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METALLURGICAL RESEARCH AND INDUSTRIALISATION*

IN the distant past this country was foremost in metallurgical industry and contributed much to human knowledge of metals and alloys. India was the first country to evolve the composition of some of the well-known alloys. Now in our own time too this country has the distinction of being one of the largest iron and steel manufacturing countries in the world. The Tata Iron & Steel Co., the Steel Corporation of India and the Mysore Iron and Steel Works have contributed to raising India to this place of honour.

During the years of the war, India's steel production reached 2 million tons per year. Other metallurgical enterprises such as the manufacture of alloy steels, ferro-chrome,

ferro-manganese, ferro-silicon and aluminium, were also started. But the position is not one for complacency.

THE IMPERATIVE NEED FOR A PROSPEROUS METALLURGICAL INDUSTRY

Although we possess a sizeable iron and steel industry, we are backward in other aspects of metallurgical industry, which cover a very vast field. We are entirely dependent on other countries for high-speed tool and alloy steels, aluminium, magnesium, various ferrous and non-ferrous alloys and their products. In consequence, engineering industries, the manufacture of internal combustion engines, electrical industry, ship-building, aircraft, chemical industries and several other important industries, which depend on metallurgy for the supply of the necessary constructional material, have not grown in the country. If India is to embark on any kind of industrialisation,

* Extracts from an Address delivered by the Hon'ble Mr. C. Rajagopalachari, on the occasion of the Foundation-Stone Laying Ceremony of the National Metallurgical Laboratory, at Jamshedpur, on 21st November 1946.

and achieve success in a reasonable measure, high priority must be given to the proper establishment of metallurgical industries, on an adequate scale. The mineral wealth of the country must be fully exploited. India is not far behind the richest countries in the world in respect of minerals of economic value. Not only clay, limestone, iron ore and gypsum but bauxite, chromate, manganese ore, rutile, monazite, and ilmenite are available in plenty. All these valuable minerals should be worked up for the growing needs of the country and not just exported as hitherto. During the past 30 years India's export of manganese ores ranged from one-fourth to more than half of total world-production. And this mineral is almost entirely absorbed in iron and steel industry.

It has been estimated that in the near future hydro-electrical energy at the rate of over 4 million K.W. will be produced as a result of various hydro-electric projects. A large part of this energy will be available in the vicinity of the raw mineral resources of the country. Electro-metallurgical and electro-chemical industries based on electricity thus available at low cost can play a great role in the industrial life of the country. Our immediate requirements 20,000 tons of aluminium, 5,000 tons of magnesium, 15,000 tons of copper, 60,000 tons of electric furnace steel per year, and large quantities of other electro-thermal products like alloy steels, ferro-chrome, ferro-manganese, ferro-silicon, graphite and carborundum, can be based on this cheap electrical energy.

SCIENTIFIC RESEARCH—AN ESSENTIAL PRE-REQUISITE TO PROGRESS

For the organisation and progress of industries, scientific research of a high order is an essential prerequisite. Taking the lowest view of the matter, scientific research pays. It helps to increase efficiency of means used to lower cost of production and to evolve new processes and new products. All experience in recent times show that research, pure as well as applied, helps industries earn very handsome dividends. It is no good leaving things entirely to the government or to anyone else. Excepting in a few isolated cases like the Tata organisation and perhaps the tea and jute interests of the country, industries in India, big and small, are not yet alive in adequate measure to the advantages of scientific research. Among the many factors that have been responsible for this state of affairs, there is the vicious circle that we have to face in all progressive endeavour. Without prosperity industry cannot afford research, and without research industry cannot prosper. This circle must be

broken, somehow or other, and soon. The responsibility, therefore, falls on Government to help scientific research in the cause of national progress. The Council of Scientific and Industrial Research has, therefore, founded National Laboratories.

FUNCTION OF THE NATIONAL LABORATORIES

It is not intended that these National Laboratories should take upon themselves the functions properly belonging to individual or collective industrial concerns in respect of research. The nature of research work intended to be carried on in the National Laboratories is of the kind that is not ordinarily covered by the work of research that can be conducted by industries themselves, by individual concerns or on a co-operative basis. The Government has to be on the watch for new developments in scientific knowledge which may be of economic or social value to the nation. When such developments offer sufficiently attractive openings, the industries will in most instances probably be ready to take them up and develop them. But the Government has to take the initiative, whenever possible, in collaboration with the particular industry, in exploring new ideas on an adequate scale and, in the event of successful development, taking appropriate steps to secure the widest possible application of the results. Applied scientific research has often necessarily to be carried out in a big institution. The National Metallurgical Laboratory will work in the closest collaboration with all the existing research institutes. While carrying out such tasks as devolve on it in connection with metallurgical research, it will endeavour to promote research by the industry itself, individually, or through co-operative organisations, so that the metallurgical industry of India can soon come to rely upon its own strength and initiative. The metallurgical and other industrialists of the country will give the fullest support to this most important National Laboratory.

SCIENCE—A GREAT UNIFYING FORCE

We are on the threshold of a future full of trials, heavy duties and great rewards. In the trials and in the duties that await us, scientists and engineers of the country have to take a very large part. They have great opportunities for service, far greater than they had ever before. They will see the whole country rallying round them, howsoever apparently divergent be the views and aspirations of political or other groups. Science is a great unifying force and may save us where religion as practised has not only not availed, but seems to hinder and divide.