

**THREE-PHASE TRANSMISSION: A
PRACTICAL TREATISE ON THE
ECONOMIC CONDITIONS
GOVERNING THE TRANSMISSION OF
ELECTRIC ENERGY BY UNDERGROUND
AND OVERHEAD CONDUCTORS**

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Three-Phase Transmission: A Practical Treatise on the Economic Conditions Governing the Transmission of Electric Energy by Underground and Overhead Conductors by William Brew

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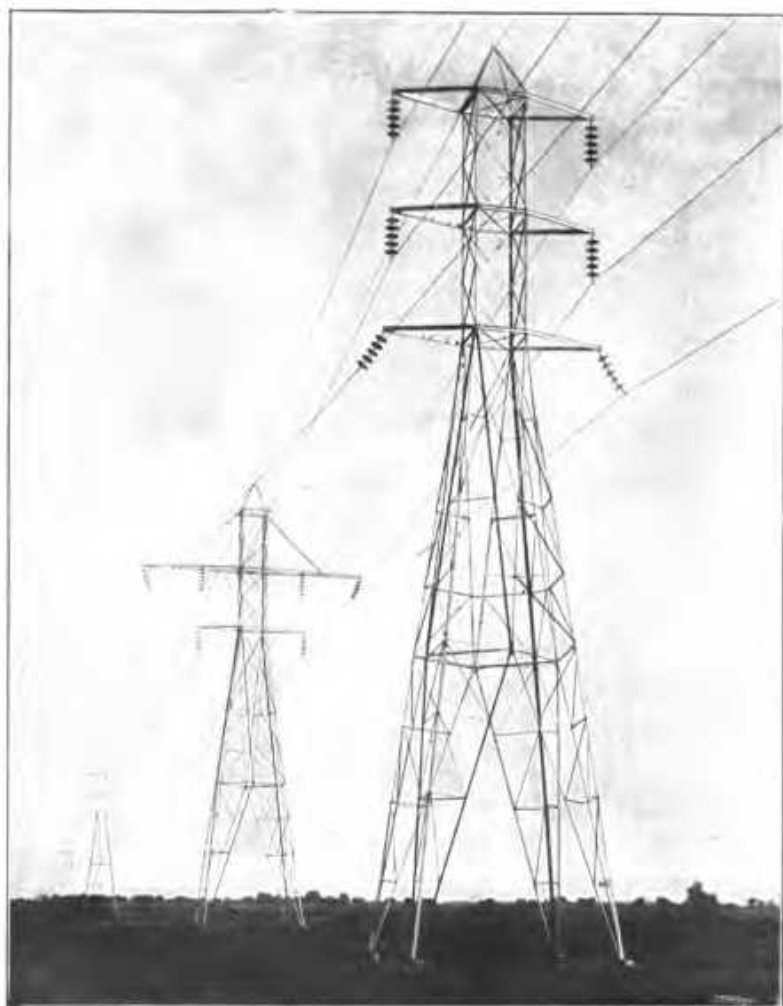
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WILLIAM BREW

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THREE-PHASE TRANSMISSION



Overhead Line for 100,000 Volts, showing Transposing Towers.

THREE-PHASE TRANSMISSION

A Practical Treatise

*ON THE ECONOMIC CONDITIONS GOVERNING THE
TRANSMISSION OF ELECTRIC ENERGY
BY UNDERGROUND AND OVERHEAD CONDUCTORS*

BY

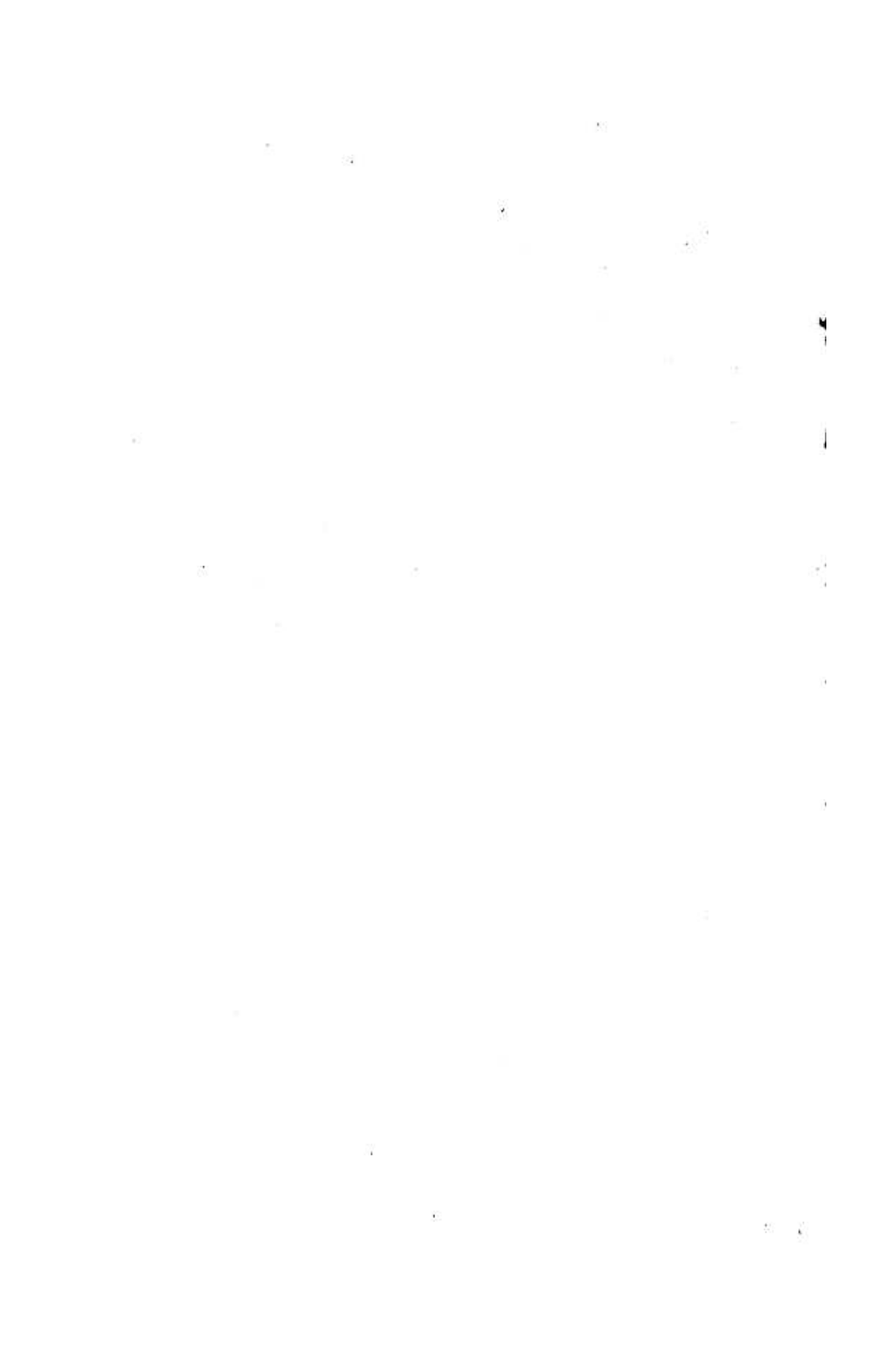
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PREFACE

WITH the increasing range of literature designed to meet the requirements of the electrical student, engineer, and specialist, some explanation may perhaps be offered for the appearance of a book devoting itself almost entirely to the electrical transmission of energy by three-phase currents.

That this system of transmission is eminently suited to modern requirements is obvious from the fact that, with the extended application of electricity to industrial purposes, undertakings formerly distributing single-phase or continuous current have alike resorted to three-phase transmission in order to enable them to cope with their widening field of operations. Thus with the very general use of three-phase transmission the practical consideration of the subject in all its bearings has become of the greatest importance.

Most engineers concerned with the generation and distribution of electrical energy have from time to time met difficulties involving financial and other considerations, which many text-books, excellent in other respects, have ignored completely, whereas the importance of sound financial principles in all technical questions cannot be overestimated.

It appeared, therefore, there was a want of a practical treatise upon the subject of three-phase transmission with definite aims in view. In the first place, to bring prominently before the reader such economical and financial points as engineers and specialists engaged upon new works would find useful; in the second place, to provide the earnest student with concrete examples of problems which, whilst demanding scientific treatment, are yet dependent upon commercial considerations for their useful solution.

Accordingly, in the following pages, the endeavour has been made to keep constantly in view the all-governing question:— Will it pay?

Whilst some knowledge of electrical engineering on the part of the reader is assumed, mathematics have been omitted as far as possible, and where algebraical expressions are introduced these are of the most elementary character.

References also have for the most part been omitted as uninteresting to the general reader and involving an amount of labour and research incommensurate with their utility to practical engineers.

The book contains some original investigation and much data not hitherto published, which, it is hoped, may prove of interest.

In conclusion, the author desires to express his indebtedness to Dr W. E. Sumpner for valuable suggestions, also to Messrs The British Insulated & Helsby Cables Ltd.; Ferranti Ltd.; Maschinenfabrik Oerlikon, Reyrolle & Co. Ltd.; and to the Council of the Institution of Electrical Engineers, for details and illustrations of plant kindly furnished by them. Much credit is also due to the publishers for the pains they have taken to make the book perfect in every respect.

W. B.

LONDON, *January 1911.*

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