

young men but to follow the traditions of their elders—a stultifying state of affairs.

Mr. Strehlow gives a detailed account of the visit of initiates to one of these sacred caves, an account which recaptures the spirit of the occasion, and he follows this with a number of northern Aranda myths. It is interesting to see various threads running through them all, or at least through the majority. For example, the manner of origin of men from their totemic ancestor, in these cases so 'patrilineal' as to dispense altogether with any female intermediary, the sons being 'born' from the armpits of the father, as if the original inventors of the myth were unwilling to admit any possible claim on the part of women. Another point which is brought out is the hostility between the original father and his sons, leading to gross cruelty and frequently even to cannibalism.

The second part of the book deals with the three Aranda sub-groups already mentioned, distinguishing the customs of each group, especially those connected with *tjurunga* and initiation ceremonies.

The third part is concerned with *tjurunga* ownership, quarrels about which were frequent during the performances of the sacred ceremonies. The term *tjurunga*, as differentiated from *tjurunga*, is very indefinite and covers at least eleven different items, objects of stone or wood, sacred ground paintings or even sacred chants. In this section the author gives concise accounts of initiation festivals and also details of the laws governing *tjurunga* ownership.

The photographs illustrating the book are rather small and not very clear, but nevertheless give a good impression of the scenes they portray. The book itself is a valuable addition to our rather exiguous knowledge of this interesting and diminishing race.

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ALTERNATING-CURRENT POWER TRANSMISSION

Le grandi linee di trasmissione d'energia
Calcolazione elettrica. Per A. Dalla Verde. Pp. xi + 386. (Milano: Cesare Tamburini, 1947.) 1700 lire.

AT present, the all-important problems of power transmission are those relating to long-distance energy transport and interconnexion of high-power networks. Examples of the first class are transmission from Norway to the Continent of Europe or to Great Britain, from the Victoria Falls to the industrial areas of South Africa, from Tasmania to Australia, from the Lower Danube to Central Germany. In the second class the realization of a European Grid system is the most imminent.

Quantitatively, these problems resolve into the transmission of total powers of the order of 1,000 to 3,000 MW. over distances of 600 km. and upwards. Transmission by alternating current at high voltage is the method which has been most fully developed. This system has become commonplace at voltages up to 220 kV. The maximum voltage at which extensive practical experience is available is 287 kV.—the voltage used for transmitting power from the Boulder Dam to Los Angeles. Sweden is constructing a 380 kV. power line more than 600 km. long, and a 220 kV. line in France has been designed with the view of facilitating its conversion to 400 kV. in the future. In progressing from 287 kV. to 400 kV., detail problems relating to the conductors and insulators have to be examined, such as corona losses, and

transient voltages arising from switching or from natural causes.

Costs of transmission lines and apparatus rise so rapidly with voltage that every component has to be examined with the view of attaining maximum overall economy. The costs of the transmission lines themselves are so great that there is also incentive to study alternatives to the established three-phase, 50-cycle systems, such as D.C. transmission.

These generalities should make it evident that new authoritative work on electrical transmission is worth serious examination.

The appearance of an Italian treatise is specially opportune as Italy has done much individualistic pioneer work in electrical transmission at very high voltages, in conditions which demand the closest attention to economy. The volume under review deals with alternating-current transmission in seven main sections: fundamental line constants, electrical calculations of line characteristics, vector and circle diagrams, voltage regulation, static and dynamic stability of three-phase systems, and choice of the fundamental elements of a transmission system.

Two appendices—hyperbolic functions and symmetrical components—give an easy review of the mathematical aspects of the subject.

The treatise is remarkably clear and objective, and in the reviewer's opinion takes a very high place among works of the kind. There are minor blemishes in printing, and some of the illustrations are difficult to decipher; but on the whole it is a pleasure to read the book. It covers adequately all electrical aspects of alternating-current transmission, and enables any conscientious reader to design a high-voltage transmission line which would be both safe and economical. Even with the best guidance from books, it has to be recognized that special tests must be made on site before finalizing designs of transmission lines. Two examples illustrate this point. In the case of 70 kV. lines erected more than twenty years ago on the coast of French Morocco near Casablanca, early experience showed that no normal type of insulator would withstand the salt-laden atmosphere which provoked flash-over on such a scale that it appeared probable that the transmission project would have to be abandoned. A remarkably bold and successful solution was found by the local engineers, who improvised oil-filled insulators which saved the situation.

The second case is that of the British 132 kV. Grid lines, which were originally insulated in accordance with the requirements of the empirical formula $(U/15 + 1) = \text{number of disks per chain recommended by Signor Dalla Verde}$. Even with 20 per cent additional insulation, which was provided for in the mechanical clearances, flash-over troubles were so prevalent during fog in industrial areas that the degree of continuity of supply was altogether inadequate. In this case the situation was saved by the use of specially shaped anti-fog insulators which a British firm had developed. The lesson to be deduced is that experience at lower voltages in Great Britain and at the same voltage in other countries proved insufficient warning of the electrical difficulties arising from our peculiar atmospheric conditions.

It is to be hoped that engineers will have an opportunity of bringing to reality some of the projects mentioned at the beginning of this review. Young engineers who may be interested in them could find no better guidance than that provided in Signor Dalla Verde's book.

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