CURRENT SCIENCE

Vol. X] FEBRUARY 1941 [No. 2

WAR EFFORTS AND THE KEY INDUSTRIES OF INDIA

THE rapid rise to power of countries organised in deadly earnest has been the marvel of the last decade; and the technique of warfare developed in these countries has hardly been less revolutionary than the technique of the organisation of the State. The democratic governments could only look wistfully at this war preparation of the totalitarian States, for they could not secure the whole-hearted co-operation of all sections of the people in counter-preparation until they could rouse popular enthusiasm with the slogan "our country is in danger". In India, the most important political party professed faith in complete non-violence; and the other parties have been reluctant to lend their support to additional military expenditure on the ground that so long as India remains a dependency and her sons have no effective voice in military administration, defence of India is an imperial problem of Great Britain and that Indian defence forces are no concern of the people of India. The fateful events that have followed the German conquest of the small neutral nations of Western Europe and the complete collapse of France have rude awakened us to the danger which the victory of totalitarian States exposes us to; and there has developed a genuine interest in the war-efforts of the country. Uninformed criticism has

even swung to the opposite extreme. People are not wanting who question the adequacy of a war-effort which is intended to expand the army of this vast country by 130,000 men, when during 1914–18 nearly a million combatants were sent overseas from India. This arises from a failure to appreciate how completely 1940–41 differs from 1914–18. Then massed infantry and cavalry equipped with rifles, supported by artillery and machine-gun units and maintained by animal transport were fully competent to deal with the enemy, and were in fact the main weapons of offence. Air power was important, but was only a side-show, and the use of mechanised vehicles was in a very elementary stage. To-day, military science has been revolutionised. Riflemen are of little value unless used in co-operation with more highly technical mechanised arms. The German army easily broke through the French line by striking with armoured divisions supported by dive-bombers from air and by well-equipped machine-gun men on motor vehicles. Finally came the mass of foot soldiers to hold and consolidate the ground already gained. The adequacy of military preparations is therefore not to be judged by the recruitment of new combatants, but by the expansion of the production of modern munitions of all kinds. It has been estimated that a single active combatant in the field requires 10 tons of equipment in order that he may be effective, and that munitions include 60,000 items of materials and supplies of which India can produce only 30,000 items.

This view-point was emphasised more than a year ago in a broadcast by H. E. Sir Robert Cassels; when he lamented that India's industrial backwardness stood in the way of adequate military preparation. "India's greatest asset is a large supply of the finest types of fighting men. Her great weaknesses are a low national income and a limited industrial development, incapable as yet of supplying the technical equipment of a modern army. History has amply shown that victory is not the prerogative of a large organisation swollen with ill-armed soldiery, but rather of small well-equipped armies modern for their period. This is even more true to-day than it was at any time before, and now-a-days large ill-equipped armies are nothing more than sheep for slaughter." Indeed this difficulty was realised by the Chatfield Committee which made an exhaustive enquiry into the problems of Indian defence about three years ago. They concluded that the ordnance factories were woefully inadequate and recommended their immediate expansion at a cost of about 7 crores of rupees. The British Government even agreed to defray a part of this capital expenditure by a generous subvention. It is indeed significant that General Auchinleck, the Secretary-Member of the Chatfield Committee, should have been appointed the Commander-in-Chief in India in succession to Sir Robert Cassels. This selection justifies the belief that the programme of mechanisation together with the development of those industrial resources which are needed for defence will receive in future infinitely more attention from the Government of India than in the past.

It is no use ignoring the fact that the Indian nationalists have a grievance against the Government of India for their lack of foresight in handling problems of industrial development. Under the stress of the war

of 1914, the Government of India declared in 1915 that India was entitled to receive all the support that a Government could give in order to enable her to take a leading position among the manufacturing countries of the world. But the lessons of that war were soon forgotten. As Sir Ardeshir Dalal made a pointed reference in his Presidential Speech at the last Science Congress, the industries created by the last war languished and died in the post-war period for want of encouragement and protection from Government. It will be unfair to maintain that the Government were altogether blind to these tragic happenings. A Fiscal Commission was appointed, and in accordance with its recommendations, a policy of discriminating protection was adopted. Only those infant industries were protected which would in the long run be able to dispense with protection. The result has been that industries came into being which could command an abundant supply of raw materials and a ready market for finished products within the country itself. Thus in 1938–39, cotton manufactures stood at 920 million lbs. and cotton piece-goods at 4,200 million yards. Paper registered a production of 1·35 million cwt. in 1939–40. Match industry has maintained itself under protection, and India is producing more sugar than her current requirements. And even unhelped by tariffs the production of cement has gone up from 1,000 tons in 1914 to more than a million tons in the current year. But we are fast approaching a limit to such expansion in the home production of consumer's goods. Indian produce such as jute, tea, cotton, hide and oil-seeds have got to seek a market abroad with the result that a trade balance has to be maintained by import of a certain minimum of consumer's goods. An increase in national income and a consequential increase in the *per capita* consumption of manufactured goods would have been a way out of the difficulty. But this unfortunately has not come to pass; and the gains from industries producing consumer's goods have been offset by the difficulties of the masses whose agricultural products are fetching lower prices and are having shrinking foreign markets.

The way out of this impasse, which is also a solution of the difficulties that are hampering our defence preparations, lies in the establishment of key industries. Adopting a division which is convenient in practice, one can speak of a category of industries and services that supply materials to other industries rather than to the individual consumer, industries that are calculated to improve the capital equipment of the country. The nation has till now been content to produce some types of consumer's goods with the aid of foreign machinery. But, from the point of view of sustained progress, the development of key industries is of paramount importance. The metallurgical industries, the engineering and machine tool industries, the chemical industries and the transportation industries broadly cover this category. In war time, the output of these industries are closely integrated with that of Ordnance and Armament factories which are directly managed by the State for the production of munitions. Leaving aside actual training of combatants, war effort becomes synonymous with expansion in the production of munitions by bringing into being these new industries or very rapid development of such of them as are already in existence.

The vision and enterprise of the Tatas have given India one key industry which is proving of incalculable value in the present crisis. Under the stimulus of the war, the Tatas have increased their production of steel in 1939–40 to more than a million tons. The Bengal Steel Corporation and the Mysore Iron and Steel Works will, between them, be soon responsible for the production of another 300,000 tons of steel. The possibilities of India as maker of steel are immense. Indian ores are rich and within easy distance of coal deposits. Limestone, dolomite, manganese and chromite are plentiful. There is no reason why India should not supply all the steel requirements of the countries represented in the Eastern Group Conference. At Jamshedpur have just been installed two five-ton electric furnaces for the manufacture of the superior quality of alloy steel required by the Defence Department, and similar steps for producing high grade steel have been taken in the Mysore Steel Works. Manufacture of armour plates which have passed the Army tests has been taken in hand and Acid Steel of superior quality has also been just produced from Indian pig iron; this successful development is likely to have far-reaching effects on the manufacture in India of locomotives, railway wheels, tyres and axles for which acid steel is specified. The manufacture of tin plate is making good progress, and the Indian Steel and Wire Products Co., are turning out 50,000 tons of bars, rods and wire nails per annum.

While India is rapidly developing her capacity for the production of iron and steel, the progress of the other metallurgical industries has been disappointing. The Indian Copper Corporation only produces a fraction of the country's requirements, while aluminium, nickel, lead, zinc, tungsten and other important metals have all been imported till now. Good deposits of nickel are stated to have been found in Nepal, but they are in areas too inaccessible for successful working. Under the stress of the war, the Government of India has promised to grant protection to the aluminium industry in future; and as a result the Aluminium Production Co. of India, Ltd., are establishing an aluminium smelter in Travancore of an ultimate capacity of 5,000 tons per year. Electric power will be supplied by the Travancore State at a very favourable rate. Steps have been taken to acquire suitable deposits of bauxite from which alumina will be manufactured locally. A sheet rolling mill for the production of aluminium sheet has also been erected near Calcutta. The increasing output of munitions of all kinds with the possibility of construction of ships, tanks, motor vehicles and aircraft in India will all make demands on the aluminium industry which, it is hoped, will be met from sources within the country. Apart from this aluminium industry in the making, no visible progress has yet been made in establishing other non-ferrous metallurgical industries.

If our progress in non-ferrous metallurgical industries has been disappointing, our progress in engineering and machine tool industries has been still more so. In 1938–39, India imported machinery and mill work worth 19 crores of rupees, instruments and scientific appliances worth 6 crores of rupees, and even belting for machinery worth 50 lakhs of rupees. Besides the railway workshops, the engineering industries are mostly located around Calcutta and Bombay and give employment to nearly

300,000 persons. They specialise in fabricating structural steel work like bridges and storage tanks, and also supply part of the country's demand for engineering stores in the textile, tea, mining and sugar industries. Small beginnings have also been made in the manufacture of workshop machines, low horse-power electric motors, transformers and electrical lamps. The Government has appointed a Director-General of Engineering Supplies with headquarters at Calcutta; and a special advisory committee has been set up to serve as liaison between Government and the Industry. The people of India are, however, suspicious that some "bottlenecks" exist in the engineering industry behind the scenes, and they are convinced that conscious purposeful direction can produce vast changes. Already there are pointers in the right direction. The growth of these industries has been largely retarded by the inadequate facilities for training of craftsmen and the limited use of apprenticeship facilities. Active remedial measures are being adopted; and schemes for the annual training of 4,000 skilled mechanics in the various technical and scientific institutes of the country at the expense of the Government of India have been sanctioned. These industries were hard hit in the slump that followed the war of 1914. Once bitten, twice shy. They have now to be created by a Government with imagination. This is a war where machines and munitions count more than men, and no extraneous interests should be allowed to hamper the attainment of India's self-sufficiency in this field. And once created for war purposes, these industries, we hope, will in peace time, convert swords into plough shares: and the future Government of India, we also hope, will not hesitate to fulfil the pledge which Sir A. Ramaswamy Mudaliar gave in March 1940: "In case we, in any form, encourage the development of industries for our war needs, we shall make it clear that at the end of the war, those entrepreneurs who had come to the assistance of the State would not be left high and dry to take care of themselves."

The heavy chemical industries of India are rapidly getting in the way of production and may soon satisfy a large part of the country's requirements. Even before the war began, most of the acids and salts were being manufactured in India. It is also welcome news that there are deposits of sulphur in Baluchistan and deposits of pyrites in Simla hills, Behar and Hyderabad, which can be drawn upon for manufacturing sulphuric acid if the foreign supply of sulphur were, for any reason, cut off. Some of the paper and textile mills are producing alkali and bleaching powder for their own requirements. With commendable vision, the Mysore Chemicals and Fertilisers have put up a plant for the production of synthetic ammonia and ammonium sulphate with a capacity of 6,000 tons a year. The Mettur Chemicals will also soon be producing large quantities of chlorine, bleaching powder and caustic soda. But the biggest development in the field has been the establishment of two factories one in the neighbourhood of Calcutta by the Imperial Chemical Industries, Ltd., and the other in Kathiawar by the Tata Chemicals, Ltd., which was started with an authorised capital of Rs. 5 crores of which Rs. 1¼ crores were issued in 1939. These huge concerns aim at producing at an early date in the country itself all our requirements of acids, alkalis, bleaching materials and artificial fertilisers, like potassium and ammonium sulphate.

It is an entirely different tale when we

consider the dye-stuff and synthetic drug industry. The import of dyeing and tanning materials amounted to 3·9 crores of rupees in 1937–38, more than 60 per cent. of the supplies coming from Germany. In September 1939, the Indian Millowners, in anticipation of war, had laid by considerable stocks of dyestuffs, and also the stock of German dyestuff in Bombay, which was confiscated, as enemy property, was found to be of very considerable magnitude. If, however, the contingency were to arise that maritime communications with Britain were seriously dislocated, practically all the dye-houses in India will have to close down. The history of the British dye-stuff industry should be an object lesson to us in our present situation. Before 1914, Great Britain did not possess a dye-stuff industry of any importance, over 90 per cent. of the dyes used being imported from Germany. As the last war progressed, the situation became very serious and it was realised that British dependence on Germany for dyes was tantamount to a much wider and more fundamental weakness of British Chemical Industry, as the production of dyes was intimately connected with the production of chemicals in general. Modern war depends for its successful prosecution on an abundant supply of an infinite variety of chemicals; and a dye-stuff and a fine chemical industry must be considered an integral part of every defence programme. The British Government took immediate and far-reaching steps. Beginning with a direct and large subsidy for the formation of a company which ultimately was absorbed in the Imperial Chemical Industries, millions of pounds were spent on the rapid development of every branch of the industry. Later on, the importation of dyes and even intermediates was prohibited. As a result, the British dye-stuff factories are now producing over 90 per cent. of their home requirements and have in addition a considerable export trade. The Government of India have just set up a plant for the recovery of toluene and benzene from coal-tar at a cost of 16 lakhs of rupees; and the Hon'ble the Commerce Member has announced that he would soon appoint an expert committee to explore the possibilities of establishing a Dye-stuff and Fine Chemical Industry in India. It is to be hoped that the Government of India will follow in the footsteps of the enlightened Government of Great Britain in this matter and that before long, this vital key industry will form a part of the capital equipment of Industrial India.

In India, the railways are either owned or controlled by the State while air transport services are in receipt of considerable subsidy. The railway workshops and the private engineering industries practically manufacture the whole of the rolling stock excepting locomotives. Sir M. Visvesvaraya lamented that no progress had been made in the manufacture of locomotives in India, even though in Mysore a metre gauge engine was built many years ago, and the railway workshops at Ajmere were capable of doing this job successfully. Under the continuous pressure of public opinion, Government decided just before the war to start manufacture of metre gauge engines at Ajmere and broad gauge engines at Kancharapara. But the war has upset these plans, as these workshops are now needed to manufacture more urgent munitions.

The Chairman of the Tata Iron & Steel Co., several years ago expressed the hope

that the steel plates manufactured at Jamshedpur might be used for ship building in the yards of Calcutta. This dream has not yet been realised. The yards at Calcutta are even now not capable of building launches and tugs of more than 1,500 tons, and manufacture of ocean-going vessels is absolutely beyond their capacity. The proposals for building shipyards have not yet received the support and encouragement which are necessary for their speedy accomplishment. The Scindia Steam Navigation Co., has however just taken up this enterprise in real earnest and in spite of the indifference of the Government is going ahead with the project of establishing a ship-building yard in the new harbour of Vizagapatam.

Nor has Indian war effort reached a stage when the ability to build aeroplanes and automobiles is considered essential. It is in these spheres, that the difference between war effort as it is and war effort as it should be, is most glaring. The Defence Department even a few months ago, was of the opinion that it was quite useless for the purposes of the present war to imagine the possibility of developments in these directions. Thanks, however, to the keen interest and the financial assistance of the Mysore State, Mr. Walchand Hirachand is putting up an Aircraft Factory in the neighbourhood of Bangalore. The American technicians in charge hope to produce aeroplanes from this factory in six months. The scheme for establishing an Automobile Industry in Bombay has not made much headway even though the project was mooted by Sir M. Visvesvarava in 1935, and a detailed report submitted in April 1936. It was intended to manufacture 11,000 vehicles every year in a factory with a capital outlay of 2¼ crores of rupees. The Indian Industrialists are obsessed with the fear that the manufacture of motor vehicles is too difficult to be undertaken by Indian workmen in the near future. They forget however, that the thought and skill required in manufacture have been transferred from workmen to automatic machines. Russia started the manufacture of motor vehicles about 7 years ago and produced 200,000 vehicles in 1938. Immediately on the declaration of the war, the Australian Government passed a Motor Vehicle Bounty Act, which provided for a bounty of 1½ million pounds for the first 60,000 automobiles manufactured in this country. The Government of India are not yet satisfied that the proposals for a motor car industry would be conducive to war effort. There is a silver lining however, in that non-official British opinion in India is now very strongly in favour of starting these industries. In an article on the 15th November 1940. *The Statesman* urged that Indian production of aircraft, ocean-going ships and motor engines was "fundamental and inescapable, and if we fail to do these things we do so at our peril". It advocated the wholesale transference of some factories from Great Britain to India as it sometimes "ceases to be good policy to put up factories to be knocked down and to seek new sites in a small island where work is for ever being interefered with from the air". They say that great responsibilities and small minds go ill together; there is no lack of complications in Eastern Asia; and the people of India hope that in these vital matters of key industries, the decisions of the Government of India will be guided by a national outlook and by a bold, constructive and vigorous programme which will make the defences of India as invulnerable as is humanly possible.

J. C. GHOSH.