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## BOOK REVIEWS.

**Insulation and Design of Electrical Windings.**—By A. P. M. Fleming and R. Johnson. Published by Longmans, Green and Co., London. Canadian Selling Agents, Renouf Publishing Co., Montreal; 224 pp.; 102 diagrams; size 6 x 9 ins.; cloth. Price, \$2.25. (Reviewed by Prof. H. W. Price, Department of Electrical Engineering, University of Toronto.)

Relatively there are very few books on insulation which attempt to treat the subject generally. The authors of this volume have offered a valuable addition to this literature, and in it have included a large collection of data in tabular and curved forms on mechanical and electrical properties of insulation for rotating and static electrical machinery. It is difficult to predict with exactness the service to be expected of insulation, because in so many situations it is subjected not only to fairly definitely-known electrical stress and frequency, but also to variable and imperfectly-known punishment or fatigue from mechanical strain in construction and operation, dirt and moisture, overheating, high frequency, etc. Therefore trial and error is largely depended upon for advice. The authors have made many tests to find individual effects of these variables in operating life of insulations, and their results are interesting as an aid toward good judgment in design.

The first three chapters are devoted to an account of physical characteristics of gaseous, liquid and solid dielectrics, the nature and extent of electrical stresses to be met in practical work and properties of many insulating materials when subjected to electrical stress, fatigue from continued over-stress or abnormal frequency, effects of oil and moisture on both electrical and mechanical characteristics, properties when dried out in various ways after abuse, etc. The authors have evidently made many investigations themselves, have also collected data from other sources, and with many curves, tables and discussion, offer a good assembly of information.

A large section is devoted to "design of insulation and windings," insulation tests, etc. Various windings for

motors, generators, and transformers are discussed from the insulation point of view, and many sketches are offered showing actual materials and thickness provided for specified service. This information is extensive and valuable, but in view of titles of book and chapter one wonders why no attempt is made to explain how the authors would proceed with their data to choose insulation other than by copy-cut-try methods, which their preface states they desire to make less necessary.

The last two chapters concern drying and handling of windings in factory and in service, and causes of failures in service. Such matters as drying of transformer oil, which have been fully dealt with by others, are given little space. Here, as in several other places in the book, the authors have wisely preferred definite references to their selections from literature now available on the point in question.

**Sanitary Engineering.**—By Francis Wood, M.I.C.E., F.G.S. Published by Chas. Griffin and Co., Exeter St., Strand, London; 306 pp.; 181 illustrations; size 5½ x 7½ ins.; cloth. Price \$2.25 net.

This is the third edition of a practical manual of town drainage, sewerage and refuse disposal. It contains a number of additions covering improvements and alterations, which have developed in the design and construction of sewers, particularly in the application of concrete; also in the ventilation of sewers or oxygenation of the sewage, and other subjects which have been given great attention since the publication of the first edition 13 years ago.

The book contains 20 chapters, the first three or which are of an elementary nature and deal lightly with hydraulics together with formulæ for the velocity of flow in pipes, etc. Following, 12 pages are devoted to a technical consideration of earth pressure and retaining walls. Chapter V. is on power, and a few facts are given concerning water-power, steam, electricity and compressed air. In the reviewer's opinion, the six pages devoted to the subject of power might well have been omitted as the subject matter is so elementary as to be entirely lacking in practical information respecting the subjects mentioned. Mere definitions of horsepower, ohm, ampere, volt, etc., seem quite out of place in a book written specially for the sanitary engineer.

The subject of house drainage has been well and thoroughly treated, both from the standpoint of the urban and rural dwelling. Chapter VII. has to do with land drainage, evaporation, rainfall, etc. The subject of sewers and sewerage systems are taken up in a capable and comprehensive manner in some 70 pages, under the headings of Sewers, Separate System, Sewage Pumping, Sewer Ventilation, Drainage Areas, Manholes, etc. A chapter of 20 pages is devoted to trade refuse and river disposal. The titles of the remaining chapters are Sewage Disposal, Bacterial Treatment, Sludge Disposal, Construction Materials and Cleansing of Sewers, Refuse Disposal, Chimneys and Foundations. The book is well indexed, the illustrations are particularly clear and the whole subject is treated in such a way as to render the book a valuable one to sanitary engineers, architects, inspectors, contractors and students.