

CENTRAL ELECTRICAL RESEARCH BOARD

THE greatest need of the moment in India is the development of industries and power development in the *sine qua non* for industrialisation. Though some strides in this direction have already been made in recent years, very much more remains to be done. Though India is not favourably placed with regard to the natural supplies of coal and oil, the potential water power resources are indeed very great. On the basis of the Meares Triennial Report, our resources even on the most conservative estimates are about 12 million kw. But the developed resources so far constitute only 6 to 7 per cent. of this potential. Thus in the post-war period attention will have to be first concentrated on the production of power.

In India electric power development would mainly be in the hands of the several Provincial Governments and Governments of Indian States. Further for some of the schemes, such as the Tungabhadra project, the Machand project, etc., co-operation of two or three Governments is essential. Thus there is need for a central co-ordinating body for pooling the resources and for their efficient development. The formation of the Central Technical Power Board by the Government of India is, therefore, most welcome in this connection. The work of the Board would no doubt be directed predominantly towards development of the potential power resources, but in addition is bound to be of invaluable assistance to the existing electric supply organizations and in the development of the electrical manufacturing industry.

At present the electric supply organizations, in India, are severely handicapped as regards technical facilities in solving many of their problems. As an example, and perhaps as one of great urgency, could be mentioned the lack of adequate high voltage testing facilities. A high voltage testing laboratory is essential for solving many of the pressing problems of the electric supply industry—especially transmission and insulation problems which are peculiar to Indian conditions. There are many such problems of electric supply requiring close study, the solving of which would ultimately lead to increase in reliability and effect considerable savings in capital cost and maintenance. In fact, increased use of electricity in industry has really only one limitation—cost. As the cost is reduced there is as yet hardly any limit in sight to further expansion of industry. It is, therefore, imperative that there should be some organization on the lines of the British Electrical and Allied Industries Research Association, England (E.R.A.)* which would undertake to solve the problems of the electric supply industry. The E.R.A. which took its birth during the last World War has even during the short period of its existence, been of immense help to the British Electric Supply and Electrical Manufacturing Industries. The scope of its work and the pressure upon its resources are still rapidly expanding.

* Details regarding E.R.A. and its activities are found else where in the issue.

As striking examples of the results achieved through the co-operation of the E.R.A. and the electric supply industry, a few may be mentioned.

(i) When the E.R.A. was formed, very little definite knowledge existed on the current-carrying capacity of underground cables. It was the general practice to give such cables too low a rating with the result that inefficient use was made of the vast capital expenditure on cable systems. The work of the Association enabled the permissible loading of many networks to be substantially raised and thus lead to millions of pounds being saved in extensions. The economy effected, by the reduction of the cost of supply, materially assisted the growth which followed.

(ii) In the field of rural electrification, designs of cheap overhead construction for rural distribution have been worked out by the E.R.A. and over 300 of these lines have been successfully operated and have resulted in substantial savings in cost.

(iii) Several years ago, it was estimated that breakdown of insulation in electrical plant was costing the supply authorities and consumers at least one million pounds per annum. It is now admitted that the work of the E.R.A. on this count alone has resulted in savings of nearly 50 per cent.

(iv) Apart from effecting reductions in the cost, many of the researches bear directly upon reliability and safety, thus increasing the public confidence and minimizing the consequential damages due to failures in supply.

Many more examples could be cited, but the above are sufficient to show how useful, indeed, indispensable, an organization on the lines of the E.R.A. would be to the Indian Electric Supply Industry.

As regards the electrical manufacturing industry, at present, India is indeed in a pitiable condition. Even with the existing comparatively meagre consumption of electricity, the annual consumption of electric goods is over Rs. 6 crores. Yet there is no well organized large-scale manufacture. The production is more or less limited to a few articles such as cables and wires manufactured by the Indian Cable Co., at Jamshedpur, small transformers and insulators manufactured by the Mysore Government concerns at Bangalore, and lamps manufactured at Calcutta, Bombay, Agra and Bangalore. These meet only to a very small extent the demands of the country. India is depending on foreign import even for the simplest of her requirements in the matter of electrical equipment. With expansion of power the need for electrical machinery would be greatly enhanced and India can ill-afford to continue to import from abroad. The war has, however, already given a stimulus in this field as in many others, and a number of small concerns are springing up in the country for the manufacture of articles such as fans, heaters, radio components, small motors, electric light fittings, etc. In the post-war period the development would, no doubt, be on a much larger scale. But before an industry could be started and

established on a sound basis there would be a number of pressing problems peculiar to Indian conditions, such as a thorough investigation of the question of proper utilization of indigenous raw materials, etc., requiring immediate attention; and in this respect also, India badly needs an organization of the type of E.R.A. which will be of the greatest assistance to the Electrical Manufacturing Industry.

The phenomenal expansion of the electrical and allied industries in the past twenty-five years in England is due to a large extent to the work of the E.R.A. Manufacturers have also found the Association indispensable for the preparation of standard specifications. Mention must be made of the exceptionally valuable work done by the E.R.A. in the field of insulation alone. Their investigations cover a very wide field and include materials such as fabrics, tapes, varnished cloths, varnishes, enamels, filling compounds, paper, mica, asbestos press-boards, vulcanized fibre, ebonite and composite insulating materials based on synthetic resin, etc. The results of their investigations have not only effected definite improvements both in the properties of the insulating materials and in the technique of their selection and utilization, but also have led to considerable expansion of the industries themselves.

Towards its establishment and maintenance the E.R.A. receives generous financial support from the Government through the Department of Scientific and Industrial Research (D.S.I.R.), the Central Electricity Board, the B.B.C. and the G.P.O., the British Electrical and Allied Manufacturers' Association (B.E.A.M.A.), the Institution of Electrical Engineers (I.E.E.), the Cable Manufacturers' Association (C.M.A.) and many electric supply undertakings. The expenditure of the Association is now over

£100,000 per annum and would have been much higher had it not been for the diversion of energy and personnel caused by the war effort.

Unfortunately in India there are as yet no organizations corresponding to the I.E.E., B.E.A.M.A., C.M.A., etc., which would supplement Government assistance in the setting up of a Research Association on the lines of the E.R.A. Hence the inception and direction of its activities in the early stages at least will have to rest mainly with the Government through the Central Technical Power Board. Research takes time, yet the results must be available in time for their utilization, hence the problem of providing facilities and building up staff to undertake the researches needed for post-war development is most urgent. A moderate beginning could be made by utilizing the existing facilities for experimental investigations in the laboratories of the Indian Institute of Science, Bangalore, and providing the Institute with some additional equipment of which the most important are those connected with High Voltage Testing, comprising:

- (1) One million volt power-frequency testing equipment.
- (2) Two million volt impulse-testing equipment.
- (3) 200-KV high voltage D.C. testing equipment.
- (4) A 125-KV H.F. testing equipment.

The approximate cost of the above equipment based on pre-war prices would amount to about Rs. 4 lakhs. A suitable building to house the above would, in addition, cost another lakh of rupees.

In due course the organization could have its own laboratory and staff.

H. N. RAMACHANDRA RAO.

OBITUARY

THE LATE DR. S. L. GHOSE

THE news of the premature death of Dr. S. L. Ghose, Professor of Botany, Government College, Lahore, has been received with profound sorrow by his numerous friends, colleagues and pupils. His departure from this world at an early age of fifty-two has created a gap in the ranks of Indian workers in Botany which is hard to fill.

S. L. Ghose was the youngest son of Mr. N. C. Ghose, who served as headmaster in many high schools in the Punjab and N.W.F.P. Born on 13th December 1893, he received education in many schools and ultimately passed his Matriculation from the Government High School, Ludhiana. He joined the Forman Christian College, Lahore, in 1908, and developed interest in biological sciences in his early years and in 1910 shifted to Government College, Lahore, where he had a brilliant academic career. In 1921 he proceeded to the University of Cambridge and worked under the guidance of Dr. A. C. Seward and Doctor Borraideale. For his researches on Myxophyceæ, he was awarded Doctorate in Philosophy in 1923. He joined the University of Rangoon the same year and was responsible for establishing

the Biology Department. In 1928, he returned to Government College, Lahore, as Assistant Professor of Botany, and on the death of Dr. S. R. Kashyap, he was appointed Professor of Botany, which post he held with distinction till his death on March 24, 1945.

He was elected Vice-President of the Indian Botanical Society for 1922-23, and was President of the Botany Section of the Patna Session of the All-India Science Congress in 1933.

His contributions to the study of Myxophyceæ of Northern India and Burma are of an outstanding nature and by his pioneer work he showed the way to others into a realm hitherto practically untouched and unexplored. He was the author of twenty original papers of outstanding merit. By his genial temperament and sympathetic approach he had endeared himself to all his pupils. Besides being an inspiring teacher he was a sympathetic guide in the field of research. Indian Algology has suffered an irreparable loss by the demise of this veteran and the Panjab University an inspiring professor of Botany.

M. S. RANDHAWA.