.

On the basis of a new unit, that of the dimension of solid angle or convergence, the author has established a practical unit of Actinicity for the measurement of the intrinsic actinic intensity of surfaces; light sources and expanses and by these means has developed a scientific method of photographic practice in which exposure is deduced from unit measurements by the simplest, easily comprehended, analytical reasoning.

**WATKINS, A.** Photography; Its Principles and Applications. 100 ill.,  
*Second Edition.* 5¾ x 8½, 349 pp. \$3.00

(Author is past president of the Photographic Convention.)

**CONTENTS:** First Principles. Lenses. Exposure Influences Practical Exposure. Development Influences. Practical Development. Cameras and Dark Room Orthochromatic Photography. Printing Processes. Hand Camera Work. Enlarging and Slide Making. Color Photography. General Applications. Record Applications. Science Applications. Plate Speed Testing. Process Work (Photo-Mechanical Printing). Pinhole Photography.

ASTRONOMY

**BALL, S. R.** *Popular Guide to the Heavens.* A series of eighty-three plates, colored and lithographed, with explanatory text and index. *Third Edition.* Ill., 7 x 9, 96 pp. **\$5.00**

**CONTENTS:** The Celestial Sphere and the Solar System; The Planets and Satellites; The Sun; Eclipses of the Sun and Moon; Comets; The Moon; The Sky; Month by Month and the Index to the Planets; The Star Maps; Star Clusters and Nebulae; Select List of Telescopic Objects; Standard Time.

**CHAMBERS, GEORGE F.** *Astronomy.* 358 ill., 8 colored plates.  $4\frac{3}{4}$  x  $6\frac{1}{2}$ , 350 pp. **\$1.50**

**CONTENTS:** The Sun. Moon. Tides. The Planets Generally. Most Interesting and Familiar Planets. Less Known Planets. Eclipses. Comets. Shooting Stars. The Stars. Groups of Stars and Nebula. The Constellations. Telescopes. Time and Its Measurement. The Spectroscope Astronomically. Table of the Constellations, with a brief Descriptive Account of Each. Statistics Respecting the Planets and Their Satellites. Catalog of Celestial Objects easy for Small Telescopes. Written especially for the reader, who, without being acquainted with the higher mathematics of the subject, and without fitting up a costly laboratory, would like to have some knowledge of the elementary relations between the heavenly bodies and the every day life of the world. The very large number of excellent illustrations make the book the more interesting.

**NOLAN, THOMAS.** *The Telescope. Revised and Enlarged.* Ill.,  $3\frac{3}{4}$  x 6, boards, 128 pp. (Van Nostrand's Science Series, No. 51.) **\$0.75**

**CONTENTS:** *The Optical Principles Involved in the Construction of the Telescope.* The Simple Refracting Telescope; The Reflecting Telescope; The Compound Refracting, or Modern Aplanatic and Achromatic Telescope; Comparison of Refracting and Reflecting Telescopes; Improvements in the Telescope since 1880. *Bibliography.* Books, Scientific Papers; Periodical Literature.

**SHAW, W. N.** *Forecasting Weather.* 155 ill., folding maps, charts,  $6$  x  $8\frac{3}{4}$ , 408 pp. **\$3.50**

(Author is director of the Meteorological Office of London.)

**CONTENTS:** Synoptic Charts. Relation of Wind to Barometric Pressure. Relation of Temperature and Weather to Barometric Pressure. Types of Weather and the Further Outlook in Weather Forecasting. Local Weather in Relation to Weather Type. Physical Processes of Weather. Life History of Surface Air Currents. Relation of Air Currents to Barometric Minima. Trajectories of Air. Minor Fluctuations of Pressure. Line Squalls and Lignes de Grain. Gales and Storm Warnings. Anticyclones and Land Fog. Coastal Forecasts, Sea Fogs and Thunderstorms. Forecasts for Agriculturists. Colliery Warnings. Approach of Depressions. Movement of Depressions. The Upper Air. Statistical Methods for Long Period and Seasonal Forecasting. Practical Utility of Weather Forecasts.



# ELECTRICAL ENGINEERING

## ELECTRICITY AND MAGNETISM

**ASHE, SYDNEY W.** *Electricity, Experimentally and Practically Applied.*

A book for the beginner and for the practical man. *Second Edition, Revised.* 422 ill.,  $5\frac{1}{2} \times 7\frac{3}{4}$ , 375 pp. **\$2.00**

**CONTENTS:** Magnetism. Electro-magnetism. Electro-magnetic Induction. Ohm's Law. Batteries, Primary and Storage. Electrolysis and Electrolytic Corrosion. The Three-wire System. Electrical Measurements. The Shunt Motor. The Series Motor. Arc Lighting. Incandescent Lighting. Thomson Recording Wattmeter. Principles of Alternating Currents. The Transformer. The Induction Motor. The Rotary Converter. Appendix. Experimental Projection.

Treats of the fundamentals of electricity in an experimental and practical way, showing, where possible, the direct application of theory to practical engineering, with the aid of simple mathematics. It embodies the details of the successful experimental lectures given by the author to the employees of the New York Edison Co., the Edison Illuminating Co. of Brooklyn, the Edison Illuminating Co. of Boston, the Consolidated Gas, Electric Light and Power Co. of Baltimore, and to the students of the Polytechnic Institute of Brooklyn. The volume is particularly adapted to courses given to practical men and should likewise prove useful as a reference for high schools and college laboratory courses.

**ATKINSON, P.** *Elements of Dynamic Electricity and Magnetism.* *Fourth*

*Edition.* 120 ill.,  $5 \times 7\frac{1}{2}$ , 405 pp. **\$2.00**

**CONTENTS:** Voltaic Battery; Definitions; One-Fluid Cells; Two-Fluid Cells; Battery Formation; Magnetism; Electromagnetism; Electric Measurement; The Dynamo and Motor-Electrolysis; Electric Storage; The Relation of Electricity to Heat; To Light; The Electric Telegraph; The Telephone.

**CARHART, HENRY S.** *Thermo-Electromotive Force in Electric Cells.*

The thermo-electric force between a metal and a solution of one of its salts. Ill.,  $5 \times 7\frac{1}{2}$ . *In Press*

**CONTENTS:** Thermo-Electromotive Force Between Metals; Thermo-Electromotive Force Between Metals and Liquids; Concentration Cells; Temperature Coefficients; Thermodynamics of the Voltaic Cell; Electromotive Force of Concentration Cells; Thermodynamics of Concentration Cells; Thermodynamics of Normal Cells; Thermo-EMF Without Temperature Difference.

**CLARKSON, RALPH P.** *Elementary Electrical Engineering.* A textbook of

theory and practice, particularly adapted for the instruction of mechanical, civil, and chemical engineers and others desiring a short course.

Ill.,  $5 \times 7\frac{1}{2}$ , 208 pp. *In Press*

**CONTENTS:** Introduction; Units and Terms; The Solution of Circuits; The Generation of Electricity; Electrical Measuring Instruments; Illumination and Power; Electrical Transmission; Theory of Lighting Devices; Wire Tables. period.

**EWING, A. J.** *The Magnetic Induction in Iron and Other Metals.* *Third*

*Edition, Revised.* 159 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 393 pp. **\$5.00**

**CONTENTS:** Introductory; Measurements of Magnetic Quality; Magnetometric Method; Ballistic Method; Examples of Magnetism; Magnetic Hysteresis; Magnetism in Weak Fields; In Strong Fields; Effects of Temperature; Effects of Stress; Magnetic Circuit; Molecular Theory; Magnetic Testing.



**HEAVISIDE, O. Electromagnetic Theory.** Three volumes. Ill.

Vol. I. *Second Issue.* Ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 466 pp. *Reprinting*

**CONTENTS:** Introduction; Outlines of the Electromagnetic Connections; The Elements of Vectorial Algebra and Analysis; Theory of Plane Electromagnetic Waves; A Gravitational and Electromagnetic Analogy.

Vol. II. Ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 568 pp. *Reprinting*

**CONTENTS:** Mathematics and the Age of the Earth; Pure Diffusion of Electric Displacement; Electromagnetic Waves and Generalized Differentiation; Generalized Differentiation and Divergent Series.

Vol. III. Ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 529 pp. *Reprinting*

**CONTENTS:** Waves from Moving Sources; Note on the Size and Inertia of Electrons; Vector Analysis; Waves in the Ether.

A scholarly work that will provide the means of solving many of the problems which those engaged in practical electrical industrial operations are called upon to consider, and it should also be of great value to the scienti

**PALMER, A. R. Electrical Experiments.** 52 ill.,  $5 \times 7\frac{1}{4}$ , 115 pp. \$0.75

**CONTENTS:** Cells; The Current and Power Spent in Series and Parallel Circuits; Calibration; Ohm's Law; Electrolysis; Accumulators; The Magnetic Effect of a Current; Induced Currents; The Heating Effect of a Current; Simple Technical Experiments; More Advanced Experiments.

**ROBERTS, JOHN, Jr. Laboratory Work in Electrical Engineering** (Preliminary Grade.) A series of laboratory experiments for first- and second-year students of electrical engineering. 108 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 218 pp. \$2.00

**CONTENTS:** Method of Graphical Representation; Ohm's Law; Measurement of Resistance, E. M. F., and Current; The Potentiometer; Calibration of Electrical Measuring Instruments; Miscellaneous Experiments; Physical Tables.

**SWOOPE, C. WALTON. Lessons in Practical Electricity, Principles, Experiments and Arithmetical Problems.** An elementary textbook. *Fifteenth Edition, Revised and Enlarged*, with a new chapter on electric lighting by H. H. Stillman. 404 ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , 507 pp. \$2.00

**CONTENTS:** Magnetism; Magnetisation; Magnetic Fields; Theory of Magnetism; Magnetic Induction; Magnetic Circuits; Earth's Magnetism; Voltaic Electricity; Batteries; Electrolysis; Measurement of Current Strength; Resistance; Ohm's Law and Battery Connections; Circuits and Their Resistance; Electromagnetism; Galvanometers; Electromagnets; Ammeters; Electrical Work and Power; Measurement of Pressure; Measurement of Resistance; Electrical Development of Heat; Electrodynamics; Electromagnetic Induction; The Induction Coil; Dynamo-Electric Machines; Armatures; Direct Current Dynamos; Direct Current Motors; Electric Lighting; Alternating Currents; Tables; Formulas.

This book combines the principles of electricity upon which the practical applications of to-day depend, with the experimental demonstration of these principles and the elements of the arithmetic of electricity used in making practical electrical measurements and calculations. Thirty thousand copies of this book have been used in classes for practical men and by individuals, a fact which attests its merit.

**WILSON, JOHN F. Essentials of Electrical Engineering.** A textbook for colleges and technical schools. 300 ill.,  $6 \times 9$ , 350 pp. \$2.50

(Author is instructor of electrical engineering in the University of Michigan.)

**CONTENTS:** The Electric Circuit; Magnetism and Magnetic Induction; Practical Construction of the Dynamo; The Continuous Current Generator; The Continuous Current Motor; Losses, Efficiencies and Ratings of Continuous Current Dynamos; Polyphase Alternating Currents; The Alternating Current Generator;



The Synchronous Motor; Current Rectifying Apparatus; The Transformer; Transformer Connections; The Induction Motor; Single Phase Commutating Motors; Electric Lamps; Circuit Interrupting Apparatus; Meters; Power Transmission and Distribution; The Storage Battery; Harmonic Quantities; Inductance; Capacity; The Complex Quantity; Admittance Conductance and Susceptance; Resuscitation from Electric Shock.

A text that aims to emphasize the fact that continuous and alternating currents are subject to the same laws. The fundamental laws of the electric circuit are fully developed before the study of machines is taken up, so that having a thorough knowledge of the electric circuit, the student experiences little difficulty in the physical phenomena that take place in the more common types of electrical apparatus. A knowledge of trigonometry is essential and familiarity with calculus advantageous, but not indispensable.

### HANDBOOKS

**FOSTER, HORATIO A.** *Electrical Engineer's Pocketbook.* A handbook of useful data for electricians and electrical engineers. With the collaboration of eminent specialists. *Seventh Edition, Completely Revised.* 1128 ill., 718 tables, 4¾ x 7, full leather, 1636 pp. \$5.00

**CONTENTS:** Symbols, Units, Instruments; Measurements; Magnetic Properties of Iron; Electromagnets; Properties of Conductors; Relations and Dimensions of Conductors; Underground Conduit Construction; Standard Symbols; Cable Testing; Dynamos and Motors; Tests of Dynamos and Motors; The Static Transformer; Standardization Rules; Illuminating Engineering; Electric Arc Lighting; Electric Incandescent Lighting; Electric Street Railways; Electrolysis; Transmission of Power; Storage Batteries; Switchboards; Lighting Arresters; Electricity Meters; Wireless Telegraphy; Telegraphy; Telephony; Electricity in the U. S. Army and Navy; Resonance; Electric Automobiles; Electrochemistry and Electrometallurgy; X-rays; Electric Heating, Cooking, and Welding; Lightning Conductors; Mechanical Section; Index.

The book as now presented shows some corrections of typographical and other errors, together with some new material in the sections and switchboards and units, while the standardization rules of the A. I. E. E. included are the latest. The aim throughout has been to supply in exhaustive and condensed form, the data essential to the engineer engaged in any of the branches of the vast domain of electrical engineering.

## DYNAMO ELECTRIC MACHINERY—DIRECT AND ALTERNATING CURRENTS

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**CONTENTS:** Introduction. Types of Motors and Advantages of Electric Drive. *Direct-Current Motors.* Action of Shunt Motors; Shunt-Motor Starting Boxes; Shunt-Motor Speed Control by Variation of Resistance of Armature Circuit; Multiple-Voltage Systems of Motor Speed Control; Speed Control of Shunt Motors by Variation of Field Current; Speed Control of Motors by Variation of Field Reluctance; Direct Current Series Motors; Control of Direct-Current Series Motors; Compound-Wound Motors. *Alternating-Current Motors.* Classification and History; Synchronous Alternating-Current Motors; Polyphase Induction Motors; Starting of Polyphase Induction Motors; Speed Control of Polyphase Induction Motors; Single-Phase Induction Motors; Commutating Alternating-Current Motors. *Applications of Electric Motors.* Service Conditions; Power Requirements of Various Tools, etc.

Aims to set forth the action and operation of various types of electric motors,



with sufficient comprehensiveness for most persons who study or use these machines, even including students and practitioners who specialize in electrical engineering. The present edition contains many amendments and additions, both in text and illustrations, to make the subject matter clearer and more complete. The work is the outgrowth of a course of lectures at Columbia University. References are made to United States and foreign patents as well as articles and books in which may be found further descriptions of the various machines and methods considered.

**FRITH, JULIUS.** *Alternating Current Design.* 27 ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 131 pp. **\$2.50**

**CONTENTS:** Alternating Currents. Armature Reaction. Relation of Dimensions to Output. Example of the Design of an Alternator. Synchronous Machinery in Parallel. Compound Wound Alternators. Induction Motors. Theory. Example of the Design of an Induction Motor. Static Transformers. Example of the Design of a Transformer. Transmission Lines. Choking Coils. Additional Example of the Design of an Alternator. Design of a Smaller Two-Phase Squirrel-Cage Induction Motor and Auto Starter.

**GOLDSCHMIDT, RUDOLF.** *The Alternating Current Commutator Motor. The Leakage of Induction Motors.* In one volume. 247 ill.,  $5\frac{1}{4} \times 8\frac{3}{4}$ . 220 pp. **\$3.00**

**CONTENTS:** THE ALTERNATING CURRENT COMMUTATOR MOTOR. Introduction. The Series Commutator Motor. The Thomson Repulsion Motor. The Repulsion Motor of Latom-Winter-Eichberg. Special Types. Examples of Performances of Commutator Motors. THE LEAKAGE OF INDUCTION MOTORS. The Circle Diagram. The No-load Current. The Leakage. The Leakage Factor. General Examples.

**HAY, A.** *An Introductory Course of Continuous-Current Engineering.* 183 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 337 pp. **\$2.50**

**CONTENTS:** Electrical Units; Electromagnets; Magnetism; Hysteresis; Measuring Instruments; Dynamo Construction; Dynamo Used as Motor; Construction and Management of Motors; Secondary Cells and Their Uses; The Electric Arc; Mercury Vapor Lamps; Incandescent Lamps; Photometry; Switches; Conductors; Insulation.

**LIVINGSTONE, R.** *The Mechanical Design and Construction of Generators.* 126 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 228 pp. **\$4.50**

**CONTENTS:** Pulleys, Gearing and Couplings; Rotor Hubs and End Plates; Unbalanced Magnetic Pull; Shafts and Bearings (Slow Speed); Alignment of Shafts; Stator Frames; Stresses in Rotors; Poles and End Clamps; Field Coil Supports; Rotor Bodies; Cylindrical Rotors; Shafts and Bearing (High Speed); General Details; Types of Rotors (High Speed); Appendix.

**LOUDIN, M. A.** *Standard Polyphase Apparatus and Systems. Sixth Edition, Thoroughly Revised.* 207 ill.,  $5\frac{1}{2} \times 8\frac{1}{4}$ , 369 pp. **\$3.00**

**CONTENTS:** Definitions of Alternating Current Terms; Generators; Induction Motors; Synchronous Motors; Transformers; Rotary Converters; Motor Generators; Frequency Changers; Other Converting Apparatus; Switchboards; Station Equipment; Lightning Protection; Line Construction; Two and Three Phase Systems; Choice of Frequency; Relative Weights of Copper for Various Systems; Calculation of Transmission Lines.

**RAYMOND, E. B.** *Alternating Current Engineering Practically Treated. Third Edition, Revised and Enlarged.* 104 ill.,  $5\frac{1}{2} \times 8$ , 252 pp. **\$2.50**

**CONTENTS:** The General Subject of Magnetism and Alternating Currents; The Transformer; The Compensator; Distribution Systems; Alternating Current Motors; Induction Motors; Repulsion Motor; Alternating Current Generator; Testing; Rotary Converter; Converter vs. Motor Generators.



**SHELDON, S., and HAUSMANN, E.** *Dynamo Electric Machinery.* Its construction, design and operation. In two volumes.

Vol. I., *Direct Current Machines.* *Ninth Edition, Revised.* 218 ill.,  
5½ x 7¾, 337 pp. \$2.50

**CONTENTS:** Electrical Laws and Facts. Magnetic Laws and Facts. Armatures. Field Magnets. Armature Reactions. Commutation. Generators. Efficiency of Operators. Constant-potential Generators. Constant Current Generators. Motors: Shunt Motors. Series Motors. Dynamotors. Motor Generators, Borsters and Storage Batteries. Central Station Equipment.

Vol. II., *Alternating Current Machines.* *Tenth Edition, Completely Revised.* 236 ill., 5¾ x 7¾, cloth, 364 pp. \$2.50

**CONTENTS:** Properties of Alternating Currents; Self-Induction; Capacity; Alternating Current Circuits; Alternators; The Transformer. *Motors.* Induction Motors; Synchronous Motors; Single-Phase Commutator Motors; Converters; Power Transmission.

Intended as a text-book for the use of students pursuing electrical or non-electrical engineering courses. The method of presentation is considered as especially adapted for classroom exercises, which consist of recitations, computations, and occasional lectures, and which are supplemented by laboratory exercises, the two being correlated with a view to training the mind of the student and adding somewhat to his knowledge. It will be found that in treatment the sequence is such that parts which it may seem undesirable to require from other than electrical engineering students may be omitted without introducing a discontinuity in the matter which remains.

ARMATURE WINDING AND CONSTRUCTION

**ARNOLD, E.** *Armature Windings of Direct-Current Dynamos.* Extension and application of a general winding rule. Translated from the original German by Francis B. DeGress. 146 ill., 6 x 9½, 130 pp. \$2.00

**CONTENTS:** Methods of Connecting Inductors for Obtaining Direct Currents. *Closed-coil Windings.* General Formula for Winding Direct Current Armatures; Ring Armature Windings; Drum Windings; Disk Armature Windings. *Open-Coil Windings.* Ring Armature Windings; Drum Armatures, Thomson-Houston Winding; Disk Armature Windings, Wilde's Disk Armature; Ferranti-Thomson Disk Armature; Bollman Disk Armature.

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**CONTENTS:** The Commutator; Types of Windings; Explanation of Terms; Drum Windings; Parallel Windings; Series Windings; Series Parallel Windings; Construction of Drum Windings; Hand Windings; Bar Windings—Evolute Windings; Barrel Windings; Former Windings; Construction of Armatures—The Core; Mechanical Construction.

**LIVINGSTONE, R.** *Mechanical Design and Construction of Commutators.* 62 ill., 5 x 8½, 93 pp. \$4.50

**CONTENTS:** Introductory; Design of "V" Ring Commutators; Assembling of "V" Ring Commutators; Design of Shrink-Ring Commutators; Assembling of Shrink-Ring Commutators; Descriptions of Various Types of Construction; Hints on Design; Various Mechanical Problems Involved in Design.

## TRANSFORMERS

### **FLEMING, J. A.** *Alternate-Current Transformer in Theory and Practice.*

Vol. I., The Induction of Electric Currents. *Third Edition.* Ill.,  
5¾ x 8¾, 611 pp. \$6.50

Vol. II., The Utilization of Induced Currents. *Third Edition.* Ill.,  
5¾ x 8¾, 604 pp. \$6.50

**CONTENTS:** Historical Introduction; Electromagnetic Induction; Theory of Simple Periodic Currents; Mutual and Self-Induction; Dynamical Theory of Induction; Induction Coil and Transformers; Historical Development; Distribution of Energy by Transformers; Alternating Current Electric Stations; Construction and Action of Transformers; Other Uses for Transformers.

### **HOBART, H. M.** *The Design of Static Transformers.* 101 ills., 5¾ x 8¾,

189 pp. \$2.50

**CONTENTS:** Introductory. The Leading Dimensions of a Transformer of a Given Rating. The Core Loss and the "Annual Efficiency." No-Load Current Power Factor and Efficiency. The Design of the Windings and Insulation. The Influence of Frequency. The Regulation of Transformers. The Heating of Transformers. Transformer Cases and Tanks. Forced-cooled Transformers.

This is exclusively a practical book giving an introduction to the practical aspects of transformer design and construction. It points out the application of the various theories set forth by the foremost engineers in their writings, which usually are not available in book form but only scattered through various papers and articles.

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### TESTING

### **BEDELL, FREDERICK, and PIERCE, C. A.** *Direct and Alternating Current*

*Manual.* With directions for testing and a discussion of the theory of electrical apparatus. *Second Edition, Greatly Enlarged.* Ill. 6 x 9,  
373 pp. \$2.00

(Authors are professors of applied electricity in Cornell University.)

**CONTENTS:** Direct-Current Generators and Motors. Synchronous Alternators. Single-Phase Currents. Transformers. Polyphase Currents. Phase Changers, Potential Regulators, etc. Induction Motors. Induction Machines: Frequency Changers and Induction Generators. Synchronous Machines. Wave Analysis. Problems.

A concise, logically and systematically arranged treatment of the most important tests on direct and alternating-current apparatus, eliminating all superfluous and unessential material. Its terse and clear presentation enables the student quickly to master the essential principles of the subject. It should be in the hands of practicing engineers, especially those engaged in testing; and of college graduates entering upon their professional work.

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for amateurs and practical men. *Sixth Edition.* 87 ills., 5 x 7½, 189  
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**CONTENTS:** MEASUREMENT OF CURRENT. Instruments. MEASUREMENT OF POWER. Instruments. MOTORS. GENERATORS. Kinds and Classification. Erection of Motors and Dynamos. Care of Machines. Faults. MOTOR STARTERS AND REGULATORS. Mechanical Features. Faults. Fuses. Circuit-Breakers. ACCUMULATORS. Charging. Erecting. Faults. General Hints. Boosters.



**CROCKER, F. B., and WHEELER, S. S.** **The Management of Electrical Machinery.** A thoroughly revised and enlarged edition of "The Practical Management of Dynamos and Motors." *Eighth Edition.* 131 ill., 5 x 6½, 222 pp. **\$1.00**

**CONTENTS:** *Selection and Management.* Principles of Generators and Motors; Selection of Dynamo-Electric Machinery; Installation of Machines, Foundations, and Mechanical Connections; Installation of Generators, Electrical Connections and Auxiliary Apparatus; Operation of Generators; Connection and Operation of Electric Motors. *Inspecting and Testing.* Adjustment, Friction, Balance, Noise, Heating, and Sparking; Electrical Resistance; Voltage and Current; Speed and Torque; Power and Efficiency. *Localization and Remedy of Troubles.* Sparking at the Commutator; Heating of Generators, Motors, Commutator, Brushes, Armature, Field Magnets and Bearings; Noisy Operation; Speed Regulation; Motor Stops or Fails to Start; Regulation of Voltage of Generator; Generator Fails to Generate. *Constant Current (Arc) Generators.* The Brush Arc Generator; The Ft. Wayne (Wood) Generator; The Thomson-Houston Arc Generator; Management of Railway Motors.

**DAVIES, F. H.** **Foundations and Machinery Fixing.** 53 ill., 4¼ x 6½, 146 pp. (Electrical Installation Manuals Series.) **\$1.00**

**CONTENTS:** The Functions of Foundations, Nature of Soils and Piling. Trial Bores. Design: The Proportions of Foundations for Engines, Turbines and Dynamo-Electric Machinery. Materials for Foundations. Holding-down Bolts and Anchor Plates. Excavation Construction of Foundations. Vibration: Causes and Effects; Methods of Isolating Machinery. The Fixing of Electric Motors.

**EDDY, L. C.** **Laboratory Manual of Alternating Currents.** 21 ill., 5½ x 8, 26 pp. **\$0.50**

(Author is assistant professor of electrical engineering at Norwich University.)

**CONTENTS:** To Distinguish an Alternating Current from a Direct Current; Effects of Choke Coils upon Alternating Currents; Inductance and Resistance; Frequency Effects; Vector Diagram Analysis; To Determine Frequency; Power in Alternating-Current Circuits; Effects of Condensers upon Alternating Currents; Experiments with Capacity and Inductance; Branched Circuits Containing Reactions; Power and Heat Developed in Circuits Containing Reactance; Alternating-Current Transmission Line Characteristics (Non-Inductive Load); Alternating-Current Transmission Line Characteristics (Inductive Load); Alternating-Current Generator Characteristics; Characteristics of Three-Phase Delta-Connected Systems; Characteristics of Three-Phase Star-Connected Systems; Power in Three-Phase Systems; Rotary Converter (D.C. Side); One Wattmeter Method—Three-Phase System; Power Factor of Squirrel-Cage Induction Motor; Rotary Converter (A.C. Side); Synchronous Motor; Effect upon the Power Factor of a Transmission Line of Variation in the Field Current of a Synchronous Motor Floating on the Line; Single-Phase Motor; Rotor-Wound Induction Motor; Transformer Regulation.

A series of simple experiments on alternating currents for students whose electrical training includes only the essentials of the subject.

**JOHNSON, C. H., and EARLE, R. P.** **Practical Tests for the Electrical Laboratory.** *In Press*

**KINZBRUNNER, CHARLES.** **The Testing of Alternating Current Machines in Laboratories and Test Rooms.** A practical work for students and engineers. Vol. I. General Tests; Transformers, Alternators. 141 ill., 5½ x 8¾, 164 pp. **\$2.00**

**CONTENTS:** Instruments and Apparatus; Resistance Measurements; Measurement of Periodicity, Slip, Power Factor and Power; Phasemeters and Synchronizers; Testing of Transformers; Alternators; Miscellaneous Tests.



**MORECROFT, J. H., and HEHRE, F. W.** A Short Course in the Testing of Electrical Machinery. *Third Edition, Revised and Enlarged.* 88 ill., 6 x 9, 176 pp. **\$1.75**

(Authors are professor and instructor of electrical engineering in Columbia University.)

**CONTENTS:** DIRECT CURRENT EXPERIMENTS. "Fall of Potential" along a Conductor Carrying Current; Measurement of Armature Circuit and Shunt Field Resistances; The Shunt Generator; Preliminary Work with a Generator, Magnetization Curve, External Characteristic; The Compound Generator; Armature Characteristic of a Shunt Generator, External Characteristic of a Compound Generator, Effect of Operating a Compound Generator at Speeds Higher or Lower than Rated Value; The Shunt Motor; Speed Characteristics, Commercial Efficiency by Brake Test; The Motor Starting Rheostat; Shunt Motor Efficiency by the Stray Power Method; The Series Motor; Current Torque Curves of Different Types of Motors. Parallel Operation of Shunt and Compound Generators.—ALTERNATING CURRENT EXPERIMENTS. Wave Shape, Power and Power Factor, Effective Values; Properties of the Alternating Current Circuit; The Alternator, Its Characteristics on Non-Inductive and Inductive Load, Prediction of External Characteristic; The Transformer, Operation and Characteristic Curves; Measurement of Losses and Prediction of Efficiency; The Induction Motor: Its Operating Characteristics with and without added Rotor Resistances; The Synchronous Motor: Synchronizing and Phase Characteristics; The Rotary Converter; Effect of Speed and Voltage upon Ratio, Operating Characteristics; Parallel Operation of Alternators; Distribution of Load, Circulating Circuit, etc.; Three-Phase Circuits; Current and Voltage Relations, Measurement of Power.

An analysis in non-mathematical language of the characteristics of the most important types of electrical apparatus with which the practicing engineer might come in contact. The work was written so as to be useful to non-electrical students and engineers.

**SEVER, G. F.** Electrical Engineering Experiments and Tests on Direct-Current Machinery. With diagrams and figures. *Second Edition, Revised and Enlarged.* Ill.,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 66 pp. **\$1.00**

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(Author is professor of physics and electrical engineering at Ohio University.)

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(Author is professor of electrical engineering in the University of London.)

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(Author is assistant professor of physics and electrical engineering at the Polytechnic Institute of Brooklyn.)



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**MONCKTON, C. C. F.** *Radio Telegraphy.* 173 ill.,  $5\frac{3}{4} \times 8\frac{1}{2}$ , 272 pp. (Van Nostrand's Westminster Series.) **\$2.00**

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**RUHMER, E.** *Wireless Telephony in Theory and Practice.* Translated from the German by J. Erskine-Murray, D.Sc. 145 ill.,  $6 \times 8\frac{3}{4}$ , 225 pp. **\$4.50**

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**SEWALL, C. H.** *Wireless Telegraphy.* Its origin, development, inventions and apparatus. *Second Edition, Corrected.* 77 ill., 5 plates,  $5\frac{3}{4} \times 8\frac{1}{2}$ , 235 pp. **\$2.00**

**CONTENTS:** Prophecy; Discovery; Achievement; Explanatory; Descriptive; Inventors and Inventions; Comparative Merits of Wireless Telegraphy and of Telegraphy by Wires and Cables and the Commercial Outlook for Each; Nomenclature; Transmitters; Wave-Responsive Devices; Wave-Gates; Shields; Condensers; Inductance Coils; Keys, etc.

**STONE, ELLERY W.** *Elements of Radiotelegraphy.* 125 ill., 33 plates  $5 \times 7\frac{1}{2}$ , flexible fabrikoid, 274 pp. **\$2.50**

**CONTENTS:** Principles of Radiotelegraphy; Electrical Terms; Condensers; In-



ductances; Electro-Magnetic Induction; Alternating Current; Damping and Resonance; Logarithmic Decrement; Wave Length, Frequency, Time Period; The Marconi 1896 Transmitter; Coupled Circuits; Lodge 1898 Transmitter; Theory of Ionization; Spark Gaps; Marconi 1900 Transmitter; The Quenched Spark Gap; The Telefunken Transmitter; The Four Radio Transmitter Circuits; Transmitting Keys; Transformers; Condensers; Modern Spark Gaps; Transmitting Inductances; Antenna Current Ammeter; Antenna Condenser; Antenna Switch; Complete Transmitter; Marconi System; Telefunken System; Kilbourne & Clark System; Haller Cunningham System; Fessenden System; Multitone System; French Postal and Telegraph Department System; Wave Meters; Decremeters; Adjustment of a Modern Transmitter; Undamped Wave Transmitters; The Poulsen Arc Transmitter; Poulsen Arc Keys; Antennae; Various Types of Antennae; Tower Construction; Earth Connections; Antenna Resistance; Wave Propagation; Aerial Communication; Pioneer Receivers; Detectors; Modern Receivers; Receiving Transformers; Receiving Condensers; Telephone Receivers; Audibility Measurements; Harmonic Oscillation of Receivers; The Edison Effect; Electron Tube Detectors; Electric Tube Amplifiers; The Heterodyne; Audion Beat Receiver; Modern Electron Tubes; Magnetic Control; Conclusion; Appendix.

## POWER PLANTS, POWER TRANSMISSION AND DISTRIBUTION

**ABBOTT, A. V.** *The Electrical Transmission of Energy.* A manual for the design of electrical circuits. *Fifth Edition, Entirely Rewritten and Enlarged.* Ill.,  $6\frac{1}{4} \times 10$ , 675 pp. **\$5.00**

**CONTENTS:** Introduction; The Properties of Wire; The Construction of Aerial Circuits; The Construction of Underground Circuits; Special Railway Circuits; Electrical Instruments; Methods of Electrical Measurement; Continuous-Current Conductors; Conductors for Alternating Currents; Series Distribution; Parallel Distribution; Miscellaneous Methods; Polyphase Transmission; The Cost of Production and Distribution.

**COLLIS, A. G.** *High and Low Tension Switch-gear Design.* 94 ill., and folding plates,  $6 \times 9$ , 233 pp. **\$3.50**

Contains the result of researches made with the object of obtaining accurate data as to the effects caused by opening and closing the circuits with various types of electrical apparatus. The major portion of this work is expressly intended as an introduction to the main elements of design of both direct and alternating current switch gear, and the treatment is such that the essentials may be easily understood. A number of oscillograph records are given. These are the result of patient perseverance; were obtained only with great difficulty and expense; up to the present are unique; and believed to be the first published records of their kind.

**COLLIS, A. G.** *Switchgear and the Control of Electric Light and Power Circuits.* 47 ill.,  $4\frac{1}{4} \times 6\frac{1}{2}$ . (Installation Manuals Series.) **\$0.50**

The book contains oscillograph records of the effects of opening and closing various types of switchgear, together with many valuable diagrams. Mathematical treatment has been particularly avoided, and the matter presented in as readable a form as possible, so that the points dealt with may be easily understood without unduly burdening the mind.

**CUSHING, Jr., H. C., and HARRISON, NEWTON.** *Central Station Management.* Compiled especially for the managers, superintendents and engineers of electric light and power central stations, and is in accordance with the latest accepted practice.  $5\frac{1}{4} \times 7\frac{3}{4}$ , 417 pp. **\$2.00**

**CONTENTS:** The Light, Heat and Power Business of Central Stations; Operating Expenses in Electric Lighting; State Protection for Lighting from Competition; Technical Features Governing Cost; Costs and Their Relation to Charges and Pur-



chasing Power; How Central Stations Get Business; "New Business" for Central Stations; The Simplified Rate Problems of Electric Lighting; Financial Considerations Governing Rates; The Basis of Rates for Current; Rates to Charge for Electric Power; What the Rates Must Pay For; The Minimum Rate Charge; Lighting and Bills for Lighting; The Prepayment of Current; Light and Its Cost; Efficiencies in Electric Lighting; General Distribution of Light; Scientific Lighting of City Streets; The Illumination of Interiors; Scientific Lighting of a Home; Accidents Due to Bad Lighting; Rates for Electric Cooking; District Heating from Central Stations; The Advantage of Farming by Central Station Power; Steam in Central Station Use; Management and Care of Boilers; Increasing Boiler Capacities in Central Stations; Increasing the Efficiency of Boilers; Boiler Corrosion in Central Stations; Boiler Furnaces for Central Stations; Electrical Injuries, Cares, etc.

An interesting work showing how many central stations have solved their problems. The authors, because of their association with the periodical "Central Station," have had the opportunity to give close study to the questions brought out in this book.

**EDLER, R.** *Switches and Switchgear.* Translated by Ph. Laubach. 365 ill., 6¼ x 9, 412 pp. **\$4.00**

**CONTENTS:** General Remarks on the Design of Switchgear; Connecting Leads; Cable Sockets; Connectors; Copper Bars; Contact Blocks; Bolts; Contact Springs and Brushes; Carbon Contacts; Devices to Eliminate Sparking at the Main Contacts; Switches and Change-Over Switches for Low and Medium Pressure; High-Pressure Switches; Fuses; Self-Acting Switches; Automatic Switches; Circuit Breakers; Time Relays, etc.; Starting and Regulating Resistances; Controllers; Accumulator Switches, etc.

**GARRARD, CHAS. C., Ph.D.** *Electric Switch and Controlling Gear.* A handbook on the design, manufacture and use of switchgear and switchboards in central stations, factories and mines. 433 ill., 5½ x 8½, 656 pp. **\$6.00**

**CONTENTS:** Materials and Manufacturing Methods; Apparatus for Making and Breaking Electric Circuits; Apparatus for Preventing a Dangerous Condition of the Current Flowing; Apparatus for Regulating the Amount of Current; Apparatus for Starting and Controlling Electrical Running Machinery; Low and Medium Tension Switchboards; High-Tension and Extra-High-Tension Switchboards; Apparatus for Protecting Electrical Machinery Against Abnormal Electrical Conditions. *Appendices.* National Electric Code; Abstract to Switchgear Requirements; Abstract of American Standardization Rules; I. E. E. Wiring Rules; Switchgear Requirements; Abstract of Board of Trade Regulations in so Far as They Affect Switchgear; Abstract of Factory Rules in so Far as They Affect Switchgear; Abstract of Mining Rules Relating to Switchgear; Abstract of V. D. E. Rules; Standard Symbols.

**GEAR, H. B., and WILLIAMS, P. F.** *Electric Central Station Distribution Systems.* Their design and construction. *Second Edition, Revised and Enlarged.* 187 ill., 5½ x 7½, 455 pp. **\$3.50**

**CONTENTS:** Systems of Distribution; Transmission and Conversion; Voltage Regulation; Line Transformers; Secondary Distribution; Special Schemes of Transformation; Protective Apparatus; Overhead Construction; Pole Lines; Overhead Construction: Lines and Accessories; Underground Construction; Cable Work; Distribution Economics; Properties of Conductors; Alternating-Current Circuits.

A comprehensive treatise brought up to date, dealing with the distribution of electricity for electric light and power, from the standpoint of the practical distribution engineer. In this new edition the subject of urban transmission and high-tension distribution has been given a separate chapter. The chapters on overhead and underground construction have been expanded to include the progress made in recent years. The discussion of diversity factor



has been broadened and supplemented by a statement of the relation of diversity to the cost of service, and to rate systems. The discussion of methods of voltage regulation, secondary distribution, special schemes of transformation, and distribution economics, contains matter gathered during the author's fifteen years' experience in the development of the distribution system of the Commonwealth Edison Company of Chicago. The work is devoted almost entirely to American practice.

**HOBART, H. M.** **Heavy Electrical Engineering.** Ill., 6 x 9 $\frac{1}{4}$ , cloth. 330 pp. \$4.50

**CONTENTS:** Overall Efficiency of Generating Stations and the Relation Between Coal Consumption and Outgoing Electrical Energy; Steam Raising Plant; Piston Engines and Steam Turbines; Condensing Plant; Electric Generating Plant; Design of Generating Stations; High Tension Transmission Lines; High Tension Continuous Current Series System; Electric Traction Calculations; Traction Motors and Electrification of Railways.

**HUTCHINSON, R. W., Jr.** **Long Distance Electric Power Transmission.** Being a treatise on the hydro electric generation of energy, its transformation, transmission, and distribution. *Second Edition.* Ill., cloth, 5 $\frac{1}{2}$  x 8, 350 pp. \$3.00

**CONTENTS:** Laws of Hydraulics; Applied Hydraulics; Hydraulic Machines and Accessory Apparatus; Generators, Switches and Protective Devices; Laws Governing the Transmission of Energy; The Transmission Line; Transformers; Converters; Motors; Practical Plants; Distinctive Features of Prominent Long Distance Transmissions.

**JAMES, HENRY D.** **Controllers for Electric Motors.** A treatise on the modern industrial controller, together with typical applications to the industries. 259 ill., 5 $\frac{1}{2}$  x 8 $\frac{1}{2}$ , 360 pp. \$3.00

**CONTENTS:** Introduction; Historical; Design Details; How to Read a Diagram; Methods of Acceleration; Starting Characteristics of D. C. Motors; Speed Control and Dynamic Braking; D. C. Magnetic Contractor Control; A. C. Starters and Controllers; Resistors; Protective Devices; Series Parallel Control; Voltage Control for D. C. Motors; Mine Hoists; Pumps; Machine Tool Controller; Printing, Paper and Rubber Calenders; Steel Mills; Cranes; Car Dumpers; Ore and Coal Bridges; Coke Elevators; Oil Wells; Mine Locomotives.

A comprehensive treatment explaining the principles underlying the operation of industrial controllers so as to be of practical assistance to technical students, operating engineers, purchasers and users of electrical apparatus. The preliminary chapters are quite elementary so as to make an understanding of the fundamentals easy. In the application sections, the processes and methods of operation are described in some detail, as information is always essential to a proper understanding of the control. Many controller troubles arise from the lack of complete information of this nature.

**KLINGENBERG, G.** **Large Electric Power Stations.** Their design and construction, with examples of existing stations. 180 ill., 7 plates, 7 x 10, 260 pp. \$5.00

**CONTENTS:** Introduction; Principles for the Construction of Large Electric Power Works, Fundamental Terms, Engine Room, Boiler House, Storage and Transport of Coal, Ash Removal, Switchgear, Position of Power Station, Architectural Features, Summary and Energy Diagram; Comparisons of Costs of Electrical Transmission of Energy and of the Transport of Coal; Economy and Generating Costs in Relation to Capacity and Utility Factor; Markische Electrical Works, Coal Storage and Transport, Boiler House, Engine Room Switchgear, Economic Results Obtained in the Markische Works; Fundamental Data for the Framing of Tariffs, Determination of Prime Costs, Comparison Between Private Supply and Supply from a General Power Station; Second Example of the



Installations of the Victoria Falls and Transvaal Power Company, Ltd., in South Africa, History, Brakpan and Simmerpan Power Stations and Hercules Substation, Preparatory Work for Further Development, Second Part of the Rosher-ville Power Station; Preparatory Work for Further Development, Vereeniging Power Station, Summary.

Deals with the problems of the construction of large electric plants in relation especially to the reduction of full consumption and lowering the price of electric current when supplied consumers. It contains a study of the questions of economy in capital outlay and production. Engineering and financial considerations are treated in their proper relation to each other.

**KOESTER, FRANK.** *Hydroelectric Developments and Engineering.* A practical and theoretical treatise on the development, design, construction, equipment, and operation of hydroelectric transmission plants. *Second Edition.* 500 ill.,  $7\frac{3}{4} \times 10\frac{3}{4}$ , 475 pp. **\$5.00**

**CONTENTS:** Investigation. Forest Preservation. Hydraulics. Economy in Development. Gravity Dams. Movable Dams. Fish-ways, Head Race Trenches. Flumes. Tunnels. Syphon System. Racks. Screens. Gates Collecting Basin. Steel, Wooden and Reinforced Concrete Penstocks. Power Plant Arrangement. Excavation. Foundations. Superstructure. Structural Steel. Turbines. Draft Tubes. Regulating Devices. Oiling Systems. Testing Turbines. Generators. Switching Room. Switch-boards. Switch-board Equipment. Wiring Diagrams. Bus Bar. Oil Switches. Relays. Transmission Lines. A. C. Conductors. D. C. Conductors. Strength. Spacing and Size of Conductors. Transposition. Corona Effect. Wooden and Concreted Poles. Reinforced Concrete Poles and Towers. Steel Towers. Economical Spans. Insulators. Wall Outlets. Substations. Transformers. Transformer Connections. Converters. Motor-generators. Frequency Changes. Switch Gear of Substations. Line Protection. Choke Coils. Horn, Multigap and Fluid Lightning Arresters. Description of Eight Hydroelectric Transmission Plants, viz.: two American, one Mexican, one Norwegian, two German, one Swiss-Italian, and one Austro-Hungarian.

**KOESTER, F.** *Steam Electric Power Plants and Their Construction.* A practical treatise on the design of central light and power stations and their economical construction and operation. *Second Edition.* 340 ill.,  $8 \times 10\frac{1}{2}$ , 455 pp. **\$5.00**

**CONTENTS:** Location; General Layout; Coal Storage; Condenser Water Supply; Excavation and Foundations; Building; Structural Steel; Architectural Features; Boilers; Mechanical Stokers; Grates; Coal; Combustion; Draft; Flues; Chimneys; Feed Water; Superheaters; Superheated Steam; Piping; Reciprocating Engines; Turbines; Condensers; Pumping Machinery; Oiling System; Electrical Equipment; Design of Small Plants; Testing Power Plants; Descriptive Discussion of Typical American and European Light and Power Plants; Data of Most Recent Plants.

**TAYLOR, WM. T.** *Calculation of Electric Conductors.* Ill., large folding chart,  $8 \times 11\frac{1}{4}$ , 34 pp. *In Press*

**CONTENTS:** The Logarithmic Chart as Applied to Cable Calculation; Practical Examples; Useful Conversions, and Calculating Chart for Electric Cables.

**TAYLOR, WM. T.** *Electric Power Conductors and Cables; Their Practical Applications.* *In Press*

**CONTENTS:** Relative Advantages of Overhead and Underground Transmission and Distribution; Conductors; Carrying Capacity of Conductors; Factors Determining Size of Conductors; Calculation of Conductors for Underground Service and Insulated Cable Systems; Treatment of Logarithmic Charts and Vector Relations; Calculation of Conductors for Overhead Service and Bare Conductor Systems; Tables of Wires and Cables.



ELECTRIC RAILWAYS

**ASHE, S. W., and KEILEY, J. D.** *Electric Railways Theoretically and Practically Treated.* Fully illustrated.

Vol. I., Rolling Stock, by Prof. Ashe and Mr. Keiley. *Second Edition.*  
Ill.,  $5\frac{1}{2} \times 7\frac{3}{4}$ , 290 pp. **\$2.50**

**CONTENTS:** Units-Curve Plotting-Instruments; Analysis of Train Performance; Train Recording and Indicating Instruments; Direct Current Series Railway Motor; Alternating Current Single Phase Motors; Types of Control and Their Operation; Car Bodies; Trucks; Brakes and Braking; Electric Locomotives; Electrical Measurements.

Vol. II. Engineering Preliminaries and Direct Current Substations, by Prof. Ashe. Ill.,  $5\frac{1}{2} \times 7\frac{3}{4}$ , 288 pp. **\$2.50**

**CONTENTS:** Preliminary Considerations; Determination of Required Motor Capacity; Schedules and Load Diagrams; Power House and Sub-Stations Location; Rotary Converter Sub-Stations; The Rotary Converter; The Transformer; Insulating Oils; Auxiliary Sub-Station Apparatus.

**AUSTIN, EDWIN.** *Single-Phase Electric Railways.* 346 ill.,  $8 \times 11$ , 308 pp. **\$5.00**

**CONTENTS:** The Single-Phase System; The London, Brighton and South Coast Railway; The Midland Railway; The Midi Railway; The Blankanese-Hamburg-Ohlsdorf Railway; The Dessau-Bitterfeld Railway; The Murnua-Oberammergau Railway; The Mittelwald Railway; The St. Polten-Mariazell Railway; The Martigny-Orsieres Railway; The Valle-Maggia Railway; The Rhaetian Railway; The Lotschberg-Simplon Railway; The Rotterdam-Scheveningen Railway; The Thamshavn-Lokken Railway; The Rjukan Railway; The Swedish State Railways; The Parma Single-Phase Tramways; The New York, New Haven and Hartford Railway; The New York, Westchester and Boston Railway; The Spokane and Inland Empire Railway; The Rock Island and Southern Railway; The Hoosac Tunnel Railway; The St. Clair Tunnel Railway.

Devoted to exact and careful descriptions of complete railways and portions of main line railways electrified on the single-phase system, of which there are two in England and a great number in Europe and six in the United States.

**DAVIES, F. H.** *Electric Power and Traction.* Ill.,  $6 \times 8\frac{1}{2}$ , 293 pp. (Van Nostrand's Westminster Series.) **\$2.00**

**CONTENTS:** Generation and Distribution of Power; Electric Motors; Application of Electric Power; Collieries; Engineering Workshops; Textile Factories; Printing; At Sea; On Canals; Electric Traction; Overhead System and Track Work; Conduit System; Surface Contact; Car Building and Equipment; Electric Railways.

**GANT, L. W.** *Elements of Electric Traction for Motormen and Others.* 38 ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 217 pp. **\$2.50**

**CONTENTS:** Introduction; Principles of Magnetism; Principles of Electricity; Principle of the Dynamo; Principle of the Continuous-Current Motor Power and Power Measurement; Mechanics of Traction; Characteristic Properties of Continuous-Current Motors; Application of Motors to Traction; Brakes.

**HOBART, H. M.** *Electric Trains.* 88 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 220 pp. *Reprinting*

**LIVERMORE, V. P., and WILLIAMS, J.** *How to Become a Competent Motorman.* Being a practical treatise on the proper method of operating a street railway motor car; also giving details how to overcome

certain defects. *Second Edition, Entirely Rewritten and Enlarged.*  
52 ill., 5 x 6½, 247 pp. \$1.00

**CONTENTS:** Accidents; Brakes; Circuits; Circuit Breakers; Cars; Air Compressor; Car Control and Controllers; Electrical Current; Motor Defects; Lamps; Lightning Arrester; Railway Signals; Switches; Electrical Terms; Troubles; "Don'ts" Electrical Units; Valves.

**PARSHALL, H. F., and HOBART, H. M.** *Electric Railway Engineering.*  
437 ill., 8 x 11, 463 pp. \$7.50

**CONTENTS:** Tractive Resistance at Constant Speed; Acceleration; Tractive Force and the Power and Energy at the Axles; Characteristics of Electric Railway Motors; Section Characteristics; Construction of Load Curves; Electrical Power Generating Plant; High Tension Transmission System; Sub-Stations; Distributing System; Rolling Stock; Locomotives and Motor Carriages and Their Electrical Equipment; Trucks.

**SAYERS, H. M.** *Brakes for Tramway Cars.* 6 x 9, 76 pp. \$1.25

**CONTENTS:** Importance and Function of Tramway Car Brakes; Classification; Coefficients of Static and Sliding Friction; Wheel Brakes; Hand and Mechanical, Electrical, Their Theoretical and Actual Effectiveness; Influence of Rail Conditions; Sanding and Cleaning; Mechanical and Magnetic Track Brakes; Combined Track and Wheel Brakes; Adjustment and Maintenance of Brakes; General Conclusions as to Choice and Use of Brake; A Typical Accident; Useful Tables and Data.

**SHELDON, SAMUEL, and HAUSMANN, ERICH.** *Electric Traction and Transmission Engineering.* *New Edition in Press*

(Authors are in charge of the department of physics and electrical engineering at Polytechnic Institute, Brooklyn.)

**CONTENTS:** Determination of the Number and Size of Cars for an Urban Road. Tractive Effort Required for Car Propulsion. Types and Performance Curves of Motors. Speed Curves. Railway Motor Control. Energy Consumption. The Distributing System. Substations. Transmission Lines. Steam and Hydraulic Power Stations.

The essential facts to be considered in determining the final elements of a complete electric traction system are here carefully presented so as to present a perspective view of the installation from the cars to the power station. The nature and sequence of the various problems involved are indicated, and methods for their solution are suggested and illustrated.

## ELECTRIC LIGHTING

**ATKINSON, PHILIP.** *Elements of Electric Lighting.* Including electric generation, measurement, storage and distribution. *Tenth Edition.*  
*Fully Revised and New Matter Added.* Ill., 5 x 7½, 280 pp. \$1.50

**CONTENTS:** Electricity a Mode of Molecular Motion; Principles of the Dynamo; Direct Current Dynamos; Alternating Current Dynamos; Electrical Terms and Units; Electrical Measurements; The Arc Lamp; The Incandescent Lamp; The Storage Battery; Distribution.

**AYRTON, H.** *Electric Arc.* With numerous figures, diagrams and plates.  
Ill., 6 x 8¾, 479 pp. \$5.50

**CONTENTS:** Appearance; History; "Striking" and Sudden Variations of Current; Curves Involving P. D., Constant Current, and Length of Arc; Area of Crater and Crater Ratios; Variations of P. D. with Diameter of Cored Carbons Constant Current Resistance Curves; Constant P. D. Curves; The Equation for



P. D., Current, and Length of Arc with Solid Carbons; P. D. Between Each Carbon and the Arc; Fall of Potential; Relation Between E. M. F. of Generator, Resistance in Series with Arc, P. D., Current and Length of Arc; Power Efficiency; Hissing Arcs; Light and Luminous Efficiency of the Arc; Mechanism of the Arc; Reasons for Different Effects with Solid and Cored Carbons.

**BARHAM, G. B.** *The Development of the Incandescent Electric Lamp.* 25 ill., 2 plates, 10 tables,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 206 pp. \$2.50

**CONTENTS:** Some Earlier Forms of Incandescent Lamps. The Carbon Filament Lamp. Improvements in the Carbon Filament Lamps. The "Metalized" Filaments. Tantalum and the Tantalum Lamp. Tungsten and Tungsten Ores. The Tungsten Lamp. Just-Hanaman Method of Making Filaments. The Tungsten Lamp. The Colloidal Method of Making Filaments. The Amalgam and Plating Methods of Making Filaments. Methods of Making Filaments from Powdered Tungsten. Other Methods, Manufacturing Processes and Early Discoveries. Osmium and the Osmium Lamp. Silicon and the Helion Lamp.

**CHILD, CLEMENT D.** *Electric Arcs.* Experiments upon the arc between different electrodes in various environments and their explanation. 58 ill., 5 x 7, 203 pages. \$2.00

(Author is professor of physics in Colgate University.)

**CONTENTS:** Introduction; Arc in Air between Carbon Electrodes; Arc in Air between Other Substances than Carbon; Arc with Pressures Greater or Less than Atmospheric Pressure in Other Gases than Air; Mercury Arc; Alternating Current Arc; Photometry of the Electric Arc; Use of Arc in Wireless Telephony; Theory of the Electric Arc.

A discussion of the electric arc giving special attention to the explanation of the phenomena and to those investigations that were made in recent years. A rather full account is given of the experiments on the mercury arc and the discussion of the more recent theories.

**JEHL, F.** *The Manufacture of Carbons for Electric Lighting and Other Purposes.* 83 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , cloth, 232 pp. \$5.00

**CONTENTS:** Physical Properties of Carbon; Historical Notes; Facts Concerning Carbon; Modern Process of Carbon Manufacture; A "New" Raw Material; Gas Generators; Furnace; Estimation of High Temperatures; Gas Analysis; Building a Carbon Factory; Capital Necessary; Soot or Lampblack; Soot Factories; American Methods of Manufacture.

**JOHNSON, J. H.** *Arc Lamps and Accessory Apparatus.* 29 ill.,  $4\frac{1}{4} \times 6\frac{1}{2}$ , 132 pp. (Electrical Installation Manual Series.) \$0.75

**CONTENTS:** General Principles of Illumination. Open Type Arc Lamps. Enclosed Arc Lamps. Carbon Flame Lamps. Transforming Apparatus. Sealing and Protective Apparatus. Methods of Suspension and Switchgear. Lamp Adjustments and Faults. Application of Arc Lamps. Metallic Flame Arcs.

**The Manufacture of Electric Light Carbons.** A practical guide to the establishment of a carbon factory. *New Edition.* Ill.,  $5\frac{1}{2} \times 8$ . \$1.00

**CONTENTS:** Preparation of Material; Drying Rooms; Firing the Carbons; Saturating; Coring; Description of Plant Required; Cost of Plant; Cost of Materials and Labor; Estimated Profit.

**NERZ, F.** *Searchlights: Their Theory, Construction and Application.* Translated by Charles Rodgers. 47 ill., 6 x 8, 145 pp. *Reprinting*

**CONTENTS:** Historical; Theoretical Considerations; Performance of Searchlights; Testing of Searchlight Mirrors; Applications of Searchlights in the Field, in the Land Fortress, for Coast Defence, on Battleships; Details of Construction; The Shunt Lamp—Remote Control—Signalling Gear—The Iris Shut-

ter—The Dispenser—The Double Dispenser—Searchlights for Special Purposes; Transportable Power Supply: Power-wagon with Steam Turbine—Power-wagon with Petrol or Alcohol Motor—Power-wagon with Petroleum Motor.

**PALAZ, A.** *A Treatise on Industrial Photometry.* With special application to electric lighting. Authorized translation from the French by George W. Patterson, Jr., and M. R. Patterson. *Second Edition, Revised.* Ill.,  $6\frac{1}{4} \times 9\frac{1}{4}$ , 334 pp. \$4.00

**CONTENTS:** Principles of Photometry; Photometers; Photometric Standards; General Equipment and Auxiliary Apparatus of Practical Photometry; Electric Lights; Distribution and Measurement of Illumination.

**RASCH, E.** *Electric Arc Phenomena.* Translated by K. Tornberg. 52 ill.,  $5 \times 7$ , 187 pp. \$2.00

**CONTENTS:** General Outline of Electric Arc Phenomena; The Typical Carbon Arc; External Phenomena; Arc Adjustment; Typical Electrode Materials and their Physical Properties; Theory of Electrical Discharges through Gases; Spark Discharges; Empirical Results; Voltage and Current Conditions in the Arc; Distribution of Energy in the Arc; Efficiency of Commercial Types of Arcs.

Gives in clear and concise form practically all that modern physics has to say about the Electric Arc. This information is carefully classified, so that the inventor or manufacturer can readily utilize it, each theory or physical fact being fully set forth, together with tables of constants or curves embodying recent experimental results. Everything that is likely to be useful is discussed, e.g., thermal conductivity and specific heat of mixtures of electrode materials, theories of light, etc. Pure carbon arcs, flame carbon arcs, mercury vapor arcs and metallic oxide arcs all receive attention. In most cases references are given to original papers.

**REY, JEAN.** *The Range of Electric Searchlight Projectors.* Translated by J. H. Johnson, M. Inst. E. E. 27 ill., 6 extra full-page illus.,  $7 \times 10\frac{1}{2}$ , 165 pp. *Reprinting*

**CONTENTS:** Determination of the Luminous Flux Emitted by an Electric Arc; Theoretical Illumination Obtained with a Specified Reflector; Efficiency of Electric Searchlight Projectors; Practical Value of the Illumination by Searchlight Projectors; Searchlights with Mangin Mirrors; General Law Giving the Value of the Range of an Electric Searchlight Apart from the Visual Sharpness; Practical Application of the Law of Ranges Apart from the Visual Sharpness; Practical Examples and Problems in Respect of the Range Variation in the Range with the Size of the Searchlight and the Atmospheric Transparency; Visual Sharpness; Appendix.

**SOLOMON, MAURICE.** *Electric Lamps.* 112 ill.,  $6 \times 8\frac{1}{2}$ , 339 pp. (Westminster Series.) \$2.00

**CONTENTS:** The Principles of Artificial Illumination; The Production of Artificial Light; Photometry; Methods of Testing; Carbon-Filament Lamps; The Nernst Lamp; Metallic-Filament Lamps; The Electric Arc; The Manufacture and Testing of Arc Lamp Carbons; Arc Lamps; Miscellaneous Lamps; Comparison of Lamps of Different Types.

### WIRING FOR LIGHT AND POWER

**CRAIG, J. W., and WOODWARD, W. P.** *Questions and Answers About Electrical Apparatus.* Illustrating general points and information concerning testing, operation, troubles and defects of electrical apparatus. *Third Edition, Revised and Enlarged.* Ill.,  $4\frac{1}{2} \times 6\frac{3}{4}$ , leather, 256 pp. \$1.50

**CONTENTS:** Systems; Illuminating Engineering; Incandescent Lamps; Arc



Lamps; Direct Current Motors; Alternating Current Motors; Constant Potential Transformers; Constant Current Transformers; Mercury Arc Rectifiers; Meters and Instruments; Interior Wiring; Exterior Wiring; Central Station Operation and Apparatus; Wire Table.

**DEVEY, R. G.** Mill and Factory Wiring. 128 ill., 8 tables,  $4\frac{1}{4} \times 6\frac{1}{2}$ , 209 pp. (Electrical Installation Manuals Series.) \$1.00

**CONTENTS:** Methods of Wiring; Wiring and Connections for Electric Power and Light; Wiring Calculations and Tables; Tables; Lay-Out of Wiring Network in Factories.

**MONTGOMERY, J. H.** Electric Wiring Specifications.  $4 \times 6\frac{1}{2}$ , 140 pp. \$1.00

(Author is professor of physics and electrical engineering, University of Southern California.)

**CONTENTS:** *Introduction. Directions for Use. Wiring Specifications.* General Conditions; Description; Labor and Workmanship; Materials; Generators and Motors; Switchboard; Service Entrance. *Special Specifications.* Fixtures; Wiring Exposed to Moisture; Wiring in Show Windows; Motors on Grounded Trolley Service; Moving Picture Machines; Bell Wiring. *Schedule of Lights and Conductors. Illumination Data. Inspection and Superintendence.*

These specifications are arranged for convenient use by architects and contractors who may be called upon to draw up a set of specifications for electrical work and haven't the necessary information at hand. It is intended to provide good modern construction for work of comparatively small extent. The text is so written and indexed that the typist may copy directly from the book and have a correctly worded and arranged set of specifications.

**REDFERN, J. B., and SAVIN, J.** Bells, Indicators, Telephones, Fire and Burglar Alarm. 85 ill.,  $4\frac{1}{4} \times 6\frac{3}{4}$ , 123 pp. (Electrical Installation Manuals Series.) \$0.75

**CONTENTS:** Electric Bells. Push Buttons. Polarized Bells. Bell Circuits. Fire Alarm Apparatus. Indicators and Indicator Circuits. Direct Working Telephones. Battery Call Telephones with Induction Coil. Magneto-Telephones. Inter-Communicating Telephones. Cables. Telephone Switchboards.

**WALKER, SYDNEY F.** Electric Wiring and Fitting For Plumbers and Gasfitters. 94 ill.,  $5 \times 7\frac{1}{2}$ , 168 pp. \$2.50

**CONTENTS:** Introductory; The Insulation of Wires, Their Protection, Fixing, etc.; Fixing Wires and Cables; Lamps; Switches, Fuses, Distribution Boards, etc.

**WRIGHT, J.** Testing, Fault Localization and General Hints for Linemen. 19 ill.,  $4\frac{1}{4} \times 6\frac{1}{2}$ , 88 pp. (Electrical Installation Manuals Series.) \$0.50

**CONTENTS:** Testing by Telephone. The Megger and Its Uses. Surface Leakage. "Guard-Wire" Principle in Insulation Testing. Applications of the Mil-Ammeter. Repairing Broken Metal Filaments. Resistances and Artificial Loads. Polarity. Fuse Hints. Uses of the Voltmeter. Measuring Galvanometer, and Battery Resistance. Short Circuits. Bell Circuits. Telephone Circuits. Lamps and Lighting. The Nodon Valve. Finding Resistance of Wire Coil. Condensers. Flexible Conductors. Care of Testing Apparatus. Testing H. P. by Prony Brake. Ohm's Law. Wheatstone Bridge. Lampholders and Wall-Sockets. Earthing. A Home-Made Galvanometer.

WIRES AND CABLES

**DEL MAR, WILLIAM A.** Electric Power Conductors. *Second Edition, Revised.* 69 ill., 6 x 9, 330 pp. \$2.00

(Author is assistant engineer, electrical transmission department, New York Central Railroad.)

**CONTENTS:** *Wires and Cables. Materials and Gauges.* Materials; Wires; Cables. *Electrical Properties.* Resistance of Wires and Cables; Resistance of Networks; Skin Effect; Carrying Capacity. *Insulation and Insulated Conductors.* Insulation; Insulated Cables; Insulators. *Determination of Size for Given Voltage Drop and Power Loss.* Voltage and Systems of Distribution; Lamp Wiring Calculations; Continuous Current Railway Feeder Calculations; Negative Booster Calculations; Alternating Current Feeder Calculations; Economical Size of Conductors and Kelvin's Law. *Determination of Size for Given Stress in Spans.* *Specifications. Tests. Installation.* Underground Lines; Overhead Lines; Splicing. *Depreciation and Deterioration.* Depreciation; Deterioration by Electrolysis and Miscellaneous Causes. *Third Rail Circuits. Rail Bonds. Tables of Inductance and Capacity. Appendices.* Basis of B. & S. Gauge. Basis of Skin Effect and Carrying Capacity Formulæ; Method of Calculating Thickness of Rubber Insulation; Basis of Direct and Alternating Current Transmission Formulæ; Basis of Formulæ for Stresses in Spans; Explanation of Specifications; Basis of Tables and Inductance.

**DWIGHT, HERBERT B.** Transmission Line Formulas for Electrical Engineers and Engineering Students. 27 ill., 5 x 7, 143 pp. \$2.00

**CONTENTS:** *Working Formulas.* Regulation Chart; Introduction; Elements of a Transmission Line; Regulation Chart; Formulas for Short Lines; "K" Formulas; Convergent Series. *Theory.* Conductors; Transmission Line Problems; Reactance of Wire. Single Phase; Skin Effect; Reactance of Cable. Single Phase; Reactance of Two-Phase and Three-Phase Lines; Capacity of Single-Phase Line; Capacity of Two-Phase and Three-Phase Lines; Theory of Convergent Series. *Tables.*

A compilation of a set of instructions for engineers, that will enable them to make electrical calculations for transmission lines with the least possible amount of labor. The *Theory* has been placed separately in the second part of the work for reference and contains the derivation of the principal formulas used in connection with transmission lines.

**FOWLE, FRANK F.** The Protection of Railroads from Overhead Transmission Line Crossings. 35 ill., 5½ x 7¾, 75 pp. \$1.50

**CONTENTS:** What the Dangers are. Effects of Failure of High-tension. Transmission Line at Railroad Crossings. Examples of High-tension Practice in Line Construction. Failures of High-tension Lines. Failure of Poles, Cross-arms and Pins. Failure of Phase-wires and Insulators. Ruin Caused by Break of High-tension Wire. Screen Protection. Bridge and Catenary Types of Reinforced Crossing. Underground Crossings. Insulation Used by Different Companies on Three-conductor High-tension Cables. Discussion of Proposed Type of Crossing. Classification of Crossings by Voltage. Sleet Load, Wind Pressure. Corrected Wind Velocities—Miles per Hour. Observed Wind Velocities. Temperatures. Factors of Safety. Structures. Foundations. Insulators. Conductors. Separation of Conductors. Dead Ending and Tying. Ground Cable. Low Voltage Circuits on the High-tension Line. Conclusions. List of References to the Transactions of the American Institute of Electrical Engineers.

**KAPPER, F.** Overhead Transmission Lines and Distributing Circuits. Their design and construction. Translated by P. R. Friedlaender. 297 ill., 2 plates, 7¾ x 10, 310 pp. \$4.00

**CONTENTS:** Conductor Materials; Sag and Tension of the Line; Design of the Supporting Structures; Stability of Poles and Masts; Forces of the Foundation



Block; Fixing the Poles in the Ground; Concrete and Cement Foundation Work; Pole Construction; Overhead Line Insulators; Attachment of the Insulators to Their Pins; Attachment of the Wire to the Insulator; Joints and Branch Connections on the Line; Arrangement of the Wires; Earthing; Crossings Over Postal Wires, Railways, and Roads; Erection of Poles and Masts; Erecting the Wire; Rules and Hints for the Design and Erection of Overhead Lines; Instruments for Surveying and Laying Out the Route of a Line; Surveying the Route of a Transmission Line; The Most Economical Length of Span; Comparison of the Various Supporting Structures with Reference to the Minimum Annual Charges; Local Overhead Distributing Systems; Agreements with Contractors; Tools and Appliances; Regulations Dealing with the Erection and Operation of Overhead Lines.

**PERRINE, F. A. C.** **Conductors for Electrical Distribution.** Their manufacture and materials, the calculation of circuits, pole line construction, underground working and other uses. *Second Edition, Revised.* Ill.,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 294 pp. **\$3.50**

**CONTENTS:** Conductor Materials; Alloyed Conductors; Manufacture of Wire; Wire; Finishing and Insulation; Cables; Classification; Calculation of Circuits; Kelvin's Law of Economy in Circuits; Multiple Arc Distribution; Alternating Current Calculation; Overhead Lines; Pole Lines; Line Insulators; Underground Conductors.

**RAPHAEL, F. CHAS.** **The Localisation of Faults in Electric Light and Power Mains.** With chapters on insulation testing. *Third Revised Edition.* 128 ill.,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 210 pp. **\$3.50**

**CONTENTS:** Introductory; Insulation Testing of Low-Pressure Networks During Working; Insulation Testing of High-Pressure Mains During Working; Loop Methods of Fault Localising; Fall of Potential Methods; Induction Methods; General Notes as to the Application of Methods; Discontinuities and Short-Circuits; Tramway Feeders; Miscellaneous Methods and Particular Cases; Duplicate Feeders and Automatic Systems of Mains Protection; Proofs of Formulae; Legal Standard Wire Gauge; Standard Sizes of Conductors for Electric Supply Mains.

**RUSSELL, ALEXANDER.** **The Theory of Electric Cables and Networks.** Ill.,  $6 \times 8\frac{1}{2}$ , 280 pp. **\$3.00**

**CONTENTS:** Fundamental Principles; Conductivity; Insulativity; Distributing Networks; Insulation Resistance of House Wiring; Insulation Resistance of Networks; Faults in Networks; Dielectric Strength; The Grading of Cables; The Heating of Cables; Electrical Safety Valves; Lightning Conductors.

**WEBB, H. L.** **A Practical Guide to the Testing of Insulated Wires and Cables.** *Sixth Edition.* 38 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 124 pp. **\$1.00**

**CONTENTS:** Principles of Testing; Galvanometers; Keys; Resistance Boxes; Bridges; Condensers; Testing Batteries and Accessories; Battery Connections; Testing of Galvanometer; Insulation; Tests for Capacity and Conductor Resistance; Connections of Permanent Set of Testing Instruments; General Remarks; Records of Tests,

## INDUCTION COILS, ELECTROMAGNETS, ETC.

**GRAY, J.** *Electrical Influence Machines; their historical development and modern forms, with instructions for making them. Second Edition, Revised and Enlarged.* 105 ill., 5 x 6 $\frac{3}{4}$ , 296 pp. \$2.00

**CONTENTS:** General Sketch of the Phenomena and Leading Principles of Static Electricity; Historical Development; Description of the Following Machines: Varley and Toepler's, Holtz, Wimshurst, Lord Kelvin's, Pidgeon, and Compressed Air; Theory of Influence Machines; Practical Construction of Influence Machines.

**HALLER, G. F., and CUNNINGHAM, E. T.** *The Tesla High-Frequency Coil: Its Construction and Uses.* 56 ill., 5 $\frac{1}{2}$  x 8, 121 pp. \$1.25

**CONTENTS:** General Survey. The Transformer. The Condenser. The Oscillation Transformer. The Interrupter. The Construction of the Boxes. Assembling. Theory of the Coil. Uses of the Coil. Dimensions of a Seven Inch Standard Coil. Appendix.

No attempt has been made to give a mathematical explanation of the oscillation transformer, and other parts of the high-frequency apparatus, for the simple reason that the theory is too complex, and when obtained of no practical use. Neither have the authors tried to lead the amateurs, who are just learning to string bells and connect batteries, from the elements of the galvanic cell up to the working of a high-potential, alternating current, but have merely made an effort to place in the hands of advanced amateurs in electrical science a practical working manual on the construction of high-frequency coils, now so useful in scientific investigation.

**UNDERHILL, CHARLES R.** *Solenoids, Electromagnets and Electromagnetic Windings. Second Edition, Thoroughly Revised.* 224 ill., 5 x 8, 363 pp. \$3.00

**CONTENTS:** Introductory. Magnetism and Permanent Magnets. Electric Circuit. Electromagnetic Calculations. The Solenoid. Practical Solenoids. Iron-clad Solenoid. Plunger Electromagnets. Electromagnets with External Armatures. Electromagnetic Phenomena. Alternating Currents. Alternating Current Electromagnets. Quick-acting Electromagnets, and Method of Reducing Sparking. Materials, Bobbins and Terminals. Insulation of Coils. Magnet Wire. Insulated Wires. Electromagnetic Windings. Forms of Windings and Special Types. Heating of Electromagnetic Windings. Tables and Charts.

Mr. Underhill is favorably known for his experimental and practical work on this subject, from which he has deduced laws. These, when published in the technical journals, were very favorably received. In this new work these laws and their applications are clearly explained, and it should be welcomed by the electrical profession generally as well as by the manufacturers of electrical apparatus.

## X-RAYS AND RADIUM

**JONES, HARRY C.** *The Electrical Nature of Matter and Radioactivity. Third Edition, Revised.* 5 $\frac{5}{8}$  x 8 $\frac{1}{4}$ , 220 pp. \$2.00

(Author is professor of physical chemistry at Johns Hopkins University.)  
**CONTENTS:** The Electrical Conductivity of Gases; The Determination of the Mass of the Negative Ion in Gases; Nature of the Corpuscle; The Electrical Theory of Matter; The Nature of the Atom in Terms of the Electron Theory; The X-rays; The Discovery of Radium; Other Radioactive Substances in Pitchblende; The Alpha Rays; The Beta and Gamma Rays; Other Properties of the Radiations; Production of Heat by Radium Salts; Emanation from Radioactive Substances; Helium Produced from the Emanation; Induced Radioactivity; Production of Radioactive Matter; Theoretical Considerations;



**SODDY, F.** **Radioactivity.** An elementary treatise from the standpoint of the disintegration theory. 40 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 226 pp. *Reprinting*

**CONTENTS:** Radiation Phenomena; Radioactive Elements; Uranium, Thorium, Radium, Polonium and Actinium; Electrical Properties of Gases; Measuring Radioactivity; Alpha, Beta and Gamma Rays; Uranium X and Thorium X; The Radioactive Emanation of Thorium; The Theory of Atomic Disintegration; Radioactive Properties of Radium; The Material Properties of the Radium Emanation and Its Transmutation into Helium; The Energy of Radioactive Change; Anticipations.

### ELECTRIC BATTERIES

**COOPER, W. R.** **Primary Batteries: Their Theory, Use and Construction.** *New and Enlarged Edition.* 215 ill.,  $6 \times 9$ , 450 pp. **\$6.00**

**CONTENTS:** Historical; The Simple Voltaic Element; Local Action Polarisation; Theory of the Voltaic Cell; Non-Chemical Cells and Thermopiles; Testing Cells; One-Fluid Cells; Two-Fluid Cells; Dry Cells; Standard Cells; Selenium Cells; Carbon Consuming Cells and the Commercial Generation of Electrical Energy.

### ELECTROCHEMISTRY AND ELECTROMETALLURGY

**BONNEY, G. E.** **The Electro-platers' Handbook.** A practical manual for amateurs and students in electro-metallurgy. *Fifth Edition, Revised.* 61 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 237 pp. **\$1.50**

**CONTENTS:** Electro-Deposition of Metals; Electro-Deposition by Current from Batteries; Dynamo-Electric Plating Machines; Electro-Platers' Materials; Electro-Plating with Silver, Gold, Nickel, Copper Alloys, Zinc, Tin, Iron, etc.; Electrotyping; Appendix.

**GORE, G.** **The Art of Electrolytic Separation of Metals.** (Theoretical and Practical.) 106 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 317 pp. **\$4.50**

**CONTENTS:** Chief Electrical Facts and Principles; Thermal Phenomena of the Electrolytic Separation of Metals; Chemical Facts and Principles; Chemico-electric or Voltaic Action; Electrochemical Action; Generation of Electric Current by Dynamo Electric Machines; Establishing and Working an Electrolytic Copper Refinery; Other Applications of Electrolysis in Separating and Refining Metals.

**HERING, CARL, and GETMAN, FREDK. H.** **Standard Table of Electro-Chemical Equivalents and Their Derivatives.** With explanatory text on electro-chemical calculations, solutions of typical practical examples and introductory notes on electrochemistry. Ill.,  $4\frac{1}{8} \times 5\frac{5}{8}$ , flexible fabrikoid, 140 pp. **\$2.00**

**CONTENTS:** Fundamental Laws; Fundamental Data and Description of the Tables. Table 1. Electrochemical Equivalents by Weight. Table 2. Grams per Ampere-hour in the Order of Magnitude. Table 3. Electrophysical Equivalents by Volume. Table 4. Valences of the Elements in Their Combinations; Calculations Involving Electrochemical Equivalents; Examples; Electrolysis; Theory of Electrolytic Dissociation; Faraday's Law; Coulometers; The Electron Theory; *Appendix.* Valence; Elementary Principles of Chemical Reaction and Calculations; Conversion Factors Used in Electrochemical Calculations; Glossary of Terms.

This is the first and only book containing the standard data on electrochemical equivalents and describing how to apply them in practice. It contains the most complete table of electrochemical equivalents ever published, based on the

latest and best internationally adopted standard constants, accompanied by detailed descriptions, with typical examples, of the methods of making the calculations for electrolytic baths, batteries, electrochemical reactions in general, etc. Also a brief outline of the principles and theories involved. It is written in an easily understood style and is intended to serve both as a reference book and as a treatise on this kind of calculations, for the engineer, chemist, electrochemist, electroplater, teacher and student. It will prove to be valuable and time-saving to all who have to deal with such calculations either in practice or as teachers and students, as also those who are interested in the principles involved.

**KERSHAW, J. B. C.** *Electrometallurgy.* 61 ill., 6 x 8½, 303 pp. (Van Nostrand's Westminster Series.) **\$2.50**

**CONTENTS:** Aluminum; Bullion and Gold; Calcium Carbide and Acetylene Gas; Carborundum; Copper; Ferro-Alloys; Glass and Quartz Glass; Graphite; Iron and Steel; Lead; Miscellaneous Products; Nickel; Sodium; Tin; Zinc.

**RIDEAL, ERIC K.** *Industrial Electrometallurgy, Including Electrolytic and Electrothermal Processes.* Ill., 5½ x 8¾, 259 pp. (Industrial Chemistry Series.) **\$3.00**

**CONTENTS:** Introduction; Electrolysis in Aqueous Solutions; Electrolysis in Fused Electrolytes; The Electrolytic Preparation of the Rarer Metals; Electrothermal Processes; Carborundum and Oxysilicides of Carbon; The Carbides; Electrothermal Nitrogen Fixation by Metals and Metallic Compounds; Iron and the Ferro-Alloys; Appendix.

Among the many branches of applied chemistry electrochemistry has shown a great technical development, and in this book an endeavor has been made to indicate both the limits and possibilities of the application of electrolytic and electrothermal methods in this domain.

**URQUHART, J. W.** *Electro-plating.* A practical handbook on the deposition of copper, silver, nickel, gold, brass, aluminum, platinum, etc. *Sixth Edition.* Ill., 5¼ x 7½, 238 pp. **\$2.00**

**CONTENTS:** The Plating Room; Preparation of Articles; Chemicals and Materials; Batteries; Galvanometer; Dynamo-Electric Machines; Deposition of Copper, Silver, Gold, Nickel and Other Metals; Dynamo Machine Working; Improvements in Nickel Plating Processes.

**URQUHART, J. W.** *Electrotyping.* A practical manual forming a new and systematic guide to the reproduction and multiplication of printing surfaces, etc. 5¼ x 7½, cloth, 236 pp. **\$2.00**

**CONTENTS:** Metals Used by Electrotypers; Sources of Electricity; Solutions; Depositing and Moulding Apparatus; Moulding Materials; Preparation of the Work; Depositing Process; Hard Facings for Electrotypes; Final Preparation of the Work.

**WATT, A.** *Electro-plating and Electro refining of Metals.* Being a new edition of Alexander Watts' "Electro-Deposition." Revised and largely rewritten by Arnold Philip. *Second Edition, Revised.* 160 ill., 6¼ x 8, 704 pp. **\$5.00**

**CONTENTS:** Batteries; Thermopiles; Cost of Electrical Installations for Small Output for Electroplating; Electro-Deposition of Copper; Deposition of Gold by Simple Immersion; Electro-Deposition of Gold and Silver; Various Gilding Operations; Imitation Antique Silver; Electro-Deposition of Nickel, Tin, Iron, Zinc and Other Metals and Alloys; Recovery of Gold and Silver Waste from Waste Solutions; Mechanical Operations Involved in Electro-Deposition; Materials Used; Electro-Plating.



**WATT, A.** *Electro-metallurgy Practically Treated. Fifteenth Edition, Considerably Enlarged.* Ill., 5 x 7½, 235 pp. \$1.00

**CONTENTS:** Electro-Deposition of Copper, Silver, Gold, Brass, Bronze, Zinc, and Iron; Electro-Metallurgical Cabinet.

ELECTRICITY IN MINING

**DUNCAN, W. G., and PENMAN, D.** *The Electrical Equipment of Collieries.* 157 ill., 6½ x 9, 329 pp. \$5.00

**CONTENTS:** General Principles, Magnetism, Units, Cells; Dynamos and Motors; Transmission and Distribution of Power; Prime Movers; Lighting by Electricity; Initial Outlay and Working Cost of Electrical Installations; Electricity Applied to Coal-Cutting; Electric Haulage, Winding and Locomotives; Electric-Power Drills and Underground Coal Conveyors; Typical Colliery Electrical Installations; Miscellaneous Applications of Electric Current; Comparison of the Different Modes of Transmitting Power; Dangers Occurring from the Use of Electricity in Collieries.

**FREUDMACHER, P. W.** *Electrical Mining Installations.* 36 ill., 4¼ x 6¼, 102 pp. (Electrical Installation Manual Series.) \$1.00

**CONTENTS:** General Principles; Generating Plant; Generating Station Switch gear; Transmission; Underground Cables and Fittings; Electric Haulage and Pumping; Electric Coal Cutting, Drilling, Ventilating, Winding, and Winding Systems Special Rules for the Installation and Use of Electricity; Definitions.

**HEATHER, H. J.** *Electrical Engineering for Mechanical and Mining Engineers.* 183 ill., 5¾ x 8¾, 344 pp. \$4.50

**CONTENTS:** The Electric Circuit. Continuous Currents. Resistance. Alternating Currents. Electrical Measurements. Continuous Current Dynamos. Continuous Current Motors and Parallel Running of Dynamos. Alternating Current Generators. Synchronous Motors and Parallel Running of Alternators. Transformers. Polyphase Systems and Transformations. Induction Motors. Effects of Running under Abnormal Conditions.

**HUTCHINSON, R. W., Jr., and THOMAS, W. A.** *Electricity in Mining.* Being a theoretical and practical treatise on the construction, operation, and maintenance of electrical mining machinery. Ill. *In Press.*

**MAURICE, WILLIAM.** *Electric Blasting Apparatus and Explosives.* With special reference to colliery practice. 88 ill., 5¾ x 8½, 167 pp. \$3.50

**CONTENTS:** Electric Fuses and Detonations Exploders; Wires and Cables; Testing; Explosives and Explosive Risks; Practical Applications; Laws and Regulations Relating to the Storage and Use of Explosives; Home Office Memorandum on the Permitted List Test.

**PATCHELL, W. H.** *Application of Electric Power to Mines and Heavy Industries.* 91 ill., 6½ x 9¼, 344 pp. \$4.00

**CONTENTS:** Electricity in Mines. Cables. Coal Cutters. Conveyors. Underground Lighting. Signalling. Hauling. Rating of Haulage. Haulage Calculations. Controller Resistances. Locomotives. Winding Engines. Types of Winders. Ventilation. Pumping. Ram Pumps and High Lift Centrifugals. Rolling Mills. Machine Tools. Welding of Metals. Electric and Induction Furnaces.

**PATERSON, G. W. L.** *Electric Mine Signalling Installations.* A practical treatise on the fitting-up and maintenance of electrical signalling apparatus in mines. 139 ill., 5¼ x 7¾, 203 pp. \$1.50

**CONTENTS:** Ringing Keys and Tappers; Electric Mining Bells; Signal Alarms and Relays; Electric Mining Indicators or Annunciators; Electric Generators for Mine Signal Installations; Primary Batteries for Signal Installations; Electric

## ELECTRICITY ON SHIPBOARD

Mining Shaft Signals; Electric Shaft Signal Wiring; Electric Engine Plane Signals; Electric Engine Plane Signal Wiring; Appendix.

Aims to illustrate and describe such apparatus which, as a result of experience, has been found to give the best results in practical mining work, and further to indicate, by the aid of plans and diagrams, the most approved methods of installing the apparatus and maintaining it in working order.

**WALKER, S. F.** *Electricity in Mining.* 168 ill., 51 plates, 6 x 8½. \$4.50  
**CONTENTS:** Definitions; Units; Electric Mining Signals and Telephones, Electric Lighting for Mines; Generation of Electricity; Distribution of Power by Electricity; Application of Electricity to Driving Machines, etc., in Mines; Faults in Electrical Apparatus.

## ELECTRICITY ON SHIPBOARD

**HOBART, H. M.** *Electric Propulsion of Ships.* 44 ill., 6 x 9, 167 pp.

*Reprinting*

**CONTENTS:** Introduction. Size and Power of Ships. Energy required per Ten Mile in Propelling Ships at Constant Speed. Frictional Resistance of Ships. Momentum of Ships. Speed and Efficiency of Propellers. Mechanical Speed-reduction Gearing for Steam Turbines. Electrical Speed-reduction Gearing for Steam Turbines. Use of Superheated Steam in Marine Engines. Electrical Gear as a Means of Improving the Load Factor. Internal Combustion Engines for Ship Propulsion. Some Systems of Propelling Ships Electrically. The Alter-phase System for Ship Propulsion. The Durtnall System of Propelling Ships. The Emmet System of Ship Propulsion.

A study of the various elements that enter into this new subject. The author points out wherein the electric motor may prove the most efficient propelling medium for large ships. Attention is drawn to the difficulties that might be encountered by the space limitations on shipboard and means of overcoming them suggested.

**JOHNSON, T. M.** *Ship Wiring and Fitting.* 47 ill., 4¼ x 6½, 92 pp.  
 (Electrical Installation Manuals Series.)

*Reprinting*

**CONTENTS:** General Electric Lighting. Generating Sets. Dynamo Mains Switchboards. Circuits. Cables and Wiring. Fuseboards. Fittings and Incandescent Lamps. Plugs and Sockets. Switches. Lamps. Electric Bells. Telephones. Electric Fans. Special Apparatus.

## VARIOUS APPLICATIONS OF ELECTRICITY

**BROUGHTON, H. H.** *Electric Cranes, Their Design, Construction and Application.* *New Edition in Press*

**CONTENTS:** Introductory. Electric Equipment. Structural Steelwork. The Power Required to Drive Cranes. Mechanical Equipment. Crane Arrangements. Arrangement of Crane Mechanisms. Overhead Traveling Cranes and Gantry Cranes. Jib Cranes. Building Ship Equipments. Fitting-out Basin Cranes. Steelworks Cranes. Specifications. Properties of Sections, and Conductors.

**GROTH, L. A.** *Welding and Cutting Metals by Aid of Gases or Electricity.* 124 ill., 6 x 9, 280 pp. (Van Nostrand's Westminster Series.) \$2.50

**CONTENTS:** Gases and Sources for their Generation. Welding. Blowpipes. Welding of Sheet Iron. Welding Applied to Steam Boilers. Cutting Metals. Reports. Accidents. Legislation Relating to Calcium Carbide and Acetylene. Useful Tables.

Welding by the various methods now practiced is associated with and dependent upon many different factors, all of which must be considered simultaneously to enable even the most skillful workman to produce satisfactory results. This general description, therefore, of the various and distinct



methods, their suitability and selection for different operations, together with a collection of results and tests obtained, with the many illustrations given, should assist in the advance in technical knowledge and lead to the gradual accumulation of practical experience so necessary in every new industry.

**LEMSTRÖM, S.** *Electricity in Agriculture and Horticulture.* Ill., 6 x 9,  
72 pp. **\$1.50**

It is well known that the question which is the subject of this book has been a favorite field of investigation for a century past. As the subject is connected with no less than three sciences—viz., physics, botany, and agricultural physics—it is in itself not particularly attractive. The causes which induced me to begin the investigation of this matter were manifold, and I venture to hope that an exposition of them will not be without general interest. (Extract from Author's Introductory Remarks.)

**VOSMAER, A.** *Ozone, Its Manufacture, Properties and Uses.* 75 ill., 6 x 9,  
210 pp. **\$2.50**

**CONTENTS:** *Nature of Ozone.* Early History; Constitution; Nature; Occurrence; Properties; Tests. *Manufacture of Ozone.* Non-electrical Methods; Electrical Methods. *Electrolysis.* Electrical Discharges. In General: The Brush Discharge in Detail; Influence of Medium; Influence of Electrodes; Influence of Current; Influence of Circuit; Influence of Radiations, Magnetic, and Electric Fields; Influence of Dielectric; Theory; Ozonators; Non-dielectric System; Dielectric System; Efficiency. *Uses of Ozone.* Purification of Drinking Water; Purification of Air; Therapeutic Uses; Uses in the Industries; List of American Patents Bearing on Ozone; Bibliography.

Investigations and experiences with ozone covering a period of over fifteen years have led the author of this work to form opinions on the subject which often differ widely from those commonly accepted. In this work the results of these investigations and the conclusions formed by the author are clearly set forth. The aim has been to produce a book thoroughly scientific and accurate as distinguished from the mass of literature pertaining to ozone that is purely commercial and intended for advertising uses. This subject, which involves so many of the sciences, is still practically in its infancy, and its possibilities may yet prove limitless.

ENGINEERING LAW—VALUATION

**BALL, W. V.** *The Law Affecting Engineers.* Being a concise statement of the powers and duties of an engineer as between employer and contractor; as arbitrator and as expert witness.  $5\frac{3}{4} \times 9$ , 305 pp. **\$3.50**

**CONTENTS:** Status of an Engineer; Fees; Employment of an Engineer in a Salaried Post; Engineer as a Witness; Engineer and the Law of Negligence; Engineering Contracts; Old Materials on the Site; Tenders; Bills of Quantities; Specifications; Plans, Drawings and Designs; Extras and Alterations; Time; Certificates and Payment; Penalties and Bonuses; Maintenance and Defect Clauses; Subcontractors and Subcontracting; The Engineer's Assistant; Contracts Relating to the Supply of Electricity and Machinery; Arbitrations and Awards. Represents largely English practice, but the same laws would apply in substance in this country. Reference is frequently made to American decisions.

**FOSTER, HORATIO A.** *Engineering Valuation of Public Utilities and Factories.* 50 specimen forms.  $6 \times 9$ , 361 pp. **\$3.00**

**CONTENTS:** Value: Commercial, Economics, Physical; Intangible; Worth Present, Original Cost; Reproduction Value, New; Overhead Charges; Organization Expense; Legal Expense; Engineering; Interest; Taxes and Insurance; Brokerage and Discount; Scrap or Salvage Value; Wearing or Service Value; Remaining Service Value; Development Expense; Franchise Value; Going Concern; Good Will; Reports of Valuation; Values of Public Utilities Property; Direction for the Valuation of Tangible Property; Permanence of Valuation; Instructions for Valuation; Forms for Use in Evaluating Property; Forms for Tabulating Final Result; Valuation of: Real Estate, Buildings, Railroads, Street Railways, Water and Undeveloped Power Privilege, Damages to a Water Power Hydro-Electric Plant; Water-Works Property, Telephone Property, Electric Light Property, Gas Property, Manufacturing Property, Valuation Forms; Cost of Valuing a Property; Value of Good Will, Going Concern and Going Value; Depreciation in Factories; Railways; Definitions of Term or Classes of Depreciation; Obsolescence; Inadequacy and Supercession; Wear and Tear; Deferred Maintenance, Elements of; Rules on Depreciation in Great Britain; Metcalfe's Classification of Depreciation; Methods of Calculating; Rates of Depreciation; Renewals; Rules Laid Down by Chicago; Amortization: Definition; Of Capital; Of Patents; Depreciation Funds: Handling of; Reserves; In Wisconsin; In Nebraska; Abstracts from Court Decisions; Appreciation; Franchise: Definition; Term Franchises; Indeterminate; Abstracts of Court Decisions; Tax; Capitalization: Discussion, Abstracts from Court Decisions, Control of Public Utilities Properties, Lists of Public Service Commissions; State; Municipal; Court Decisions: *Wilcox, et al. vs. Consolidated Gas Company. City of Knoxville vs. Knoxville Water Company; National Water Works vs. Kansas City; Kennebec Water District vs. City of Waterville; Montgomery County vs. Schuylkill Bridge Company; San Diego Land and Farm Company vs. Sanford et al.; Monongahela Navigation Company vs. United States; Cotting vs. Kansas City Stock Yards Company et al.; Smyth vs. Ames.* Covers all phases of the valuation of public service properties from the legal, economic and engineering points of view. The author's connection with many large interests has enabled him to obtain much of this valuable information at first hand, and to arrange a complete and authoritative treatise bearing on all the elements of valuation that should be useful to engineers, attorneys, accountants, public officials and managers of public service corporations.

**HAYES, HAMMOND V.** *Public Utilities, Their Fair Present Value and Return.*  $5\frac{3}{4} \times 8\frac{1}{2}$ , 220 pp. **\$2.00**

**CONTENTS:** *The Present Controversy. Ascertainment of Fair Present Value.* Basis for Fair Charges for Service for New Company; Basis for fair Charges for Service for a Previously Unregulated Company; Non-Competitive Successful



Undertakings; Non-Competitive Unsuccessful Undertakings; Fair Value of Property of Competitive Undertakings. *Fair Rate of Return. Replacement Cost. Cost of Promotion; Physical Property; Going Value. Actual Original Cost. Going Value. Depreciation.*

This book is intended to supplement the author's previous work, "Public Utilities, Their Cost and Depreciation" (see below), by entering into a discussion of the line of reasoning which must be followed by those whose duty it is to ascertain the fair present value of a property after an appraisal has been made and all the necessary information relative to it has been obtained. Likewise the subjects of going value and depreciation have been treated at some length with the hope of removing some of the existing misunderstandings concerning them. The present work advocates the use of a method of valuation somewhat different from those that have been pursued in the past in that the use of overhead charges has been reduced to a minimum. It is believed that this method of caring for the costs usually claimed as overhead charges will tend to greater accuracy and will eliminate much future controversy.

**HAYES, HAMMOND V. Public Utilities, Their Cost New and Depreciation.**

*Second Edition. 5¾ x 8½, 275 pp. \$2.00*

**CONTENTS:** Property Valuations—General Considerations. Replacement Costs of Physical Property. Determination of Replacement Cost. Value as Going Concern. Values of Good Will and Franchises. Original Cost. Commercial Value. The Worth of Service to the Consumer. Reserves for Depreciation. Life of Plant. Depreciation. Fair Present Value—Rates. Fair Present Value—Condemnation Sale. General Consideration Relative to the Regulation of Public Utility Undertakings.

The increasing supervision by state authorities in the United States of the operation of public service undertakings has necessitated valuations of the properties employed by many classes of utilities. Much of the work done in making these valuations was carried out under the direction of engineers of wide experience, who have formulated methods designed to furnish data upon which the true present value of the property under investigation could be determined with as near an approach to accuracy as is possible.

On the other hand a careful study of the details of the methods used by the various engineers and by the commissions, engaged upon this work, shows a considerable variation both in theories and principles that have been followed. It is of interest and of great importance that all such variations should be noted and the fundamental principles, involved in any complete valuation, be defined so clearly that two competent and experienced engineers presenting figures as to the value of the same property, independently, would obtain substantially the same results.

An attempt has been made to record in this work the principles, as far as they have been established, which must form the basis of a valuation of the property of a public utility undertaking. References have been given to decisions, which have been rendered in many important cases, bearing upon this subject.

**HUMPHREYS, A. C. Lectures Notes on Some of the Business Features of**

**Engineering Practice.** With lectures and papers by other authors.

*Second Edition, Revised and Enlarged. 6½ x 9¼, 585 pp. \$2.50*

These notes were written and gathered by Dr. Humphreys, president of Stevens Institute of Technology, in order to put into printed form for textbook use with the senior class in engineering, and aims to point out what an engineer need know and understand of modern business methods and practice as applied to the business of engineering.



# CIVIL ENGINEERING

**FRYE, ALBERT I.** *Civil Engineers' Pocketbook.* A reference book for engineers, contractors and students, containing rules, data, methods, formulas and tables. 1200 ill., 620 tables,  $4\frac{3}{4} \times 7$ , leather, 1658 pp. \$5.00

**CONTENTS:** Elementary Arithmetic. Powers, Roots, Reciprocals. Practical Arithmetic. Measures, Weights, Money. Algebra. Logarithms of Numbers. Plane Geometry. Solid Geometry. Plane Trigonometry. Spherical Trigonometry. Mensuration. Analytical Geometry. Descriptive Geometry. The Calculus. Mechanics. Theory of Stresses in Structures. Natural History of Materials. Explosives. Preservatives. Lumber, Lumbering. Metallurgy. Building Stones and Cements. Quarrying. Stone Cutting. Masonry. Stereotomy. Weights and Specific Gravity of Materials. Resistance of Materials. Properties and Tables of Plane Surfaces. Properties and Tables of Steel Shapes. Beams and Girders. Columns. Structural Details. Metal Gauges. Cordage, Wire and Cables. Pipes and Tubes. Bridges. Railroad Bridges. Electric Railway Bridges. Highway Bridges. Cantilever Bridges. Movable Bridges. Suspension Bridges. Arches. Trestles. Roofs. Buildings. Retaining Walls. Dams. Foundations. Wharves, Piers and Docks. Breakwaters. Jetties. Earthwork. Rock Excavation. Dredging. Tunneling. Surveying, Leveling. Railroads. Highways. Hydrostatics. Hydraulics. Water Supply. Water Works. Sanitation. Irrigation. Waterways. Water Power. Steam and Gas Power. Electric Power and Lighting.

A comprehensive treatment of Civil Engineering, in seventy sections, in which each main subject receives economic consideration and analysis, and is reinforced with excerpts from, and references to, the most important cost and other data in our leading technical publications—including hundreds of illustrations, all drawn and specially made for this book, of up-to-date engineering structures and details. "How to design engineering structures economically" has received careful study in the preparation of this work. The fundamental principles laid down can be followed readily by every young engineer, and carried to practical completion in the finished structure. Most of the tables are new and have been prepared regardless of time and expense. Many of them have been arranged in a novel manner, which will appeal especially to engineers; and all have been carefully checked and rechecked, to eliminate the possibility of errors. Graphical methods have been illustrated freely throughout the work, and in connection with analytical solutions. Methods and cost of work have received special attention. A voluminous and authentic glossary of engineering terms is added at the end of the book.

**MAXWELL, W. H., and BROWN, J. T.** (Editors.) *The Encyclopedia of Municipal and Sanitary Engineering.* A handy working guide in all matters connected with municipal and sanitary engineering and administration. Ill.,  $8 \times 10$ , 570 pp. \$10.00

It has become well-nigh impossible for those interested in local administration to keep themselves informed, even in general outline, on the many and varied subjects to which attention is now demanded by the State. The requisite information can only be gained by the expenditure of time, labor, and money in searching through a mass of literature mainly in the form of papers and reports. For the first time such information is presented concisely and in a form convenient for immediate reference. In order to facilitate this, the longer articles are divided into sections, the order of which, as well as their pith and scope, is shown by a brief index at the head of the article. A careful system of cross-referencing has been followed in order that the reader may rapidly acquire information in the cognate aspects of a subject.

The work has been prepared by many well-known experts, whose experience in the matters with which they deal is well known; but the information has been gathered from all parts of the world.

**RANKINE, W. J. M.** *Manual of Civil Engineering. Twenty-fourth Edition.* Revised by W. J. Millar, C.E. 300 ill.,  $5\frac{1}{2} \times 8$ , 822 pp. \$7.50

**CONTENTS:** *Field Work.* Surveying with the Chain; Surveying by Angular



Measurements; Levelling; Setting-Out; Marine Surveying; Copying, Enlarging and Reducing Plans. *Materials and Structures*. Principles of Stability and Strength; Earthwork; Masonry; Carpentry; Metallic Structures; Underground and Submerged Structures. *Combined Structures*. Lines of Land-Carriage; Works of Inland Navigation; Tidal and Coast Works.

SURVEYING (Field and Table Books)

**BOILEAU, J. T.** **A New and Complete Set of Traverse Tables.** Showing the difference of latitude and departure of every minute of the quadrant and to five places of decimals. *Fourteenth Edition.*  $6\frac{1}{2} \times 9\frac{3}{4}$ , 96 pp. **\$5.00**

**CONTENTS:** Tables of: Difference of Latitude and Departure of Every Minute of the Quadrant to Five Decimal Places; Length of a Degree, Minute and Second of Latitude and Longitude for Every Degree of the Quadrant; Conversion Tables Showing: Yards and Feet into Chains, Links and Decimals of Links; Chains and Links into Yards and Decimals of Yards; Chains and Links into Feet and Decimals of Feet, and Other Useful Tables for Surveyors.

**BURT, W. A.** **A Key to the Solar Compass, and Surveyor's Companion.** Comprising all the rules necessary for use in the field. *Eighth Edition.* Ill.,  $4 \times 7$ , leather, 118 pp. **\$2.50**

A complete description of the author's invention, the solar compass, together with full rules for its use in the field by surveying parties, and contains also descriptions of the linear surveys, and the public land system of the United States, notes on the barometer, suggestions for an outfit for a four months' survey. A carefully compiled set of traverse tables and tables of natural sines and tangents, as well as a table of chords have also been added.

**CAREY, ALFRED E., and OLIVER, F. W.** **Tidal Lands.** A study of shore problems. Ill.,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 298 pp. **\$5.00**

**CONTENTS:** Tidal and Current Data; The Tidal Compartment of a River; The Foreshore; The Function of Vegetation; Sand Dunes; The Fixation and Plant Protection of Sand Dunes; Shingle Beaches and Their Fixation; Tidal Land Reclamation (Works); Erosion and Accretion (Works); Plant Winning of Tidal Lands—Salt Marshes; Miscellanea (Cliffs, Rivers, Channels); Blakeney Point, Norfolk, from an Engineering Point of View; The State and Local Control; Complementary Problems; Appendices; List of Dune Plants; Types of Shingle Beach (English); Plants of the Shingle Beach; Plants of the Salt Marsh; Salt Marsh Development; On the Distribution of *Suaeda Fruticosa* on the Blakeney Beach; List of Authorities in England and Wales Having Powers and Duties in Relation to Defense Against the Sea.

**CLEVENGER, S. R.** **A Treatise on the Method of Government Surveying** as prescribed by the U. S. Congress and Commissioner of the General Land Office, with complete mathematical, astronomical, and practical instructions for the use of the United States Surveyors in the field. 33 ill.,  $4\frac{1}{4} \times 6\frac{3}{4}$ , 200 pp. **\$2.50**

**CONTENTS:** Introduction; Initial Point; Principal Base; Standard Parallel; Meridians; Township Lines; Division Meandering; Triangulations; Astronomy Used in Surveying; Convergency and Divergency; Compasses; Chaining; Flagging; Blazing; Corners; Bearings; Field Notes; Various Tables.

**DORR, B. F.** **The Surveyor's Guide and Table Book.** *Seventh Edition.* With a second appendix. 22 ill.,  $4\frac{1}{2} \times 6\frac{1}{2}$ , 150 pp. **\$2.00**

In this book is given all of the information, especially from the legal standpoint that a surveyor should have at his immediate command for reference, including a traverse table and tables of the natural sines and tangents.

**FAIRCHILD, JOHN F.** Graphical Compass Conversion Chart and Tables. Chart in two colors, 3 tables and descriptive matter. \$0.50

This graphical chart, with the tables accompanying it, is intended primarily to afford a ready method of comparison between the American (English) and French method of denoting circle and magnetic compass angles and also of comparison with the mills system used in military practice, accompanied by a clock face for assistance in visualizing angles.

**GRUNSKY, C. E.** Topographic Stadia Surveying. A manual with reduction tables and a new type of reduction diagram. 18 ill.,  $4\frac{1}{2} \times 7\frac{1}{2}$ , flexible fabrikoid, 105 pp. \$2.00

**CONTENTS:** Introduction and Definitions; The Stadia Formula; Diagrams for the Reduction of Stadia Measurements; The Slide-rule as an Aid in Reducing Stadia Notes; Methods of Stadia Surveying; Practical Suggestions; The Platting of Stadia Notes; How to Use the Stadia Diagrams; Stadia Diagram in Pocket. The notes on stadia surveying, presented in this manual, were assembled for the benefit of the surveyor who has occasion to use the telemeter. The method of surveying described and the special type of diagram for the reduction of stadia notes have been found so satisfactory by the author, and by others who have tried them out, that he considers it a duty to give the profession the benefit of his experience, and believes that they will be generally accepted as a valuable addition to the literature of the subject.

**GURDEN, R. L.** Traverse Tables. Computed to four-place decimals for every single minute of angle up to 100 of distance. For the use of surveyors and engineers. *Fifth Edition.* Folio,  $9\frac{1}{2} \times 14$ , 270 pp. \$7.50

The distinctive features of this book, and the method of the employment of the Tables, may be briefly summarized as follows: I. The Tables are calculated to Single Minutes and to 100 of distance. II. The Traverses are given to four places of Decimals. III. The angles 0 to  $45^\circ$  are given at top of page, and  $45^\circ$  to  $90^\circ$  at the foot. IV. The whole numbers are given in the two center columns only.

**McCULLOUGH, ERNEST.** Practical Surveying. For surveyors' assistants, vocational and high schools. *Second Edition, Corrected.* 229 ill., 1 colored map,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 410 pp. \$2.50

**CONTENTS:** Introductory; Chain Surveying; Levelling; Compass Surveying; Trigonometry; Transit Surveying; Surveying Law and Practice; Engineering Surveying; The Essentials of Algebra.

Written for students whose mathematical training stopped with arithmetic. It is intended primarily for home study and should be of service to surveyors who wish to "break in" assistants. No algebra or geometry required as a preliminary. The book is essentially a treatise on practical mathematics applied to land and engineering surveying. It is excellent for review purposes and for reference. Complete in every respect. Not an elementary treatise, although it does begin with the elements of the subject. The author has been a teacher in evening classes attended by young men in the employ of surveyors, contractors and engineers. He writes clearly and understands the difficulties encountered by students lacking the mathematical training required for an understanding of the modern college texts on surveying. He has been in active practice as an engineer since the year 1887, and the book is therefore very practical throughout, yet rigid in treatment.

**MULFORD, A. C.** Boundaries and Landmarks. Ill.,  $5\frac{3}{4} \times 8\frac{1}{4}$ , 98 pp. \$1.00

**CONTENTS:** Work and Training of the Surveyor; Description of Property; Simple Deeds without Dimensions; Relative Legal Value of Evidences of Boundary. *Landmarks.* Stakes and Stones; Marked Timber; Ditches and Balks; Fences and Walls; Deeds with Complete Descriptions; Sources of Error in Descriptions; Relations of the Surveyor and the Lawyer; House Lots; Highway Records; Re-Running Old



Highway Records; Laying Out New Roads; Responsibilities of the Surveyor. Explains and endeavors to familiarize the surveyor with the types of old boundaries and landmarks commonly found in Eastern United States. This work shows how to meet the conditions that might arise in country surveying, such as the relocation of old boundaries, the significance attached to natural landmarks, their position, and what relation they bear to the land surveyed. The meaning meant to be conveyed by certain kinds of old landmarks is carefully explained and the question of old deeds and how they are to be construed is taken up. Methods of actual measurement and surveying instruments are not discussed in this book, which devotes itself entirely to the question of locating boundaries.

**ORMSBY, M. T. M.** *Elementary Principles of Surveying.* A textbook for the use of students, engineers, etc. 138 ill., 4 folding plates.  $4\frac{3}{4} \times 7\frac{1}{2}$ , 241 pp. **\$2.00**

**CONTENTS:** Chain Surveying; Traverse Surveying; Levelling and Contouring; Triangulation Surveys; Tacheometric Surveying; Curve Ranging; Answers to Exercises.

**STILES, A.** *Tables for Field Engineers.* Designed for use in the field. Ill.,  $4\frac{1}{4} \times 6\frac{3}{4}$ , 156 pp. **\$1.00**

**CONTENTS:** Explanation of Tables; Table of Radii and Their Logarithms, Tangential Offsets and Middle Ordinates; Table of Chords, Versed Sines, External Secants and Tangents to a One Degree Curve; Table of Natural Sines and Tangents to Every Degree and Minute of the Quadrant.

**TRAVERSE TABLE.** *Third Edition.*  $3\frac{3}{4} \times 6$ , boards, 196 pp. (Van Nostrand Science Series, No. 115.) **\$0.75**

**CONTENTS:** Traverse Table Showing the Difference of Latitude and Departure for Distances Between 1 and 100 and for Angles to Quarter Degrees Between  $1^\circ$  and  $90^\circ$ ; Table of Natural Sines and Tangents for Each Five Minutes of the Quadrant.

**VAN NOSTRAND'S Table Book for Civil and Mechanical Engineers.** Compiled by Geo. W. Plympton.  $3\frac{3}{4} \times 6$ , boards, 195 pp. (Van Nostrand Science Series, No. 104.) **\$0.75**

full leather, **\$1.00**

A series of useful tables that the engineer might be called upon to consult in his daily practice, such as conversion tables, squares, cubes and roots, natural sines and tangents, areas of circles, weights of metals in various forms, strength columns, velocity of rivers and force of the wind, copper wire tables, soldering, brazing, rainfall tables, etc.

**WHARTON, W. J. L.** *Hydrographical Surveying.* A description of the means and methods employed in constructing marine charts. *Third Edition*, revised and brought up-to-date by Admiral Sir Mostyn Field. Ill.,  $6 \times 9$ , cloth. *In Press*

**WILLIAMSON, JAMES.** *Surveying and Field Work.* A practical textbook. 271 ill., 2 plates,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 360 pp. **\$3.00**

**CONTENTS:** Surveying; Fundamental Principles. *Chain Surveying.* Instruments, Field Operations, Running a Survey Line, Arrangement of Survey Lines, Errors, Special Problems; Plotting the Plan; Compass and Sextant Surveying; The Theodolite; Transverse Surveying with the Theodolite; Plotting Traverse Survey, by Angle and Distance, by Co-ordinate or Latitude and Departure Method; Triangulation; Problems; Levelling; Errors in Levelling; Sections, Contours, etc.; Setting Out Curves; Calculation of Areas; Calculation of Earth Work Quantities; Adjustment of Instruments; Geometric and Trigonometric Formulæ.

**WILLIAMSON, R. S.** Practical Tables in Meteorology and Hypsometry.

Being an appendix to the paper on the Use of the Barometer on Surveys and Reconnaissances. Submitted to the Chief of Engineers, U. S.

A.  $9\frac{1}{4} \times 12$ , 155 pp.

**\$2.50**

**CONTENTS:** Table A, Giving the Correction to be Applied to English Barometers; Table B, For Reducing Observations to Level; Table C, Psychrometrical Tables; Table D, For Computing Differences of Altitude from Observations with the Barometer.

**WRIGHT, T. W., and HAYFORD, J. F.** Adjustment of Observations. By the method of least squares, with applications to geodetic work. *Second Edition, Rewritten.* Ill., cloth,  $6 \times 9$ , 307 pp.

**\$3.00**

**CONTENTS:** Law of Error; Adjustment of Direct Observations of One Unknown; Indirect Observations; Condition Observations; Application to Adjustment of Triangulation; Method of Angles; Of Deductions; Application to Base Line Measurement and to Leveling; Application to Selection of Methods of Observation.

RAILWAY ENGINEERING**BALL, J. D. W.** Reinforced Concrete Railway Structures. 124 ill.,  $6 \times 8\frac{3}{4}$ , 228 pp.

**\$2.50**

**CONTENTS:** Preliminary Considerations; Bending Stresses; Shear Stress; Floors and Buildings; Foundations and Rafts; Retaining Walls; Bridges; Arches Bridges; Sleepers, Fence Posts, etc.; Summary of Notation Employed. Aims to describe the generally accepted principles and processes upon which the design and construction of reinforced concrete structures depend, and more especially those structures that come within the railway engineer's practice. Complicated formulas and calculations have, as far as possible, been avoided and the attention concentrated upon arriving at results as simply as possible and presenting them conveniently.

**CARY, E. R.** Solution of Railroad Problems by the Slide Rule. 43 ill.,  $4 \times 6$ , 146 pp.

**\$1.00**

(Author is professor of Railroad Engineering and Geodesy in Rensselaer Polytechnic Institute, Troy, N. Y.)

**CONTENTS:** The Slide Rule. Simple Curves. Compound Curves. Vertical Curves. Turnouts. The Easement Curve. Earthwork. Problems. Diagrams Tables.

The ease and rapidity of solving problems in railroad curves by the use of the slide rule led the author to develop this set of problems. The object of this book is to present similar problems for the convenience of students who have studied Railroad Curves and the Theory of the Slide Rule. A discussion of the slide rule, the development of the equations used and a discussion of the easement curve have been added to make the book of more general interest.

**DERR, W. L.** Block Signal Operation. A practical manual. Pocket size. *Second Edition.* Ill.,  $7 \times 4\frac{3}{4}$ , oblong, 270 pp.

**\$1.50**

**CONTENTS:** Introductory; General Principles; Block Signals; Signal Lamps; Block Tower; Signal Bells; Block Record; Train Orders at Block Stations; Blocking at Junctions and Crossings; Manual Blocking; Controlled Manual Blocking; Automatic Blocking; Machine Blocking.

**DILWORTH, EDWARD C.** Steel Railway Bridges, Designs and Weights. 55 ill., 105 full-page plates,  $12\frac{1}{2} \times 9\frac{1}{2}$ , 191 pp.

**\$6.00**

(Author is designing and contracting engineer with the Pittsburgh-Des Moines Steel Co., and was formerly designing engineer with the American Bridge Co.)

**CONTENTS:** Designing; Centrifugal Force; Draw Spans; Turntables; Detail-



ing; Camber-Plate Girders; Notes on Weight Curves; Specifications for Ry. Bridges Am. Ry. Eng. Asso.; Facilitating Design; Deck Plate Girders—Weight Curves; Single-Track Through Plate Girders—Weight Curves; Double Track Through Plate Girders—Weight Curves; Alternate and Misc. Details for Plate Girder Spans; Single-Track Deck Riveted Spans—Timber Floor—Weight Curves; Single-Track Poney Riveted Spans—Weight Curves; Double-Track Poney Riveted Spans—Weight Curves; Single-Track Through Riveted Spans—Weight Curves; Double-Track Through Riveted Spans—Weight Curves; Typical Detail of Rocker Nest; Double-Track Deck Riveted Spans—Weight Curves; Alternate and Misc. Details for Deck Spans; Single-Track Through Pin Spans—Weight Curves; Alternate and Miscellaneous Details for Pin and Riveted Spans; Double-Track Through Pin Spans—Weight Curves; Single Track Through Plate Girder Draw Spans—Weight Curves; Single-Track Through Riveted Draw Spans—Weight Curves; Counter-Balanced Draw Spans—286' Long; Double Track Through Riveted Draw Spans—Weight Curves; Single-Track Viaducts—Weight Curves; Alternate and Miscellaneous Details for Viaducts; Double-Track Viaducts—Weight Curves; Turntables—Deck 85' Long; Turntables—Through—85' Long; Wheel Load Diagram for E50; Moments, Shears, and Reactions E50; Moments and Shears for Truss Bridges; Draw Span Formulæ and Coefficients; Allowable Web Shears; Compressive Stresses; Centers of Gravity for Plate Girder Flanges; Maximum Length for Plates; Approximate Radii of Gyration; Maximum Lengths of Shapes; Memorandum for Estimating.

**GARCIA, A. J. R. V. Dictionary of Railway Terms in Spanish-English and English-Spanish.** 6 x 9, 350 pp. **\$3.00**

A Spanish-English and English-Spanish dictionary containing not only the principal terms, but all the rare words as well as those of recent origin that concern railway enterprise, the details of the laying of the line, the rolling stock from its trucks and wagons to its luxurious dining cars, and the stations with their hotels, garages and dependencies. Special terms that in Cuba, Mexico, and South America differ from those used in Spain are also included.

**JORDAN, LEONARD C. The Practical Railway Spiral.** With short working formulas and full tables of deflection angles and complete notes of illustrative examples. 7 diagrams, 4 x 6½, leather, 164 pp. **\$1.50**

(Author is principal of the civil engineering department in the Heffley Institute, Brooklyn.)

**CONTENTS:** Introduction. Superelevation. The Curve Easement. Spiral Development. Revision. **TABLES:** Maximum Velocity on Curves. Minimum Length of Spirals. Deflection Angles of General Spiral. Functions and Deflections of all Spirals. Radii and Logarithms. Corrections, Tangents and Externals. Tangents and Externals to a One Degree Curve.

Attempts to clear up and modify the theory and to eliminate the existing inconsistencies of spiral curves. The Author who has had considerable experience on railroad maintenance, in actual track work itself and on location both in mountainous country and on the plains, believes that "the Practical Railway Spiral" is the closest possible approach to the perfect curve easement in accord with the requirements of many of the best American railways.

**SELLEW, WILLIAM H. Steel Rails, Their History, Properties, Strength and Manufacture.** With notes on the principles of rolling stock and track design. 361 ill., 35 folding plates, 7¾ x 10¾, 575 pp. **\$10.00**

(Author is principal assistant engineer, Michigan Central Railroad.)

**CONTENTS:** DEVELOPMENT OF THE PRESENT SECTION. Early Sections. Present Sections. **PRESSURE OF THE WHEEL ON THE RAIL.** Speeds of Modern Locomotives. Weights of Modern Locomotives. Effect of Excess Balance and Angularity of the Main Rod. Effect of Irregularities in the Track. Effect of Rocking of the Engine. Effect of Flat Spots in the Wheels. Impact Tests. The Dynamic Augment of the Wheel Load. Electric Locomotives. Cars. **SUPPORTS OF THE RAIL.** The Tie. Bearing of the Rail on the Tie. Fastening of the Rail to the Tie. Strength of the Tie. Bearing on the Ballast. Bearing on the Sub-grade. Supporting Power of the Tie.



**STRESSES IN THE RAIL.** Stresses at Point of Contact of the Wheel with the Rail. Proposed Solutions of the Bending Stress in the Rail. Tests to Determine the Bending Stress in the Rail. Calculation of the Bending and Shearing Stress in the Rail. Effect of the Joint. **STRENGTH OF THE RAIL.** Influence of Stress and Strain on the Strength of the Rail. Effect of Low Temperature on the Strength of the Rail. Physical Tests of the Strength of the Rail. The Strength of the Rail and Proper Weights for Various Conditions of Loading. **INFLUENCE OF DETAIL OF MANUFACTURE.** Chemical Composition. Extraction of the Iron from Its Ore. Conversion of the Steel. Casting the Ingot. Influence of Mechanical Work. **RAIL SPECIFICATIONS.** Comparison of American Specifications. Specifications of the New York Central Lines. Specifications for Rails Rolled for Export. British Standard Specifications of Bull-Headed Railway Rails. British Standard Specifications of Flat Bottom Railway Rails. Specifications for Street Railway Rails. Bibliography of Rail Specifications. Appendix, Reports and Records.

**SELLEW, W. H. Railway Maintenance Engineering.** With notes on construction. 194 ill., 6 folding plates,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 380 pp. (Van Nostrand's Textbooks.) \$3.00

**CONTENTS:** *Engineering.* Reconnaissance and Exploration Surveys; Location; Construction; Estimation of Quantities; Curves and Spirals. *Land.* Basic Divisions of Land; Purchase of Land. *Grading.* Sections; Drainage; Construction of the Road-Bed; Construction Contract; Bearing Power of the Sub-Grade. *Bridges, Trestles and Culverts.* *Ties.* Forms of: Metal Ties, Concrete Ties; Conservation of the Timber; Supply; Strength of Ties. *Rails.* Specifications; Length; Rail Failures. *Other Track Material.* Derails; Crossings; Joints; Bolts; Nut Locks; Spikes; Tie Plates; Anti-Creepers; Bumping Posts. *Ballast.* Sub-Ballast; Sections; Specifications; Physical Tests; Cleaning; Handling and Distribution; Distribution of Pressure. *Maintaining Track and Right of Way.* Track Laying; Surfacing; Right of Way Fences; Snow and Sand Fences, and Snow Sheds; Crossings; Signs; Roadway Small Tools; Section Work; Fires on Right of Way. *Station and Roadway Buildings.* Local Stations; Terminal Passenger and Freight Stations; Track Scales. *Water Stations.* Pumping; Tanks; Stand-Pipes; Track Tanks; Water-Treating Plants. *Fuel Stations.* Platforms; Docks; Clam Shells; Mechanical Plants; Storage of Coal. *Shops and Engine Houses.* Round House, Heating Plants; Turn Table; Cinder Pits; Sand Houses; Shops. *Icing Stations.* Harvesting Natural Ice; Manufacture of Ice; Insulation; Building for Storing Ice; Delivering Ice to Cars. *Signals and Interlockers.* Essentials of Signalling; Train Order and Manual Block Signals; Mechanical Interlocking.

This book is intended primarily for classroom use, but contains considerable matter of a character sufficiently advanced to claim the attention of engineers in the maintenance of way departments of railways.

**SHUNK, W. F. The Field Engineer.** A handy book of practice in the survey, location, and trackwork of railroads, containing a large collection of rules and tables, original and selected, applicable to both the standard and narrow gauge, and prepared with special reference to the wants of the young engineer. *Twenty-first Edition, Revised and Enlarged.* Ill.,  $4\frac{1}{4} \times 6\frac{3}{4}$ , flexible fabrikoid, 355 pp. \$2.50

**CONTENTS:** Logarithms; Plane Trigonometry; Adjustment and Use of Instruments; Propositions and Problems Relating to the Circle Tracing Curves and Turning Obstacles in the Field; Suggestions as to Field Work and Location Projects; Problems in Field Locations; Track Problems; Tables.

**WAGNER, H. E., and EDWARDS, H. W. Railway Engineering Estimates.**

*In Press*



CEMENT AND CONCRETE**ANDREWS, E. S. Elementary Principles of Reinforced Concrete Construction.**

A textbook for the use of students, engineers, architects, and builders.  
*Second Edition, Revised and Enlarged.* 57 ill., 5 x 7½, 255 pp. **\$2.00**

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**BALL, J. D. W. Reinforced Concrete Railway Structures.** 124 ill., 6 x 8¾, 228 pp. **\$2.50**

**CONTENTS:** Preliminary Considerations; Bending Stresses; Shear Stress; Floors and Buildings; Foundations and Rafts; Retaining Walls; Bridges; Arches Bridges; Sleepers, Fence Posts, etc.; Summary of Notation Employed.

**BROWN, WM. A. The Portland Cement Industry.** A practical treatise on the building, equipping and economical running of a Portland cement plant. With notes on physical testing. Ill., 5¾ x 8¾, 168 pp. **\$3.00**

**CONTENTS:** Introductory; Historical; Development of the Industry; Manufacture; Raw Materials; Design and Construction of a Modern Portland Cement Plant; The Rotary Kiln; Power Plants; Miscellaneous; Costs and Statistics; Equipment; Development of Cement Testing; Chemical Composition; Fineness; Tensile Strength; Time of Setting; Soundness or Constancy of Volume.  
 A concise, well arranged and abundantly illustrated manual treating the cement industry from all angles.

**CASLER, MELVIN D. Simplified Reinforced Concrete Mathematics.** Derivation of simple, universal formulas and their application to beams, columns and arches, with nomographic computing device. Ill., 5 x 7½, 66 pp. **\$1.00**

The main purpose of this book is to provide the engineer with practical working formulas for the design and investigation of reinforced concrete members, and with means for applying these formulas with a minimum of computation. The proposed formulas are derived for general application to beams subject to direct longitudinal stress in conjunction with transverse moment, to eccentrically loaded columns, and to arches. One of its objects is to simplify the formulas and their application to beams, columns and arches, without loss in mathematical accuracy, so as to make the use of special curves and tables for various assumptions to properties, stresses, dimensions, etc., etc. The author has also included some labor-saving devices for use in proportioning members and has demonstrated, by definite examples, the application of the formulas to beams, columns and arches. For work of varied nature, the methods given in the book effect a large saving in time over prevalent methods of computation. The contents are: Derivation of Formulas; Labor-Saving Devices; Illustrative Examples; General Notes on Reinforced Concrete Design.

**COCHRAN, JEROME. A Treatise on Cement Specifications.** Illus., 5¾ x 8¾, 113 pp. **\$1.00**

**CONTENTS:** Introduction. General Conditions Covering the Use of Cement. Furnishing Cement to the Contractor. Purchase of Cement from Manufacturer. Delivery and Storage of Cement. Inspection and Tests of Cement. Test Requirements for Cement. Methods of Testing Cement. Significance of Tests of Cement.



Methods of Chemical Analysis of Portland Cement. Bibliography of Specification for Cement. Bibliography of Foreign Cement Specifications.

Brings together into a logical sequence all the points that need be taken into

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**HAWKESWORTH, J.** **Graphical Handbook for Reinforced Concrete Design.** A series of plates, showing graphically, by means of plotted curves, the required design for slabs, beams, and columns under various conditions of external loading, together with practical examples showing the method of using each plate. Ill.,  $9 \times 11\frac{1}{4}$ , 64 pp. **\$2.00**

**CONTENTS:** Values of Constant for Determining Resisting Moments; Design of Slabs; Spacing of Square Bars; External Bending Moment in Footing Slabs; Value of Resisting Moment; Conversion of Areas of Metal Cross Section; Location of Neutral Axis; Allowable Stresses and Loads; Design of Hooped Columns; Complete Design of a Reinforced Concrete Structure.

**MARSH, C. F., and DUNN, WM.** **Manual of Reinforced Concrete.** *Third Edition, Rewritten and Considerably Enlarged* by the addition of much useful information and many new tables and diagrams. Ill., numerous folding plates,  $4\frac{1}{4} \times 6\frac{1}{2}$ , 491 pp. **\$2.00**

**CONTENTS:** Materials; Construction; Waterproofing; Loads, Bending Moments and Shearing Forces; Calculations; General Information, Tables, Diagrams.

**MARSH, CHARLES F.** **Reinforced Concrete Compression Member Diagram.**  $40 \times 30\frac{1}{2}$ , in a cloth folder,  $9\frac{1}{2} \times 7\frac{1}{4}$ . **\$1.50**

The description accompanying the diagram is very explicit and gives general instructions for using the diagrams which have been prepared in accordance with the second report of the joint committee appointed by the Royal Institute of British Architects and the London County Council Draft Regulations, consisting of four graphs on one sheet, all continuously related to each other. The manner of use for designing a pillar is, roughly, as follows: Taking the load as starting point trace to an intersection with a line for the size of pillar selected, red lines showing circular cores, and blue, square cores. From this first intersection trace on to intersect with another line, representing the proportion of vertical steel, and then on to meet a line representing, either by its red, green or blue color, the kind of concrete chosen and the value of a constant chosen from a table and dependent upon the kind of binding and its spacing. Thus a ratio of volumes of concrete and hooping is derived, and by the aid of another diagram, a factor is ascertained which gives the size of the binding, having regard to the previously chosen spacing. A pillar already designed may be checked by working back the opposite way.

**MARTIN, NATHANIEL.** **The Properties and Design of Reinforced Concrete.** Instructions, authorized methods of calculation, experimental results, and reports by the French Government Commissions on Reinforced Concrete. 29 diagrams,  $6\frac{3}{4} \times 9\frac{1}{4}$ , 133 pp. **\$1.50**

(Author is lecturer on reinforced concrete in the Glasgow Royal Technical College.)

**CONTENTS:** Instructions Relative to the Use of Reinforced Concrete. A Circular Issued by the French Ministry of Public Works in Explanation of the Instructions. Report of the Draft Regulations by the Commission Nominated by the General Council of Bridges and Roads. The Experimental Work of the Commission. The



Report and Draft Regulations Presented by the Commission, being a Review of the Principal Results of the Experimental Work of the Commission. Some Conclusions of the Commission from the Study of the Elementary Properties of the Materials Constituting Reinforced Concrete. Notes Presented by M. Considère. Appendix.

**RICHARDS, W. A., and NORTH, H. B. A Manual of Cement Testing.**

For the use of engineers and chemists in colleges and in the field. 56 ill.,  $5\frac{3}{4} \times 8$ , 147 pp. **\$1.50**

**CONTENTS:** Classification, Composition, Manufacture. Sampling. Fineness Specific Gravity. Normal Consistency. Constancy of Volume. Tensile Strength Compressive Strength and Transverse Tests. Sand and Stone. Laboratory Equipment. Part Played by Chemical Analysis. Preparation of Sample for Analysis. Analysis of Cement, Limestone, Marl, Slag and Clay. Standard Specifications for Portland Cement.

This laboratory manual is intended to assist in bringing about uniformity in the testing of cement. The authors have endeavored to present, in a somewhat condensed form, such directions as will enable a student in the laboratory or an operator in the field office to interpret correctly the Standard Methods of Testing and Specifications for Cement, as published by a committee of the American Society of Civil Engineers, American Society for Testing Materials, Association of American Portland Cement Manufacturers and the American Railway Engineers and Maintenance of Way Association. Sufficient detail is given to enable all students to learn the same manipulations and thus be able to perform each test in a certain well-defined and similar manner. Mr. Richards is a practical engineer and has been engaged in practical engineering work and teaching of engineering subjects for a number of years, and Dr. North has made a special study of cement and for two years was a student of Prof. Henri Le Chatelier, the great French authority on cement.

**RINGS, FREDERICK. Reinforced Concrete Bridges. 373 illustrations. **\$5.00****  
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**CONTENTS:** Disadvantages and Advantages. Architectural Treatment. Water and Weather Proofing. The Materials Used. Regulations of the London County Council. Practical Suggestions and Superintendence. Bending Moments, Stresses, and Strains. Loads on Bridges and External Stresses. Calverts, Coverings, Tunnels, etc., Design of Girder Bridges. Calculation of Girder Bridges and Worked Problems. Examples of Girder Bridges. Design of Arched Bridges and Abutments. Theory of the Arch. Examples of Arched Bridges. Formula, Notes, Schedules, and Other Useful Information.

A record of the most important features and facts for the bridge designer. The series of bridges illustrated, while possibly not the most remarkable structures extant, are, however, illustrative of the various types occurring in the usual practice of the civil engineer.

**RINGS, FREDERICK. Reinforced Concrete in Theory and Practice. **\$4.50****  
*Second Edition, Revised and Enlarged.* Ill.,  $5\frac{1}{4} \times 8$ , 260 pp.

**CONTENTS:** Introductory; Materials; Execution of Work; Applications of Reinforced Concrete; Loads, Moments, Stresses, Resistance; Formulae for Slabs with Single Reinforcements; Shearing Stresses and Adhesion; Formulae for Columns; Arch and Bridge Construction; Retaining Walls, Circular Structures, etc.; Worked Examples; London County Council Regulations; Memoranda and Tables; Symbols.

Does not advocate or give prominence to any particular method of construction, but gives in a concise form the best of many formulæ and systems used in various countries, and deals with the subject in such a manner as to be intelligible to average students of architecture who have not been required to devote that amount of study to the theory of construction which is demanded of the engineer, to whom, however, it should also be useful.

**SEARLE, A. B. Cement, Concrete and Bricks. 113 ill.,  $5\frac{1}{2} \times 8\frac{1}{4}$ , 415 pp. **\$3.00****

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(Author is professor of civil engineering at Manhattan College.)

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tion by Headings. European and American Methods. St. Gothard and Fort George Tunnels. Comparison of Methods. Excavating Tunnels through Soft Ground. General Discussion. The Belgian Method. The German Method. Baltimore Belt Line Tunnel. The Full Section Method. The English, American and Austrian Methods. Special Treacherous Ground Method. Italian Method; Quicksand Tunneling: Pilot Method. Open-Cut Tunneling Methods; Tunnels under City Streets. Boston Subway, and New York Rapid Transit. Submarine Tunneling—General Discussion—The Severn Tunnel. The Compressed Air Method—The Milwaukee Water Works. The Shield System. The Shield and Compressed Air Method. The Pennsylvania Railroad Tunnel under the Hudson River. Tunnels at Very Shallow Depths.—The Cofferdam Method.—The Van Buren Street Tunnel, Chicago—The Pneumatic Caisson Method. The Tunnels under the Harlem, Seine and Detroit Rivers. Accidents and Repairs in Tunneling During and After Construction. Relieving Timber-Lined Tunnels with Masonry. Ventilating and Lighting of Tunnels During Construction. Cost of Tunnel Excavation, and the Time Required for the Work.

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This book appeared originally as Part II of the 1917 Good Roads Year Book, which was an outline of road building compiled from material contributed by over fifty leading American highway engineers.



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**GUY, A. E.** *Experiments on the Flexure of Beams, resulting in the Discovery of New Laws of Failure by Buckling.* Reprinted from the *American Machinist.* Ill., diagrams and folding plates,  $6 \times 8\frac{1}{2}$ , 122 pp. \$1.25

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**SCHINDLER, K.** *Iron and Steel Constructional Work.* A concise handbook with examples for practical application. Translated from the German and adapted to English practice by Chas. Salter. 115 ill.,  $5 \times 7\frac{1}{2}$ , 152 pp. **\$2.00**

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tion of Shed Members and Foundations; Sheeted Sheds; Standard Sections for Sheds with Open Sides and Gables; Sheeted Roofs; Standardizing of Shed Members and Foundations for Sheds Having Slated Roofs and Brick Panelled Walls; Standard Sections for Sheds with Open Sides and Gables; Slated Roofs; Standard Stresses and Sections for Roof Principals; External Coverings; Gutters, Pipes, Ventilation, Doors, Windows and Skylights.

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An investigation of the relative adaptability of the cantilever and suspension types to long-span construction, together with a determination of the economic proportions and outlines of the methods of design.

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(Author is assistant professor of structural design at Carnegie Institute of Technology.)

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(Author was under-secretary for irrigation to the Government of India.)

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**HALL, W. S.** *Elements of the Differential and Integral Calculus. Sixth Edition, Revised.* Ill.,  $6 \times 9$ , 261 pp. **\$2.75**

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(Author is professor of mathematics at Stevens Institute of Technology.)

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(Author is professor of Railroad Engineering and Geodesy in Rensselaer Polytechnic Institute Troy, N. Y.)

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# MECHANICAL ENGINEERING

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 (Author is instructor in physics in the Sheffield Scientific School of Yale University.)



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**MILLS, CLIFFORD N.** *A Short Course in Elementary Mechanics for Engineers.* 36 ill.,  $4\frac{1}{2} \times 6\frac{3}{4}$ , 137 pp. **\$1.00**

(Author is professor of mathematics in the South Dakota State College of Agriculture and Mechanic Arts.)

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**RANKINE, W. J., and BAMBER, E. F. A Mechanical Textbook, or Introduction to the Study of Mechanics. Fifth Edition.** 158 ill.,  $5\frac{3}{4} \times 8$ , 324 pp. **\$4.00**

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**STAHL, A. W., and WOODS, A. T. Elementary Mechanism. A textbook for students of mechanical engineering. Seventeenth Edition,** 198 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 319 pp. **\$2.25**

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**TEMPLETON, WM. The Practical Mechanic's Workshop Companion.** Comprising a great variety of the most useful rules and formulas in mechanical science, with numerous tables of practical data and calculated results for facilitating mechanical operations. *Nineteenth Edition, Revised*, modernized and considerably enlarged by Walter S. Hutton. Ill.,  $4\frac{1}{4} \times 6\frac{1}{2}$ , leather, 484 pp. **\$2.00**



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**CONTENTS:** Kinematics; Motion; Matter in Motion; Newton's Laws; Dynamics of a Particle; Statics of a Body; Friction; Work and Energy; Dynamics of Rotation; Elastic Solids; Impact; Metric Units; Dimensions of Units; Tables; Synopsis for Ready Reference.

### HEAT—THERMODYNAMICS

**DRAPER, CHARLES H.** *Heat and the Principles of Thermodynamics.* *New and Revised Edition.* 193 ill.,  $5\frac{3}{4} \times 8$ , 444 pp. **\$2.25**

**CONTENTS:** Units of Measurement. Symbols. Formula. EXPERIMENTAL. Temperature. The Thermometer. Expansion of Solids, Liquids, and Gases. Remarks on Expansion. Specific Heat—Calorimetry. Liquefaction and Solidification. Latent Heat. Properties of Vapors. Ebullition. Latent Heat. Liquefaction of Gases. Hygrometry. Heat and Electricity. Conductivity. Thermo-Chemistry. Radiation. Measurement of Temperature. PRINCIPLES OF THERMODYNAMICS. Work and Energy. Mechanical Equivalent of Heat. The Kinetic Theory. Internal and External Work. Isothermal Curves. Continuity of State. Specific Heats of Gases. Adiabatic Changes and Curves. Heat Engines. Theory of Heat Engines. Some Applications of Carnot's Principle. Miscellaneous Examples and Exercises. Appendix. Answers to Exercises.

The subject matter in this new edition has been revised and rewritten in order that the book may be in accord with the recent advances made in the methods of heat measurement and the theories brought to light by recent investigations.

**ENNIS, WILLIAM D.** *Applied Thermodynamics for Engineers.* *Fourth Edition, Corrected.* 316 ill.,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 514 pp. **\$5.00.**

**CONTENTS:** The Nature and Effects of Heat. The Heat Unit. Specific Heat First Law of Thermodynamics. Laws of Gases. Absolute Temperature. The Perfect Gas. Thermal Capacities. Specific Heats of Gases. Joule's Law. Graphical Representations. The Carnot Cycle. The Second Law of Thermodynamics. Entropy. Compressed Air. Hot Air Engines. Gas Power. Theory of Vapors. The Steam Engine. Modified Cycle. Multiple Expansion. Engine Testing. The Steam Turbine. Results of Trials of Engines and Turbines. The Steam Power Plant. Distillation. Fusion. Liquefaction of Gases. Mechanical Refrigeration.

The author's aim has been to prepare a manual on the fundamental principles of heat machinery that will be useful in the class-room and the laboratory, and to the designer. The subject is treated from the physical standpoint and as related to its engineering applications. Differential equations have been almost wholly eliminated, the mathematical complications have been as far as possible avoided, and the rule has been kept in mind to employ the Calculus only in the few places where it really makes things simpler. This new edition represents a



careful and comprehensive revision of the original book which was very enthusiastically received and used as a text in many of the best universities in the country. Answers to many of the numerical problems have been incorporated and additional problems set.

**HIRSCHFELD, C. F.** *Engineering Thermodynamics. Second Edition.* Ill.,  $3\frac{3}{4} \times 6$ , cloth, 162 pp. (Van Nostrand's Science Series, No. 45.) **\$0.75**

**CONTENTS:** Heat; Gases; Entropy; Cycles; Flow of Gases; Vapors; Expansion and Compressions of Vapors; Vapor Cycles; Flow of Vapor.

**KLEIN, J. F.** *Physical Significance of Entropy, or the Second Law.*  $6\frac{1}{4} \times 9\frac{1}{4}$ , 108 pp. **\$1.50**

(Author is professor of mechanical engineering at Lehigh University.)

**CONTENTS:** Introduction. The Definitions, General Preliminaries, Development, Current and Precise Statements of the Matters Considered. Concerning the Application of the Calculus of Probabilities. Analytical Expressions for a few Primary Relations. The Physical Interpretations. Summary of Connection between Probability, Irreversibility, Entropy, and the Second Law. Reach and Scope of the Second Law.

**PARTINGTON, JAMES R.** *A Text-book of Thermodynamics* (with special reference to Chemistry.) 91 diagrams,  $6 \times 9$ , 550 pp. **\$4.00**

**CONTENTS:** Thermometry and Calorimetry. The First Law of Thermodynamics and Some Applications. The Second Law of Thermodynamics; Entropy. The Thermodynamic Functions and Equilibrium. Fluids. Ideal and Permanent Gases. Changes of Physical State. Van der Waals' Equation and the Theory of Continuity of States. Thermochemistry. Gas Mixtures. Elementary Theory of Dilute Solutions. General Theory of Mixtures and Solutions. Capillarity and Adsorption. Electrochemistry. The Theorem of Nernst. Kinetic Theories in Thermodynamics. Expounds the principles of thermodynamics and illustrates their applicability to the various problems of physical chemistry. Chemical problems receive the main consideration and other branches are either briefly treated or omitted. The author aims to show that a comprehension of the fundamentals of thermodynamics may be applied advantageously to the solution and interpretation of modern experimental work.

**ZEUNER, A.** *Technical Thermodynamics. Second Edition.* Translated from the *Fifth, Completely Revised, German Edition* of Dr. Zeuner's original treatise on thermodynamics by J. F. Klein. Two volumes. Ill.,  $6\frac{3}{4} \times 9\frac{1}{2}$ . **\$8.00**

**CONTENTS:** Fundamental Equations of Thermo-Dynamics; Theory of Gases; Reversible Changes in the State of a Gas; Reversible and Non-Reversible Changes of State of Gases; Flow and Efflux of Gases; Theories of Air Engines; Internal-Combustion Engines; Vapors; Reversible and Non-Reversible Change of Wet Vapors; Flow and Efflux of Wet Vapors; Reversible and Non-Reversible Changes of Superheated Vapor of Water; Theory of Steam Engines; Tables.

## FUELS

**BRISLEE, F. J.** *An Introduction to the Study of Fuel.* A text book for those entering the engineering, chemical and technical industries. 60 ill.,  $6\frac{1}{4} \times 9$ , 293 pp. (Outlines of Industrial Chemistry.) *Reprinting*

**CONTENTS:** General Chemical Principles; Weight and Volume of Air Required for Combustion; Analysis of Fuel and Fuel Gases; Calorimetry and Determination of the Heating Value of a Fuel; Measurement of High Temperatures; Pyrometry; Calculation of Combustion Temperatures; Natural Solid Fuels; Artificial Solid Fuels; Gaseous Fuel; Manufacture of Producer Gas and Water Gas; Theory of the



Producer Gas and Water Gas Reactions; Explosion and Explosion Engines; Air Supply and Measurement of Draught; Furnace Efficiency and Fuel Economy; Heat Balances, Furnace and Boiler Tests; Liquid Fuels; Appendices.

**ELLIS, CARLETON, and MEIGS, JOSEPH V.** Gasolene and Other Motor Fuels. *In Press*

This book will be very complete and extensive, and will interest the members of the petroleum industry, the natural gas industry, the coke oven industries, the illuminating gas and associate industries, the alcohol industry, and the manufacturer of automobiles.

**HERINGTON, C. F.** Powdered Coal as a Fuel. *New Edition in Press*

**CONTENTS:** Introduction; Coals Suitable for Powdering Preparation of Powdered Coal; Feeding and Burning Powdered Coal; Powdered Coal in the Cement Industry; Application of Powdered Coal to Reverberatory Furnaces; Powdered Coal in Metallurgical Furnaces; Powdered Coal Under Boilers; Powdered Coal for Locomotives; Explosions; Bibliography.

This book, written for the engineers, superintendents and owners of plants, explains how the greatest efficiency can be obtained from the use of coal by powdering. Many examples of plants in operation are given in detail, together with sound and conservative analysis of results. A great deal of information on the very live subject is contained in the author's description of current practice, and special attention is given to such questions as the grade of coal to use, costs and proper applications. The illustrations are plentiful, well selected, and carefully executed, so that the reader will find them very helpful.

**KERSHAW, JOHN B. C.** Fuel, Water and Gas Analysis For Steam Users. *Second Edition, Revised and Enlarged.* Ill., 6 x 9, 213 pp. *In Press*

**CONTENTS:** *Fuel.* Natural and Artificial Fuels, Their Origin, Composition and Methods of Sampling; The Approximate Analysis of Fuel; Preparing the Sample, Testing the Fuel; The Calorific Valuation of Solid Fuels; The Calorific Valuation of Liquid and Gaseous Fuels; The Practical Applications of the Test Results. *Water.* The Sources of Feed Water Supply and the Physical and Chemical Characteristics of the Same; The Approximate Analysis of Water; The Practical Applications of the Test Results; The Use of Softening Reagents and the Tests Necessary to Regulate Their Amount. *Waste Gases.* The Chemical and Physical Characteristics of the Waste Gases—Sampling the Gases; The Approximate Analysis of the Water Gases; The Use of Continuous and Recording Gas-Testing Apparatus; The Practical Applications of the Gas-Test Results; Appendix.

**LEWES, V. B.** Liquid and Gaseous Fuels and the Part They Play in Modern Power Production. Ill., 5¾ x 8½, 348 pp. (Van Nostrand's Westminster Series.) **\$3.00**

**CONTENTS:** Combustion; Formation and Composition of Fuel; Determination of Calorific Value; Liquid Fuels; Use of Liquid Fuels; Liquid and Gaseous Fuels; Manufacture of Coal Gas; Use of Coal Gas for Heating and Power; Water Gas; Poor Fuel Gas; The Fuel of the Future.

**MOORE, HAROLD.** Liquid Fuels for Internal Combustion Engines. A practical treatise for engineers and chemists. 48 illustrations. 5½ x 8¾, 215 pp. **\$5.00**

**CONTENTS:** Petroleum; Shale Oil and Its Products; Coal Tars and Their Products; Lignite Tars and Their Products; Production of the Carbonisation of Wood and Peat; Animal and Vegetable Oils; Methyl and Ethyl Alcohol; Fuels for Engines Fitted with Carburettors; Fuels for Engines Fitted with Vaporisers; Fuel Oils for Engines Fitted with Atomisers; The Examination of Liquid Fuels; Calorimetry.



**POPPLEWELL, W. H.** Prevention of Smoke, Combined with the Economical Combustion of Fuel. 50 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 220 pp. **\$3.50**

**CONTENTS:** Fuels and Combustion; Hand; Firing in Boiler Furnaces; Mechanical Stroking; Powdered Fuel Firing; Gaseous Fuel; Testing of Boilers; Smoke Observations; Standard Smoke Tests; Legal Aspect of the Smoke Question; Means for Lessening Smoke.

**SEXTON, A. H.** Fuel and Refractory Materials. *Third Edition, Revised.* 104 ill.,  $5 \times 7\frac{1}{2}$ , 374 pp. *Reprinting*

**CONTENTS:** Combustion. Heating Power of Fuels. Fuels. Wood, Peat, Coal. Solid Prepared Fuels. Charcoal, Peat-charcoal, Coke. Coal Washing. Liquid Fuels. Gaseous Fuels. Recovery of By-products. Furnaces for Metallurgical Purposes. Supply of Air to the Furnace. Removal of Waste Products. Smoke. Smoke Prevention. Pyrometry. Calorimetry. Utilization of Fuel. Testing Fuels. Refractory Materials. Bricks. Crucibles. Notes and Tables.

### PRODUCER GAS

**ALLEN, H.** Modern Power Gas Producer Practice and Applications.

A practical treatise dealing with the gasification of various classes of fuel by the pressure and suction systems of producer. 136 ill.,  $5\frac{1}{2} \times 7\frac{1}{2}$ , 344 pp. *Reprinting*

**CONTENTS:** Natural Gas in England; Manufactured Gas; Chemistry of Manufacture and Combustion of Power Gas; Specific Heat; Calculating the Volume of Gas Produced from Fuel; Coal; Gasification of Fuel; Gas Producers, Pressure Type; Recent Improvements in Gas Producers; Suction Gas Producers; Successful Operation of; Application of; Power Gas Installations; Application of Gaseous Fuel to Internal Combustion Engines; Thermal Power, Flame Temperature, and Explosion Pressures of Combustible Gases; Proportions of Pipes in Gas Plants; Gas Analysis; Examination of Various Classes of Fuels; Their Thermal Value; Thermal Value of Combustible Gases; Dangers in Manufacture of Power Gas; Testing Gas Producers; Patents; Appendix.

**LATTA, NISBET.** American Producer Gas Practice and Industrial Gas Engineering. 247 ill.,  $7\frac{3}{4} \times 10\frac{3}{4}$ , 547 pp. **\$6.00**

**CONTENTS:** Producer Operation; The Producer; Cleaning the Gas; Works Details; Producer Types; Moving Gases; Solid Fuels; Physical Properties of Gases; Chemical Properties of Gases; Gas Analysis; Gas Power; Gas Engines; Furnaces and Kilns; Burning Lime and Cement; Preheating Air; Doherty Combustion Economizer; Combustion in Furnaces; Temperature, Radiation and Conduction; Data; Heat Measurement; Flues and Chimneys; Materials; Useful Tables; Glossary.

A manual in simple language, of producer gas engineering practice, as applied to everyday operations upon a practical and commercial basis, omitting any theorizing and laboratory results unsuitable to commercial and manufacturing conditions, Readable alike to the engineer, operator and promoter.

### WATER

**CHRISTIE, WILLIAM W.** Water, Its Purification and Use in the Industries. 79 ill., 3 folding plates, 2 colored inserts,  $5\frac{1}{2} \times 8$ , 230 pp. **\$2.00**

**CONTENTS:** Sources of Water. Impurities; Uses, Reagents. Water Softening: Cold Process Systems; Hot Process Systems. Results Accomplished by Softening Systems. Pressure Filters. Aeration. Sterilization. Ozone. Ice. Drinking Water.

Open Filters. Alum. Chloride of Lime. Tannin. Measurement of Water. Oil Filters. Boiler Water. Miscellaneous Tables.

Contains general information regarding water together with tables of value to users of water for manufacturing and industrial purposes, so written as to present the technical aspect of the subject, describing the various machines and apparatus without referring to them by their makers' names. It is believed that this work, for the first time, brings together much scattered information on the subject of water purification, especially the mechanical part, some of which was entirely unavailable. The methods of and materials for chemical treatment of water are given prominence.

**COLES-FINCH, W.** *Water, Its Origin and Use.* Fully illustrated,  $5\frac{3}{4} \times 8\frac{1}{4}$ , 540 pp. **\$5.00**

**CONTENTS:** Heat. Atmosphere. Clouds. Rain, Water. Forms of Water, Snow. Ice. Glaciers. Springs. Rivers. Waterfalls. Lakes. Ocean and Sea. Mountains and Volcanoes. Chalk. Denudation. Water, How Obtained. Use. Abuse and Waste of Water. Lessons from Nature.

The scientific side of the subject, though not unduly emphasized, is not lost sight of in this work, which combines the sciences of heat, hydrostatics and physical geography. It tells in a popular manner of the various forms under which water is present in the solar system, the laws governing these changes of form and the uses man has made of it, so that it reads as interestingly as a novel. The volume is illustrated most lavishly largely by excellent reproductions of photographs by Mrs. Aubrey le Blond of Alpine phenomena associated with water.

**COWELL, W. B.** *Pure Air, Ozone and Water.* A practical treatise of their utilization and value in oil, grease, soap, paint, glue and other industries. Ill.,  $5 \times 7\frac{1}{2}$ , 91 pp. **\$2.50**

**CONTENTS:** Atmospheric Air; Compressed Air; Liquid Air; Purification of Water; Fleshings and Bones; Ozonized Air in the Bleaching and Deodorizing of Fats, Glues, etc.; General Information.

**DE LA COUX, H.** *The Industrial Uses of Water.* Translated from the French and revised by Arthur Morris. 132 ill.,  $6\frac{1}{4} \times 10$ , 362 pp. **\$5.00**

**CONTENTS:** Water, Its Chemical Action and Composition; Effects of Water in the Industries; Difficulties with Water; Appropriate Remedies; Preliminary Treatment and Apparatus; Residuary Waters and Their Purification; Qualitative, Quantitative and Hydrotimetric Analysis.

**WANKLYN, J. A.** *Water Analysis.* A practical treatise on the examination of potable water. *Eleventh Edition.* Revised by W. J. Cooper. Ill.,  $5 \times 7\frac{1}{4}$ , 240 pp. **\$2.00**

### POWER AND POWER TRANSMISSION

**BALL, R. S.** *Natural Sources of Power.* 104 ill.,  $6 \times 8\frac{1}{2}$ , 364 pp. (Van Nostrand's Westminster Series.) **\$2.50**

**CONTENTS:** Units with Metric Equivalents and Abbreviations; Introductory Water Power and Methods of Measuring; Application of Water Power to the Propulsion of Machinery; The Hydraulic Turbine; Various Types of Turbine; Construction of Water-Power Plants; Water-Power Installations; The Regulation of Turbines; Wind Pressure; Velocity and Methods of Measuring; The Application of Wind Power to Industry; Modern Windmills; Constructional Details; Power of Modern Windmills; Appendices.

**CHRISTIE, W. W.** *Chimney Design and Theory.* A book for engineers and architects. *Second Edition, Revised and Enlarged.* Ill.,  $6\frac{1}{4} \times 9$ , 200 pp. **\$3.00**

**CONTENTS:** Theory of Chimney Draft; Formulas; Tables; Wind Pressure;



Air-space in Grates; Foundation Materials; Brick Chimney Materials; Steel Chimneys, Their Theory, Examples of Existing Structures; Chimney Performances; Special Types; Straightening Chimneys; Flues; House Chimneys; Lightning Protection; General Information.

**SVENSEN, CARL L.** *A Handbook on Piping.* 359 ill., 8 folding plates, 6¼ x 9¼, 367 pp. **\$4.00**

**CONTENTS:** Pipe; Dimensions and Strength of Pipe; Pipe Threads; Pipe Fittings; Pipe Joints; Standard Valves; Special Valves; Steam Piping; Drip and Blow-Off Piping; Exhaust Piping and Condensers; Feed Water Heaters; Piping for Heating Systems; Water and Hydraulic Piping; Compressed Air, Gas and Oil Piping; Erection Workmanship; Miscellaneous; Piping Insulation; Piping Drawings; Specifications; List of Books and References; Appendix.

This work is offered for the purpose of supplying in convenient form information and data regarding piping, fittings, pipe joints, valves, pipe drawings, and pipe lines and their accessories. The variety and extent of tables, illustrations and formulæ will be sufficient to make it of value to both engineers and students.

**TRINKS, W.** *Governors and the Governing of Prime Movers.* 140 ill., 6 x 9¼, 254 pp. **\$3.50**

**CONTENTS:** Introduction; General Statements; The Direct-Control Governor as a Motor; Promptness and Traversing Time; Adjustment of Equilibrium Speed; Shaft Governors; Natural Period of Vibration of Governors; Effects of Outside Forces Impressed upon Governors; Interaction Between Governor and Prime Mover; Discarded Types of Speed Governors; Rate-of-Flow Governors; Pressure Governors; Relay Governing; Governor Troubles and Their Remedies; Self-Regulating Features of Prime Movers; Appendix.

This volume, giving the essentials and principles of governors and the properties of prime movers with regard to regulations, fills a gap in our engineering literature, being the only book of any consequence on its subject. The essentials are so presented as to be within the grasp of undergraduates as well as practicing engineers. The lucid presentation of the essentials will assist engineers to keep apace with the changing practice and put them in a position to judge existing and future types of governors, as well as the properties of prime movers that effect regulation. Every drawing was especially made for this book, and shows diagrammatically the important features that the reader should be familiar with.

**WALLIS-TAYLER, A. J.** *Bearings and Lubrication.* A handbook for every user of machinery. 75 ill., 6 x 9, 216 pp. **\$1.50**

**CONTENTS:** Friction; Bearings; Stuffing Boxes and Packings; Lubrication; Action of Oils on Metals; Determination of the Lubricating Value of Oils; Adulteration of Oils; Lubricators; General Observations; Storage of Oil; Oil Cans.

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**GOODEVE, T. M.** *Textbook on the Steam-Engine.* With a supplement on Gas Engines, and Part II. on Heat Engines. *Fifteenth Edition.* 187 ill., 5¼ x 7½, 416 pp. **\$3.50**

**GOULD, E. S.** *The Arithmetic of the Steam Engine.* Ill.,  $5\frac{1}{2} \times 8\frac{1}{4}$ , 80 pp. **\$1.00**

**CONTENTS:** Heat; Absolute Zero; Ice; Steam; Pressure and Volume; Combustion and Combustibles; Steam Used Expansively; Back Pressure; Mean effective Pressure; Clearance; Horse Power; Indicator Diagrams; Compound Engine; Work; Falling Bodies; Tables of Properties of Saturated Steam; Hyperbolic Logarithms.

**HECK, ROBERT C. H.** *The Steam Engine and Turbine.* A textbook for engineering students. 400 ill.,  $6 \times 9$ , 625 pp. **\$4.50**

**CONTENTS:** Introductory; Elementary Theory of the Heat Engine; Properties and Behavior of Steam; Ideal Steam Cycles, for Engine and for Turbine; Action of the Steam in the Engine; Performance and Efficiency of the Engine; Working and Construction of the Engine; Valve Gears and Governors; Action of the Steam in the Turbine; Sundry Steam Tables. *Appendix:* Tables and Diagrams of the Properties of Steam.

Essentially a text-book, intended to be studied and taught, emphasizing the scientific side of the subject, and founded upon the idea that what the student needs is a thorough grounding in principles, with a general knowledge of construction and of the questions underlying economy in operation. It is designed to fill a place in a well-developed course, and does not aim to cover the whole field of steam-power engineering, but should be supplemented by laboratory work and instruction, by visits of inspection, and by the course in machine design. No attempt is made to supply the knowledge of detail and of expedient and the skill in operation that can be acquired only by experience and practice.

**HECK, R. C. H.** *The Steam Engine and Other Steam Motors.* A text-book for engineering colleges and a treatise for engineers. In two volumes.  $6\frac{1}{4} \times 9\frac{1}{2}$ , cloth.

Vol. I. *The Thermodynamics and the Mechanics of the Engine. Second Edition, Revised.* 187 ill., 400 pp. **\$4.50**

**CONTENTS:** General View of the Subject; Elementary Thermodynamics of Heat-Engine; Theory of Steam Engine; Action of Steam in the Engine; Dynamics of Steam; Entropy; Temperature Diagram; Mechanics of the Engine; Tables on Superheated Steam.

Vol. II. *Form, Construction, and Working of the Engine: The Steam Turbine.* 698 ill., 686 pp. **\$5.50**

**CONTENTS:** Form and Construction of the Engine; Valve Gears and Their Action; Governors or Regulators; Steam Action in the Multiple Expansion Engine; Steam Turbine; Steam Engine Performance; Tables.

**KLEIN, J. F.** *Design of a High Speed Steam Engine. Second Edition, Revised and Enlarged.* 140 ill.,  $6\frac{1}{2} \times 9\frac{1}{4}$ , 257 pp. **\$5.00**

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**LALLIER, ERNEST V.** *An Elementary Manual of the Steam Engine.* Containing also a chapter on the theory, construction and operation of internal combustion engines. For the operating engineer. 102 ill.,  $6 \times 8\frac{1}{2}$ , 274 pp. **\$2.00**

(Author is instructor in engineering at the Hebrew Technical Institute, New York.)

**CONTENTS:** Reciprocating Steam Engines. Action of the Eccentric. The



Governor. Engine Calculations. The Piston. Work done by Steam during Formation. The Expansive Working of Steam. The Indicator. Description of Indicator. Heat. Boilers. Fire-tube Boilers. Calculation for Tubular Boilers. Water-tube Boiler Pumps. Corliss Engine. Pipes and Fittings. Rotary Engines. Internal Combustion Engines. Lubrication.

Written with a view to presenting the fundamental principles of the use of steam and steam engines in an elementary manner, so as to be useful to students of steam engineering who, while possessing excellent training in mathematics and general science, are yet so immature as to be unable readily to make practical application of their general knowledge; and the average operating man, who despite his experience realizes his lack of an adequate grasp of fundamental principles. The advancement of both of these classes is seriously hampered, and this new work aims to teach the subject so that each may be able to supplement his partial knowledge.

**RANKINE, W. J. M.** **A Manual of the Steam Engine and Other Prime Movers.** *Seventeenth Edition, Revised*, by W. J. Millar, with a section on Gas, Oil and Air Engines by Bryan Donkin. Ill., 6 x 8, 672 pp. **\$6.00**

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**RICHARDSON, J.** **The Modern Steam Engine; Theory, Design, Construction, Use.** A practical treatise. 293 ill., 6 x 9, 396 pp. **\$3.50**

**CONTENTS:** Unit of Power; Natural Forces; Early Types of Engine; The Watt Engine; Use of Steam in Multiple Cylinder or Compound Engines; Valve Gears; Double or Compound Slide Valves; Releasing Valve Gear; Exhaust Valves and Valve Driving Gear; The Governor; Electrical Regulation Condensers; The Steam Turbine; Design of Details; Examples of Various Types; Feed and Steam Heating; Hints to Users.

**ROSE, J.** **Key to Engines and Engine Running.** A practical treatise upon the management of steam-engines and boilers for the use of those who desire to pass an examination to take charge of an engine or boiler. Ill.,  $5\frac{3}{4} \times 8$ , 417 pp. **\$2.50**

**CONTENTS:** Care, Management and Inspection of Boilers for Stationary Engines; The Steam Engine and its Accessories; Starting a Slide Valve Engine; Valve Gear; High-Speed Engines; Link Motion; Locomotive Running; Care and Management of Marine Engines; Condensing Engines; Various Kinds of Engines; Pumps; Injectors; Engineers Calculations; Mechanical Forces; Horse Power; Water; Heat; Steam; Steam Engine Indicators and Indicator Diagrams.

**WATSON, E. P.** **Small Engines and Boilers.** A manual of concise and specific directions for the construction of small steam engines and boilers of modern types from five horse-power down to model sizes. 35 ill.,  $5\frac{1}{2} \times 8\frac{1}{4}$ , 126 pp. **\$1.25**

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## SLIDE VALVES

**AUCHINCLOSS, W. S.** *The Practical Application of the Slide Valve and Link Motion to Stationary, Portable, Locomotive, and Marine Engines.* With new and simple methods for proportioning the parts. *Fifteenth Edition, Revised.* 52 ill., 6 x 9, 144 pp. \$2.00

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**BEGTRUP, J.** *The Slide Valve and Its Functions.* With special reference to modern practice in the United States. *Second Edition.* 90 ill., 6¼ x 9, 145 pp. \$2.00

**CONTENTS:** The Common Slide-Valve; Improved Slide-Valves; Four-Valve Systems; Independent Cut-off; The Slide-Valve on Pumps; Angularity of Connecting Rod and Eccentric Rod.

**HALSEY, F. A.** *Slide Valve Gears.* An explanation of the action and construction of plain and cut-off slide valves. *Twelfth Edition, Revised and Enlarged.* 109 ill., 5¼ x 7½, 213 pp. \$1.50

**CONTENTS:** The Slide Valve with Fixed Eccentric; The Slide Valve with Shifting and Swinging Eccentric; The Slide Valve with Independent Cut-off; The Slide Valve with Link Motion.

**YOUNGSON, PETER.** *Slide Valves and Valve Gearing.* 115 ill., 10 folding plates, 7 x 10, 194 pp. \$3.00

This work has been specially written for marine engineers. It is intended to illustrate the working and management of marine valve gear in as simple and complete a manner as possible, and sea going engineers will find it very useful.

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## BOILERS

**BATEY, JOHN.** *Steam Boilers and Combustion.* 18 ill., 4¾ x 7½, 220 pp. \$2.00

**CONTENTS:** Combustion and Steam Production; Information in Regard to Boilers and Production of Steam; Water and Steam; Steam Boilers; Vertical Boilers; Marine, or Scotch Boiler; Water-Tube Boilers; Steam Boiler Practice; Combustion; Hydrocarbons, Radiant and Convected Heat, Distillation, etc.; Temperature; Lessons Taught by Experiments; Philadelphia Exhibition Tests; Normal Results Obtained by Abnormal Methods; Analysis of Actual Performance of Locomotive Boiler; Movement of Gases Through Tubes.



- BOOTH, WILLIAM H.** *Water Softening and Treatment.* 92 ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 308 pp. *Reprinting*
- CONTENTS:** *The Treatment of Water by Softening, Oil Separation and Filtration.* Natural Waters; Water, Its Sources and Impurities; Salts in Water; Reactions of Salts in Solution; The Less Usual Reagents; Scale and Its Effects; Water Analysis; Apparatus in Commercial Use; Detartarizers; Filters; Boiler Compounds; Corrosion; Incrustation of Pipes; Oil Separation; Mechanical Boiler Cleaners; Pure Water. *Air Pumps, Condensers, and Circulating Pumps. Feed Heating-Stage Heating. Water Cooling. Feed Pumps, Injectors.*
- CHRISTIE, W. W.** *Boiler-waters, Scale, Corrosion, Foaming.* 77 ill.,  $6\frac{1}{2} \times 9\frac{1}{4}$ , 242 pp. **\$3.00**
- CONTENTS:** Water, Its Properties; Materials Found in Water; Water Analysis; Boiler; Scale; Transmission of Heat; Conductivity of Solids; Corrosion; Feed-Water Pipes; Blow-Off Pipes; Tubes; Priming and Foaming; Oil; Grease; Zinc; Hardness of Water; Feed-Water Heaters; Economizers; Water-softening; Tables.
- PRATT, H. K.** *Boiler Draught.* Ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 205 pp. **\$1.25**
- CONTENTS:** Draught; Calculations Relating to Air; Chimneys; Construction; Artificial Draught; Forced; Induced; A Comparison; Application of Mechanical Draught for Land Installation and Marine Practice; Chemistry of Combustion. A description of the various methods and systems in use in England to maintain the most efficient condition of boiler draught, together with other information that bears on the subject.
- PULL, ERNEST.** *Modern Steam Boilers, Their Construction, Management and Use.* A practical handbook for marine and general engineers, steam users, and students in engineering colleges and technical institutes. 195 ill., 5 folding plates,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 295 pp. **\$5.00**
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- PULLEN, W. W. F.** *Injectors: Theory, Construction and Working.* *Third Edition.* 148 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 214 pp. **\$2.00**
- CONTENTS:** The Injector; Construction and Arrangement of Simple High Pressure Injectors; Construction and Arrangement of High-Pressure Compound Injectors; Injector Calculations for Simple High-Pressure Types; The Steam Jet; High-Pressure Compound Injectors; Exhaust Injectors; The Exhaust Injector; The Ejector Condenser; The Water Injector; Air Injectors; Air Ejectors; Historical Summary.
- RIMMER, E. J.** *Boiler Explosions, Collapses and Mishaps.* With an introduction by A. A. Hudson. Ill.,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 151 pp. **\$2.25**
- CONTENTS:** Legislation in Regard to Boilers and Boiler Explosions; Formal Investigations and Findings of Commissioners as to Negligence; Cause and Prevention of Explosions (with reference to Board of Trade Reports); Evidence of Causes of Explosions; Appendices.
- A summary of the causes of boiler explosions and the recommendations for their prevention contained in the Reports of the Board of Trade from 1882 to 1911, together with a statement of the statutory duties of steam users and their liabilities as defined by the commissioners holding investigations under the boiler explosions acts.
- ROWAN, F. J.** *The Practical Physics of the Modern Steam Boiler.* Preface by Prof. R. H. Thurston. Ill.,  $6\frac{1}{4} \times 8\frac{3}{4}$ , 669 pp. **\$3.00**
- CONTENTS:** General Considerations; Fundamental Elements of Boiler Design; Combustion; Transmission of Heat; Circulation of Water; Effects of Temperature on Tenacity and Ductility; Corrosion and Incrustation; Historical Sketch of Boiler Design; Boiler Tests and Results.

## STEAM TURBINES

See also "Marine Engines."

**STODOLA, A.** *Steam Turbines.* *Second Revised Edition* of the authorized translation from the second revised German edition by L. C. Loewenstein. 241 ill., 3 lithographed tables,  $6\frac{1}{2} \times 9\frac{1}{2}$ , cloth, 509 pp. \$5.00

**CONTENTS:** Elementary Theory of the Steam Turbine; Axial Turbines; Radial Turbines; Theory of the Steam Turbine Thermo-dynamically Considered; Steady Flow of Steam; Conversion of Energy in the Steam Turbine; Construction of Most Important Turbine Parts; Critical Angular Velocity of a Multiple Loaded Shaft; Steam Turbine Parts; A Few Special Problems of Steam Turbine Theory and Construction; Future of the Heat Engine; Mathematical Derivations of Difficult Formulas in Text.

**WILDA, H.** *Steam Turbines.* Their theory and construction. Translated from the German by Chas. Salter and revised and adapted to English practice. 104 ill.,  $5 \times 7\frac{1}{2}$ , 203 pp. \$2.00

**CONTENTS:** Introduction and Properties of Steam. Flow of Steam. Classification of Steam Turbines According to Arrangement of Vanes. The Flow of Steam through the Steam Turbine. Details of Steam Turbines. General Arrangement of Various Turbines in Practice. Condensers. Utilisation of Exhaust Steam. Practical Application of Steam Turbines.

## STEAM AND STEAM TABLES

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An historical work describing in detail the machines which, from time to time, have been invented for estimating the output of prime movers and the power absorbed by machines when driven by engines or motors. The author spent considerable time investigating the subject, and himself an inventor of some repute never completed his book, but the work was finished by Mr. Boys, who added considerable new matter.

**PULLEN, W. W. F. Testing of Engines, Boilers and Auxiliary Apparatus.** *Second Edition.* 733 ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 746 pp. **\$5.50**

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Brings together into one volume those methods of analysis which can be used to good advantage in the power plant, and which will aid the power station engineer in keeping costs of generation at the lowest figure.

### LOCOMOTIVES.

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**CONTENTS:** Preliminary Observations and Data; Advantages of Oil Fuel; Principles of Combustion; Methods of Burning Oil Fuel: Different Systems; Steam-jet System, Air-jet System; Pressure-jet System; Pressure-jet Systems—Comparative Tests: Burners; Firebox Conditions and Dampers; Draught Regulation; Regulation of Oil Supply to Furnace; Evaporation Capacity and Heating Surface; Disposition of the Apparatus for Pressure-jet System; Oil Tanks; Piping; Firebricks and Fire Doors; Making Tests and Taking Records; Running Conditions; Instructions to Enginemen; Specification Clauses for Locomotive Oil-Burning Equipments; Auxiliary Apparatus; Holden's Injector and Steam Fitting for Locomotives; The Meyer-Smith Lighting-Up or Starting Heater; The Thermoscope; The "Premier" Steam Trap; Conversion Table; List of Modern Publications and Papers on Oil Fuel, etc.; Reference.

**YODER, J. H., and WHAREN, G. B.** *Locomotive Valves and Valve Gears.* With a special treatise on valve setting. An explanation of the construction and action of the plain slide valve, the piston valve and the gears which operate them, as applied to locomotives. Based on notes used in schools for apprentices, Pennsylvania Railroad. 274 ill.,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 277 pp. **\$3.00**

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Valve Gear; Layout of Walschaert Gear; Baker Locomotive Valve Gear; The Young Locomotive Valve, Valve Gear and Reverse Gear; The Gooch Stationary Link; The Allen Valve Gear; Effects of Altering the Valve and Its Events; Locomotive Valve Setting; Stephenson Gear; Walschaert Gear; Rules for Valve Setting; Baker Locomotive Valve Gear; Summary; The Indicator Diagram and Its Application; Application of the Diagram; Horse Power of Locomotives; Tractive Force of Two-Cylinder Compound Locomotives; Tractive Force of Mallet Articulated Compound Locomotives; Classification of Locomotives.

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**CARPENTER, R. C., and DIEDERICHS, H.** *Internal Combustion Engines.* Their theory, construction and operation. *Third Edition, Revised.* 379 ill., 6¼ x 9½, 612 pp. \$5.50

(Authors are professors of experimental engineering in Cornell University.)

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and Running. Description of Four Cycle Engine. Valves and Cams. Regulation of the Engine. Types of Four Cycle Engines. High Speed Engine. Horizontal Engine. Two Cycle Engine. Air Compressors for Diesel Engines. Solid Injection Motors. INSTALLING AND RUNNING.—Space Occupied and General Dimensions. Starting up the Engine. Management of Diesel Engines. Cost of Operation of Diesel Engines. TESTING.—Object of Testing. Test on 200 B.H.P. Diesel Engine. Test on 300 B.H.P. High Speed Marine Engine. Test on 500 B.H.P. Engine. Test on High Speed Diesel Engine. DIESEL ENGINE FOR MARINE WORK, ADVANTAGES.—Design and Arrangement of Diesel Marine Engines. Methods of Reversing Diesel Engines. Auxiliaries for Diesel Ships. Horse Power of Marine Diesel Engines. Weights of Marine Diesel Engines. The Design of Large Engines. CONSTRUCTION.—Two-Cycle Engine. Swiss Type. Belgium Types. Swedish Type. German Types. British Types. Four-Cycle Engine. Dutch Type. German Types. Danish Type. Russian Types. Small Diesel Engines. DESIGN.—Cylinders and Cylinder Covers. Pistons. Cylinder Dimensions. Crank Shafts. Air Compressors. Scavenging Pumps. THE FUTURE OF THE DIESEL ENGINE.

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A conservative and the only complete up to date book in English on the gas turbine. The author explains all of the various types of gas turbines that have forced their way into practical use, and gives a very complete account of the many experimental researches that were carried on to obtain these finished products.

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Deals with the theory, principles of operation, and most important constructional features of the large size single-acting and double-acting gas engines, and is intended as a guide for the student when designing large gas engines, as well as to give information about the principal features and details of the large gas engines to engineers who have not specialized in this branch. The theoretical portions of the book deal with the question of efficiency. The matter of compression and mixture ratios are dealt with under the assumption of constant and variable specific heats. The conditions governing the designs of the various engine parts, however, have received special attention. The book is very fully illustrated, containing a large number of sectional drawings of modern engines.

**ENNIS, WILLIAM D.** *Vapors for Heat Engines.* Ill., 5 x 7, 65 pp. \$1.00

A discussion of the arguments for and against the use of fluids other than steam as working media in heat engines. Beginning with the pressure-temperature curve as limiting the potential efficiency of Carnot, the detailed study shows that the thermal properties of the vapors notably influence efficiency and capacity of apparatus. Some new and interesting criteria of maximum efficiency are developed. There are various new equations, tables, and diagrams: among them, those giving the temperature-entropy characteristics of several volatile vapors. The book is in a sense a companion volume to the author's "Applied Thermodynamics"; but, as a discussion of a subject of some commercial importance, has been made self-explanatory.

**GROVER, F.** *Practical Treatise on Modern Gas and Oil Engines.* *Fifth Edition.* 173 ill., 5½ x 7½, 380 pp. \$3.00

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**GÜLDNER, H.** *The Design and Construction of Internal-Combustion Engines.* Translated and revised, with additions on American Engines, by H. Diederichs. A handbook for designers and builders of gas and oil engines. 728 ill., 36 folding plates, 9 x 11, 690 pp.

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**MARSHALL, W. J., and SANKEY, H. R.** *Gas Engines.* 125 ill., 6 x 8½, 293 pp. (Van Nostrand's Westminster Series.) **\$2.00**

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**MATHOT, R. E.** *Construction and General Working of Internal Combustion Engines.* Translated from the French by W. A. Tookey. Ill., 6 x 9, 576 pp. **\$5.00**

**CONTENTS:** HISTORICAL AND RETROSPECTIVE. The Progress of Gas Power Gas vs. Steam Engines. The Future of Gas Power. CONSTRUCTION AND DESIGN. Principal Types of Engines. Horizontal Gas Engines. Vertical Gas Engines. Marine Gas Engines. Two-Cycle Engines. Four-Cycle Engines. The Working of Gas Engines. Governing and Valve Gears. Details of Construction. Moving Parts. POWER AND EFFICIENCY. Testing and Testing Apparatus. Indicator Diagrams and Explosion Records. Results of Trials. Dimensions, Classifications and Tests of Engines. Bibliography.

**PURDAY, H. F. P.** *Diesel Engine Design.* 271 ill., 5½ x 8½, 311 pp. *In Press*

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**WIMPERIS, H. E.** *The Internal Combustion Engine.* A text-book for the use of students and engineers. *New and Enlarged Edition.* 104 ill., 6 x 8¾, 336 pp. **\$3.00**

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**WIMPERIS, H. E.** *Primer of the Internal Combustion Engines.* 60 ill., 5 x 7, 145 pp. **\$1.50**

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**BOTTONE, S. R.** *Magnetos for Automobilists: How Made and How Used.* A handbook of practical instruction in the manufacture and adaptation of the magneto to the needs of the motorist. *Second Edition.* 35 ill., 5 x 7, 118 pp. \$1.00

**CONTENTS:** The Magneto; Component Parts of the Magneto; Magnetization; The Armature Screen; High Tension Magnetos; Practical Hints; Latest Types of Magnetos.

**BUTLER, H. J.** *Motor Bodies and Chassis.* A textbook dealing with the complete car for the use of owners, students, and others. With a foreword by the Rt. Hon. The Lord Montague of Beaulieu. 39 ill., 6 x 9, 352 pp. \$3.00

**CONTENTS:** Varieties of Motor Bodies Defined. Dimensions of the Body. Body Design; Phaetons, Limousines, Landauettes and other Designs. The Coachbuilder and the Motorist. Motor Body Drawing. Motor Body Making. Mounting. Comfort in the Motor Body. Decoration of the Car. Painting. Stove Enameling and French Polishing. Weather Protection. Interior Illumination. Exterior Illumination. Body Accessories. How to Choose a Chassis. The Petrol Engine. Ignition. Cooling the Cylinder. Transmission. Lubrication. Brakes. Steering Gear. Wheels. Tires. Springs. Chassis. Accessories. Preservation of the Car. Motoring and Its Cost. Commercial Motoring and Its Cost.

**CLARK, A. GRAHAM.** *Text-Book on Motor Car Engineering.* In two volumes.

Vol. I. Construction. 213 ill., 6 x 8¾, 445 pp. \$4.00

**CONTENTS:** The General Principles and Construction of the Petrol Engine. Details of Engine Construction. Petrol. Fuels Other than Petrol. Carburettors and Carburation. Thermodynamics of the Petrol Engine. Horse-Power. Mechanical, Thermal and Combustion Efficiencies. Principles and Construction of Coil and Accumulator Ignition. Magneto Ignition. Engine Control Systems. Engine Cooling Systems. Crank Effort Diagrams. Clutches and Brakes. Change Speed Gears. Transmission Gears. Steering Gears. Lubricants, Lubrication, Ball and Roller Bearings. Chassis Construction. General Principles of the Steam Car. Steam Engines and Condensers. Steam Generators and Pipe Diagrams. The Electric Car. Materials Used in Motor Car Construction. Syllabus of the City and Guilds of London Institute in Motor Car Engineering. Examination Papers. Physical Properties of Petrols. Mathematical Tables and Constants.



Vol. II. Design. 67 ill., 6 x 8¾, 404 pp.

\$3.50

**CONTENTS:** Introduction; Materials of Construction; General Considerations in Engine Design; Power Requirements; Determination of Engine Dimensions; Cylinders and Valves; Valve Gears; Pistons, Gudgeons and Connecting Rods; Crankshafts and Fly-wheels; The Balancing of Engines; Crankcases and Gear-boxes; Engine Lubricating and Cooling Arrangements, Inlet, Exhaust and Fuel Piping, etc.; Clutches and Brakes; Gearing; Transmission Gear; Frames, Axels and Springs-Torque and Radius Rods; Steering Gears.

DOMMETT, W. E. Motor Car Mechanism. 102 ill., 5 x 7½, 202 pp. \$2.00

**CONTENTS:** The Engine; Properties of Gases; Brake Horse-Power, Dynamometers, Empirical Formula for Horse Power, and Mechanics Problems. *Valves.* Construction, Arrangement, and Actuation; Sleeve, Rotary Plug, Piston, Rotary Disk, Main Piston Acting as a Valve; Fuels and Carbureters; Lubrication and Lubricating Systems; Magnetos and Accumulators; Cooling Systems; Traction; Frames and Springs; Front Axles; Steering Gear; Clutches; Speed Gears and Brakes; The Back-Axle, Cardan Shaft, Radius Rods, Torque; Steam Cars; Other Transmission Systems; Appendix.

DYKE, A. L. Automobile and Gasoline Engine Encyclopedia. Treating on the construction, operation and repairing of automobiles and gasoline engines, also trucks, tractors, airplanes and motorcycles. *Tenth Edition.* Ill., 6½ x 10, 940 pp. \$5.00

**CONTENTS:** Engines; Carburetion; Cooling and Lubrication; Ignition; Coil and Battery; Magnetos; Electric Systems; Operation, Care, etc.; Tires; Miscellaneous; Supplements.

FRASER, EDW. S., and JONES, RALPH B. Motor Vehicles and Their Engines. A practical handbook on the care, repair and management of motor trucks and automobiles for owners, chauffeurs, garagemen and schools. 278 ill., 6 x 9, flexible fabrikoid, 357 pp. \$2.00

**CONTENTS:** The Gas Engine; Principles of Two and Four-Cycle Engines; Timing; Engine Balance and Firing Order; Cooling Systems; Fuel Feed Systems; Fuels; Elements of Carburetion; Carburetors; Puddle Type Carburetors; Magnetism; Elementary Electricity; Batteries; Induction; Battery Ignition Systems; Magnetos, Rotor Type; Dual and Duplex Ignition Systems; Starting and Lighting Systems; Power Transmission; Clutches; Transmissions; Drives; Differentials; Running Gear; Tires and Rims; How to Drive; Engine Troubles Experienced on the Road; Lubrication; Care and Adjustment; Care and Adjustment Tables.

A complete book on the automobile written in the simplest language and with technicalities reduced to a minimum. The fundamentals of gas motor operation, as well as the care and operation of the principal accessories of motor vehicles are discussed in detail and at greater length than usual. The last four chapters are the result of the authors' observations and experience with the great number of trucks, tractors, automobiles and motorcycles operating under their supervision, and a study of them will be of great help in obtaining the maximum economy, efficiency and life of the apparatus.

SCHAEFER, C. T. Motor Truck Design and Construction. 292 ill., 6 x 9, 326 pp. \$2.50

**CONTENTS:** The General Layout of the Chassis; The Motor Truck Engine, Its Construction and Lubrication; The Motor Cooling System; Carburetion and Carburetors; Ignition Systems; Governors and Speed Controlling Devices; The Clutch and Transmission; Universal Joint and Propeller Shaft; The Differential; The Final Drive; Front and Four Wheel Drives; Motor Truck Brakes; The Front Axle; Steering Gears and Fundamental Principles of Steering Mechanisms;



Motor Truck Frames; Power Plant Mountings; Springs and Spring Suspensions; The Fuel Supply System; Control; The Muffler; Motor Truck Wheels; Motor Truck Tires and Rams; Electric Lighting and Starting on Commercial Vehicles. This volume has been written to fill a pressing want; to give a practical discussion of the gasoline propelled commercial car of the present type, and to present this subject in the plainest possible manner by the use of numerous illustrations. In other words, this work is compiled for the engineer, who, when he desires information on current practice, may quickly obtain the same without a general study. At the same time a general outline of the underlying principles is given for the student, commercial vehicle owner and operator who may desire to familiarize himself with the construction of the various units that make up the complete vehicle.

### AVIATION AND AERONAUTICS

**BEDELL, FREDERICK.** *The Air Propeller.* Its working characteristics and theory, with a brief discussion of the airplane engine and the power available for airplane propulsion. Ill., 6 x 9, paper, 96 pp. **\$1.00**

**CONTENTS:** Power Available from the Air Propeller and the Airplane Engine; The Airplane Engine; The Air Propeller; Introductory, Conditions of Propeller Operation, Propeller Characteristics, Propeller Theory; Appendix.

**BEDELL, FREDERICK.** *Airplane Characteristics.* A systematic introduction for flyer and student and for all who are interested in aviation. 50 ill., 6¼ x 9¼, 123 pp. **\$1.60**

**CONTENTS:** Sustenation; Relations in Flight; Resistance; Lateral Stability; Directional Stability; Appendix: Thrust Characteristics; Power Characteristics; Control and Other Diagrams.

**BEDELL, FREDERICK.** *The Airplane.* Ill., 6 x 9. *In Press*

Most of the chapters in this book will consist of material published for the first time. Six chapters will consist essentially of material that has appeared in Bedell's "The Air Propeller" and "Airplane Characteristics."

**CHATLEY, H.** *Principles and Design of Aeroplanes. Second Edition, Revised.* Ill., 4 x 6, 115 pp. (Van Nostrand's Science Series, No. 126.) **\$0.75**

**CONTENTS:** The Aeroplane; Air Pressure; Weight and Power; Propellers and Motors; Balancing; Construction; Difficulties; Future Development; Cost; Other Flying Machines; Gyroplane and Ornithoptere.

An elementary text on the design of flying machines without presenting any preconceived idea as to the best type of machine. The history of aviation is touched on only to point out how it affected the progress of the science and practice. The chapter on costs, in this new edition, has been considerably changed and the entire work corrected.

**ENNIS, WILLIAM D.** *Flying Machines To-day.* 123 ill., 5½ x 8, 218 pp. **\$1.50**

(Author is professor of mechanical engineering at Brooklyn Polytechnic Institute, Brooklyn.)

**CONTENTS:** THE DELIGHTS AND DANGERS OF FLYING—Dangers of Aviation—What it is Like to Fly. SOARING FLIGHT BY MAN—What Holds it Up. Lifting Power. Why so Many Sails. Steering. TURNING CORNERS—What Happens When Making a Turn. Lateral Stability. Wing Warping. Automatic Control. The Gyroscope. Wind Gusts. AIR AND THE WIND—Sailing Balloons. Field

and Speed. GAS AND BALLAST—Buoyancy in Air. Ascending and Descending. The Ballonet. The Equilibrator. DIRIGIBLE BALLOONS AND OTHER KINDS—Shapes. Dimensions. Fabrics. Framing. Keeping the Keel Horizontal. Stability. Rudders and Planes. Arrangement and Accessories. Amateur Dirigibles. The Fort Omaha Plant. Balloon Progress. THE QUESTION OF POWER—Resistance of Aeroplanes. Resistance of Dirigibles. Independent Speed and Timetable. The Cost of Speed. The Propeller. GETTING UP AND DOWN; MODELS AND GLIDERS; AEROPLANE DETAILS—Launching. Descending Gliders. Models. Balancing. Weights. Miscellaneous. Things to Look After. SOME AEROPLANES—SOME ACCOMPLISHMENTS. THE POSSIBILITIES IN AVIATION—The Case of the Dirigible. The Orthopter. The Helicopter Composite Types. What is Promised. AERIAL WARFARE.

**GREENHILL, G.** *The Dynamics of Mechanical Flight.* 58 ill., 6 x 9, 127 pp. \$2.50

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A mathematical elucidation of the problems involved in mechanical flight; an attempt at their solution.

**KENNEDY, RANKIN.** *The Principles of Aeroplane Construction.* 51 diagrams, 5½ x 8½, 145pp. \$2.00

**CONTENTS:** Elementary Mechanics and Physics. Principles of Inclined Planes. Air and Its Properties. Principles of the Aeroplane. The Curves of the Aeroplane. Centers of Gravity. Balancing; Steering. The Propeller. The Hélicoptère. The Wing Propeller. The Engine. The Future of the Aeroplane.

**KENNEDY, RANKIN.** *Flying Machines; Practice and Design.* Their principles, construction and working. 62 ill., 5½ x 8½, 162 pp. \$2.50

**CONTENTS:** Principles of Flying Machines; Practical and Possible Flying Machines; Starting Up Aeroplanes; Miscellaneous Appliances; Materials for Construction of Flying Machines; Dirigible Balloons; Notes on Air Pressures, Wind and Atmosphere; Practical Engineering of Flying Machines.

**LANCHESTER, F. W.** *The Flying Machine from an Engineering Standpoint.* Ill., 6 x 9, 135 pp. \$3.00

(Author is a member of the British Advisory Committee for Aeronautics.)

**CONTENTS:** Introduction; The Air Considered as the "Permanent Way"; Catastrophic Instability; The Laws of Resistance; Body-Resistance; Total Resistance; Propulsion; Motive Power Installation; Relating to the Design of the Aerofoil; Resistance of Struts, Wires, Wheels, etc.; Vertical Surface; The Dynamic Load-Factor and Factor of Safety; Landing Gear; Acentric Types of Machine; Stability and Control. *Appendices.* A Discussion of Skin-Friction; A Note of the Stability of the Flying Machine as Affected by Considerations Relating to Propulsion; Report on Test of Author's Aerofoil of 1894; Pneumatic Hydraulic Alighting Mechanism Designed for Messrs. White and Thompson. *A Discussion Concerning the Theory of Sustentation and Expenditure of Power in Flight.* Introduction; Direct Resistance as Related to Skin-Friction; Sustentation in Flight; The Dynamic System.

Deals with those problems in mechanical flight which come more directly within the purview of the aeronautical constructor. Matters of essentially scientific interest, such as the theory of stability longitudinal, lateral, and rotative (or asymmetric), have been in the main taken for granted; that is to say, the results of existing investigations have been assumed as established fact and so stated.



**LANCHESTER, F. W. Aerial Flight. Illustrated.**

Vol. I. Aerodynamics. 162 ill., 438 pp. **\$6.00**

**CONTENTS:** Fluid Resistance and Its Associated Phenomena; Viscosity and Skin Friction; The Hydrodynamics of Analytical Theory; Wing Form and Motion in the Peritery; The Aeroplane; The Normal Plane; The Inclined Aeroplane; The Economics of Flight; The Aerofoil; On Propulsion, the Screw Propeller, and the Power Expended in Flight; Experimental Aerodynamics; Glossary; Appendices.

Vol. II. Aerodnetics. 208 ill., 433 pp. **\$6.00**

**CONTENTS:** Free Flight; General Principles and Phenomena; The Phugoid Theory; The Equations of the Flight Path; The Phugoid 1852-1872; Dirigible Balloons from 1883-1897; 1898-1906; Flying Machine Theory—The Flight Path Plotted; Elementary Deductions from the Phugoid Theory; Stability of the Flight Path as Affected by Resistance and Moment of Inertia; Experimental Evidence and Verification of the Phugoid Theory; Lateral and Directional Stability; Review of Chapters I to VII, and General Conclusions; Soaring; Experimental; Aerodnetics.

**NEILSON, ROBERT M. Aeroplane Patents. 77 ill., 5¾ x 8¾, 101 pp. \$2.00**

**CONTENTS:** Advice to Inventors. Review of British Patents; British Patents and Applications for Patents; British Patents and Applications for Patents from 1860 to 1910, Arranged in Order of Application; British Patentees, Arranged Alphabetically; United States Patents from 1896 to 1909, Arranged in Order of Issue; United States Patentees, Arranged Alphabetically.

Intended to give useful hints and data relating to patents, to inventors and manufacturers interested in heavier-than-air flying machines. Many important questions that suggest themselves to patent attorneys, inventors and manufacturers are dealt with in language as simple as possible. The difficulty that users and manufacturers experience in ascertaining how new devices may be used without infringement of patents is met by the section of the book in which many of the important existing are reviewed.

For other books on patents see section on industrial trades.

**PETIT, ROBERT. How to Build an Aeroplane. Translated by T. O'B. Hubbard and J. H. Ledeboer. 93 ill., 5¾ x 8¾, 131 pp. \$1.50**

**CONTENTS:** General Principles of Aeroplane Design. Theory and Calculation. Resistance, Lift, Power, Calculations for the Design of an Aeroplane, Application of Power, Design of Propeller, Arrangements of Surfaces, Stability, Center of Gravity, etc. Materials. Construction of Propellers. Arrangements for Starting and Landing. Controls. Placing Motor. The Planes. Curvatures. Motors.

**PORTER, J. R. The Helicopter Flying Machine. Ill., 5¼ x 7½, 88 pp. \$1.50**

**CONTENTS:** The Aeroplane; Lifting Screws; The Helicopter; Description of Nos. 1 and 2 Turbine Machine; Theory Applied to the Centrifugal Propeller Machine; The Deflecting Surface; Further Theoretical Considerations; Resistance to Forward Motion; Stability Under Various Conditions; Parachute Action; Motor and Gearing; Stresses; Conclusions; Tables of Squares and Cubes.

**WIDMER, EMIL J. Military Observation Balloons (Captive and Free).**

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of Crew; High Transportation; Marching Order of the Balloon Transportation; Lifting Over Obstacles; Deflation and Refilling of the Balloon; The Use of a Kite Balloon in Time of War; The Rules for Examining and Accepting the Cloth to be Used in the Manufacture of a Kite Balloon; The Care of the Kite Balloon Material and the Repair of Same; Materials Used; The Spherical Captive Balloon; Equipment of the Spherical Balloon; Inflation, Anchoring, Ascension; The Free Balloon; Equipment of the Free Balloon; Preparation for Ascension; The Ascension.

### PUMPS

**INNES, C. H.** Centrifugal Pumps, Turbines and Water Motors. Including the theory and practice of hydraulics. *Fifth Edition.* 287 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 350 pp. **\$3.00**

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**LOEWENSTEIN, L. C., and CRISSEY, C. P.** Centrifugal Pumps, Their Design and Construction. 320 ill., 8 folding plates,  $6\frac{3}{4} \times 9\frac{3}{4}$ , 432 pp. **\$5.00**

**CONTENTS:** Theory of Centrifugal Pumps. Consumption of Power and Efficiency Regulation and Classification of Centrifugal Pumps. Calculation of Impellers and Guide Vanes. Design of Important Pump Parts. Types of Centrifugal Pumps. Testing of Centrifugal Pumps.

Presents the theory of centrifugal pumps in very easy and simple form and should be useful both to the busy engineer and student. Valuable test data are given for the designer and a method of proper classification of pumps extremely useful to the designer and manufacturer is outlined. The methods of calculating the important pumps parts, both from the standpoint of strength and of proper operation, is fully covered, and the article on critical speeds presents the latest methods of calculation with illustrative examples. About one-half of the book is devoted to the description of the various types of centrifugal pumps manufactured, and excellent and numerous working drawings give in detail the construction of nearly every make of centrifugal pump upon the market to-day. The book also gives a concise historical review of the centrifugal pump art, and describes the various means employed in testing centrifugal pumps.

### COMPRESSED AIR

**INNES, C. H.** The Fan: Including the Theory and Practice of Centrifugal and Axial Fans. 142 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , cloth, 258 pp. **\$4.00**

**CONTENTS:** Conservation of Energy; Losses of Head; Manometer, Anemometer and Pilot Tube; Calculation of Density of Air; Change of Moment of Momentum; Theoretical Characteristics; Design of Fans; Variation of Pressure in Centrifugal Fans; Various Tests on Fans; Comparison Between Theory and Experiment; High Pressure Fans; Theory of Propeller Ventilating Fans; Experiments; Types of Propeller Ventilating Fan.

**WEISBACH, J., and HERRMANN, G.** Mechanics of Air Machinery. Authorized translation, with an appendix on American practice by A. Trowbridge. 92 ill., 8vo, 213 pp. **\$3.75**

**CONTENTS:** Movement of Air by Difference of Temperature; Natural Ventilation; Artificial Ventilation; Theory and Practice; Blowing Engines; Vacuum Pumps; Tuyeres; Hot Air Blast; Clearances in Blowers; Losses due to Various Causes; Indicating of Blowers; Resistance in Blowers; Sizes of Blast Reservoirs and Tuyeres; The Hot Air Blast; Design of Piston Blowers; Compressors; Driving Force of Blowers; Fly-wheels of Cylinder Blowers; Rotary Blowers; Fans; Recent American Practice.



REFRIGERATION—DRYING

**HAUSBRAND, E. Drying by Means of Air and Steam.** With explanations, formulas, and tables, for use in practice. Translated from the German by A. C. Wright. Ill.,  $5 \times 7\frac{1}{2}$ , 77 pp. **\$2.50**

**CONTENTS:** Comparison Between English and Metric Systems and the Centrifugal and Fahrenheit Thermometers; Tables and Calculations; Drying Apparatus; Drying by Superheated Steam; Heating Surface; Velocity of Air Current; Dimensions of Drying Room; Surface of the Drying Material; Losses of Heat.

**HAUSBRAND, E. Evaporating, Condensing and Cooling Apparatus.** Explanation, formula and tables for use in practice. Translated from the *Second Revised German Edition* by A. C. Wright. 26 ill., 76 tables,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 400 pp. **\$6.00**

**CONTENTS:** The Coefficient of Transmission of Heat, and the Mean Temperature Difference; Parallel and Opposite Currents; Apparatus for Heating with Direct Fire; Injection of Saturated Steam; Superheated Steam; Evaporation by Means of Hot Liquids; Transference of Heat; Evaporation in a Vacuum; Multiple-effect Evaporator; Weight of Water which must be Evaporated from 100 kilos. of Liquor in order to bring its Original Percentage of Solids from 1-25 per cent. up to 20-70 per cent.; Relative Proportion of the Heating Surfaces in the Elements of the Multiple Evaporator and their Real Dimensions; Pressure Exerted by Currents of Steam and Air upon Floating Drops of Water; Motion of Floating Drops of Water; Splashing of Evaporating Liquids; The Diameter of Pipes for Steam, Alcohol Vapor and Air; Diameter of Water Pipes; Loss of Heat from Apparatus and Pipes; Condensers; Heating Liquids by Steam; Cooling of Liquids; The Volumes to be Exhausted from Condensers; Air Pumps and the Vacua they Produce; Volumetric Efficiency of Air-Pumps; The Volumes of Air which must be Exhausted from a Vessel in order to Reduce its Original Pressure to a Certain Lower Pressure; Tables.

**LEASK, A. R. Refrigerating Machinery.** Its principles and management. *Fourth Edition.* Ill.,  $5 \times 7$ , 296 pp. *Reprinting*

**LEDOUX, M. Ice-making Machines.** The theory of the action of the various forms of cold producing machines. Revised and translated by J. E. Denton, D. S. Jacobus and A. Riesenberger. *Sixth Edition, Revised.*  $3\frac{3}{4} \times 6$ , boards, 258 pp. (Van Nostrand Science Series, No. 46.) **\$0.75**

**CONTENTS:** Introduction; General Thermodynamic Principles Governing the Action of Refrigerating Machinery; Refrigerating Machines Employing the Vapor of Volatile Liquids; Compression Systems; Ammonia Absorption Machines.

**MARLOW, THOMAS G. Drying Machinery and Practice.** A handbook on the theory and practice of drying and desiccating, with classified description of installations, machinery, and apparatus. 173 ill.,  $6 \times 9$ , 388 pp. *Reprinting*

**CONTENTS:** Introductory. Drying by Gravitation, Absorption, and Condensation. Mechanical Drying. Drying by Evaporation. Methods of Applying the Heat. Methods of Removing the Vapor. Handling the Materials. Evaporative Drying Installations: Floors, Gantries and Rocks, Sheds, Pans and Troughs, Kilns, Stoves, Cylinders, Tunnels, Rooms, Ovens, Desiccators, Autoclaves. Bibliography. Glossary of Terms.

**PAULDING, C. P. Transmission of Heat Through Cold Storage Insulation.**

Formulas, principles, and data relating to insulation of every kind. A manual for refrigerating engineers. Ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , 41 pp. \$1.00

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**PAULDING, C. P.** **Practical Laws and Data on the Condensation of Steam in Covered and Bare Pipes.** To which is added a translation of Péclet's "Theory and Experiments on the Transmission of Heat Through Insulating Materials." 184 ill.,  $6\frac{1}{2} \times 9\frac{1}{2}$ , 107 pp. \$2.00

**CONTENTS:** Loss of Heat from Covered Steam Pipes; Loss of Heat from Bare Steam Pipes; Emission and Transmission of Heat; Transmission of Heat Through Solid Bodies; Applications of Formulas; Notes on the Use of the Formulas.

**WALLIS-TAYLER, A. J.** **Refrigeration, Cold Storage and Ice-Making.** A practical treatise on the art and science of refrigeration. With which is incorporated "Refrigerating and Ice-Making Machinery." *Third Edition, Thoroughly Revised.* 414 ill.,  $6 \times 9$ , 610 pp. \$5.50

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**WRIGHT, F. W.** **The Design of Condensing Plant.** A practical treatise. 96 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , 210 pp. *Reprinting*

**CONTENTS:** Heat Units, etc.; Jet Condensers; Ejector Condensers; Surface Condensers; Design of Jet Condensers; Design of Surface Condensers; Evaporative Condensers; Water Cooling Plant; Air Pump Efficiencies.

### CONVEYING MACHINERY

**BOTTCHER, ANTON.** **Cranes; Their Construction, Mechanical Equipment and Working.** Translated and supplemented with American, English, and Continental practice by A. Tollhausen. 560 ill., 63 plates,  $8\frac{1}{2} \times 11\frac{1}{2}$ , 517 pp. *Reprinting*

**CONTENTS:** First Principles or Fundamental Formulas Used in Crane Building Practice; Statics, Dynamics, Elasticity, and Strength; General Arrangement of Cranes; Traveling, Rotatory, Sheer Legs or Mast Cranes; Special Crane Accessories; Crane Driving Principles; Hand, Shaft, Steam, Hydraulic, Electrical; Crane Parts or Accessories; The Design and Calculation of Crane Girders; Full Plate, Lattice; Descriptions and Calculations of Various German, American, and British Crane Installations; Fourteen Specifications of Various Crane Types; Supplementary Tables; An Index to the Articles and Papers Published on Cranes.

**MARKS, E. C. R.** **Notes on the Construction of Cranes and Lifting Machinery.** With numerous diagrams and figures. *Third Edition, Revised and Enlarged.*  $5\frac{1}{4} \times 7\frac{1}{2}$ , 268 pp. \$2.75

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Inventions Relating to Lifting Machinery; Examples of Present Practice by Leading Makers of Lifting Machinery.

**VOLK, C.** Haulage and Winding Appliances Used in Mines. Translated from the German by Charles Salter. 155 ill., 6 plates,  $6\frac{1}{4} \times 10$ , 160 pp. **\$4.00**

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**WILDA, HERMANN.** Cranes and Hoists. Their construction and calculation. Translated from the German by Chas. Salter. 399 ill.,  $4\frac{3}{4} \times 7\frac{1}{2}$ , 168 pp. **\$2.00**

**CONTENTS:** *Elements of Lifting Tackle.* Hemp Rope; Wire Ropes; Chains; Rope and Chain Pulleys; Rope and Chain Drums; Grooved Chain Wheels and Sprockets; Pulley Spindles and Fixings; Guides for Ropes and Chains; Capstans; Driving Means for Rope Drums; Hooks; Hand Cranks; Chain Wheels; Holding Gears; Brakes; Reversing Gears; Pinions; Worm Gearing; Bearings; Bolts; Couplings; Traversing Wheels. *Types of Cranes and Hoists.* Pulleys and Pulley Connections; Winches; Travelling Crabs; Lifting Jacks; Cranes; Tabulated Data for Calculation for Oval and Like Link Chains (Table); Data for Design of Plate Girders (Table).

**ZIMMER, GEORGE F.** The Mechanical Handling and Storing of Material. Being a treatise on the handling and storing of materials, such as grain, coal, ore, timber, etc., by automatic or semi-automatic machinery, together with the various accessories used in the manipulation of such plant. 1044 ill.,  $7\frac{3}{4} \times 19\frac{1}{2}$ , 766 pp. **\$15.00**

**CONTENTS:** *Continuous Handling of Material.* Elevators; Conveyors; Worm or Archimedean Screw Conveyors; Push-Plate or Scraper Conveyors; Push-Trough Conveyors; Band Conveyors; Steel Plate Conveyors, Slat Conveyors, Picking Belts, and Continuous Trough Conveyors; Vibrating or Reciprocating Trough Conveyors; Gravity Bucket Conveyors; Summary of Driving Power, Speed of Travel, and Wear and Tear of Elevating and Conveying Machinery; The Handling of Hot Coke in Gasworks; Coal Face Conveyors; Casting Machines; Miscellaneous Conveyors; Tightening and Equalizing Gears for Elevators and Conveyors; Conveying by Gravity; Automatic Feeding Devices; The Handling of Material by Pneumatic Means; Conveying Material by Hydraulic Means; The Mechanical Disposal of Ashes from Steamers. *Intermittent Handling of Material.* Endless Rope and Chain Haulage; Ropeways; Aerial Cableways or Cable Cranes; Coaling Vessels at Sea; Mono-Rails and Telfers; Handling Raw Material in Connection with Blast-Furnaces; The Mechanical Handling of Coke from Coke Ovens. *Unloading and Loading Appliances.* Discharging by Means of Skips and Grabs; Transporters, Bridge or Cantilever Cranes; Unloading Vessels by Means of Barge or Ship Elevators and Marine Legs; Floating Loading Devices; Unloading by Means of Specially Constructed Self-Emptying Hopper Wagons; Unloading Railway Wagons by Means of Tips or Hoists; Colliery Tips or Tipplers; Loading Coal into Ships Otherwise Than by Tips; Miscellaneous Loading and Unloading Devices. *Miscellaneous Installations.* The Coaling of Railway Engines; Coal, Coke, and Ash Handling Plants for Boiler Houses, Gasworks, Etc.; Storing of Coal and Other Minerals in Stock Heaps and Silos; The Ware-

housing of Grain; Automatic Weighing of Material; Table Giving Weights of Various Materials; Trade Directory of Firms of Repute Who Are Makers of the Different Machines for the Mechanical Handling and Storing of Material. An authoritative, up-to-date volume on a subject of ever-increasing importance to engineers, manufacturers, contractors, millers and managers of railways, collieries, mines, gas works and power stations.

**ZIMMER, GEORGE F.** *Mechanical Handling of Material and Its National Importance During and After the War.* 134 ill., 10 plates, 7 x 10, 138 pp. **\$4.00**

**CONTENTS:** Introduction; Pneumatic Handling; Ash Hoists; Mono-Rails; Storing of Coal; Conveyers and Elevators and Their Suitability for Different Uses; Telphers; Terminal Plant; Mechanical Equipment of Boiler-Houses; Pneumatic Ash Conveyors; Mechanical or Automatic Stokers; Handling of Material in Gas Works; Floating Loading Devices; Importance of Coaling Under Way; Oil Fuel Bunkering at Sea; Mechanical Trimming of Coal in Bunkers; Portable Loading and Unloading Devices; Coaling Locomotive Engines; Concluding Remarks. The principal object of this work is to explain to those responsible for the output in industrial establishments how to replace men by machines. Examples of systems and plants in operation are described in the hope that some will be found applicable, with modification, to existing establishments for the benefit of the owner and the country at large. The installation of plants and machines described in this volume have effected a saving of workers, ranging with the nature and importance of the plant, of from one to 250 men, more than enough for a company of infantry.

### MACHINE SHOP PRACTICE

**BURLEY, GEO. W.** *The Testing of Machine Tools.* 110 ill., 5 x 7½, 239 pp. **\$2.00**

**CONTENTS:** Introduction; Tests on Machine-Tool Elements and Accuracy; Machine-Tool Speed and Speed Tests; Machine-Tool Mechanical Efficiency Tests; Cutting Force Tests; Output and Power Consumption Tests; Comparative Tool Testing; Commercial Machine-Tool Testing; Lathe Test Report.

**BURLEY, GEO. W.** *Machine and Fitting Shop Practice.* In two volumes. Vol. I., Measurements and Gauging; Setting-Out; Vice Work, Chipping, Filing, and Scraping. 194 ill., 4½ x 7¼, 212 pp. **\$2.00**

**CONTENTS:** Introduction; Materials of Construction; Shop Measurements and Measuring Instruments; Gauging and Gauges; Setting-out; Tools and Operations; The Vice; The Hammer and Chisel; Chipping; Files, Their Form and Uses; Scrapers and Scraping; Appendix.

Vol. II. Planing, Shaping and Slotting; Drilling, Boring and Reaming; Milling and Gearwheel Cutting; Lathe Work; Grinding and Lapping; Screw-Thread Cutting; Interchangeable System of Manufacture. 238 ill., 4½ x 7¼, 250 pp. **\$2.00**

**CONTENTS:** Planer, Shaper, and Slotter Practice; Drilling, Boring, and Reaming; Milling; Gear-Wheel Cutting; Lathe Methods and Operators; Grinding and Lapping; Screw-Threads and Their Formation; Interchangeable System of Manufacture; Appendix.

**BURLEY, GEORGE W.** *Lathes, Their Construction and Operation.* 200 ill., 4¾ x 7½, 242 pp. **\$2.00**

**CONTENTS:** Evolution of the Lathe, Classification of Modern Lathes; Hand-Turning Lathes; Engine Lathes; Turret Lathes; Vertical Lathes; Special



Lathes; Lathe Accessories; Lathe Cutting Tools; Lathe Work; Cutting Speeds and Feeds; Appendix.

**DIXON, D. B.** *The Machinist's and Steam Engineer's Practical Calculator.*

A compilation of useful rules and problems arithmetically solved. *Fourth Edition.* Pocket form,  $5\frac{1}{2} \times 3\frac{1}{2}$ , 300 pp. **\$1.25**

**CONTENTS:** Signs; Definitions; Tables; Decimal Fractions; Proportion; Involutions; Evolution; Mensuration; Screw Cutting; Gearing; Pumps; Steam Engine Indicator; Wire Gauges; Pulleys; Shafts; The Fulcrum; The Injector; Steel; Recipes; Steam Boilers; Steam Engine; Rules and Problems.

**DUNKLEY, W. G.** *The Design of Machine Elements.* A handbook for students and draughtsmen engaged in engineering design. In two volumes.

Vol. I. Forces and Stresses, Shafting and Bearings; Couplings, Springs. 123 ill., 16 tables,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 210 pp. **\$2.00**

**CONTENTS:** Conditions for Equilibrium Between Forces Acting on a Body; Stress, Strain; Twisting and Bending Moment; Shafts and Studs; Bearings, Pedestals, Hangers, Wall Brackets and Swivel Bearings; Ball and Roller-Bearings; Keys and Couplings; Springs.

Vol. II. Screws and Bolts, Clutches; Belts and Pulleys, Gearing. 122 ill., 15 tables,  $5\frac{1}{2} \times 8\frac{1}{2}$ , 220 pp. **\$2.00**

**CONTENTS:** Screw Threads, Bolts, and Screws; Belts and Pulleys; Driving Clutches; Gearing; Driving Chains, Lifting Chains, Wire Ropes.

**DURHAM, HARRY W.** *Saws: Their care and treatment.* Ill.,  $5\frac{1}{4} \times 7\frac{1}{4}$ , 272 pp. **\$2.50**

**CONTENTS:** General Introductory Notes on Saws; Particulars of Reciprocating Saws; Particulars of Circular Saws; Sharpening Saws by Hand Filing; Saw-Sharpening Machines; Setting the Teeth of Saws; Hammering and Tensioning Circular and Reciprocating Saws; Sharpening Large Band Saws; The Saw Sharpening Room; Small and Narrow Band-Saws; Wide Band-Saws; Tensioning, Levelling and Hammering Band-Saws; Doctoring Band-Saws; Miscellaneous; Saw Packing and Saw Guides; Power to Drive Sawing Machines.

A complete reference guide on the care and treatment of saws for all interested in the art of saw fitting, written in simple, non-technical language, so as to be of service to the beginner as well as to the expert.

**GEORGI, F., and SCHUBERT, A.** *Sheet Metal Working.* Cutting, Punching, Bending, Folding, Pressing, Drawing, and Embossing Metals and Machinery for Same. Translated from the German by Chas. Salter. 125 ill., 2 folding plates,  $5\frac{3}{4} \times 8\frac{3}{4}$ , 160 pp. **\$8.50**

**CONTENTS:** History of the Iron and Sheet Metal Working Industry; The Material and Its Properties; Devices and Machines for Bending Sheet Metal; Presses and Tools; Curling and Flattening Sheet Metal; Raising and Hollowing; Can Making; Slot-Punching Machine; Machines for Making Cutting Tools; Press Tools for Making Water Pails; Drawing; Simple Burr Trimming Device; Clamps; Rolling Thin Plate; Electric Drive; Standardization; Tool Materials, Their Use and Treatment; Learning a Trade; Pneumatic Tools; Appendix and Tables.

**PRATT, JAMES A.** *Elementary Machine Shop Practice.* *In Press*

**CONTENTS:** Machine Shop Small Tools; Filing; Scraping; Flat and Cylindrical; Development of Measurement; Measuring Instruments, Linear and Angular; Drill and Wire Gauges; Hardening and Tempering; Annealing; Machine Adjustments; Belting; Emery Wheels and Grindstones; Polishing Wheels; Lathe Tools; Lathe Operation; The Standard Tapers; Drill Press Practice; Sharper Operation; Slotter Operation; Grinder Operation; Milling Machine Operation; The Elements



of Gearing; Planer Operation; Machine Shop Calculations; Glossary of Machine Shop Terms.

**RANKINE, W. J. M.** *A Manual of Machinery and Millwork. Seventh Edition, Revised*, by W. J. Millar. 289 ill., 6 x 9, 617 pp. **\$6.00**

**CONTENTS:** *Geometry of Machinery*; Elementary Rules of Descriptive Geometry; Motions of Primary Moving Pieces in Machines; Motions of Secondary Moving Pieces; Elementary Combinations in Mechanism; Aggregate Combinations; Adjustments; *Dynamics of Machinery*; General Principles; Performance of Work by Machines; Regulating Apparatus; Efficiency and Counter Efficiency of Pieces, Combinations and Trains in Mechanism; *Materials, Construction and Strength of Machinery*; Materials Used; Strengths of Materials; Action of Cutting Tools.

**REULEAUX, F.** *The Constructor.* A handbook of machine design. Authorized, complete and unabridged translation from the *Fourth Enlarged German Edition* by H. H. Suplee. 1200 ill., 9¼ x 12, 330 pp. **\$4.00**

**CONTENTS:** *Strength of Materials.* This section contains Tables, Formulas and full data for determining the strength of all forms used in construction, including Beams, Columns, Plates, Rings, Springs, etc., in all materials in practical use. *The Elements of Graphostatics.* Containing a clear explanation of the method of making calculations by use of lines instead of algebraic formulas, and showing the application of the method to Machine Design as fully as it has heretofore been used for Framed Structures. *The Construction of Machine Elements.* Riveting; Hooping; Keying; Bolts and Screws; Journal; Lateral and Thrust; Bearings: Lateral and Thrust; Supports for Bearings; Axles; Shafting; Couplings, Rigid, Flexible and Clutch; Simple Levers; Cranks; Combined Levers; Connecting Rods; Cross Heads; Friction Wheels; Toothed Gearing; Ratchet Gearing, a new and very full treatment of this important subject; Tension Organs, including Belts, Hemp Rope, Wire Rope and Chains, generally considered; Belting, Including Capacity and Efficiency, also Proportions of Pulleys; Rope Transmission, Including Hemp, Cotton and Wire Rope; also Proportions of Sheaves, Construction of Stations, and Arrangement of Long Distance Transmission Systems; Chain Transmission; Pressure Organs, Including Water Motors, Pumps, Water-Pressure Engines, Steam Engines, Steering Gear and Meters; Conductors for Pressure Organs, Including Pipes, Pipe Connections, Pistons, Plungers, Stuffing Boxes, and a discussion of Long Distance Hydraulic Transmission; Reservoirs for Pressure Organs, Including Tanks, Accumulations and Steam Boilers; Valves, Including all Kinds of Lift and Slide Valves, Both Self-Acting and Mechanically Operated. *Mathematical Tablets.* Including Tables of Curves, Areas, and Volumes Giving Rectangular and Polar Equation, Moment of Inertia, Radius of Curvature, Rectification, and Center of Gravity; also Tables of Trigonometrical Functions and Formulæ, Squares, Cubes, Square Roots and Cube Roots, Reciprocals, etc., and many constants.

**SAUNDERS, C. H.** *Handbook of Practical Mechanics for Use in the Shop and Draughting Room.* Ill., 225 pp. **\$1.50**  
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**CONTENTS:** Rules, Tables and Formulas and Solutions of Practical Problems by Simple and Quick Methods; Lathe Thread Cutting; Cams; Bevel and Worm Gears; Standard Keys; Bolts; Tapping Drills; Metric System; Weights of Metals; Speed of Pulleys; Tapers and Angles; Shop Recipes; Wire and Plate Gauges.

**SCRIBNER, J. M.** *Engineers' and Mechanics' Companion. Twenty-first Edition, Revised.* Ill., 4½ x 6½, leather, 273 pp. **\$1.50**

**CONTENTS:** U. S. Weights and Measures; French and English Weights and Measures; Synopsis of Arithmetic; Mensuration of Surfaces and Solids; Of Artificer's Work; Engineering; Mechanical Powers and Centers; Strength of Materials;



Hydrodynamics; Motion; Water Wheels; Friction; Effects of Heat; Steam and Locomotive Engines; Weight of Metals, Miscellaneous Notes.

**SHAW, THOS. R.** *The Driving of Machine Tools.* 139 ill., 37 tables, 4¾ x 7½, 221 pp. \$2.00

**CONTENTS:** Cone Pulleys and Gearing; Application of the Cone Pulley; The All-Gear Drive; Application of Motor Drive; Planning Machine Drives; Drives for Various Machines; Miscellany; Appendix.

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General principles governing design and operation in order to get the most satisfactory results are given from actual workshop practice. This book will be equally beneficial to the engineer and the operator, and help to a better understanding and consequently better appreciation of the possibilities of grinding, with the inevitable result of increased efficiency in the workshop.

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**SMITH, ROBERT H.** *Text-Book of Advanced Machine Work.* Prepared for students in technical, manual training, and trade schools, and for the apprentice in the shop. *Third Edition, Revised and Enlarged.* 609 ill., 5¼ x 8¼, 575 pp. \$3.00

(Author is instructor of machine tool work at Massachusetts Institute of Technology.)

**CONTENTS:** Engine Lathe Work; Cutting Tools; Measuring; Turning; Fitting; Threading; Chucking; Reaming; Mandrels or Arbors; Curve Turning and Forming; Inside Calipers and Inside Micrometers; Boring and Inside Threading; Brass Finishing; Broaching; Drilling Jigs; Boring, Boring Bars and Boring Machines; Eccentric Turning; Nurling; Cylindrical, Internal Surface and Cutter Grinding; Planing; Milling; Spur, Bevel, Worm and Spiral Gear Cutting; Tool-making; Spiral Milling; The Plug and Button Methods of Locating Holes of Precision in Jigs and Fixtures; Sine Bar.

**SMITH, ROBERT H.** *Text-Book of the Principles of Machine Work.* Prepared for students in technical, manual training, and trade schools, and for the apprentice in the shop. *In Press*

**CONTENTS:** Metals and Materials Used in Machine Construction and Names the Tools and Instruments and Schedules of Operations of Hand Processes; It treats of Laying Out Work; Chipping, Filing and Scraping; Hardening and Tempering Carbon and High-speed Steels; Pipe Fitting; Soldering and Brazing; Lacing Belts, Alining Shafting and Installing Machines; Drills and Drilling; Taps and Tapping; Speed Lathes, Hand Tools and Hand Turning; Pneumatic Chipping and Riveting; Autogenous Welding.

The aim of these books—"Advanced Machine Work" and "Principles of Machine Work"—is to give the beginner the advantages of text-books that he may acquire the fundamental as well as advanced principles in a logical, sys-



tematic, and progressive manner and in the shortest time possible. Machines, mechanisms and tools are illustrated graphically by means of original perspective and mechanical drawings, and briefly and systematically described by condensed tables. Operations in machining, standard and typical problems in machine construction are given in condensed schedules which name the material, operations, machines, speeds, feeds, jigs, fixtures and tools. Calculations are supplied by condensed rules and formulas. Facts and principles are supplied which a student or apprentice in school or shop must rediscover or obtain from instructor or foreman.

**ZUR NEDDEN, F.** *Engineering Workshop Machines and Processes.* A handbook for the use of students and others taking the workshop training recommended by the Institution of Civil Engineers. Translated and revised by John A. Davenport, with an Introduction by Alex. B. W. Kennedy. Ill.,  $5\frac{1}{2} \times 8\frac{3}{4}$ , 231 pp. **\$2.00**

**CONTENTS:** General Remarks. The Modern Engineering Works. The Materials of Construction. Foundry and Pattern Shop. Forging. The Machine Shop. Measuring and Marking-off. Fitting, Erecting and Testing. Appendix. The Education and Training of Engineers.

This work attempts to fill the gap that exists between the usual theoretical training of the engineer and his practical work. The author links the commercial side of engineering practice with the theoretical and scientific, and points out how the cost of materials in the uses to which it is put and other considerations enter into the design of a machine.

### GEARS AND GEAR CUTTING

**HALSEY, F. A.** *Worm and Spiral Gearing. Second Edition, Revised and Enlarged.* 26 folding plates,  $3\frac{3}{4} \times 6$ , boards, 95 pp. (Van Nostrand Science Series, No. 116.) **\$0.75**

**CONTENTS:** *Worm Gearing.* Theory of Worm Efficiency; Examples from Practice; Limiting Speed and Pressure; Step Bearings. *Spiral Gearing.* Spiral Gears Compared with Spur Gears; Speed Ratio; Preliminary Solution; Lengths of Normal Helixes; Final Solution by Changing the Center Distance; Graphical Solution with Changed Center Distance; Final and Graphical Solutions with Unchanged Center Distance; Finding the Pitch of the Tooth Helix; Special and Graphical Solutions for a Helix Angle of 45 Degrees; Special and Graphical Solutions for Gears of Equal Diameters; Selection of the Cutter.

**HORNER, JOSEPH G.** *Gear Cutting. In theory and Practice.* 367 ill.,  $6 \times 8\frac{3}{4}$ , 406 pp. *Reprinting*

**CONTENTS:** *Principles of Design.* Elements of Tooth Forms; Tooth Curves; Pitches; Tooth Proportions; Gears Related to the Spurs; Bevel Gears. *Methods of Cutting.* Form Cuttings; Form Planing and Generating Methods. *Machines.* Machines Using Form Cutters; Form Planing; Machines That Generate by Planing Tools; Machines That Generate Bevels by Planing; Generating by Hobbing; Generating by Milling; Materials, Manufacture and Strength; Appendix.

**INGHAM, A. E.** *Gearing.* A practical treatise. 57 ill.  $6 \times 9$ , 194 pp. **\$2.50**

**CONTENTS:** Spur Gears; Bevel Gears; Worm Gearing; Spiral Gearing; Helical Gears; Appendix.

Presents in a very simple manner the general scientific principles which underlie the subject, and gives particulars of the most approved methods of solving problems associated with the various forms of gears. The information is described and classified, and numerical examples are included illustrating the application of data. Numerous tables and charts are given from which almost the whole of the necessary particulars can be obtained without calculation.



**WHITE, G. T. Toothed Gearing.** 136 ill., 5 x 7 $\frac{3}{4}$ , 226 pp. **\$2.00**

**CONTENTS:** Kinematics; The Spur Wheel, Cycloidal Teeth; Annular Wheels, Cycloidal Teeth; The Spur Wheel, Involute Teeth; Obliquity of Action; Pin Gearing; Non-Circular, Lobed, Helical, Bevel and Skew Bevel Wheels; Worm Gearing; Oblique Worm and Wheel; Screw Wheels or Spiral Wheels; Strength of Teeth; Durability Trains of Wheels; The Odontograph.

### ILLUMINATION

**BLOCH, L. The Science of Illumination.** An outline of the principles of artificial lighting. Translated by W. C. Clinton. 47 ill., 32 tables, 5 $\frac{1}{2}$  x 8 $\frac{3}{4}$ , 190 pp. **\$2.50**

**CONTENTS:** Fundamental Units in Illumination. Measurement and Calculation of Luminous Intensity, or Candle-Power. Estimation of Illumination. Calculation of Illumination. Measurement of Illumination. Indirect Lighting. Appendices.

Deals with the estimation, calculation and measurement of illumination. The book starts with an exposition of the fundamental principles and gives methods for determining mean spherical and mean hemispherical candle power. The methods of predetermination for direct lighting are shown to be applicable to indirect lighting provided the necessary experimental data are available.

**ECK, J. Light, Radiation and Illumination.** Translated from the German of Paul Hogner. 59 ill., folding plates, 5 $\frac{1}{2}$  x 8 $\frac{1}{2}$ , 100 pp. **\$2.50**

**CONTENTS:** Light Emission from Surfaces; Light Emission from Bodies; Light Emission from Arc Lamps; Illumination (Radiation Density); Unidirectional Illumination; Calculation Methods; The Horizontal Surface Illumination of Streets and Open Spaces; Determination of Vertical Surface Illumination from Mean Horizontal Surface Illumination.

**HOUSTOUN, R. A. Studies in Light Production.** 22 ill., 5 $\frac{3}{4}$  x 8 $\frac{3}{4}$ , 120 pp. **\$2.00**

**CONTENTS:** The Energy Spectrum; The Black Body; Flames; Welsbach Mantle Carbon Glow Lamp; The Arc; The Nernst Lamp; Metal Filament Lamps; The Mercury Arc; Light of the Future; On the Absolute Measurement of Light; A Proposal for an Ultimate Light Standard; On Apparatus and Experimental Methods. These studies were written for the purpose of collecting information about the efficiency of our artificial illuminants as energy transformers, both for the sake of rendering the facts readily accessible and also for information as to the lines future progress is likely to take.

### ACETYLENE LIGHTING

**GIBBS, W. E. Lighting by Acetylene, Generators, Burners and Electric Furnaces.** *Second Edition, Revised.* 66 ill., 5 $\frac{1}{4}$  x 7 $\frac{1}{2}$ , 170 pp. **\$1.50**

**CONTENTS:** Acetylene; Dangers; Electric Furnaces; Generation of Acetylene; Dry and Wet Process Generators; The Plunger; Impurities of Carbide and Acetylene; Lamps; Burners; Experiments; Fire Regulations; U. S. Patents.

### GAS AND GAS LIGHTING

**BIRCHMORE, W. H. Interpretation of Gas Analyses.** Ill., 5 x 7 $\frac{1}{2}$ , 86 pp. **\$1.25**

**CONTENTS:** Introduction; The Translation of the Analysis; The Atmosphere;

Specific Gravity and Liter Weights; Combustion; Products; The Immaterial Products of Combustion; Tension of Aqueous Vapor According to Regnault.

**FRANZEN, H.** *Exercises in Gas Analysis.* Translated from the first German edition, with corrections and additions by the author, by Thomas Callan. 30 diagrams,  $5 \times 7\frac{1}{4}$ , 127 pp. **\$1.00**

Presents a systematic introduction to the methods used in gas analysis, grading the exercises carefully from easy to more difficult ones, and to each exercise adding a brief discussion of the theoretical questions involved. The well tried methods of Hempel and Bunte have received special attention.

**HOLE, W.** *The Distribution of Gas. Third Edition.* 687 ill.,  $6\frac{1}{4} \times 8\frac{3}{4}$ , 865 pp. **\$8.50**

**CONTENTS:** Rights and Duties of Gas Undertakings; Preliminary Considerations; Discharges from Pipes; Discharges from Pipes under High Pressure; Station Governors; Districting; District Governors; Cast Iron Pipes and Irregulars; Steel Pipes and Connections; Joints and Jointing; Main-Laying; Valves and Main Coeks; Subways; Service; Wet-Dry, Prepayment, and Fixing Meters; Pipes and Joints for Internal Fitting; Internal Fitting and Lighting; Gas Fires and Cookers; Gas Engines; Pressure Gauges and Registers; Complaints and Repairs; Gas as an Aid to Ventilation. *Public Lighting.* Low-Pressure Self-Intensifying and High-Pressure Systems; Lighting and Extinguishing Lamps; High-Pressure Distribution and Transmission; Compressors; High Pressure; Distributing Apparatus; Internal Lighting and Heating; Unaccounted-For Gas; Fusion and Electrolysis; Appendix.

A complete and comprehensive treatise embodying all that is required as an outfit on the subject of distribution, not only to students, but also to managers of gas works. This new edition has been much enlarged and brought up to date by the addition of much new matter and the careful compression of the old material.

**LANGHE, K. R.** *The By-Products of Coal-Gas Manufacture.* Trans. by Chas. Salter. 13 ill.,  $5 \times 7\frac{1}{2}$ , 162 pp. **\$2.50**

**CONTENTS:** Production of Coal Gas; Coke; Retort Graphite; Gas Tar; The Gas Liquor; Treatment of the Gas-Purifying Agents; Treating the Cyanogen Sludge; Treating the Crude Liquors; Treatment of the Crude Ammonium Thiocyanate and Cuprous Thiocyanate; Potassium Ferricyanide; The Cyanogen Pigments; Sulphur and Sulphuric Acid.

**LATTA, M. N.** *Handbook of American Gas-Engineering Practice.* Ill.,  $6\frac{1}{4} \times 8\frac{3}{4}$ , fabrikoid, 477 pp. **\$5.00**

**CONTENTS:** *Water Gas Manufacture;* Generator; Carburetter; Superheater; Wash-Box and Tar; Scrubbers; Condensers; Purifiers; Exhausters; Station-Meters; Holders; Works Operation; *Gas Distribution;* Naphthalene; Mains; Services; Consumers' Meters; Pressure; House Piping; Appliances; *General Technical Data;* Properties of Gases; Steam; Mathematical Tables; Conversion Factors; Pipe and Miscellaneous Data.

**EWES, V. B.** *The Carbonisation of Coal.* A scientific review of the formation, composition and destructive distillation of coal for gas, coke and by-products. 27 ill.,  $6 \times 8\frac{3}{4}$ , 330 pp. **\$5.00**

**CONTENTS:** The Formation, Composition, Classification, and Distribution of Coal. Form of Retorts used in Gas Manufacture. Coke Ovens and their Development. Conditions existing in the Destructive Distillation of Coal. Primary Gaseous Products of the Destructive Distillation of Coal and the Bodies from which it has been formed. Tar; Its Formation, Use and Decomposition. Coke. Nitrogen and Sulphur of Coal, and their Recovery. Modern Coal Gas. Appendix.

The chemical and mechanical principles involved in the destructive distillation of coal are carefully pointed out and the work of various investigators critically presented together with much data gathered from the author's own recent investigations and he attempts to define the probable lines along which future advances in the carbonization of coal may be expected,



**LUNGE, GEORGE.** *Technical Gas Analysis.* 143 ill., 6 x 9, 422 pp. \$4.50

**CONTENTS:** *General Remarks on Technical Gas.* Sampling; Measurement of Gases; Measuring Apparatus; Adjustment or Calibration of Gas-Measuring Apparatus; Measuring in Gas-meters; Various Apparatus for Gas Analysis. *Methods Employed in Technical Gas Analysis.* Estimation of Solid and Liquid Admixtures in Gases; Estimation of Gases by Absorption: (a) by gas-volumetric methods, (b) by titration, (c) by weight; Estimation of Gases by Combustion; Gas Analysis by Optical and Acoustical Methods; Separation of Gases by Low Temperatures; Estimation of the Specific Gravity of Gases; Measurement of Pressure and of Draught; Determination of the Calorific Value and Illuminating Power of Gases. *Special Methods for Detecting and Estimating Various Gases and Vapors Occurring in Technical Operations.* Analysis of Gaseous Mixtures Produced on a Large Scale. Compressed and Liquefied Gases. Gas Volumetric Analysis. Appendix. Tables.

A comprehensive and generally useful work for chemists working on gas analysis. The work of other investigators is quoted only where it would be helpful toward a better use of the book, and for this reason the author does not attempt to mention everything published on the subject. This book superseding, as it does, Winkler and Lunge's previous work, is not based on the former, and is in reality an entirely new treatise.

**MEADE, ALWYNE.** *Modern Gas Works Practice.* With an introductory note by Stanley H. Jones, M. Inst. C. E. 340 ill., 7¾ x 9¾, 540 pp. \$8.50

**CONTENTS:** The Planning and Laying Out of Gasworks Foundations; Gasworks' Buildings, etc.; The Horizontal Retort Bench; Control of Horizontal Retort Settings; Vertical Retorts and Chamber Ovens; Refractory Materials; Retort-Bench Appurtenances; Mechanical Handling of Materials; Electrical Plant in Gasworks; Gas-Making and Other Coals; Carbonization of Coal; Condensation of Coal Gas; Exhausting Machinery; Preliminary Purification of Coal Gas; Recovery of Cyanogen; Dry Purification of Coal Gas; Storage of Gas; Water Gas: Its Manufacture, Enrichment and Use.

**"MENTOR."** *Self Instruction for Students in Gas Engineering:*

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*Advanced. Third Edition.* Ill., 5 x 7¼, 245 pp. \$2.00

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**O'CONNOR, H.** The Gas Engineers' Pocketbook. Comprising tables, notes and memoranda relating to the manufacture, distribution and use of coal gas and the construction of gas works. *Third Edition, Revised.* Ill., 4 $\frac{3}{4}$  x 7, full leather, 478 pp.

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**BRASSEY, EARL, and LEYLAND, JOHN (Editors)** *The Naval Annual, 1919.*  
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(Author is professor naval architecture and marine engineering in the University of Michigan.)



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**SEATON, A. E., and ROUNTHWAITE, H. M.** **A Pocketbook of Marine Engineering Rules and Tables.** For the use of marine engineers and naval architects, designers, draughtsmen, superintendents, and all engaged in the design and construction of marine machinery, naval and mercantile. *Twelfth Edition, Revised and Enlarged.* Ill., 199 tables,  $4\frac{1}{4} \times 6\frac{1}{2}$ , leather, 733 pp. **\$5.00**

**CONTENTS:** Prime Movers on Shipboard; Engine Power Measurements; Efficiency of Marine Machinery; Propulsion of Ships and Resistance; Compound Engines; Steam Expanding; Piston Speeds and Revolution of Engines; Cylinders; Pistons; Piston Rods; Connecting Rods; Shafting; Thrust Shafts and Blocks; Stern-Tub Main Bearing of Crankshafts; Condensers; Air Pumps; Cool-



ing Water Pumps; Feed and Other Pumps; Bilge Pumps, Pipes and Other Fittings; Pump Levers and Gear; Slide Valves for Steam Distribution; Valve Gears; Reversing Gears for Valve Motions; Steam Turning Gears; Screw Propellers; Paddle-Wheel Propeller; Sea Valves for Water Supply; Steam Turbines; Internal Combustion Engines; Motor Boats; Superheated Steam; Skin Fitting and Valves; Results of Trials of Engine Wire Gauges; Copper Pipes; Wrought Iron Pipes; Copper Pipe Flanges and Fittings; Bronze and Cast Steel Pipes in General; Stop and Regulating Valves; Balancing Engines; Evaporators; Boiler Work; Boiler Mountings and Fittings; Furnace Fittings; Ladders and Platforms; Engine and Boiler Seatings; Lloyd's Rules; Steam Trawlers; Pumps for Bilges; Surveys of Machinery; Spare Gear; Composition, Properties, and Costs of Various Materials; Plates, Bars, etc.; Beams and Girders; Test Pressures; Effect of Temperature on Metals; Weights of Materials, Machinery, etc.; Water, Fresh and Salt; Oils and Lubricants; Friction; Conductivity of Metals; Fuel Consumption; Thermometers; Saturated Steam; Conversion and Mathematical Tables; Lloyd's and Other Corporation Rules and Regulations; Distances of Various Principal Ports.

**SIMPSON, G.** *The Naval Constructor.* A vade mecum of ship design, for students, naval architects, ship builders and owners, marine superintendents, engineers and draughtsmen. *Fourth Edition, Revised and Enlarged.* 386 ill.,  $4\frac{1}{2} \times 7$ , flexible binding, 900 pp. **\$5.00**

**CONTENTS:** *Ship Calculations.* Displacement; Buoyancy; Trim; Metacenters; Stability; Gravity; Inertia; Preparation of Specifications; Freeboard; Freeboard Tables; Shelter Deckers; Kirk's Analysis; Launching; Transporting Cattle; Spectacle Frames; Strength of Ships; Resistance; Speed; Form. *Strength of Materials.* Stresses; Columns; Timber; Chains; Riveting. *Fittings and Details.* Structural; Keels; Rudders; Carriers; Framing; Floor; Tanks; Beams; Pillars; Hatch; Bulkheads; Strakes; Fitting Details; Anchors; Cranes; Hoops; Fairleads; Hawse; Rings; Shackles; Turnbuckles; Valves; Ventilation; Guns. *Rigging and Ropes.* Standing; Running; Derricks. *Equipment.* Boats; Slings; Tonnage. *Miscellaneous Tables.* Mathematical Tables Conveniently Arranged.

The most complete and valuable treatise of its kind ever issued. Contains the result of wide practical experience both in America and England.

**SOTHERN, J. W. M., and SOTHERN, R. M.** *Simple Problems in Marine Engineering Design.* *Third Edition.*  $5\frac{1}{4} \times 7\frac{3}{4}$ , 202 pp. **\$3.00**

**CONTENTS:** Simple Mathematics; General Problems; Boiler Design; Engine Design; Speed, Consumption, and I. H. P. Marine Turbine Design.

For this issue the section covering the general principles involved has been considerably enlarged and more carefully detailed by means of additional worked out examples, while the entire has been revised and corrected throughout.

**THOMAS, J. BERTRAM.** *The Strength of Ships.* 114 ill., 31 tables,  $4\frac{1}{2} \times 7\frac{1}{4}$ , 301 pp. **\$2.50**

**CONTENTS:** Materials of Construction and Their Properties; Shearing Forces and Bending Moments; Methods of Integration; Resistance of Beams to Flexure; Deflection of Beams; Fixed and Continuous Beams; Rectangular Plates Under Water Pressure; Shear Stresses in Beams; Strength of Struts; Longitudinal Strength of Ships; Transverse Strength of Ships; Riveted Joints in Ship-work; Effect of Rolling and Pitching on the Upper Structures; Rudder Calculations; Strength of Shaft-Brackets; Gun Supports; Tables.

**WALKER, S. F.** *Cold Storage, Heating and Ventilating on Board Ship.* ill.,  $5\frac{1}{2} \times 8$ , fabrikoid, 275 pp. **\$2.50**

**CONTENTS:** COLD STORAGE. The Cold Storage Problem. Methods of Cooling the Cold Chambers. Methods of Cooling the Air. Leading the Cooled Air into the Cold Chambers. How the Low Temperature of the Brine or Refrigerant is Produced. The Condenser. Lubrication and Stuffing Boxes of Compressors.



Absorption Machines. Circulating Pumps. How Refrigerating Apparatus is Measured. Power Required for Refrigerating Apparatus. Cooling Water. Form of Apparatus for Use on Board Ship. Other Applications of Refrigeration on Board Ship. Cooling Magazines and Officers' and Men's Quarters. Faults. Heating Special Requirements on Board Ship. Difficulties. Methods of Heating Available. Hot Water, Steam, Air, Combined Air and Steam Radiator. The Thermotank System. The System Applied to the S.S. Lusitania. Heating by Electricity. Regulating Heat Delivered by Electric Heaters. VENTILATION. Ventilation by Heating and Cooling. Ventilation of Laboratories and Cattle Spaces. Fans. Size and Power Required. Testing Air Current. Estimating Heat Required. Apparatus Estimated to be Required for Heating the Different Saloons, State Cabins, etc. Cost of Furnishing Heat Required.

**WHITE, HERBERT J.** Oil Tank Steamers. Their working and pumping arrangements thoroughly explained. Ill.,  $5\frac{1}{2} \times 8\frac{1}{2}$ , paper, 51 pp. **\$1.50**

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### NAVIGATION AND SEAMANSHIP

**BRADFORD, GERSHOM.** A Glossary of Navigation and Sea Terms.  $5\frac{1}{4} \times 7\frac{3}{4}$ , flexible fabrikoid, about 150 pp. (Van Nostrand's Nautical Manuals.) *In Press*

A dictionary explaining the words and phrases met with in the literature of the sea, together with accurate definitions of all terms in navigation and nautical astronomy. The illustrations have all been especially drawn for the work and materially help to a clear understanding of the text.

**BRADFORD, GERSHOM.** The Whys and Wherefores of Navigation. *Second Edition, Revised and Enlarged.* Ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , flexible fabrikoid, 210 pp. (Van Nostrand's Nautical Manuals.) **\$2.00**

**CONTENTS:** Dead Reckoning; Nautical Astronomy; Declination and Right Ascension, Including Precession; Time; Corrections for Observed Altitudes; Latitude; Azimuths and Amplitudes; Longitude; Sumner Lines and New Navigation; The Moon; Charts; Piloting; Appendix.

**COFFIN, J. H. C.** Navigation and Nautical Astronomy. Prepared originally for the use of the United States Naval Academy. *Eleventh Edition, Revised and Enlarged* by E. C. Collins. 61 ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , flexible fabrikoid, 267 pp. (Van Nostrand's Nautical Manuals.) **\$3.00**

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**DRAPER, ERNEST G.** Navigating the Ship. A series of lessons in elementary navigation based upon a course of lectures now in use at the Officers' Material School, Naval Auxiliary Reserve. Ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , 187 pp. **\$2.00**

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Work in Dead Reckoning; Examples in Dead Reckoning and Middle Latitude Sailing; Mercator Sailing; Great Circle Sailing—The Chronometer. *Celestial Navigation*. Definitions Relating to the Celestial Sphere; Time by the Sun—Solar Time, Mean Time, Conversion; Sidereal Time—Right Ascension; The Nautical Almanac; Correction of Observed Altitudes. *Navigation*. The Line of Position; Azimuths of the Sun; Marc St. Hilaire Method by a Sun Sight; Examples on Marc St. Hilaire Method by a Sun Sight; A Short Talk on the Planets and Stars—Identification of Stars; Latitude by Meridian Altitude of a Star—Latitude by Polaris (Pole or North Star); Marc St. Hilaire Method by a Star Sight; Longitude by Chronometer Sight of the Sun (Time Sight); Longitude by Chronometer Sight of a Star; Latitude by Ex-Meridian Altitude of the Sun; Examples; Latitude by Ex-Meridian Altitude of the Sun; Finding the Watch Time of Local Apparent Noon; Compass Error by an Azimuth; Correcting Longitude by a Factor; The Navigator's Routine—A Day's Work at Sea; Compass Adjustment; Appendix: Extracts from Nautical Almanac Necessary for Solution of Problems in the Book.

**KNIGHT, AUSTIN M. Modern Seamanship.** Unabridged reprint of *Seventh Edition*. 159 ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , flexible fabrikoid, 731 pp. (Van Nostrand's Nautical Manuals.) **\$3.00**

(Author is Rear Admiral in the United States Navy.)

**CONTENTS:** The Hull and Fittings of a Ship. Rope; Knotting and Splicing Mechanical Appliances on Shipboard. Blocks and Tackles. Handling Heavy Weights. Compass. Log and Lead. Submarine Signals. Boats. Handling Boats in a Surf. Ground Tackle. Carrying Out Anchors. The Steering of Steamers. The Rules of the Road. Manœuvring to Avoid Collision. Piloting. Handling a Steamer alongside a Dock. Placing a Ship in Dry Dock. Weather and the Laws of Storms. Handling Steamers in Heavy Weather. The Handling of Torpedo Vessels. Keeping Stations and Manœuvring in Squadron. Towing. Rescuing the Crew of a Wreck. Man Overboard. Stranding. Hints for Junior Officers Doing Line Duty. Appendix.

This book is the best American work on seamanship, naval and merchant service. The chapters on ship handling and the higher problems of seamanship are exceptionally good. It is now produced in pocket size at less than half the price of the original book.

**LECKY, S. T. S. Wrinkles in Practical Navigation.** Authorized facsimile of the *Eighteenth Edition, Revised and Enlarged* by William Allingham. 136 ill.,  $5\frac{3}{4} \times 8\frac{1}{2}$ , flexible fabrikoid, 846 pp. **\$5.00**

**CONTENTS:** Books and Instruments; Mile and Knot; Compass; Marine Chronometer; Sextant; Horizons; Charts; Parallel Ruler; Dividers; Pelorus; Azimuth; Station Pointer; Sounding Machines; Binocular and Telescope; Lord Kelvin's Instruments; Barometers; Ocean Meteorology; Tides, Currents, Waves and Breakers; Fog and Floating Ice; Sky Pilotage; Latitude by Various Methods; Time; Lecky's A B C Tables; Longitude; Sumner Lines; Double Altitudes; Simultaneous Altitudes; Corrections for Errors; New Meteorological Measures for Old; Compass Adjustment; Shaping the Course; Danger Angle; Distance from Land; Composition and Resolution of Forces and Velocities.

**RIESENBERG, FELIX. Standard Seamanship For the Merchant Marine.** Ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , flexible fabrikoid, about 600 pp. (Van Nostrand's Nautical Manuals.) *In Press*

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**RIESENBERG, FELIX.** *The Men on Deck.* Master, mates and crew; their duties and responsibilities. A manual for the American merchant service.  $5\frac{1}{4} \times 7\frac{3}{4}$ , flexible fabrikoid, 339 pp. (Van Nostrand's Nautical Manuals.) **\$3.00**

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Points out the things the various members of the deck department of an ocean steam vessel may reasonably be expected to know, and the things they may be required to do. The book does not pretend to tell how, but the object is to show what a modern American seaman ought to know and to do.

**RUST, A.** *Practical Tables For Navigators and Aviators.* Containing new and rapid methods for finding the longitude, azimuth and latitude, and for great circle sailing, the identification of stars, and for plotting line of position by the Sumner and Marcq Saint-Hilaire methods, 3 folding plates,  $6\frac{1}{4} \times 9\frac{1}{2}$ , 116 pp. **\$3.50**

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**SEAMANSHIP, Lectures on.** By the Department of Seamanship, Officers' Material School, Naval Auxiliary Reserve, Pelham Bay Park, N. Y.  $5\frac{1}{4} \times 7\frac{3}{4}$ , 240 pp. **\$2.00**

**CONTENTS:** Rules of the Road; Construction of a Ship; Care and Preservation of a Ship; Ground Tackle, Steering Gear, Deck Fittings; Boats, Gear, and Life-saving Equipment; Bridge and Navigating Appliances; Handling a Ship (Mooring); Stowage of Cargo; Weather and the Law of Storms; Ship Organization (Methods); Duties of the Officer of the Deck; General Duties of Junior Officers; Glossary.

**SEARLE, G. M.** *Sumner's Method for Finding a Ship's Position, Improved and Abbreviated.* Ill.,  $3\frac{3}{4} \times 6$ , boards, 51 pp. (Van Nostrand's Science Series.) **\$0.75**

The method of solution of the Sumner problem proposed in this book is believed to be better than those usually followed, in not requiring the use of a chart or diagram of any kind, but simply a small sheet of paper and the ordinary five-place logarithm tables. Nothing else is needed for an observer at a fixed point to obtain an accurate latitude and longitude but a chronometer, the error and rate of which is known, and a nautical almanac, with two observed altitudes of the sun or other celestial body. For a ship at sea—the usual case—slight corrections are needed to one of the altitudes, to allow for the change of the ship's place, and the change of the declination of the sun, or other observed body, in the interval between the observations. These corrections require an assumed value of the latitude and of the longitude of the observer, or a measured azimuth of the body observed, instead of the latter. Even if errors are made in the assumptions the final results would not be materially affected. The proof of the formulas used is given at some length; but it is not necessary to study this in order to use them. The practical ones are all together in a small space, and illustrated by numerical examples, and a proposed form for the computation.



**TODD, J., and WHALL, W. B.** *Practical Seamanship for Use in the Merchant Service.* *Fifth Edition.* 247 ill.,  $6\frac{1}{2} \times 9\frac{3}{4}$ , 385 pp. **\$12.00**

**CONTENTS:** Principal Parts of a Ship; Principal Spars and Rigging; Ropes, Knots, Bends, Hitches and Splices; Blocks, Gins and Tackles; The Common Lead Lines; The Log; Action of Wheel on the Rudder; The Hull; Anchors and Cables; Taking in and Sending Aloft the Various Masts; Handling The Sails; Sailing Ships Getting Under Weight and Anchoring; Accidents to Spars; Leaks; Fire; Man Overboard; Raft; At Single Anchor in Tideway; Cutting Rigging; Sail-making; Lights and Fog Signals; Boats; Stowage; Nautical Terms; The Steamship Officers' Duties; In Narrow Waters; Taking Bar Harbors in Heavy Weather; Handling Steamers in Heavy Weather; Collision; Saving a Shipwrecked Crew; Common Pilotage and Coasting Seamanship; Stranded; Heaving Down; Displacement; Winds; Weather and Barometers; Coating the Bottom of Steamers; The International Signal Code; To Measure a Hold.

### MARINE STEAM ENGINEERING

**HOVENDEN, F.** *Practical Mathematics for Young Engineers.* Specially arranged for the use of apprentices who intend to become marine engineers. Ill.,  $5\frac{1}{4} \times 7\frac{3}{4}$ , 144 pp. **\$1.50**

Explains clearly the rules, and limits the applications of arithmetic to the requirements of the practical draughtsman or mechanic. Many of the examples in the sections on Mensuration and Mechanics are taken from the Board of Trade examination papers. New demonstrations of some of these are given.

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**CONTENTS:** Boilers; Boiler Defects; Breakdowns; Chemistry and Gases; Dates of Inventions; Density and Scale; Engines; Electricity; Evaporators; Fuel and Combustion; Gauge Cocks; Gauges; General Questions; Heat; Indicator Cards; Length of Parts; Metals; Oil Motors; Oscillating Engines; Propellers; Pumps; Refrigeration; Safety Valves; Shaft; Slide Valves; Temperatures; Turbines.

This new edition contains over eight hundred questions and answers similar to those usually asked in the Board of Trade oral examination.

**McGIBBON, W. C.** *Marine Engineers' Pocketbook.* Mechanics, Heat, Strength of Materials, including Electricity, Refrigeration, Turbines, Oil Engines. Ill.,  $4\frac{1}{4} \times 6\frac{1}{2}$ , 476 pp. **\$4.50**

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A useful pocketbook in simple terms, giving rules and tables that sea-going engineers find necessary. In all cases the solution of problems is shown without the use of advanced mathematics.

**McGIBBON, W. C.** *Marine Engineers' Drawing Book for Board of Trade Examinations.* *Seventh Edition.* 59 plates and tables.  $12\frac{1}{4} \times 9\frac{3}{4}$ , flexible cloth, 137 pp. **\$2.50**

**CONTENTS:** Examination in Rough Working Drawing for a First Class Engineer's Certificate of Competency; A Few Hints for Beginners; Proportion of Parts; Area of Ports and Pipes; Stresses on Working Parts; Cylindrical Ves-



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This work is a series of plates on machine design, pertaining to marine machinery, giving instructions for drawing the various parts. The author believes that by giving the proportion of one part to another rather than the dimensions of all parts, the true form of the machine can better be impressed on the mind, and in all the plates only a few, easily remembered, dimensions are given and other measurements are omitted.

**McGIBBON, W. C.** Indicator Diagrams for Marine Engineers. 197 ill.,  $7\frac{3}{4} \times 9\frac{3}{4}$ , 196 pp. \$3.50

**CONTENTS:** Origin of the Indicator; Diagrams of Work; How to Take Off a Diagram from a Marine Engine; General Definition of Points, etc.; Pressure Considered; Laws Relating to Pressure and Volume; Steam Expanded in Compound Engines; Effect Produced on Diagrams Due to Sequence of Cranks; Zeuner's Valve Diagrams; To Work Out Horse-Power; To Balance an Engine; Formation of Loops and Diagrams; Diagrams from Auxiliary Engines; Trial Trip Indicator Diagrams, etc.; Defective Diagrams; Miscellaneous Diagrams.

**REED'S Engineers' Handbook** to Board Examinations for certificates of competency as first and second class engineers. By W. H. Thorn. *Nineteenth Edition, Revised and Enlarged.* 402 ill., 38 plates,  $6 \times 8\frac{3}{4}$ , 811 pp. \$9.00

**CONTENTS:** Arithmetic, Algebraic Signs; Areas; Weight of Parts; Consumption; Horse Power; Safety Valves; Counters; Thrust Problems; Temperature; Boilers; Salt Problems; Simple Machines; Stress; Friction; Indicator Diagrams; Marine Oil Motors; Questions and Answers.

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**SOMERSCALES, A. N.** Lessons in Mechanics for Marine Engineers and Engineering Students. Treated arithmetically. 149 ill.,  $5 \times 7\frac{1}{2}$ , 280 pp. \$2.50

**CONTENTS:** Plane Figures and Linear Measurements; Areas of Surfaces; Solid Measurement; Laws of Comparison; Velocity; Work Required to Lift Weights; Friction; Mechanical Advantages of Pulleys and Levers; Force, Work and Power; Wedge or Inclined Plane; Wheel and Axle; Screw; Pressure and Buoyancy of Water; Pumps; Belt, Rope and Toothed Gearing; Moments; Parallelogram of Forces; Tension, Shear and Compression; Strength of Pipes and Cylinders; Shafts; Beams; Flanged Girders; Elasticity of Metals; Momentum and Centrifugal Force; Accumulated Work or Kinetic Energy; Power of Water; Mechanical Efficiency of the Engine.

Attempts to teach the groundwork of applied mechanics by a purely arithmetical treatment.

**SOTHERN, J. W. M.** "Verbal" Notes and Sketches For Marine Engineers. A manual of marine engineering practice. Intended for the use of naval and mercantile engineer officers of all grades, and students, and is specially compiled for the use of engineer officers preparing for examinations of competency at home or abroad. *Tenth Edition, Greatly*

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**TOD, JOHN, and McGIBBON, W. C.** Marine Engineers' Board of Trade Examinations. Containing all the latest elementary questions with answers, including notes on verbals. As used in the Board of Trade Examinations, 1913. *Eighth Enlarged Edition.* 288 ill., 4 plates,  $5\frac{1}{4} \times 8$ , 390 pp. \$2.00

This new edition has been entirely reset, in order to bring it up to date. The sections on Steam Turbines and Oil Motors have received especially careful attention and contain much new matter.

## MILITARY

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**CONTENTS:** Sketches; Scales; Construction of Scales; Conventional Signs, Abbreviations; Sketching Implements; Orientation, Resection Intersection; Contours, Map Distances, Vertical Interval; Road Sketching Position, Sketching, Landscape Sketching, Map Reading.

**Bayonet Training.** Compiled from British Training Manual, 1916. Ill.,  $3\frac{5}{8} \times 5\frac{1}{8}$ , 60 pp. \$0.30

Training in the use of the bayonet is receiving much attention from all the combatant nations in Europe. The aim of the instruction is twofold: 1. To develop great alertness of mind, readiness of muscle, and habit of quick obedience to command. 2. To develop fighting spirit. Physical drill and bayonet training go hand in hand and their drill periods follow each other. The physical drill consists of calisthenic exercises for fifteen or twenty minutes, followed by some game or exercise requiring great quickness of movement. The material in this book is from the latest British Training Manual (1916), which is based on their experience, and the forces are now being trained in accordance therewith.

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**LAFFARGUE, ANDRE.** *The Attack in Trench Warfare.* Translated by an officer of infantry. Ill., 5 folding plates, 3½ x 5½, 135 pp. \$0.50

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The methods of training of infantry units for trench warfare and the degree of careful preparation necessary for the attainment of any measure of success are among the most important features of Captain Laffargue's study. This study was so highly thought of by General Joffre that he caused it to be published to the French Army before it was given out for general publication, which speaks for its excellence more than any other commendation which could be bestowed upon it. Written in conversational styles, it makes interesting reading for the layman.

**MERTENS, COLONEL.** *Tactics and Technique of River Crossings.* Translated from the German by Major Walter Krueger, Assistant Chief of Staff, 84th Division, National Army. 105 ill. and 4 maps, 6 x 9, 300 pp. \$3.00

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Presents a carefully thought out scheme of a way in which river crossings may be effected and of how the attacker, once across, may be met.

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**CONTENTS:** Mechanism and Drill; The Chief Features of the Gun; The Parts of the Gun; Backward and Forward Action; Stripping and Assembling the Gun; Tension of the Main Spring; Gas Regulator Points Before and After Firing; Stoppages; Drill with Horizontal Traversing and Vertical Searching. *The Handling of the Gun.* Characteristics of the Machine Gun; Allocation of Duties; Indication and Recognition of Targets; Signals in Use with Machine Guns; Methods of Fire—Combined Sights—Overhead Fire; Indirect Fire; The Uses of the Machine Gun in Trench Warfare; Uses of the Machine Gun in Open Warfare, Concealment of Guns, Range Cards; The Brigading of Machine Guns; Range Taking; Program of Training for Machine Gun Tactics; Emplacements for Lewis Gun.

**RAUSENBERGER, F.** *The Theory of the Recoil of Guns With Recoil Cylinders.* Translated by Alfred Slater. 3 folding plates, 6 x 9, 124 pp. \$5.00

**CONTENTS:** General; The External Forces on a Recoiling-Gun Mounting Which Comes into Action on Firing; Determination of the Brake Pressure and the Length of Recoil; The Running Forward Device; Recoil Brakes; The Running Forward Brake.



# DRAWING

## MECHANICAL DRAWING—MACHINE DESIGN

**ADLER, A. A.** *The Theory of Engineering Drawing. Second Edition, Revised.* 273 ill., 6 x 9, 330 pp. \$2.50

(Author is assistant professor of mechanical drawing and design in the Brooklyn Polytechnic Institute.)

**CONTENTS:** *The Principles of Parallel Projecting-Line Drawing.* Nature of Drawing; Science and Art; Magnitude of Objects; Commercial Application of Drawing; Oblique Projection; Orthographic Projection; Axonometric Projection. *Geometrical Problems in Orthographic Projection.* Representation of Lines and Points; Representation of Planes; Elementary Considerations of Lines and Planes; Problems Involving the Point, Line and Plane; Classification of Lines, of Surfaces; Intersection of Surfaces by Planes, and Their Development; Intersections of Surfaces with Each Other and Their Development. *The Principles of Convergent Projecting-Line Drawing.* Perspective Projection. *Pictorial Effects of Illumination.* Pictorial Effects of Illumination in Orthographic Projection, and in Perspective Projection.

This is a thorough and unusually complete course in Descriptive Geometry, besides treating the subject in an entirely new way. It treats of the various types of projections first and then gradually leads to the study of the projections of the mathematical concepts. It is the sort of a book that enables a student to apply the principles to mathematics or drawing as the classification of the subject matter fixes the principles in mind. The numerous examples given throughout the text give a clear insight into the subject.

**ADLER, A. A.** *The Principles of Parallel Projecting-Line Drawing.*

Part I. of *The Theory of Engineering Drawing.* 48 ill., 6 x 9¼, 75 pp. \$1.25

**CONTENTS:** Nature of Drawing; Science and Art of Drawing; Magnitude of Objects; Commercial Application of Drawing; Oblique Projection; Orthographic Projection; Axonometric Projection.

A complete and concise discussion of the rapid methods of making drawings that find wide application in drafting rooms. Arranged by topics so that reference to a particular type of projection is easily accomplished. The complete classification of the types of projection makes an excellent survey of the entire subject. It is a book that teaches principles rather than methods, and for this reason it should be useful as a text for elementary instruction in drawing, since it approaches the subject in an interesting manner. The book contains four chapters each chapter showing the commercial application of the type of projection considered, and gives a set of questions which thoroughly cover the text. A complete index is also included.

**COLLINS, CHAS. D.** *Drafting Room Methods, Standards and Forms.* A reference book for engineering offices and draftsmen. Ill., 6 x 9, 150 pp. \$2.00

**CONTENTS:** *The Drafting Room.* Location; Equipment; Personnel; Methods of Handling Work; Filing; General Instructions. *Standards, Symbols and Abbreviations.* Safety Standards; Notes; Abbreviations; Aeronautical Terms; Cross Sections; Definitions; Electrical Symbols; Lines; Patent Office Practice; Patent Office Symbols; Pipe Fittings; Rivet Symbols; Structural Material—Breaks; Tapped Holes; Topographic Symbols. *Forms.* Drawing Sizes; Form Sizes; Application Blanks; Arrangement of a Drawing; Building Record Book; Drawing Record Book; Pattern Drawing Book; Print Record Book; Index Cards; Material List; Specification Form; Organization Chart; Stamp Forms; Title Forms; Work Schedule Form; Work Order Form. *Miscellaneous Tables.* Bolt Stresses; Bolts and Nuts; Bolt Threads; Washers; Weight Steel Bars; Studs; Pipe Threads—Briggs; Pipe Sizes; Boiler Tubes; Pipe Flanges; Pipe Fittings—Flanged; Key Seats; Horse Power of Shafting; Gages, Plate, Wire; Metric Conversion; Weights and Measures; Decimal Equivalents; Areas of Circles; Reference Books.



**CATHCART, W. L.** Machine Design. Part I., Fastenings. 119 ill.,  $6\frac{1}{4} \times 9\frac{1}{2}$ , 303 pp. \$3.00

**CONTENTS:** Shrinkage and Pressure Joints; Screw Fastenings; Riveted Joints: Theory and Formula; Tests and Data from Practice; Keyed Joints: Pin Joints.

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**CONTENTS:** Technical Drawing; Drawing Instruments; Draughtsman's Work; Lettering Drawings; Orthographic Projection; Isometric Projection; Oblique Projection; Practical Perspective; Freehand Drawing; Practical Geometry; Workshop Drawings.

Presents practical instruction for builders' technical drawing as used in the modern office and workshop, and brings together in due order the various methods and devices obtaining in the preparation of working drawings explaining their principles and indicating their suitability or otherwise for the purpose in view.

**FOX, WILLIAM, and THOMAS, C. W.** A Practical Course in Mechanical Drawing. *Third Edition, Revised.* 89 ill., plates,  $5\frac{1}{2} \times 8$ , 104 pp. \$1.25

**CONTENTS:** Use of T-Square, Triangles and Ruling Pen; Dimension Lines; Drawing to Scale; Center Lines; Use of Dividers; Use of Bowpen; Sections; Shading; Lettering; Screws; Cog-Wheels; Reading of Drawings; Miscellaneous.

**HALL, W. S.** Descriptive Geometry, with Numerous Problems and Practical Applications. Comprising an 8vo volume of 76 pages of text and a 4to atlas of 31 plates. Two volumes.  $6 \times 9\frac{1}{4}$ , 81 pp. \$4.00

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**INNES, C. H.** Problems in Machine Design. For the use of students, draughtsmen and others. *Second Edition.* 201 ill.,  $5\frac{1}{4} \times 7\frac{1}{2}$ , cloth, 266 pp. \$3.00

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**JACOBS, F. B.** Cam Design and Manufacture. *In Press*

**CONTENTS:** Introduction; Machine Cam Design; Gas Engine Cam Design; Cam Followers; Master Cams; Machine Work Preparatory to Cutting; Different Types of Cam Cutters; Cam Cutting; Usual Cam Propositions; Cam Grinding.

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**CONTENTS:** Cams; Involute Cam; Writing Cam; Mode of Procedure; Lino-type Machine Cams.

**LEEDS, CHARLES C.** Mechanical Drawing for Trade Schools. *Third Edition, Revised and Enlarged.* Ill.,  $10\frac{3}{4} \times 7\frac{7}{8}$ , 61 lessons, 160 pp. \$2.25

(Author is professor of mechanical drawing, School of Applied Industries, Carnegie Institute of Technology.)

**CONTENTS:** Preparation of Pencils; Handling T-Square, Triangles, etc.;



Preparation and Use of Instruments; Drawing of Flanged Pin; Drawing of Machine Bolt; Lettering; Figures; Sketching; Tracing; Machine Bolt; Hidden Surfaces; Clamp; Sectioning; Sleeve; Orthographic Projection; Shaft Support; Tool Rest; Projection; Unfinished Views; Reference Matter; True Section; Flanged Pulley; Conventional Sections; Hand Wheel; Drawing to Scale; Face Plate; Coupling Assembly; Bill of Materials; Coupling; Problems in Projection; Geometrical Problems; The Ellipse; Engineering Curves; Spur Gearing; Pulley Specification; Conic Sections; Intersections and Developments; Parallel Line; Intersections and Developments; Radial Line; Triangulation Development; Spur Gear Specifications; Bevel Gearing; Isometric Projection; 12-Inch Speed Lathe Leg Details, Bed Details, Tool Rest Details, Tool Rest Assembly, Tailstock Details; Tailstock Details; Tailstock Assembly; Headstock Details; Headstock Assembly; Specification; Lathe General Assembly; Standard Data; Composite Drawing; Bench Grinder Details; Bench Grinder Details; Specification; Bench Grinder Assembly; Commutator Bar; Front Commutator Ring; Rear Commutator Ring; Armature Spider; Specification; Commutator Assembly; Generator Frame; Worm Gearing; Plate Cam; Periphery Cam; Structural Work; Rivets and Conventional Symbols; Riveted Joints; Standard Framing; Beam Connections.

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These two books on Mechanical Drawing have been prepared with the purpose in view of thoroughly grounding young draftsmen and others of the various machinery trades in the principles of mechanical drawing. The author's conviction that the use of models serves to develop copyists, and often tends to stunt or destroy a draftsman's creative faculties, has led him to discard almost entirely the use of models in teaching mechanical drawing, and he feels that it will be obvious, even to the casual observer, that when a student has been given a model of his subject for the drawing lesson, little or no effort will be required from his imagination. That faculty of imagining; that mental picturing, so necessary to the good draftsman or designer and to the man in the shop who works from drawings as well, can be developed within every student. It is part of his development, just as an understanding of the meaning (either definite, or conventional) of each line of a drawing is part of his development. Convinced of this fact, the author has arranged these lessons in a manner which he believes will attract and hold the interest of the student. Each lesson will guide the student by easy steps, illustrate some fundamental point in mechanical drawing, and work as a whole towards the development of the creative draftsman. The text of the two books is almost identical, but the arrangement is somewhat different, and the larger book contains advanced and additional problems, omitting the work in architectural drawing.

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## LETTERING

**REINHARDT, CHARLES W.** Lettering for Draftsmen, Engineers and Students. A practical system of freehand lettering for working drawings. *Fourteenth Edition, Revised and Enlarged.* 54 text ill., 15 full-page plates, 7¾ x 11, 36 pp. \$1.00

(Author was formerly Chief Draftsman, Engineering News.)

**CONTENTS:** *Text.* Inclined Lettering;—Lower Case Letters, Capital Letters, Numerals, Upright Lettering—Lower Case Letters, Capital Letters, Numerals, Extended Form; Freehand Lettering Applied to Working Drawings; Various Freehand Alphabets; Greek Alphabet; Lettering of Titles; Practice Sheets, Round Writing; Lettering for Photo-reproduction. *Plates*—I. Specimen Sheet; II. Map Lettering; III. Lettering Structural Design; IV. Italic and Modified Freehand Alphabet; V. Spurred Gothic; VI. Plain Gothic; VII. Roman Lettering; VIII. Greek Alphabet with Application; IX. Construction of Titles (by Aid of Counting Letters, etc.); X. Two Unusual Shapes; XI. Various Specimens of Titles; XII. Various Specimens of Titles; XIII. Round Writing; XIV. Specimens of Lettered Drawings, Meridians, Scales; XV. Cross-section Millimeters (detached).

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# MINERALOGY, MINING, METALLURGY

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(Author is professor of geology at Smith College.)

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Takes up the subject of metamorphism in connection with rock formation on the earth. It covers the ground of this planetismal hypothesis very clearly and completely.

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**BOWLES, OLIVER.** Tables for the Determination of Common Rocks. 3¾ x 6, boards, 64 pp. (Van Nostrand's Science Series, No. 125.) **\$0.75**

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**FOYE, J. C.** *Handbook of Mineralogy.* Determination, description and classification of minerals found in the United States. *Fifth Edition, Revised.* Thirteenth Thousand.  $3\frac{3}{4}$  x 6, boards, 180 pp. (Van Nostrand Science Series, No. 86.) **\$0.75**

**CONTENTS:** Apparatus and Reagents; Scale of Hardness and Fusibility; Systems of Crystallization; Blowpipe Reactions; Determination of Species; Description of Species; Chemical Classification; Classification by Basic Elements and Ores.

**GRATACAP, L. P.** *A Popular Guide to Mineral Collections.* For the use of visitors to public cabinets of minerals and for elementary teaching in mineralogy. 400 ill., 74 photographic plates, 6 x 9, 335 pp. **\$2.00**

**CONTENTS:** Definitions of Terms. A Guide to Mineral Collections. The Development of Mineralogy. The Bement Collection of Minerals in the American Museum of Natural History.

This work includes a preliminary statement of the fundamentals of Mineralogy, with brief epitomes of Crystallization, Composition, Optical Properties and the Physical Constants of Minerals, followed by a descriptive survey of large collections as they will be found in public museums. It contains a description, in popular form, of the remarkable Bement Collection, one of the world-famous collections of minerals, as it exists to-day in the American Museum of Natural History in New York. A final chapter on the Development of Mineralogy narrates in more or less detailed outlines the history of discovery, experiment and observation which has created the science, and offers a valuable synthesis of the stages of its growth.

**MOSES, A. J.** *The Characters of Crystals.* An introduction to physical crystallography. 321 ill. and diagrams,  $6\frac{1}{2}$  x  $9\frac{1}{2}$ , 218 pp. **\$2.00**

**CONTENTS:** *Geometrical Characters;* General Geometric Properties of Crystals; Spherical Projection; The Thirty-two Classes of Crystals; Measurement of Crystal Angles; Crystal Projection or Drawing; *Optical Characters;* Isotropic Crystals; Uniaxial Crystals; Biaxial Crystals; Determination of Optical Characters of Biaxial Crystals; Thermal, Magnetic and Electrical Characters; Characters Dependent upon Elasticity and Cohesion; Suggested Outline of a Course in Physical Crystallography.

**MOSES, ALFRED J., and PARSONS, CHARLES L.** *Elements of Mineralogy, Crystallography and Blowpipe Analysis.* From a practical standpoint. *Fifth Edition, Revised and Enlarged.* 575 ill.,  $5\frac{1}{2}$  x 8, 631 pp. **\$3.50**

(Authors are respectively Prof. of Mineralogy, Columbia University, N. Y. City, and Chief Chemist, United States Bureau of Mines.)

**CONTENTS:** *Crystallography.* Introductory; The "Systems," Their Classes,



Forms and Symbols; The Grouping of Crystals and Their Imperfections; The Determination of the Geometrical Constants of a Crystal; Crystals-Optics. *Blowpipe Analysis*. Apparatus Blast, Flame, etc.; Operations of Blowpipe Analysis; Summary of Useful Tests with the Blowpipe; Schemes for Qualitative Blowpipe Analysis. *Mineralogy*. Definition and Physical Characters; The Chemical Characters of Minerals; Formation and Occurrence; The Minerals of the Metalliferous Ore Deposits; Minerals Important in the Industries and Not Already Described; Silica and the Rock-forming Silicates; Minerals Used as Precious and Ornamental Stones. *Determinative Mineralogy*. Tables for the Rapid Determination of the Common Minerals; Table of Atomic Weights.

**RUTLEY, FRANK.** *Elements of Mineralogy. Nineteenth Edition, Revised and Enlarged* by H. H. Read, with an introduction by G. T. Holloway. 84 ill.,  $5 \times 7\frac{1}{4}$ , 416 pp. **\$1.50**

**CONTENTS:** *Properties of Minerals.* Chemistry of Minerals; Physical Properties of Minerals; Crystallography; Important Crystal Groups; Optical Properties of Minerals. *Description of Mineral Species.* Non-metallic Minerals: Carbon, Boron, Sulphur, Selenium, Ammonium, Sodium, Potassium, Calcium, Barium, Strontium, Magnesium, Aluminum, Silicon, Biaxial Silicates, Uniaxial Silicates, Isotropic Silicates. Metallic Minerals: Titanium, Thorium, Tungsten, Tantalum, Molybdenum, Uranium, Chromium, Manganese, Arsenic, Antimony, Bismuth, Tellurium, Zinc, Cadmium, Tin, Lead, Iron, Cobalt, Nickel, Copper, Mercury, Silver, Gold, Platinum, Palladium, Osmium, Iridium, Rhodium, Ruthenium. Glossary; Geological System.

In this new edition the book has been brought into line with the modern tendencies in economic mineralogy. A compact reference guide for the student and practical man.

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**CONTENTS:** *Optical Properties of Minerals.* Characters of Minerals in Ordinary Transmitted Light; In Reflected Light; With the Lower Nicol Inserted; Characters of Minerals between Crossed Nicols, and between Crossed Nicols in Convergent Light; Descriptions of Common Rock-Forming Minerals; Refractive Index of Isolated Fragments; Hints on Petrology.

**WINCHELL, N. H. and A. N.** *Elements of Optical Mineralogy.* 350 ill., 4 plates,  $6\frac{1}{4} \times 8\frac{3}{4}$ , 510 pp. **\$3.50**

**CONTENTS:** Certain Phenomena of Light; Elements of Mineralogy; Application of Polarized Light to Crystalline Substances; Description of Minerals; Analytical Tables; Optical Study of Opaque Minerals; Microchemical Methods; Partial Bibliography.

## Mining

### PROSPECTING AND SAMPLING

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**CONTENTS:** Prospecting; Rocks; Testing Minerals by the Blowpipe; The Character of Minerals; Characteristics, Testing, Occurrence, etc., of Metals and Metallic Ores; Composition of Various Rocks; Testing by Wet Process; Assay of Gold; Treatment of Ores; Surveying; Tables and Glossary of Terms.

**McMECHEN, F. L.** *Tests for Ores, Minerals and Metals of Commercial Value.* Ill.,  $4 \times 8\frac{3}{4}$ , 152 pp. **\$1.00**

**CONTENTS:** Index of Rocks; Index of Minerals and Metals; Rock Formations;

Ore and Vein Formations; Chemical Properties; Occurrence, Uses and Tests for Metals and Minerals; Glossary of Mining Terms, Working Processes, Theories, etc.; Value and Production of California Minerals.

**MERRITT, WILLIAM H.** *Field Testing for Gold and Silver.* A practical manual for prospectors and miners. 56 ill., 9 plates, 4 x 6, limp leather, 155 pp. **\$2.00**

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### MINES AND METAL MINING

(See also "*Electricity in Mining.*")

**LAMPRECHT, R.** *Recovery Work After Pit Fires.* Translated from the German by Charles Salter. 76 ill., 7 plates, 5¾ x 8¾, 187 pp. **\$5.00**

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**MURPHY, J. G.** *Practical Mining.* A field manual for mining engineers, with hints for investors. 4 x 6¼, 106 pp. **\$1.00**

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**CONTENTS:** Introductory; General Physical Conditions; General Methods of Placer Mining; Directions for the Miner; The Properties of Water; Construction of Waterways; Flow of Water in Flumes and Ditches; Iron Piping; Nozzles and Discharge; The Sluice; The Dredge.

A practical manual, avoiding all technicalities, intended to guide the miner in the preliminaries only incident to operating an hydraulic mining property.

**WABNER, R.** *Ventilation in Mines.* Translated from the German by Charles Salter. 22 ill., 30 plates, 6¾ x 10, 251 pp. **\$5.00**

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tial and True Depression of the Centrifugal Fan; New Types of Centrifugal Fan of Small Diameter and High Working Speed; Artificially Retarding the Ventilating Current; Ventilating Preliminary Workings; Blind Headings; Separate Ventilation; Supervision of Ventilation.

### GOLD AND SILVER

**BOWIE, A. J., Jr.** **A Practical Treatise on Hydraulic Mining in California.**  
*Eleventh Edition.* 73 ill., 52 tables, 7 x 10, 313 pp. **\$5.00**

**CONTENTS:** The Records of Gold Washing; History and Development of Placer-Mining in California; General Topography and Geology of California; Distribution of Gold in Deposits and the Value of Different Strata; Amount of Workable Gravel Remaining in California; The Different Methods of Mining Gold-Placers; Preliminary Investigations; Reservoirs and Dams; Measurement of Flowing Water; Ditches and Flumes; Pipes and Nozzles; Various Mechanical Appliances; Blasting Gravel Banks; Tunnels and Sluices; Tailings and Dump; Washing or Hydraulicking; Distribution of Gold in Sluices; Loss of Gold and Quicksilver; Duty of the Miner's Inch; Statistics of the Cost of Working and the Yield of Gravel.

**DENNY, G. A.** **Deep-level Mines of the Rand, and Their Future Development.** Considered from the commercial point of view. With folding plates, diagrams, and tables. 48 ill.,  $7\frac{3}{4} \times 10\frac{1}{2}$ , 182 pp. **\$10.00**

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**TINNEY, W. H.** **Gold Mining Machinery: Its Selection, Arrangement and Installation.** A practical handbook for the use of mine managers and engineers. 97 ill.,  $6\frac{1}{2} \times 9\frac{1}{4}$ , 320 pp. **\$3.00**

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### COAL AND COAL MINING

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Separation Doors, etc. Sections and Plans of Shafts and Underground Workings for the Use of Explorers. Instructions to Workmen, Need of Special Knowledge and Training for Rescue Work and Suggestions Should Men be Entombed. Equipment of Rescue Stations and Requirements of Portable Breathing Apparatus. Danger Attending use of Apparatus with Untrained Men. Suggested Rules for Guidance AFTER an ACCIDENT. Emergency Officials and Restoratives, etc. Winding and Ventilation Arrangements, etc. Rules for Guidance of Exploration Parties, etc. Special Rules in the Use of Rescue Apparatus. Suggestions Relating to the Restoration of Ventilation. Treatment of Survivors. Scientific Aids. Provision for the Conveyance of Corpses. Disposal of the Carcases of Dead Horses. Disinfectants and Precautions taken to Prevent Blood-poisoning. Information Required for Special Enquiry. Restoration on Alteration of Roadways for the Resumption of Work. Conclusion.

**MERIVALE, J. H.** *Notes and Formulae for Mining Students. Fourth Edition*, revised and enlarged by H. F. Bulman. 4¾ x 6¾, 188 pp. \$1.00

**PAMELY, C.** *Colliery Manager's Handbook.* A comprehensive treatise on the laying-out and working of collieries, designed as a book of reference for colliery managers and for the use of coal-mining students preparing for first-class certificates. *Fifth Edition, Revised and Enlarged.* 1,000 ill., 7 x 10, 1208 pp. \$10.00

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**VIRGIN, ROBT. Z.** *Coal Mine Management.* *In Press*

**WALSH, JOSEPH J.** *Physics and Chemistry of Mining and Mine Ventilation.* A practical handbook for vocational schools and for those qualifying for mine foreman and mine inspector certificates. *Second Edition, Revised and Enlarged.* Ill., 5½ x 8, 232 pp. \$2.50

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Deals fully with the fundamental theories and laws of ventilation, covering the subject with sufficient completeness to meet the needs of the mine foreman or inspector and furnishes the student with a suggestive method of study in graphic form. All of the excellent features which have made the book so useful for those studying to qualify for better position have been retained and improved.

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ing; Baling Wells; Fountains; Generation of Steam; Theory and Practice of Liquid Fuel; Fires on the Oil Fields; Administration of Oil Properties; Notes on the Treatment of Belts and Wire Rope; Useful Data and Figures.

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The author's aim has been to put in unpretentious language and concise form the main principles of an industry bristling in unsolved problems and encompassed by far-reaching possibilities, presenting unbounded opportunities for enterprising engineers of education and initiative. The author is not an arm-chair critic, but a clear observer who has had some twenty years' practical and uninterrupted experience in oil fields in all parts of the world. The information contained in this volume is based on an intimate knowledge of many widely separated oil fields accumulated during years of extensive travelling. The work contains a vast amount of useful data conveniently tabulated and arranged and it is full of kinks and suggestions of use to oil field operators. Eight colored maps showing the distribution of the oil fields of the world are among the hundreds of excellent illustrations contained in this work.

## Metallurgy

**RIDEAL, E. K.** **The Rare Earths and Metals.**  $5\frac{1}{2} \times 8\frac{3}{4}$ . (Industrial Chemistry Series.) *In Press*

**ROSENHAIN, WALTER.** **An Introduction to the Study of Physical Metallurgy.** 140 ill., 6 x 9, 375 pp. (Metallurgy Series.) **\$4.00**

**CONTENTS:** *Introductory. Structure and Constitution of Metals and Alloys.* Microscopic Examination of Metals; The Metallurgical Microscope; The Microstructure of Pure Metals and of Alloys; Thermal Study of Alloys; The Constitutional Diagram and the Physical Properties of Alloys; Typical Alloy Systems; The Iron-Carbon System. *The Properties of Metals as Related to Their Structure and Constitution.* Mechanical Testing of Metals; Effect of Strain on the Structure of Metals; Thermal Treatment of Metals; Mechanical Treatment of Metals, including Casting; Defects and Failures in Metals and Alloys.

A brief study, largely from the point of view of the internal structure of metals. Throughout the book more attention is given to the principles underlying the various operations and the laws which govern them than to the detailed description of apparatus or of experimental methods. This work should serve not only as an introduction to the subject of the chemistry and physics of metallurgy, but also as an introduction to the "Metallurgy Series" edited by the author of this, the first volume.

METALLURGICAL ANALYSIS

**PARK, JAMES.** *Laboratory Instructions in Assaying and Practical Chemistry. Second Edition.* 5¾ x 8½, 203 pp. \$3.50

**CONTENTS:** Practical Assaying; Principles of Qualitative Analysis; Quantitative Analysis of Simple and Complex Substances; Volumetric Analysis Tables.

**PLATTNER'S** *Manual of Qualitative and Quantitative Analysis with the Blowpipe.* Translated by Henry B. Cornwall, assisted by John H. Caswell. From the sixth German edition, by Prof. Friederich Kolbeck. *Eighth Edition, Revised.* 87 ill., 6¼ x 9¼, 463 pp. \$4.00

**CONTENTS:** Apparatus and Reagents. *Qualitative Blowpipe Analysis.* General Rules; Examination of Minerals, Ores and Metallurgical Products for Metallic and Non-Metallic Bodies; Examples Showing the Method of Detecting the Constituents of Various Compounds. *Quantitative Blowpipe Assays.* Preparation of Substances; Detailed Description of Assays of Silver; Gold; Copper; Lead; Bismuth; Tin; Cobalt and Nickel; Mercury and Their Alloys.

**WHITE, CHARLES H.** *Methods in Metallurgical Analysis.* 106 ill., 5¼ x 7½, 364 pp. \$2.50

(Author is assistant professor in mining and metallurgy in Harvard University and in the Massachusetts Institute of Technology.)

**CONTENTS:** Definition of the Subject; Sampling; Necessity for Correct Sampling; The Operations of Analysis, Gravimetric, Volumetric Analysis; Calorimetry; Methods of Analysis in the Metallurgy of Iron and Steel; Moisture; Hygroscopic Water; Combined Water; Loss on Ignition; Iron in Ores; Silica, Sulphur, Phosphorous, Alumina, Manganese, Lime, Magnesia and Titanium in Ore; Analysis of: Iron and Steel; Iron Slags; Limestone; Methods of Analysis in the Metallurgy of Copper, Lead, etc.; Copper, Lead, Zinc and Arsenio in Ore; Analysis of: Copper Matte; Chilled Blast Furnace Slags; Reverberatory Slags; Briquettes and other Copper Bearing Products; Copper Bullion; Alloys; Methods of Analysis in the Production of the Precious Metals; Analysis of Fluxes; Analysis of Fuels; Analysis of Clay; Methods for the Determination of Some of the Minor Metals; Methods for the Determination of Some of the Rarer Metals; Testing of Lubricating Oils; Examination of Boiler Water; Detection of the Metals; Tables; General References.

In this volume are brought together those methods in metallurgical analysis which, owing to their fitness, seem to have been most generally adopted in American metallurgical laboratories. The procedures are given for the sake of clearness in as direct statement as possible without regard to literary style.

IRON AND STEEL

(See also "Electrometallurgy")

**DICHMANN, CARL.** *The Basic Open-Hearth Steel Process.* Translated by Alleyne Reynolds. Ill., 6¼ x 9¼, 340 pp. \$4.00

**CONTENTS:** Physical Conditions in an Open-Hearth Furnace System; General Remarks on Producer Gas; Raw Materials for Producer Working; Reactions on Gasification in the Producer, Stoichiometric Relations; Thermal Conditions for Gasification of Carbon; Influence of the Individual Reactions on the Temperature of Reaction; Distillation and Producer Gas; Judgment of the Working of Producer from Analysis of the Gas; Gas and Air on Their Way Through the Furnace System; CHEMISTRY OF THE BASIC OPEN-HEARTH PROCESS; Reducing and Oxidizing Processes; Valuation of the Phosphorus Content of the Pig Iron; Comparison between the Basic Open-Hearth Process and the Pneumatic Refining Process.



**HUDSON, O. F.** **Iron and Steel.** An introductory text-book for engineers and metallurgists. With a section on Corrosion by Guy D. Bengough. (Outlines of Industrial Chemistry.) 47 ill., 6 x 9¼, 184 pp. **\$2.50**

**CONTENTS:** Mechanical Testing. Smelting of Iron Ores. Properties of Cast Iron. Foundry Practice. Mixing Cast Iron for Foundry Work. Malleable Cast Iron. Wrought Iron. **MANUFACTURE OF STEEL.** Cementation Process. Crucible Steel. Bessemer Process. Open Hearth Process. Electric Furnaces. Mechanical Treatment of Steel. Reheating. Impurities in Steel. Constitution of Iron Carbon Alloys. Heat Treatment of Steel. Special Steels. Steel Castings. Case Hardening. Welding. The Corrosion of Steel and Iron.

Presents briefly the more important principles of the metallurgy of iron and steel. Practical details of methods of production have been avoided in order that such matters as the constitution of steel and cast iron, and the effect of mechanical and heat treatment on the properties of these alloys might be adequately considered. The corrosion of iron and steel has been fully dealt with in a specially contributed section.

**JÜPTNER, H. F. V.** **Siderology: The Science of Iron.** (The Constitution of Iron Alloys and Iron.) Translated from the German by Charles Salter. Ill., 5¾ x 8¾, cloth, 352 pp. **\$5.00**

**CONTENTS:** Introduction; The Theory of Solution; Micrography; Chemical Composition of the Alloys of Iron; Chemical Composition of Slag.

**KERSHAW, J. B. C.** **Electro-Thermal Methods of Iron and Steel Production.** With an introduction by Dr. J. A. Fleming, F.R.S. 50 tables, 92 ill., 5½ x 8¼, 262 pp. **\$3.00**

**CONTENTS:** General Review of Progress in Period 1907-1912; General Principles of Electric Heating and Classification of Furnaces; Notes on Electrodes and Refractory Materials for Linings; Electric Smelting Furnaces; Electric Steel-Refining Furnaces: The Heroult, The Giord, The Stassano, The Kjellm and Röchling-Rodenhauser, The Keller; Other Types of Electric Furnace for Refining Steel; Comparative Power Consumption and Working Costs; Lists of Furnaces for Iron and Steel Production in Operation or Under Construction in 1912; Patents Granted Between 1898 and 1911; Abstracts and Reprints of Earlier Patents; Abstracts of Papers and Notes on Electric Steel Refining.

**MARKS, E. C. R.** **Manufacture of Iron and Steel Tubes.** *Second Edition, Enlarged.* 133 ill., 5 x 7½. **\$2.50**

A summary of the efforts and achievements of inventors based on their patent specifications as filed in the British Patent Office, so arranged as to be of some practical utility to manufacturers and others interested in iron and steel tubes.

**SELLEW, WILLIAM H.** **Steel Rails, Their History, Properties, Strength and Manufacture.** With notes on the principles of rolling stock and track design. 361 ill., 35 folding plates, 7¾ x 10¾, 575 pp. **\$10.00**  
(Author is principal assistant engineer, Michigan Central Railroad.)

**ABRIDGED CONTENTS:** Development of the Present Section; Pressure of the Wheel on the Rail; Supports of the Rail; Stresses in the Rail; Strength of the Rail; Influence of Detail of Manufacture; Rail Specifications.  
(For detailed table of contents see page 98.)

**SEXTON, A. H., and PRIMROSE, J. S. G.** **An Outline of the Metallurgy of Iron and Steel.** *Second Edition.* 271 ill., 6 x 8¾, 587 pp. **\$6.50**

**CONTENTS:** Iron; Pig Iron; Preparation of Materials for the Smelter;

Chemistry of the Blast Furnace; Thermal Phenomena of the Blast Furnace; The Blast Furnace; Accessories; Air Supply; The Hot Blast; Blast Furnace Slag; Calculating Charges; Blast Furnace Practice; Utilization of By-Products; Historical; The Foundry; *Malleable Iron*; Properties; Puddling; Other Methods of Preparing; The Forge and the Mill; *Steel*; Production Direct from the Ore and from Malleable Iron; Production by Partial Decarburization of Pig Iron; The Bessemer Process; Chemistry of the Bessemer Process; Thermal Phenomena of the Bessemer Blow; Working of the Bessemer Process; Bessemer Plant; Basic Bessemer Process and Plant; Modifications; Historical Notes on the Bessemer Process; The Siemens or Open-Hearth Process and Plant; Basic-Open-Hearth Process; Modifications of the Open-Hearth Process; Appliances Applicable to all Processes; Working and Casting Mild Steel; After-Treatment of Iron and Steel; Alloy Steels; Testing Iron and Steel; Rusting and Protection of Iron and Steel; Microstructure of Iron and Steel; Heat Treatment of Iron and Steel; Appendix.

**STANSBIE, J. H.** *Iron and Steel.* 86 ill., 6 x 8½, 389 pp. (Van Nostrand's Westminster Series.) **\$2.50**

**CONTENTS:** Iron Ores; Combustible and Other Materials Used in Manufacture; Primitive Methods of Production; Pig Iron and its Manufacture; Refining in Small Charges; Crucible and Weld Steel; Bessemer Process; Open-Hearth Process; Mechanical Treatment of Iron and Steel; Physical and Mechanical Properties; Iron and Steel Under the Microscope; Heat Treatment; Electric Smelting; Special Steels; Glossary.

**STEVENSON, J. L.** *Blast Furnace Calculations.* Ill., 5½ x 7½, leather, 160 pp. **\$2.50**

**CONTENTS:** Analyses of Coke, and Ores; Size of Furnace Required; To Find Working Capacity; Burden Capacity; Calculations of Cubical Contents of 18' x 80' Furnace; Volume by Method of Conical Frustra; Burden Capacity per Ton of Iron; Commencing the Designing; Furnace Bosh; Furnace Height; Hearth; Slag Tuyere; Tuyeres; Stove Power and Heating Surface; Air Capacity Required; Changes in Temperature; Summary of Power Required for any Output per Furnace per Day; Section of 260 Tons Furnace; Pig Iron; Analyses for Comparison; Pig Iron for Castings; Ores Suitable for Bessemer Process; Purple Ores; Swedish Ores; Manganese and Iron; Sundry Analyses; Forms for Recording Results of Operations.

### FOUNDRY PRACTICE

**BALE, G. R.** *Modern Iron Foundry Practice.* Part I., Foundry Equipment, Materials Used, and Processes Followed. 208 ill., 5¼ x 7½, 397 pp. **\$3.00**

**HORNER, JOSEPH G.** *Practical Iron Founding.* *Fourth Edition, Thoroughly Revised and Enlarged.* 283 ill., 5½ x 7½, 418 pp. **\$2.00**

**CONTENTS:** Sands and Their Preparations; Iron-Melting and Testing; Cupolas, Blasts and Ladles; The Shops and Their Equipments; Moulding Boxes and Tools; Shrinkage-Curving; Fracture-Faults; Principles of Green Sand Molding; Dry Sand Molding Cores; Loam Work; Elements of Machine Molding; Examples of Molding Machines; Machine Molded Gears; Miscellaneous Economies; Weights of Castings; Appendix.

**McCRACKEN E. M., and SAMPSON, C. H.** *Course in Pattern Making.* *In Press*

**CONTENTS:** General Information; Pattern Lumber; Hand Tools; Machines Used by the Pattern Maker; Moulding; Foundry Equipment; Patterns; Jaw for Steady Rest; Bearing Cap; Small Cylinder Patterns; Shaft Coupling; Bronze Bushing; Clutch Thimble; Core Box Plane; Gland; Wall Bracket; Compression



Chamber for Steam Pump; Rocker Arm; Boiler Flange; 1½-inch Return Bend; 6-inch Sheave Wheel; Piston; Piston Rings; Pulley and Gear Arms; Cylinder Head; Fly Wheel; 54-inch Sheave; Gears; Hollow Patterns; Skeleton Patterns, Loam Moulding; A Type of Pattern Construction; Additional Patterns.

**PARSONS, S. J.** *Malleable Cast Iron.* *Second Edition, Revised.* 86 ill., 6 x 9, 182 pp. *Reprinting*

**CONTENTS:** *Melting.* Analyses of Pig Irons; Crucible Furnace; Mixing; Care of Crucibles; Cupola; Air Furnace. *Moulding.* Facing Sands; Feeding; Gating; Spray Moulding; Oddside Moulding; Tube Moulding; Tub Moulding; Plate Moulding; Moulding a Cube, a Ring, Pipe, Pump Lever, Jawstock, Wheel, Elevator Bucket; Muffling; Core-making. *Annealing.* Construction of Ovens; Theories of Annealing; Annealing Ore; Treatment of Hard Castings; Packing; Charging; Building a Vault; Firing; Drawing; Re-annealing; Measurement of Temperature; American Process; Treatment of Special Castings; Annealing Pans. *Cleaning and Straightening.* Tumbling; Grinding; Causes of Distortion; Straightening Press; Straightening Wheels and Rings; Cylindrical Castings and Flanges; Irregular Shapes; Use of Wedges and Blocks; Setting Plate. *Design.* First Principles; Classification; Influence on Foundry Practice; Design of Wheels, etc. *Patterns.* Contraction; Machining Allowance; Cores; Metal Patterns; Core-boxes; Making a Spray; Setting Patterns on Plates. *Inspection and Testing.* Defects in Castings, Dirt, Scab, Cold Shuts, Sears, Blowholes; Mechanical Tests, Bending, Dropping, Drawing, Ringing; Defect Annealing; Good and Bad Tests; Shearing. *Foundry Chemistry.* Silicon; Sulphur; Phosphorus; Manganese; Carbon. *Mixing by Analysis.* Methods of Calculation. *Measurement of Temperature.* Construction and Use of Pyrometers; Installation. *Addendum.* Malleable Cast Steel.

**PAYNE, DAVID W.** *Founders' Manual.* A presentation of modern foundry operations, for the use of foundrymen, foremen, students and others. Ill., 4½ x 7½, 687 pp. \$4.00

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A ready reference guide giving authoritative instructions for the solution of the many problems which are continually presented in the foundry. The information is gathered from many sources and presented in orderly fashion, so as to be of value for students as well as experienced men.

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**RICHARDS, WILLIAM A.** *Forging of Iron and Steel.* A textbook for the use of students in colleges, secondary schools and the shop. 337 ill., 5½ x 8¼, 221 pp. \$2.00

(Author is instructor in forge, foundry and machine practice in the University High School and the University of Chicago, Chicago, Ill.)

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**ROXBURGH, WILLIAM.** *General Foundry Practice.* Being a treatise on general iron founding, job loam practice, moulding and casting of finer metals, practical metallurgy in the foundry, and pattern-making from a moulder's point of view. 161 ill., 5¾ x 8¾, 308 pp. (Van Nostrand's Westminster Series.) **\$2.50**

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