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ENGINEERING ACHIEVEMENTS IN INDIA*

UNDERSTANDING and familiarity with the physical world produces the scientist. Skill of hand, ear and eye produces the craftsman or the technician. Finally these activities are most effective when they are ably co-ordinated with one another by creative genius. Such co-ordination of mind and hand is provided by the engineer who is especially equipped to do so by his education, training and experience gained from a life-time of the practice of such co-ordination. It is the effective co-operation of the scientist, the technician and the engineer that will meet the increasing demands of the growing population of the world. Already the material world is being transformed and transformed rapidly. But the transformation may not be attributed to pure science alone. An essential element—perhaps the most important element—is the correlating faculty of the engineer. Such developments involve a large element of sound judgment and much cautious trial and error. The laurels for the adoption of the discoveries of pure science to the needs of the common man rightly belong to the engineering profession.

The achievements of Indian engineering have been considerable in the past few years. The refugee problem that followed in the wake of independence was an immense one, and the building programme to house these refugees was indeed praiseworthy. The national reconstruction demanded the construction of huge

* From the Presidential Address of Sri. Kanwar Sain at the 37th Annual General Meeting of the Institution of Engineers (India), held at Trivandrum, January 1957.

buildings and multi-storeyed structures for Governmental office buildings and other purposes; new highways with incidental bridges, causeways and other crossings; industrial townships and factories like Sindri Fertilisers; capital city constructions like Chandigarh in East Punjab and Bhubaneswar in Orissa; and many other structures of marked engineering efficiency such as the Banihal Tunnel and the Vigyan Bhavan.

The river valley development in the country is gaining momentum every day. The Tungabhadra and the Lower Bhavani Dam constructions in the South have been completed. The first phase development of the Damodar Valley is complete. Two dams, Tilaiya and Konar, and the Durgapur Barrage are already functioning. The construction of the Maithon Dam is almost over and the constructional tempo on the Panchet Hill Dam is gaining rapid pace. The Hirakud Dam with some unique features of design and construction was opened by the Prime Minister on 13th January 1957. It is the longest dam in the world measuring about 16 miles from one end to the other. The construction of the 740 feet high Bhakra Dam is progressing according to schedule and will be completed by about 1959. Koyna, Rihand, Chambal, Kosi, Nagarjunasagar and many more are under various stages of execution. An idea can be had of the magnitude of the river valley project development from the fact that the amount spent on them every year is more than what was spent during the entire century prior to Indian Independence. The development is exciting and spectacular.

The Indian Railways have registered their landmarks by the construction of the Chitteranjan Locomotive Factory and the Perambur Integral Coach Factory. The engineers of the Army have contributed their mite and shown efficiency in the construction of the Nepal Road—a national highway linking India with Nepal, the Bharat Electronics Factory at Bangalore, and the Machine Tools Factory at Ambernath. No less striking is the development in the branch of Posts and Telegraphs. Carrier current communication has been extended to most parts of the country and further development in the shape of coaxial cables for increasing the capacity of transmission between the main traffic centres is being extended. Wireless communication including VHF facilities are being increasingly used.

Realising the importance of research in the technological development of the country, several national laboratories, technological institutions, hydro-meteorologic observatories and aerodynamic research stations have been established. As an instance in point, one may mention here the part played by the Central Water and Power Research Station at Khadakwasla in taming the Brahmaputra to save the town of Dibrugarh in Assam. It looked almost certain that the town would be swallowed up by the mighty river. Nothing short of a heroic battle for Dibrugarh was fought, with the result that the town has been saved from further danger. This was made possible through basic research conducted in the laboratory and the bold action in the field.

On the industrial side too, our development has been no less marked. The Hindustan Aircraft Factory, the Telephone Industry, Electric Cable Industry, Machine Tools and Oil Refineries are a few major ones of the many enterprises. Many new heavy industries are programmed in the Second Five-Year Plan. The stress is more on the rapid industrialisation of the country, though considerable importance is attached to the agricultural improvement projects. The basic iron and steel industry has been given great importance. The Rourkela, Bhilai and Durgapur Iron and Steel Plants are being pursued vigorously.

Special mention should also be made of the Atomic Energy Plant at Trombay. This opens up a vast field for the utilization of our extensive atomic energy resource.

Our past achievements should not make us complacent and dim our vision for the future. What was done yesterday may not suffice for tomorrow. We must develop more and more of reliance on ourselves. With this object, it is necessary that the Indian engineers are given the opportunity to advance their technical knowledge by specialised study and training to equip them to shoulder greater and greater responsibilities. The challenge of these responsibilities will make them grow.

There is certainly enough talent in the country. What is required is a correct orientation and channelising of available talent on the right lines.