



Kindly write queries on separate sheets when writing about other matters, such as patents, subscriptions, books, etc. This will facilitate answering your questions. Be sure and give full name and address on every sheet.

Full hints to correspondents were printed at the head of this column in the issue of March 13th or will be sent by mail on request.

(12124) N. R. S. asks: Will you be good enough to supply me the following information? I wish to have some information as to reinforced concrete construction. One of my friends writes me a letter whose substance in asking the information is as follows: "My attention has been lately drawn to reinforced concrete construction. This method of construction is, I believe, largely adopted in America, and also to some extent in England and France. I am inclined to give it a trial, and construct one of my buildings entirely on that principle. I have, however, just heard that this construction is likely to collapse after a few years, owing to the corrosion of the metal which is imbedded in the concrete in order to strengthen and support the construction. Will you get me some information on this subject which may tend to definitely dispel or confirm my doubts?" I shall be much obliged if you will send some information on the above subject, or direct me to any other reliable and authentic source. A. We can, if you desire it, give you references to articles in our paper or books on the subject confirming our opinion, but without waiting to look these up we can assure you that your friend is entirely mistaken in the supposition that metal reinforcement in concrete is corroded by any action of the cement. Neat Portland cement, even in thin layers, is an effective preventive of rust. Tools have been taken out of concrete known to have been under water for four hundred years, as bright as when new. Iron rods have been partly imbedded in some experimental blocks of concrete exposed to sea air, and after the external part of the iron had entirely rusted away the imbedded part had not appreciably lost weight. Concrete to be effective in preventing rust, however, must be dense and without cracks, failures in reinforced concrete or corrosion of the inclosed metal being almost invariably traceable to bad workmanship. The concrete should be liquid enough to be tamped closely around the iron, and this is especially important in cinder concrete on account of the moisture absorbed by the cinders.

(12125) P. G. asks: Will you please explain the following questions? I was in New York city some time ago, and while there I visited Coney Island. I saw a show at Luna Park, representing the fight between the "Monitor" and "Merrimac" in Hampton Roads, Va. The question is this: What gives the stereoscopic effect? When I moved my head sideways, it had the vision of distance. Of course, the picture was on a curtain. Where was the machine located that projected the (moving) picture? There was no shadow of the curtain. Also, please, a description of those long red tubular lights in the post office in New York city (not the Copper-Hewitt vapor lamp). A. Without further knowledge of the picture exhibit to which you refer, we can only suppose that the stereoscopic effect mentioned is caused by the side-wise position of the head, either shutting off the sight of one eye or in so far straining it that the sense of distance of the screen is lost, the unconscious mental calculation by which distance is judged requiring the equal use of both eyes. We know of no mechanical attachment to a cinematograph or bioscope for producing the effect. The lantern may have been at the back of the screen, and the latter wet. The red lights in the New York post office to which you refer are Moore lamps, similar in principle to the Cooper-Hewitt mercury vapor lamp, i. e., the light being caused by the vibrations set up in the passage of an electric current through a partial vacuum containing a residue of rarefied gas. The gas in the Moore lamp is a secret mixture, probably containing mercury vapor and something else.

(12126) E. L. B. asks: Please state in Notes and Queries the reason limestone is used in smelting iron ore. A. Limestone is added to iron ore in the blast furnace because it is the most readily obtainable and cheapest flux. Iron ore consists generally of iron oxide mixed with a gangue or earthy matter which is most commonly silicious. The silica is infusible by itself, but in contact with iron oxide at a high temperature combines readily into silicate of iron, forming slag. To prevent the great waste of iron which would result from the combination of the gangue with the metal of the ore, it is necessary to provide a material with which the silica will readily unite, forming a fusible slag, substances thus added to take up the gangue of the ore and other impurities being known as fluxes. Silica being acid requires a base such as lime, and the slag formed is silicate of lime. The use of fluxes constitutes one of the most important improvements ever introduced into the manufacture of iron, making it possible to reduce

the metal from enormous quantities of lean ore containing as little as 25 per cent of metallic iron, whereas it was formerly unprofitable to treat ores containing much less than 70 per cent.

NEW BOOKS, ETC.

THE LIFE OF THE UNIVERSE AS CONCEIVED BY MAN FROM THE EARLIEST AGES TO THE PRESENT TIME. By Svante Arrhenius. Translated by Dr. H. Borns. Illustrated. Two volumes. London and New York: Harper & Co., 1909. 16mo. Price, 75 cents.

The original title of this work reads in German "Die Vorstellung vom Weltgebäude im Wandel der Zeiten," from which it would seem that "Life of the Universe" hardly covers the subject matter, an impression which is furthermore borne out when it is considered that Arrhenius in this work is concerned not so much with the possibility of life on other worlds, but rather with the evolution of cosmic ideas. Dr. Borns's translation (probably made from the German of Bamberger, and not from the original Swedish) is not what might be termed idiomatic. Many a Teutonism creeps in, but on the whole he has given a very faithful English rendering. This latest excursion of Arrhenius into the field of astronomy is practically without a counterpart in astronomical literature. The histories of astronomy written by Delambre and by Berry are chronologies with critical comments rather than attempts at explaining the evolution of modern astronomical conceptions. Arrhenius traces the evolution of astronomical thought from the cosmogony of primitive races through the creation myths of the ancients, the philosophic systems of antiquity, and the more scientific speculations of Copernicus and Kepler, until he arrives at the Laplacean nebular hypothesis and its modifications. If there is any truth in Haeckel's dictum that a true understanding of a science can be acquired only by a study of its evolution, then Arrhenius's book may be regarded as one of the most admirable astronomical ever written.

HYDROELECTRIC DEVELOPMENTS AND ENGINEERING. A Practical and Theoretical Treatise on the Development, Design, Construction, Equipment, and Operation of Hydroelectric Transmission Plants. By Frank Koester, Consulting Engineer, Assoc. Mem. Am. Inst. E. E., Member Society German Engineers (Berlin). With 500 illustrations. New York: D. Van Nostrand Company. 4to.; pp. 454. Price, \$5 net.

In writing this volume it was the author's intention to present a comprehensive survey of the most advanced European and American practice in hydraulic engineering. In furtherance of that end he has given an admirable discussion of air shafts and equalizing chambers in connection with pressure tunnels; seamless-welded, flangeless, telescoping penstocks to facilitate shipment and to eliminate expansion joints; siphon systems; impulse wheels with draft tubes and movable water-saving nozzles; compound turbines on a single shaft, the discharge of one being the supply of the other; rapid and complete turbine tests; thirty-thousand-volt generators and efficient devices for protecting them against lightning; novel combinations of single and three-phase generators; wagon-panel switchboard systems; segregation and decentralization of switchboards; continuous water-flow grounders and horn gaps with micrometric setting; and two-legged transmission towers and line-crossing protection. Inasmuch as it is not the object of the engineer as a designer of hydroelectric developments to design any particular machine, such as a turbine, generator, transformer, and the like, but to provide by selection, from the different makes, an assemblage of machines and devices, each designed to perform its particular function in the most economical manner, this volume may be regarded as a handbook which will enable him to have machines properly combined for the purpose of generating and transmitting electric current from water power on a satisfactory commercial basis.

AS OTHERS SEE US. By John Graham Brooks. New York: The Macmillan Company, 1909. 8vo.; 13 ill. Price, cloth, \$1.75.

There are few of us who can fail to profit by a perusal of this "study of progress"—such is the author's secondary title. The author explains that he began the study by chancing, while on a journey, upon a century-old volume of the criticisms of America by an early traveler, which with all its limitations and errors, so much relieved the monotony of his own travels by observation of change and development since the days of the critic, that he determined to let some foreign critic be his guide on all his later journeys. The result is a painstaking comparison of practically all that has been written of America by visitors from abroad, and the extent to which they consider us worth recording may be judged from the excellent bibliography at the end of the book, comprising some hundred volumes. Nothing could be more admirable than the persistent good-nature with which the author refuses to be annoyed by the occasionally insulting comments of foreign visitors when their observations are based on ignorance or prejudice, except his candid sincerity in refusing to accept from them exorbitant praise when

superficial or unwarranted. The light of after events also shows many a foreign critic once vituperated as spiteful or prejudiced to have been just and impartial. The author's style is lucid and dignified, and in spite of the fragmentary nature of the subject, the book has more sustained interest than many a work of fiction with a continuous story.

OCEAN AND INLAND WATER TRANSPORTATION. By Emory R. Johnson, Ph.D. New York: D. Appleton & Co., 1909. 12mo.; 395 pp. Price, \$1.50 net.

Some months ago it gave us great pleasure to review Dr. Johnson's "American Railroad Transportation," a most fascinating and authoritative book, which we enjoyed reading from cover to cover. When the attention of the whole country is devoted to water transportation, particularly inland waters, any book which deals with such transportation is of great interest. It therefore gives us great pleasure to make a brief mention of Dr. Johnson's later volume, which is no less complete in itself than the work relating to railroads. It is a practical and exhaustive treatise on ocean and inland water as a means of transportation, its physical and economic limits, cost, tonnage, and location. The book contains interesting illustrations and valuable statistics, which gives the reader exactly the information for which he is searching. The book is a most readable one, and is an authoritative work on the subject.

INDIA, ITS LIFE AND THOUGHT. By Dr. I. P. Jones. New York: The Macmillan Company, 1909. 8vo.; 375 pp.; fully illustrated with photographs. Price, \$2.50.

While the present unrest and political ferment in India are so much before the public the present work has an especial interest. The author's point of view is singularly sympathetic and unprejudiced, and while his book has no deliberate political aim and attempts to solve no vexed questions, it sheds a great deal of light upon the complexity of the problem of British government in India. Dr. Jones's experience of India has been that of a Christian missionary and, since his attitude is affected by that capacity, his feeling treatment of his subject is remarkably free from religious prejudice. The book is as attractive to the dilettante mental traveler as it is valuable to the ethnological or political student, and is yet adaptable to summer reading, being as interesting wherever "dipped into" as to the continuous reader. It is admirably illustrated with fine photographs, the subjects including, of course, the peerless Taj Mahal and many other less known but little less beautiful gems of Oriental art.

THE ENGINEERING INDEX FOR 1908. Compiled and published by the Engineering Magazine. New York: 1909. 437 pp.; large 8vo. Cloth, \$2.

The present volume entirely lives up to the reputation of its predecessors as being the most complete, if not the only, index of all engineering literature, whether included in books, technical periodicals, or the journals and proceedings of the engineering societies. This latest volume brings the investigator down to the close of 1908, while the earlier parts enable searches such as occur in patent cases and the like to be prosecuted with a minimum of cost and delay. In this book, as in the volume issued last year, the "classified" system of arranging the items is followed in place of the "strict alphabetic" order of the earlier volumes. In other words, the articles indexed are first grouped under the great divisions of engineering practice to which they belong—Civil, Mechanical, Electrical, Mining, etc.—and under these again they are sub-grouped according to the recognized special divisions of each field. This is possibly one of the greatest services the index renders to its regular users. The monthly continuation of the index, from the close of 1908, is to be found in the successive issues of the Engineering Magazine.

THE PROPER DISTRIBUTION OF EXPENSE BURDEN. By A. Hamilton Church. New York: The Engineering Magazine, 1908. 16mo.; 116 pp. Price, \$1.

The contents of this book, prepared originally for The Engineering Magazine, is a series of articles which at once took rank as a standard reference work on one of the most difficult questions of cost finding. A constant demand for these numbers has led to the republishing of the entire group in book form. An accurate distribution of general expense is admittedly one of the most perplexing and yet one of the most important problems with which the manufacturer must deal. The simple yet thorough analyses conducted in this volume, and the clear, common sense demonstration presented, will furnish a reliable guide to the solution of highly complex conditions in factory economy. The book is a most excellent one for all who are engaged in manufacturing.

THE COPPER HANDBOOK. Eighth annual edition. By Horace J. Stevens. Houghton, Mich.: Published by the compiler, 1909. 8vo.; 1,500 pp.; cloth. Price, \$5.

This number of the now widely known annual, which circulates in every country that has postage, more than lives up to the reputation established by its predecessors. Whereas the Copper Handbook is principally known as a complete directory of the copper mines of

the world—their offices and officers, directors and staff, works and plant, with concise but complete descriptions of the history, geography, and operations of each mine—it contains a great deal of more general interest. Even in the principal chapter of 1,185 pages describing no less than 6,767 mines there is much interesting reading even to the layman, the descriptions of Calumet and Hecla or Anaconda, for instance, being full of the romance of great industrial achievements and the conquest by American skill and enterprise of the fastnesses of nature. The book includes a glossary of mining terms and concludes with the most complete statistics of the industry, world's production of copper by countries and states, output of leading mines, variation of prices, share-holding and dividends of companies, etc. The compiler shows his confidence in the value of his work by sending it anywhere, charges prepaid, allowing a week's inspection and return of the book if not found acceptable.

HOW TO APPRECIATE PRINTS. By Frank Weitenkamp. New York: Moffat Yard & Co., 1908. 12mo.; 338 pp. Price, \$1.50 net.

Mr. Weitenkamp is the curator of the print department of the New York Public Library, and there is no better connoisseur in the world than he. His knowledge of prints and kindred material is at the disposal of all who are in any way interested in the subject. The Lenox Library, where the prints are kept at the present time, is a Mecca for students, who are directed to the proper source of material by Mr. Weitenkamp. This qualifies him to produce a very valuable treatise, which it gives us great pleasure to review. The first chapter deals with "The Taste for Prints"; then comes a chapter on "Etchings"; then one on "Line Engraving"; "Mezzo-tints"; "Tint Methods"; "Stipple and Other 'Dot' Methods"; "Wood Engraving"; "Lithography"; "The Photo-mechanical Process"; "Color Prints"; "Coloring"; "The Making of Prints"; and "Certain Minor Information." The book is admirably written and shows a broad and catholic appreciation of the entire subject. We have not seen such a good book on prints for many years. We congratulate Mr. Weitenkamp on the production of such an excellent book.

ELECTRIC RAILWAY POWER STATIONS. By C. F. Swingle. Chicago: F. J. Drake & Co., 1909. 8vo.; 720 pp.; fully illustrated with photos and diagrams. Price, \$2.50.

In this work the author attempts to include all that it is necessary for a central station engineer to know about boilers, mechanical stokers, steam engines, both turbine and reciprocating, gas engines of all kinds, pumps and auxiliaries of all kinds, dynamos, motors and switchboard instruments of every description. If this ambition were attained with complete success the book could hardly be so portable. It is possible that there may be central stations which include both gas engines, reciprocating steam engines and turbines, and operating engineers who desire all those machines described in one book, but we should say that any engineer who did not know as much of the contents of this book as applied to his particular work would prefer to learn it from separate books on the different subjects with space enough to treat them thoroughly. Questions and answers are interspersed through the book with no particular reference to the text, an examination on slide-valve setting appearing, for instance, at the end of a chapter on steam turbines. The illustrations are apparently taken principally from manufacturers' catalogues, and being photographs of half-tones does not add to their clearness. As a whole, at a time when more than ever it may be said that "of the making of many books there is no end," this work appears to us to fall naturally into the harmless but unnecessary class.

HINTS ON HOUSE FURNISHING. By W. Shaw Sparrow. New York: John Lane Company, 1909. 8vo.; 308 pp. Price, \$3 net.

The sumptuous volume before us is filled with valuable hints on house furnishing and decoration. The plates are particularly well executed and are inserted, allowing the text to be printed on paper which is agreeable to the eye and to the fingers as well. After a general introduction which covers the subject in an admirable manner, the walls and their treatment are taken up, followed by the floors and their treatment; then come the ceiling, the windows, blinds, and curtains. A chapter on textile fabrics follows, and there is an interesting chapter on artificial heat and light. Then the furnishings of the house are treated. Crockery and porcelain are treated in the next chapter, and then comes a chapter on furniture and sanitary appliances. There are also chapters which give valuable hints on rooms for various uses. There is even a section on that much-neglected subject—garden furniture. It is a beautiful book which is worthy of a large sale.

THE AUTOBIOGRAPHY OF NATHANIEL SOUTHGATE SHALER. With a Supplementary Memoir by His Wife. With illustrations. Boston and New York: The Houghton Mifflin Company, 1909. 8vo.; pp. 481. Price, \$4.

In the annals of Harvard University it would be difficult, indeed, to find a man who exerted so far-reaching an influence upon the student body at large, as well as upon those members of the faculty with whom he came into more