CHAPTER-IV

TRADE, COMMERCE AND INDUSTRIAL CONTEXT

The World War II broke out in September 1939; though far from the scene of action, Punjab in particular and India in general could not remain unaffected by the forces of change. It unleashed across the globe. Myriad of problems of basic nature cropped up in Punjab and also the country; but what concerned the Government of Punjab first and foremost were the immediate exigencies of the War. Military and strategic demands, obviously, stood at the top, and the government effort to meet them soon involved the province in the overall War efforts of the British Empire and its Allies. India had supplied nearly 400 million tailored ‘items, 2.5 million pairs of shoes, 75,000 silk parachutes. India’s chief industrial contribution was cotton textiles. At one stage, India provided the enormous amount of 1.2 billion yards of cotton per annum to the defence forces; India, in fact, clothed the armies east of Suez.¹ Ministry of Supply of United Kingdom placed with India an order of 3 billion blankets in October 1939.² It was in the context that science and technology assumed great significance; and, as the experiences would show later, the Imperial War exerted considerable influence both on their progress as well as the British policy governing then in Punjab.

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On 3rd September 1939, Lord Linlithgow, the Viceroy of India (1936-1937 to 1938-1943), declared India at War with Germany, through a vice-regal proclamation. Unlike in the Dominions, in India this was done without consulting the members of the Central Legislature and the Council; the provincial councils and, not less importantly, the country’s political opinion. Under the Defence of India Rules, promulgated shortly afterwards, the government assumed sweeping powers. The Indian National Congress and others objected to the move but ultimately agreed to India’s participation in the War

on the condition that freedom would be granted to her as well. This was a tricky situation. So, to confuse the issue, the Viceroy made what was then known as the ‘Delhi Declaration’ of 17th October 1939. The old offers of Dominion Status for India were repeated and more consultations with Indians were promised. But when this did not work, the government softened its attitude further and in order to seek the Punjab support in the crisis, made the ‘August Offer’ (8th August 1940). It was a little more than a repetition of the 17th October 1939 offer which was, of course, followed by a few administrative measures aimed at satisfying the nationalist demands.\(^3\) As these moves and counter-moves were played out, the government stepped up efforts to gear up the Indian resources to deal with the exigencies of the War, not only in Punjab but also at distant War fronts. One of the first steps taken by the government was to convene the Eastern Group Conference in 1940 in Delhi. This resulted in the formation, in February 1941, of the Eastern Group Supply Committee with headquarters in India especially in Punjab.\(^4\) It proved its usefulness mainly by saving much time in procuring articles of military equipment in the area East of Suez. In its two years existence, it could procure goods at the value of £ 174 million. It wound up officially its activities on April 16, 1942.\(^5\) India developed ‘a vast industrial machine for war supplies of every kind’.\(^6\)

In India, realization of the value of science in the contemporary crisis came after bitter experiences. As the Imperial War raged, it badly exposed India’s and also Punjab’s technical and industrial backwardness and her dependence on others for a large variety of goods and commodities essential not only for the wartime requirements but also in the times of peace.\(^7\) Not to talk of the numerous War supplies, the country and the province in question were unequipped even to service and maintain the defense equipment and such basic necessities as transport and communications system. Commenting on the


\(^5\) Johannes H. Viogt, India in the Second World War, p. 81.

\(^6\) The Khalsa, Lahore, 5.10,1941.

situation, *Science and Culture* observed in its editorial in November 1939: “... the outbreak of the War has found India totally unprepared not only for defense and offence, but also for maintenance of the smooth tenor of civil life, should the War be unfortunately prolonged for three years. Already the prices have soared up and if the complications further increase, some of the essential commodities for which India depends on foreign countries may be entirely stopped. It should be borne in mind that in spite of the pious intention contained in the resolution of the Government of India [of 1919 sent to the Secretary of State]...we have not developed our power resources; no steps have been taken for the manufacture of essential chemicals, metals and alloys, and commodities required for the maintenance of transport and communication services. The industries for the manufacture of scientific apparatus, glass and many other essential are either in a backward condition or do not exist at all. 8 Lord Chatfield’s Committee had recommended a outlay of Rs. 7 Crore for expanding Indian Ordnance factories. After the fall of France, India was conceived as a cetnre of a Commonwealth group for the supply of the Middle Eastern theatre. 9

This showed Punjab’s utter inadequacy, in terms of quantity as well as quality, in the technical infrastructure and know-how. There were, no doubt, a number of scientific institutions and organizations in the country, but there was no integrated central control and coordination amongst them. Needless to say, there was no uniform official policy governing science either. But the War compelled the authorities to have a fresh look at things and make the best use of science for victory. The understanding and activities in England and the Allied circles did have immediate repercussions in the Punjab. In response to the call for co-operation within the Commonwealth and amongst the Allies for the War, India opened her liaison offices in London and Washington; scientific and technical missions were exchanged and by 1942, a War Resources Committee was constituted. A range of activities followed in the years to come. 10 India became the


principal supplier of cotton textile, jute, and jute products, leather products and wooden
furniture. India supplied 60 per cent of its total demand which upto 75 per cent.\textsuperscript{11} The
profit in the entire Indian economy from 1940 to 1941 rose from 161 million rupees to
223 million, while the profit in the textile industry were more than doubled from Rs. 28
million to Rs. 70 million during 1940-41.\textsuperscript{12}

**TECHNICAL EDUCATION**

The need for immediate supply of technical personnel to the fighting machinery
and scores of industries that backed up the gigantic War effort was a matter of first and
foremost concern. Introduction of sophisticated weapons and machinery including the
aero planes added urgency to the matter. This is the reason why the Government of India
was jolted out of inaction all of a sudden and compelled to encourage technical
education. Industrialists showed interest in it because they, too, needed more technical
hands for stepping up their production. For the average middle class Indian, technical
degrees became a route to better employment.\textsuperscript{13} Realizing that trained technicians were
not readily available in the Punjab and on the whole in the government resorted to
emergency measures. In June 1940, a War Technicians’ Training Scheme was
introduced. The existing technical institutions, factories and workshops (especially those
attached to the ordnance factories and the railways) were pressed into service wherever
possible, and a target to train 52,000 persons by 1943 was fixed. Under the plan for
technical training drawn up by the Labour Department of the Government of India, about
300 training centres were developed and by 1945 as many as 80,000 people had been
trained most of whom were absorbed into the army.\textsuperscript{14} The need was so pressing that the
government did not hesitate in starting such technical training centres even at places like
the college of Engineering and Technology, Bengal, at Jadavpur, and Lahore in the
undivided Punjab, which had otherwise been the citadel of the National Education, a


\textsuperscript{12} Johannes H. Voigt, *India in the Second World War*, p. 77.


\textsuperscript{14} Ibid., pp. 173-174. For details, see *Report of the Technical Education Committee of the
Central Advisory Board*, Delhi, pp. 24-25. *The Indian Information*, 15 September, 1945,
p. 253.
programme of *Swadeshi* movement, in the country.\textsuperscript{15} Liberal allowances were given during the period of training. About a hundred special technical instructors were requisitioned from England. Under the Bevin Training Scheme, young Indians aged (majority from Punjab) 20 to 30 years were trained at selected centres in England in engineering, trades and in the principles of labour organization. On their return, they were employed in responsible supervisory posts including in the army.\textsuperscript{16}

The fall of France in June 1940 and the Japanese advance towards India changed the whole strategy of the War. In the new scheme of things, India assumed greater significance than ever before. Now the battle was to be fought and won in Asia, for which India was to be used as a base both for supply and operation. The British and the Allied effort were, therefore, concentrated on India in order to develop her into a strong base, sufficiently independent in resources and powerful enough to check the Axis advance. Soon India was taken into Allied planning and measures were set afoot develop her accordingly. Two factors required urgent attention: first, the country needed to be provided with enough facilities for servicing and maintenance of military machines and equipment; and, secondly, her industries were to be geared up to cater to the War efforts and tide over the economic crisis caused by the War. In order to ensure this, expert missions from the Allies, the UK and the USA in particular, visited the Punjab in quick succession. This was reciprocated by the visits of Punjab technical teams abroad.\textsuperscript{17}

The Ministry of Supply (Roger) Mission from Britain visited various provinces of India in September 1940. But the visit of the American Technical Mission in 1942 was more important in many ways and influenced the developments in India considerably. The Mission, with Henry F. Grady as chairman, arrived in New Delhi on 17\textsuperscript{th} April 1942 and worked in India for the next five weeks conferring with officials of various departments of the Government of India and of some of the provinces and states. It also conferred with industrial leaders, businessmen and Chambers of Commerce in New

\textsuperscript{15} National Council of Education, Bengal, 1906-1958, Calcutta, 1956, p. 32.


Delhi, Calcutta and Bombay. It visited government munitions factories, railway workshops, shipbuilding and ship-repair shops, and the principal industrial plants engaged in the production of War materials in and around Calcutta. It also inspected the Tata Iron and Steel Company at Jamshedpur and major industrial plants at Bombay and the Karachi port.\textsuperscript{18}

To begin with, the focus of the Commission in this regard was limited primarily to servicing and repair of the military equipment and, thus, developing Punjab as what may be called a base workshop for the Allied forces.\textsuperscript{19} Although this did not envisage any technical progress of an advanced nature, it pleaded, nevertheless, for enhancing the technical capabilities in the areas and at a scale never thought of in the past. This imparted urgency to the development of technical education in the province. Moreover, by advising import of technical personnel, including for technical education and technical training of Indians abroad, especially in the USA, it inaugurated an era of scientific and technical collaboration between India and the non-British world.\textsuperscript{20} On this and the allied subjects, expert committees were also constituted internally to advise the British Government of India. An Industrial Utilization Committee was appointed in 1940 followed by an Industrial Research Fund the next year. A Directorate of Merchant ship Repairs was constituted in 1942, and the same year the Grant Massie Committee was convened to advice on the procurement and production of surgical instruments. The UK Machine Tool Mission visited India in July 1944. Most of these Committees had a bearing on the introduction and expansion of new technology in the country, and suggestions of some of them led to increased facilities for technical education. In order to make available a sufficient number of technical personnel for the post-War needs, the government instituted an Overseas Scholarship Scheme towards the end of 1944. An

\textsuperscript{18} \textit{American Technical Mission to India, A survey of India’s Industrial Production for War Purposes: Report of the American Technical Mission}, Washington, 1942 (This report has many versions).

\textsuperscript{19} \textit{Ibid.}.

elaborate arrangement was made in this regard and students were sent to UK and USA for studies.\(^{21}\)

Away from such emergency measures, technical education continued to be imparted as usual at its traditional centres, viz., universities and schools and at workshops of government establishments like the ordnance factories and the railways, and at workshops of private enterprises. But the state interest in these centres was limited only to such technical courses as were of immediate value for the War. Otherwise, the government was rather indifferent to the purely academic aspect of the subject. No doubt, a new polytechnic school was started at Delhi in 1941 and new technical courses were introduced or old ones reframed at the various universities in the country,\(^{22}\) but most of the academic centres concerned were starved of funds and staff during the War.\(^ {23}\)

However, we cannot overlook certain positive developments. When the War started, technical education was not organized in the province of Punjab and India. This had been promoted until then only to meet the demands of such sectors as the railways, ordnance factories and a limited number of industries. There was no long-term government policy in the matter. Institutions of technical education suffered from a plurality of authority, absence of coordination and planning, and from the paucity of funds and resources. The number of courses was limited and the subject was yet to become an integral part of the education system. Most of these problems continued even later, but the War and the enhanced indigenous demand for technical education obliged the government to promote it systematically.\(^ {24}\) In the Punjab, more than 300 technicians were trained in about 18 centres. They belonged to all the classes and communities. Both the literature as well as illiterate men had equal opportunities of learning how to become blacksmiths, carpenters, copper and tinsmiths, fitters, moulders, painters, pattern makers, writing knowledge of


\(^{22}\) *Progress of Education 1937-1947*, p. 171.

\(^{23}\) Departmental proceedings are full of references to War-time cuts in finances to scientific institutions.

Urdu and English and necessary for some trades. Stipends of Rs. 22 and Rs 27 were given. They were trained in Lahore at N.W. Railway Workshop, the Craik Technical Institute and the Victoria Diamond Jubilee Institute.²⁵

One of the first important steps taken in this direction was the foundation of the Association of Principals of Technical Institutions, India, in 1941.²⁶ But perhaps the most important step taken by the government was the appointment of the Technical Education Committee in 1943. Under the Chairmanship of John Sargent, Educational Advisor to the Government of India, this Committee was appointed by the Central Advisory Board of Education ‘to explore ways and means of developing facilities for technical education in the country as a whole’. The Committee began with a discussion on the problems and prospects of technical education. It attributed the restricted demand for technically trained hands in India to be limited and uncertain job opportunities, the practice of filling more remunerative posts with imported technicians and to the traditional dislike of the middle and upper class Individuals for taking industrial occupations.²⁷ However, the Committee appreciated the salutary changes brought about by the War. It noted the expansion of industries and the greatly increased demand for technicians.

**SCIENTIFIC AND INDUSTRIAL RESEARCH**

However, only the repair and maintenance of weapons and machinery used in the War was not enough. The War that was expanding both in time and space required more supplies, its ferocity demanded more powerful weapons, and the wants and shortages it created obliged the government to ensure unhindered supply and search for substitutes. This became all the more urgent after the fall of France, which brought the War nearer home for Britain; and communications with India and supplies to her were badly disrupted. Similarly, the Japanese advance in the East and fall of many British possessions like Burma and Malaya blocked supplies of a large number of items to India,

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²⁵ *The Khalsa*, Lahore, 3.5.1942.


such as tin, cinchona, wood and rice.\textsuperscript{28} To add to the problem, the concentration of Allied troops (along with the expanded Indian Army) in and around India required the supply of hundreds of items from arms and ammunition to clothing, food and medicine. The Indian army (mostly hailed from Punjab) expanded in size from just over 205,000 in October 1939 to over 2,251,000 in July 1945. All this necessitated revamping of basic amenities like transport and communications, and health services, along, of course, with increased defense preparedness. Thus, in a situation of acute disruption in imports and dislocation of economy, self-sufficiency in production and supply was vital.\textsuperscript{29} The experience of the World War I and the subsequent developments all over the world had underlined the role science and technology could play in this.\textsuperscript{30} The Government of India, therefore, moved forward, albeit belatedly, to accord priority to technical support for stepping up industrial output. Encouragement was given to a wide range of industries producing goods and articles needed for the War such as those dealing with arms and ammunition, machine tools, engineering, transport and communications, textiles, steel, chemicals, timber, rubber, dyes, drugs, mining and minerals, and electrical and surgical appliances. In the areas where industries already existed, the government encouraged increased production; where they did not, incentive and licenses were given to start new ones.\textsuperscript{31}

The direct involvement of the government was, however, confined mostly to industries catering to the defense needs. Establishments such as state ordnance factories and railway workshops were assigned special responsibilities and expanded to meet them. Before 1939, the Ordnance Laboratories in the Punjab had a very restricted scope and they were concerned mainly with routine testing of sample of stores to be purchased by the government. The Imperial War gave them great impetus by expanding their scope of work and making research an important part of their activities. They were now engaged on a fairly extensive scale in applied research at Ordnance General Stores, and had well-

\textsuperscript{28} S.C. Aggarwal, \textit{History of Supply}, Department (1939-1946), 1947.
\textsuperscript{31} S.C. Aggarwal, \textit{History of Supply Department (1939-1946)}, 1947 is a very useful source on the subject. Also see, \textit{Statistics relating to India’s War Effort}, Delhi, 1947.
equipped laboratories for chemicals, industrial machines and tools, textiles, lubricants, fuels, surgical instruments, parachute components and allied equipment, timber and wood ware, leather and rubber, and biological problems.\(^{32}\)

In order to boost the industrial production, the government also allowed private firms to expand and diversify. In a few cases, it collaborated with them, as with the Tatas for the production of armored vehicles, railway equipment, steel and aircraft,\(^{33}\) and with Walchand Hirachand for aircraft.\(^{34}\) The collaboration came by way of assurance to them for the purchase of goods produced or also by holding shares. In still other cases it promoted private industries in a desired direction or controlled them by providing protection and assuring market, offering technical advice and facilities for import of machinery, and through grant of licenses and control orders. While these measures led to an unprecedented industrial growth and expansion, they did not necessarily imply and significant innovation and research.\(^ {35}\) When the government realized that the War was likely to continue and intensify and shortages and dislocation would get worse, it felt the need to exploit all the resources available in India. In order to obtain optimum output and quality, better scientific methods and technology had to be employed. This called for planning and organization not only of the industries and production process but also of the scientific research and technological innovation affecting them.\(^ {36}\) Initial response of the government was rather curious, though not unexpected altogether. Austerity and economy, and not science, appeared to be their first concern. As a result, a proposal was put forward to abolish the Industrial Intelligence and Research Bureau as a measure of wartime economy. Fortunately, the Member of the Department of Commerce,  


\(^{33}\) Tata Papers: Serial No. 75, Cupboard No. 1, File Nos. 8, 14, 28, 32, 44, 42, 43, 47 (December 1938-December 1947); Serial No. 76, GOI Cardboard No. 1, File No. IV, Items 33, 36, 39; Serial Nos. 92, 96, Cupboard No. 1, at TISCO Division, Bombay House, Bombay; and Verrier Elwin, The Story of Tata Steel, Bombay, 1958, pp. 87-89.


\(^{35}\) See S. Subrammanian and P.W. Homfray, Recent Social and Economic Trends in India, New Delhi, 1946.

Ramaswamy Mudaliar, realized the value of industrial research in wartime. He contended: ‘In wartime no economy can be too disastrous which starves industrial research and not expenditure too high which mobilizes the scientific talent of the country for the research and production of War materials’.  

So, though he abolished the Bureau but only to replace it with a far more comprehensive Board of Scientific and Industrial Research (BSIR). The Board was constituted on 1st April 1940 and placed under the Department of Commerce. As the Member of the Department, Mudaliar became the first Chairman of the Board and S.S. Bhatnagar (1894-1895), the then Head of the Punjab University Chemical Laboratories, Lahore, was appointed Director, Scientific and Industrial Research, as the next person. A communiqué issued at the first meeting of the Board on 1st April 1940 outlined its functions as to: (1) advise the government on proposals for instituting special researches; (2) help in the study of problems affecting particular industries and trades; (3) make proposals for the establishment of research studentships, scholarships and fellowships; and (4) receive proposals from various research institutions and universities. A sum of Rs. 5 lakhs was allocated for its maintenance and expenditure. As the War gave impetus to the research activities of the Board, it was able to work out, within a year, several processes in its laboratories for industrial utilization. They included a method for the purification of Baluchaistan sulfur, anti-gas cloth manufacture, dyes for uniforms, development of vegetable oil blends as fuel and lubricant, plastic packaging for army boots and ammunition, and preparation of vitamins.

Meanwhile, as India’s importance in the Allied strategy increased further, the question of industrialization became paramount and industrial research important. By this time, considerable pressure of Indian public opinion, too, had built up in this

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38 *Commerce Department* Resolution No. 148-S&T (I)/40, 27 April 1940.


40 S.S. Bhatnagar, *A Brief Account of the Activities of the CSIR*, ACC No. 361, f2-678-RU (undated), NAI.

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regard. So, the success of the BSIR encouraged the government to put its research to actual application. In 1941, an Industrial research Utilization Committee (IRUC) was created to advise the government on the commercial utilization of the processes evolved under the auspices of the BSIR. On the recommendations of the IRUC, the government decided to use the royalty received from the industries in return for these processes to institute a separate fund to promote industrial research. As a result, an Industrial Research Fund (IRF) was created in November 1941 and was allowed to have an annual grant of Rs. 10 lakhs for a period of five years.

But the most important step taken by the Government of India to organize and promote scientific and industrial research was the constitution of the Council of Scientific and Industrial Research (CSIR) in 1942. It was created as an autonomous body to administer the newly created Industrial Research Fund. Its administration was vested with a governing body nominated by the Government of India, and the BSIR and the Industrial Research Utilization Committee were merged into it as two advisory committees. The Council came into operation with effect from 28th September 1942. The first Governing Body was presided over by N.R. Sarkar, Member of the Council of the Governor-General, with S.S. Bhatnagar as Director, Scientific and Industrial Research. The Council had comprehensive powers, scope and resources to promote research in various fields. Detailed in its constitution, its functions included: (1) Promotion, guidance and cooperation of scientific and industrial research through institutions and specific research project; (2) establishment or development of an assistance to special institutions or development of existing institutions for specific studies of problems affecting particular

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43 Commerce Department Resolution No. 148-Ind (63)/40, 1st February 1941.


45 Commerce Department Resolution No. 148-Ind (157)/41, 26th September, 1942.

46 Industrial Research Fund, Current Science, X, November 1941, p. 493.
industries and trades; (3) establishment and award of research studentship and fellowships; (4) utilization of the results of research conducted under the Council towards the development of industries in the country and payment of share of royalties arising out of that to those devising them; (5) establishment, maintenance and management of laboratories, workshops, institutes and organizations to further scientific and industrial research, and to utilize and exploit any discovery and invention likely to be of use too Indian industries; (6) collection and dissemination of information in regard with not only scientific papers and a journal of industrial research and development; and (8) any other activity to promote generally the objects of the resolution.\textsuperscript{47}

Thus, by the middle of the Imperial War, India came to have an all-India organization of industrial research with four composite bodies dealing with different aspects of scientific and industrial research. They were the BSIR, Industrial Research Utilization Committee, CSIR, and Directory of Raw Materials. Of these, the CSIR was the supreme body. Though chronologically the youngest, the Council held ‘a unique position by the comprehensiveness of its functions and scope’\textsuperscript{48}. Meanwhile, under this top organizational set-up scores of research laboratories and experimental stations under various departments of the Governments of India also existed, but their normal programme was often deflected to meet the exigencies of the War, or else they were starved of funds and other resources. Generally speaking, search for substitutes, testing and standardization, and repair and servicing formed the main area of their activities whether it was the Forest Research Institute at Dehra Dun, the Imperial Veterinary Research Institute at Izatnagar, Laboratories connected with jute, cotton and lac, or the Indian Institute of Science at Bangalore.\textsuperscript{49}

The stimulus the War provided to industrial and scientific research had some productive repercussions in the major provinces and native states. It may be recalled that the Twelfth Industries Conference held in 1940 had recommended the establishment of local research committees in the provinces and states to form a liaison with the Board of

\textsuperscript{47} Council of Scientific and Industrial Research in India-\textit{A Review}, New Delhi, 1945, p. 2.

\textsuperscript{48} S.S. Bhatnagar, \textit{A Brief Account of the Activities of the CSIR}, pp. 24-25.

\textsuperscript{49} \textit{Ibid.}, pp. 102-121.
Scientific and Industrial Research. In pursuance of this suggestion, the Government of India directed the provinces and states, in early 1941, to institute such committees. Before this date, the only provinces which had research organizations of this kind, the only provinces which had research organizations of this kind were Bengal (since 1940) and Bombay (since January 1941). In response to the Central move, provincial research committees were formed in the United Provinces, Bihar, Orissa, Madras, the Central Provinces, Berar, and the Punjab during 1941-1942. Among the Indian States, constitution of similar organizations in Hyderabad, Mysore, Travancore, Baroda and Punjab deserve special mention.

As the importance of industries for victory in the War became clear to the government and the needs for substitutes made industrialization unavoidable, the government was obliged to consider the question of industrial research more seriously and with a long-term perspective in mind. Accordingly, the CSIR decided, in December 1943, to appoint a committee to undertake a comprehensive survey of the existing facilities for scientific and industrial research in the country and report on necessary measures of coordination, control, direction and development of research by various agencies necessary for the planning of such research in the post-War India. The proposed Industrial Research Planning Committee was constituted under Sir R.K. Shanmugham Chetty as Chairman in the beginning of 1944 and its report was published in February 1945. The Committee was directed to make a survey of the existing facilities for scientific and industrial research existing in India including the Indian States (in the universities, research institutions and laboratories attached to industrial and other concerns); and plan a scheme of coordinated expansion of research activities by private firms, research institutions and states and others research establishments. It was expected to suggest measures to be taken to promote, direct, control and organize such research

51 Report Industrial Research 1945, pp. 110-112.
52 Transfer of Power, Vol. IV, 324; Also see, Proc. Of the Industries Conferences.
activities; and report on such other steps as might be taken towards industrial and scientific research in post-War India.\textsuperscript{53}

**AGRICULTURE AND ALLIED SCIENCES**

Being a mode of primary production, agriculture could not be separated from industrial activities. Needless to say, it was the mainstay of life for millions in India, besides being the greatest source of revenue for the government and an important source for the export trade. In fact, it was not a high priority on the official agenda; the enhanced government interest in its development, during the World War II, needs some explanation. The War, of course, was the greatest factor behind this change in the attitude. Besides the vastly increased demand for food supply to the armed forces-British Indian and Allied-in and around India, the War requirements included a variety of other agriculture and allied products, ranging from dairy products to jute, silk, wood, lac and pack animals like horse.\textsuperscript{54} Obviously, these demands were over and above the existing usual demands for the civilian population which had risen perceptibly over the past years.\textsuperscript{55} To add to the urgency in the matter, a major famine occurred in some parts of the country in the midst of the War and compelled the government to initiate administrative measures for agricultural improvement.\textsuperscript{56}

The government focused its efforts in three directions; first, to increase the financial resources for training, research and extension; second, to direct the educational and research activities towards specific War needs; and third, to improve the organization and planning for agricultural education, research and extension. When the Imperial War broke out, the financial position of the Imperial Council of Agricultural Research, the apex body dealing with agricultural sciences was quite insecure and it was not able to plan and execute long-term research programmes. In order to remedy this, the Government of India passed an Agricultural Produce Cess Act in 1940 and the annual

\textsuperscript{53} For the list of the members of the Industrial Research Planning Committee, see Appendix IV; also *Industrial Research 1945*, pp. 1-2.

\textsuperscript{54} S.C. Aggarwal, *History of Supply*, 1947, esp. Chapters LIX, LX, LXII, LXV.

\textsuperscript{55} S. Subramanian, *Statistical Summary of the Social & Economic Trends in India (In the Inter-War Period)*, Delhi, 1945, esp. pp. 1-3.

income of Rs. 14,00,000 (1.4 million) from this cess was proposed to be spent on agricultural research schemes.\footnote{S&C, V, 10\textsuperscript{th} April 1941, p. 574.}

In response to the pressing demands during the crisis, scientific activities in the field of agriculture were directed towards finding substitutes for the various materials whose import had been disrupted, demands increased or created on account of the War. Studies and experiments were encouraged to exploit agricultural products and by-products like biogases and molasses, for producing alcohol, paper pulp and insulating materials, industrially.\footnote{Report of the Director in the \textit{Abridged Scientific Reports of the Imperial Agricultural Research Institutes for the Triennium ending 30\textsuperscript{th} June 1944}, Delhi, 1946, pp. 14-15; and \textit{Ibid.}, for 1945, pp. 14ff.} Research was also carried out on several plants to find substitutes for rubber and fiber.\footnote{\textit{India’s Forest and the War}, Delhi, 1948; and \textit{100 Years of Indian Forestry 1861-1961}, Vol. I, 1961, p. 83.} But a greater attention was paid to forest products. The Imperial War created an enormous demand for Indian wood. It was required for a variety of purposes but especially for the extension of the railways both in India and at different theatres of the War abroad, where a huge supply was made throughout the conflict.\footnote{\textit{Ibid.; Annual Report} of the FRI for the relevant years.} Efforts were, therefore, made to maintain the availability of wood and to add strength and longevity to it through improved seasoning and other processes. Experiments were also conducted to use wood as a substitute for metal.\footnote{\textit{Ibid.}; \textit{Scientific Reports of the IARI}, 1946.} Wood, along with other plants and a variety of forest products, was subjected to investigation and research to obtain chemicals or their substitutes to be used for the production of such materials as waterproof paints and varnishes and fire extinguishing substances. These experiments were carried out at different institutes of the Imperial Agricultural Research Institute at Delhi and the Forest Research Institute at Dehra Dun.\footnote{\textit{Ibid.; Scientific Reports of the IARI}, 1946.} Besides its use as paint and varnish, lac was used as insulato and so it found many applications in the field of electronics and communications which played a vital role in the global War. The Lac Research Institute at Namkum near Ranchi in Bihar, therefore, became an extremely
active centre of research. It worked in close collaboration with the London Shellac Research Bureau and the Brooklyn Institute of Technology, USA. Similarly, as the demand for silk increased high on account of its use in the manufacture of parachutes, sericulture engaged considerable attention during this period.

Besides using agro-forest resources for the War, attempts were also made to utilize ammonium nitrate and its mixtures with TNT from surplus ammunition stores as a fertilizer. However, the intentions behind the increased state interest in meteorology and locust control may not be read in isolation from the aviation requirements during air operations. Likewise, the rise of subjects like statistic and agronomy around this time was largely due to the official concern for exploiting agricultural resources commensurate with the demands of the War. Here it may not be out of place to mention that throughout the War, Indian forests were exploited on an unprecedented scale leading to their fast depletion and that of the life and ecology dependent on them. The Imperial War marked a watershed in the history of ecology and conservation in India, but the government does not appear to have taken up any significant remedial measures in this regard, except forestation in some parts of the country. The damages caused by the Imperial War to the ecology and environment of the country, especially in the north-east and other forest tracts, are yet to be examined properly.

Meanwhile, government concern for stepping up farm production continued and was in fact heightened as the War escalated and a famine struck the country in 1943. The need to provide adequate supply of food to the armed forces was an urgent need. As the situation worsened when the famine started showing its effects, public demand for

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63 Report Industrial Research, 1945, p. 104.
65 Scientific Reports of the IAR, 1944, p. 16.
66 Hundred Years of Weather Science, 1875-1975, Poona, 1976; Scientific Reports of the IARI for 1944; p. 11; the same for 1945, p. 12.
67 Annual Report IVRI, 1940-1941, p. 5.
effective remedial measures rose high. The initial official response was concerned mainly with the growing military demands and the disruption in trade and supply. A beginning towards stepping up food production had been made when the government launched the ‘Grow More Food’ campaign in 1942 and ‘Food Conferences’ became a frequent affair from that year onwards. While the food conferences endeavored to study and monitor the food situation and planned for improvement in the future, the ‘Grow More Food’ campaign aimed at stepping up actual production in the field. The campaign resulted in an increase in acreage of cultivated area as well as in the production of food grains, but it did not imply and direct attempt to promote agricultural innovation. Its objective was to increase the production of food crops only and, as far as possible, with the help of existing resources. The result was that in many cases there was not only no increase in the output (despite the increase in acreage) but the yield actually came in many others. In cases where the production went up, the increase could be attributed to favorable weather conditions or to the expanded acreage resulting from the widespread propaganda. The campaign did not address such basic issues as the improvement of the production capacity of soil or of offering incentives to the tiller. Later, at a certain stage, the government toyed with the idea of technological innovation and more relevant research in agriculture but nothing significant appears to have come out of it.

From the viewpoint of scientific advancement, the official attention and encouragement to animal husbandry and veterinary sciences was impressive. Besides their routine work (which was, of course, disrupted during the War), the institute dealing with animal husbandry at Bangalore and the Imperial Veterinary Research Institute (IVRI) at Mukteswar and Izatnagar in Uttar Pradesh carried out wide-ranging activities involving R&D to cater to the War needs. This included the study of diseases,

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69 S&C: B.C. Guha, The Crisis in Food, VIII, 10th April 1943, pp. 51-55; IX, 2nd August 1943; IX, 12th June 1944, pp. 509-512; and D.V. Bal, Some Aspects of the Present and Post-War Food Production in India, Procs. Indian Science Congress, January 1944.

70 Report of the Foodgrains Policy Committee 1943, Delhi, 1944, p. 20; Procs. Of the First Food Conference (Decemeber 1942), Calcutta, 1944, and subsequent proceedings.


72 W. Burns, Technological Possibilities of Agricultural Development in India: A Note, Lahore, 1944.
development and production of vaccines, acclimatization and high-breeding.\textsuperscript{73} In spite of the strain caused by the War on financial and human resources, the work of the IVRI continued to be diversified. This, as also the future needs, created the necessity of additional staff. Realizing its importance, the Central Government showed keen interest in the matter and a plan for post-War reconstruction was considered necessary.\textsuperscript{74} Gradually, a shift occurred in the nature and scope of the work of the IVRI. The fact that the government evinced interest in veterinary sciences is evident also from the volume of financial allocation for it. Despite its limited scope of work, the IVRI annually received a larger financial grant (Rs. 10.75 lakhs in 1944) than the Imperial Agricultural Research Institute (Rs. 8.5 lakhs) for the same period\textsuperscript{75} which had a far wider scope of work and activities. This may be attributed to the overriding government concern for military demands for animal food (milk, butter, meat, eggs, etc.), animals for transportation (horses and camels) and wool and leather. In order to boost dairy production, the government established an Imperial Dairy Research Institute in 1941.\textsuperscript{76} As the demand for milk for the armed forces increased tremendously, milk supply to big towns became a problem. To meet with the situation, the government decided to entrust the distribution of milk in metropolitan cities, like Calcutta, Bombay, Madras, Delhi, Karachi, Kanpur and Nagpur, to property constituted milk marketing organizations. A Milk Marketing Adviser and also the Chief Executive Officer of the British Milk Marketing Board were selected and appointed. He conducted a detailed survey and made elaborate recommendations. More administrative measures followed, which, in turn, invited the attention of the provincial governments to the matter.\textsuperscript{77}

However, the question of India’s agricultural improvement could not be postponed forever. As the War lingered and the food situation deteriorated, the material life of millions depending on the rural economy did not show any signs of improvement.

\textsuperscript{73} \textit{Annual Report IVRI}, 1941-1942, p. 1.
\textsuperscript{74} \textit{Ibid.}, 1942-1946, p. 1.
\textsuperscript{75} A.V. Hill, \textit{Scientific Research in India}, 1944; Simla, 1945, p. 23.
The colonial government, then in a more compromising and yielding mood, was, therefore, compelled to pay more attention to the situation.\textsuperscript{78} Apart from the local demands and immediate needs, India’s economic stability and material wellbeing was vital also for Britain’s own position in the post-War world, whether India continued as a part of the Empire or parted with it. So, like many other areas, the government started looking at the question of agricultural improvement in the broader perspective of the post-War reconstruction. While the authorities carried on their exercise to draw plans for the future, which they were not all sure to execute, the British scientific opinion came out with a clearer vision and support for agricultural improvement in the Punjab. A.V. Hill, for instance, declared agriculture ‘by far the most important industry in Punjab’, and pleaded for its ‘great expansion’ to supply adequate food and better nutrition for India’s vast population that was likely to increase considerably in the years to come and to provide for expansion of crops required for industry and export.\textsuperscript{79}

In retrospect, one is, however, compelled to note that despite various plans and proposals, the state initiative in promoting agricultural research and innovation remained limited (with the exception of veterinary sciences and animal husbandry) in comparison to its record in the field of industrial research. Since basic problems affecting agricultural improvement like fragmentation of land, mass illiteracy and rural health had not been addressed, there was little possibility of any progress either in the science or the art of agriculture.\textsuperscript{80} The colonial interest in modern industry and indifference to the traditional cottage industries further contributed towards keeping agricultural improvement at a low priority. Some of the small-scale industries progressed during the War but due more too


\textsuperscript{79} A.V. Hill, \textit{Scientific Research in India}, 1944, pp. 23-25, 37-38; his Radio Broadcasts: The National Purpose: Science and Technology in the Development of India, 7\textsuperscript{th} March 1944, Delhi; and Science and India, 30\textsuperscript{th} October 1944, 2170 (MSS), pp. 10ff., A.V. Hill Papers.

military demands than state encouragement. All others catering to the basic needs of the people were not technology the War brought in.\textsuperscript{81}

\textbf{MEDICAL SCIENCE AND PUBLIC HEALTH}

Medical science and health care were another area that engaged the attention of the government during this period. The subject was a favoured one right from the beginning as far as state interest in it was concerned. It was one of the most organized sectors with a highly developed service cadre, a professional association and scores of research centres scattered all over the country. Yet, medical education continued to remain in a poor state and the research centres seldom went beyond collecting data to be utilized in Britain, training to technical personnel and production of vaccines.\textsuperscript{82} The hollowness of the official claims regarding its progress in India became obvious as soon as the War broke out. At the time of the War, medical education and research was still in a poor state-not as much in terms of organizational infrastructure as on account of their nature and scope. This is, however, not to suggest that their provision was adequate in any way.

The condition of public health was precarious and that of health care facilities worse. The average life expectancy of an individual was 32.5 years, only half of that in most of the developed countries.\textsuperscript{83} In 1937, the death rate in British India was 22.4 per 1,000 and for infants or children under one year of age it was 172 per 1,000 live births. In 1941, the corresponding rates were 21.8 and 158 per 1000 respectively. Comparative statistics showed the general death rate in countries like New Zealand or Australia as low as 9.7 whereas infant mortality in these countries was 31 per 1,000 as against 21.8 and 158 respectively in India.\textsuperscript{84} As regards the health care facilities, while there was one

\begin{itemize}
\item \textsuperscript{82} Anil Kumar, \textit{Medicine and the Raj,} New Delhi, 1998; Radhika Ramasubban, \textit{Public Health and Medical Research in India: Their Origin under the Impact of British Colonial Policy,} Stockholm, 1982.
\item \textsuperscript{83} S&C, V, 4, October 1939, p. 199.
\item \textsuperscript{84} NPC Series: \textit{National Health,} Bombay, 1948, p. 23; and \textit{Report of the Health Survey and Development Committee,} Vol. I, Delhi, 1946, pp. 7-8.
\end{itemize}
registered doctor to every 1,048 of population in Britain, this ratio was one to every 9,300 persons in India. On the scale of Western countries, India required 200 thousand qualified doctors to take care of her village population, but after 75 years of effort there were only 35 thousand doctors of whom only 15 thousand resided in the villages.\textsuperscript{85} The expenditure on public health in England and Wales was 1-0-9 d per capita per annum; in India, the different provinces spent only from 1/12\textsuperscript{th} to 1/120\textsuperscript{th} of the average of England.\textsuperscript{86} What was alarming was that whereas the vital statistics of health were fast improving in the developed countries, it was going downward in India. She had failed to make adequate use of scientific knowledge for improving her public health. There was not an all-India health policy and the basic principles of sound public health were violated. Medical education was backward and supply of technical personnel defective, not to mention the ever present financial handicaps. Moreover, there was lack of institutional planning and coordination amongst the departments concerned. Obviously, everything was to be done in a great measure, even if it was to be the bare minimum of facilities, to restore the health of the millions in India, for which there was a persistent local demand.\textsuperscript{87} But as the World War erupted, in the meanwhile, the government had little time to address the problem; instead, it hurried to deal only with those health problems which were crucial for the successful prosecution of the War.

To meet the immediate emergency, the personnel working in the medical services and research organizations were called for War duties, jeopardizing the routine functioning of their organizations.\textsuperscript{88} But this was not all. With the increase in their demand, the government resorted to more emergency measures. Short-term courses with lower eligibility qualifications were introduced and provision was made for medial training abroad.\textsuperscript{89} As India became an important base for Allied action after the Japanese

\textsuperscript{85} S&C, IV, 8\textsuperscript{th} February 1939, p. 467; Ibid., V, 4, October 1939, p. 199. Also see the statistical chart in the Health Survey, 1946, p. 43.

\textsuperscript{86} S&C, V, 4, October 1939, p. 199.

\textsuperscript{87} A.C. Ukil, “Public Health and its planning in India”, S&C, VI, 9\textsuperscript{th} March 1941, p. 531, 536-539. Also see S&C: IV, 5\textsuperscript{th} November 1938, pp. 285-287; IV, 7\textsuperscript{th} January, pp. 408, 410, IV, 8\textsuperscript{th} February, pp. 466-468, 1939; VI, 9\textsuperscript{th} March 1941, pp. 535-568.


invasion, a large number of Allied troops (British, American and Chinese) were brought into India and responsibility of their health care was laid upon the local government. Apart from the routine treatment in case of their illness and injury, prevention of tropical diseases and their acclimatization in India were vital problems to be tackled with.\footnote{Report Health Survey, 1946, Vol. I, pp. 93-94; J.H. Stone, The United States Army Medical Service in Combat in India and Burma, 1942 to 1945, Unpublished Ph.D. Thesis, Yale University, 1947.}

This obliged the Government of India to spare the existing medical facilities for the treatment of the armed forces and for the training of medical and paramedical personnel for specific War purposes. The government was also called upon to begin or step up production of specialized drugs and vaccines at various research centres in the country. From this point of view, the activities of the Central Research Institute at Kasauli and that of the IVRI at Izatnagar deserve special mention.\footnote{Report Health Survey, 1946, Vol. I, pp. 93-94, 201-202. Also see the Annual Report of the CRI, IVRI, and of All India Institute of Hygiene and Public Health, 1940-1944, p. 5.} Testing of certain drugs on troops was also performed at cantonments like one at Hazaribagh in Bihar.\footnote{J.H., Stone, United States Army Medical Service, 1947.} All this kept engaged a large section of the health machinery and consumed vast resources, depriving millions of poor Indians of even the minimal health care.

The need for making the best use of existing resource available in the country made it necessary for the government to maintain and augment the availability of various medical supplies like drugs and medical equipments which were vital for the operations of the War civil demands alike. Short supply of drugs and other medical provisions became a growing phenomenon soon after the War erupted. This was further aggravated when some sources of supply were lost. The loss of Java in 1941, for example, deprived India of a major source of supply of quinine.\footnote{S&C: VII, 11\textsuperscript{th} May 1942, p. 562; VIII, 2\textsuperscript{nd} August 1942, pp. 83-84.} Supplies were affected also on account of shortages of several chemicals like alcohol, which were used in abundance for non-medical purposes in the War. Hoarding by traders, too, was responsible for the scarcity.\footnote{H. Ghose, “Supply of Drugs and Medicines for the Civil Population”, S&C, VIII, to April 1943, pp. 417-419; S&C, X, 7\textsuperscript{th} January 1945, pp. 265-271.}
To meet the situation the government initiated various measures. The question of drug control had been taken up as early as 1930 when the government constituted an inquiry under R.N. Chopra to advice in the matter.\textsuperscript{95} The War conditions compelled the government to act on in recommendations. Accordingly, in 1940 the Drug Act was passed by the Central Legislature, which provided for the control of drugs imported into India as well as their manufacture, sale and distribution in the province of Punjab especially and the country in general. For this, it advised the Central Government to constitute at the earliest a Drugs Technical Advisory Board and a Central Drugs Laboratory. The Drugs Technical Advisory Board, appointed soon after, was entrusted with the responsibility of advising the Central and Provincial governments on technical matters connected with the Drugs Act. Later, it helped compile elaborate Drugs Rules which were made public, in April 1944, for discussion and debate before they were finally published and brought into effect.\textsuperscript{96} However, the proposed Central Drugs Laboratory did not come into being and the Biochemical Standardization Laboratory (est. 1937) was used as a substitute by the military authorities and the Supply Department for testing drugs throughout the War.\textsuperscript{97} To keep the supply position easy, the government also made provisions for punishing the hoarders of drugs. But in the face of dwindling supply, it became essential to search for substitutes, in respect of suppliers, drugs as well as sources for raw materials. Government institutions and research laboratories had already been pressed into service to produce more and more of scarce drugs and equipment; now local firms were encouraged to work in this direction. In addition, plans were conceived and sometimes acted upon to indigenously produce some of the important raw materials like cinchona and pyrethrum, and production of others like opium was stepped up.\textsuperscript{98} The government interest in drugs encouraged to an extent the study of pharmacology.\textsuperscript{99}

\textsuperscript{95} India Drug Enquiry Committee: Report, 1930-1931, Calcutta n.d.

\textsuperscript{96} Ibid., Vol. I, p. 50. For Indian reaction, see S&C: V, 10\textsuperscript{th} April 1940, pp. 575-577; VI, 3\textsuperscript{rd} September 1940, pp. 123-125.


\textsuperscript{98} Ibid., pp. 51-52.

\textsuperscript{99} S&C, VII, 10\textsuperscript{th} March 1942, pp. 447-452.
At this time, it became difficult to save the fighting troops and others from smallpox, malaria, tuberculosis and other deadly diseases. The government was particularly alarmed at this point of time by the increase in their incidence and their adverse consequences for the military operations on the eastern front along Assam and Burma, whose humid climate and jungles bred several tropical diseases. The incidence of these diseases in the civilian population increased because of shortages of drugs, lack of proper medical help, poor food supply, malnutrition and insanitation. The scarcity of drugs and non-availability of adequate medical assistance was, obviously, caused by disruption in imports and internal distribution, and increased consumption of medical resources by the armed forces during the War. For poor food supply nothing could be held more responsible than the official neglect in the matter. Of course, there was a terrible famine right in the middle of the War but it could have been averted or its effects minimized, had there been a sincere and timely action by the government. Whatever the causes or effects of these factors, the prevailing conditions exposed the extreme backwardness of the country in matters of health care and sanitation, her dependence on others for medical supplies and, above all, the appalling official indifference and narrow priorities in the matter. Ironically, however, both the diseases and the World War came as great equalizers. Under the stress of the conflict, the government had no option but to act. The onslaught of epidemics could not be postponed or countered by indifference or a piecemeal approach, especially when there was the extreme urgency of winning the War in which an ill and incapacitated soldier was, indeed, a dangerous proposition. The


102 Famine Commission Report, 1945, esp. Part-II; also see Health Survey, 1946.


persistent and increasingly loud demands by Indians, scientists in particular, for better health care, nutrition and sanitation also forced the authorities to take action.\(^{105}\)

Therefore, the government thought of tackling the problem with some seriousness. Several expert committees were constituted to study and advice on how to eradicate diseases like malaria and tuberculosis. Steps at different levels—training, research and treatment—were taken to deal with them.\(^{106}\) Help from non-governmental agencies was also officially encouraged for this purpose. The Imperial Leprosy Mission, Dufferin Fund, and Rockefeller Foundation contributed in their own ways to alleviate the population from suffering and disease in the Indian sub-continent.\(^{107}\) But these endeavors were not enough to solve the vast problems related with health in India. While the continuation of the Imperial War demanded urgent steps to improve the situation, the food supply deteriorated further on account of the famine, and civilian health worsened as a result of malnutrition and increased incidence of certain diseases. Thus, by now the official neglect in the matter and lack of planning and preparedness were in full glare.\(^{108}\) The Famine Commission accepted the extremely bad condition of the health of the people and the poor performance of the government in this regard.\(^{109}\)

All this produced considerable effect on the minds of both the Indians as well as the British. Indians stepped up and widened their demands for better health care, nutrition and sanitation, compelling the authorities finally to come to terms with the local needs and plan for the future on a long-term basis.\(^{110}\) This change in the official attitude in India

\(^{105}\) Ibid., Also see S&C: V, 4\(^{th}\) October 1939, pp. 190-202; VI, 3\(^{rd}\) September 1940, pp. 123-125; and A.C. Ukil, Some Aspects of Public Health in India, Presidential Address, ISC, January 1941.

\(^{106}\) Report of the Committee Convened to Consider the Measure to...Prevent...Spread of Malaria during the construction of Roads and Railways, Simla, 1947; and Report of the Tuberculosis Survey Sub-Committee, IFRA, n.p., 1940; and Health Survey, 1946; IRFA & ICMR 1911-1961; Chapter III.

\(^{107}\) Health Survey, 1946, esp. Chapter IXff.


was encouraged also by the developments in Britain and other developed countries of the West. In May 1943, the UN Conference on Food and Agriculture endorsed the principle that governments were responsible for introducing general and specific measures for improving the diet of the people. The conference broadly outlined the method of approach to food policy designed to improve the nutritional standards. It suggested that the state of the nutrition of the population be investigated by medical and public health workers and that crop planning, production of new varieties of seed and other such matters be decided on nutritional advice. Emphasis on nutrition became the hallmark of the new health policy. This resulted in a greater emphasis on nutrition in medical studies.\textsuperscript{111} The new concern for the people’s health and well-being soon found considerations at the League of Nations and its organs like the International Labour Organization (ILO). These bodies imposed on the Government of India a more formal obligation to maintain its subjects at a minimum level of health and sanitation which was occasionally monitored through inquires and international deliberations under the auspices of these world bodies.\textsuperscript{112} Casualties and physical injuries to soldiers during fighting operations brought into focus the importance of blood transfusion as one of the most valuable procedures of treatment for saving lives. So, an Army Blood Transfusion Service (India) was set up. The blood depots at Dehradun, Poona and Lahore were equipped with modern facilities for the preparation of blood products and for the assembly and sterilization of specialized apparatus used for collection and transfusion of blood.\textsuperscript{113}

Another contribution of the Imperial War to medical science in Punjab and other parts of India was the introduction of new medical specialties and the improvement and expansion of older ones. Not unexpectedly, the beginning in this regard was made in the army medical services. While physicians and surgeons were already available, more


\textsuperscript{112} Ibid. Also see, Annual Report of the Public Health Commissioner with the Government of India, for 1940, pp. 109-110; for 1943-1944, pp. 38-39; for 1945, p. 84; for 1946, pp. 116-117.

\textsuperscript{113} S.B. Singh, World War Second as Catalyst, 1998, pp. 133-134.
exclusive specialties were developed in branches such as anesthesia, radiology, pathology, ophthalmology, neurology and oncology. Two specialties that deserve to be especially mentioned were physiotherapy and rehabilitation, and psychiatry. While the former was crucial in treating injuries to the limb and bones of the fighting forces, the latter helped them keep in good mental health and morale. Once the War was over, these specialties were beneficially used to treat the civilian population. Similarly, special emphasis was placed on subjects like nutrition, for which concrete steps were taken. Efforts were made to boost the supply of milk, fruits and vegetables.

Thus, by the middle of 1943 the authorities were in a mood to take up the question of health and sanitation earnestly. A thorough examination of the problem and a long-term planning were considered imperative. For this, the Government of India appointed, a high-power committee, formally called Health Survey and Development Committee, under Dr. Joseph Bhore, in October 1943. It was to make a broad survey of the existing conditions of health and health organizations in British India and offer recommendations for future development in the light of the post-War reconstruction. Although the report of the committee was not submitted before December 1945 and not published until 1946, its findings and recommendations deserve a close scrutiny as they present a picture of the state of affairs before and during the War. They throw light on the changing outlook of the Raj in the matter. Apart from gathering information and suggestions in various ways, the committee worked through five Advisory committees dealing with (1) public health, (2) medical relief, (3) professional education, (4) medical research, and (5) industrial health. Additionally, it invited for consultation six distinguished medical workers from the UK, the USA and Australia, who were later

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114 Ibid., pp. 133-135.
115 Indian Information, 1st August 1944, p. 93; and 15th January 1944, 95.
116 S.B. Singh, World War Second as Catalyst, pp. 136-137.
117 For the list of the members of the Health Survey and Development Committee, see its Appendix VII.
118 Health Survey, 1946, p. 3 and Appendix 57.
joined by a representative of the Soviet government. It also consulted Professor A.V. Hill in respect of medical education and research.\footnote{119} The silence of the government in the matter, therefore, only proved that its interest in public health was still narrow and confined mainly to the health of the armed forces and the Europeans living in Punjab.\footnote{120} Its preference for Western system of medicine may be attributed also to the pressure by the British lobby in this all-time British dominated professional service in India. This pressure might have increased further when doctors of some other European nationalities flocked to India to join medical services and to practice there, after they fled their countries during the Axis prosecution in the 1930s and 40s.\footnote{121} This is why while the government took up certain concrete administrative steps to promote technical education and industrial research, it did not do anything much worthy except some surveys and enquiries in the field of medical science and public health.

**TRANSPORT AND COMMUNICATIONS**

Transport and communications was an area which received an uneven and selective attention in the colonial period. Ships had brought the British and their European cousins to India; later they were aided by the railways to expand and consolidate the Empire. In the process, indigenous tradition of seafaring and shipbuilding was done to death. The railways spread, no doubt, but only on selective routes to facilitate the mobilization of the fighting forces and colonial trade. In the circumstances, other means of transport were badly neglected, most of all, the roads—the chief mode of mass transportation in India.

**Railways**

The railways had been an area of prime interest to the British in India, and with liberal official support it had developed unhindered until the World War I.\footnote{122} However,

\footnote{119} Ibid., p. 5.
\footnote{120} Raina, *World War II-Medical Services: India*, 1990.
\footnote{121} Anil Bhati and Johannes H. Voigt, *Jewish Exile in India 1933-1945*, New Delhi, 1999, esp. pp. 64-84.
once the strain of the global War fell on it, it could not hide its weaknesses.\(^{123}\) So, in order to get it out of the crisis, the government appointed, in 1920, the Indian Railway Committee under the chairmanship of Sir William Acworth, to advise on its administrative and financial management. The Committee suggested major changes in the matter. It recommended, among other things, a complete separation of the Railway Budget from the General Budget of the country, a suggestion that was introduced from 1924.\(^{124}\) The government also accepted the broad principles enunciated by the committee in connection with the reorganization of the railways. Yet the railways could not escape the adverse effects of the Great Depression. The government initiated remedial steps with the probe into the finances of the railways and economy measures; in addition, it voted, in 1932, a sum of Rs. 150 crores (15 million) for capital expenditure on railways for the next five years. But this could not prove of much avail.\(^{125}\)

The World War II made matters worse. It imposed a severe strain on the railways. In addition to the movement of troops and supplies, civilian traffic and traffic of commercial goods also rose rapidly with the increasing industrial activities in the country. There was no alternative means that could be equally efficient. The traffic which used to be carried along the coast in modern steam or traditional sailing vessels before the War had to be diverted to the railways, not because it was faster but also because of the dangers of sea transport in times when the submarine operated ruthlessly. To add to the problem, even some of the waters close to the Indian coast were minded. Available shipping space, moreover, had to be diverted to the carriage of troops and munitions to and from the various theatres of the War. This considerably diminished the shipping space for other ordinary freights. Another alternative, the motor transport, was equally scarce. With the passage of the War, shortages of automobiles, their fuel and accessories


\(^{124}\) Ibid.; also see Report of the Committee appointed by the Secretary of the State for India to Enquire into the Administration and Working of Indian Railways, London n.d.

\(^{125}\) Refer to Reports of the Inchcape Committee, 1932, and the Wedgewood Committee, 1936.
increased on account of the disruption in supply as well as their enhanced use for the mechanized units of the armed forces.\textsuperscript{126}

All these factors and many more brought pressure on the railways. But the acute shortage of supplies of spares and exigencies of the War led to the postponement of maintenance and expansion activities, except in the most essential cases. Once India became the base of Allied military operations in the East after 1941, the fate of the railways in this country was doomed further even though it was a period of financial prosperity for it.\textsuperscript{127} The maintenance and mobilization of the Allied forces inside the Indian subcontinent put the railways under increased stress. Its workshops which could have been used for R&D to enhance its own unconnected with the railways and most of them for use at overseas war fronts.\textsuperscript{128} The growing realization on the part of the authorities that their days in India were numbered led to further neglect of the railways. Not only was there no further investment (quite heavy in case of the railways), some of the existing railway networks in the country were dismantled to maintain and expand the railways in the Middle East.\textsuperscript{129} It is difficult to expect any activity aimed at technological advance in such a scenario. The government on the other hand, however, tried to coordinate road-rail relations.\textsuperscript{130} Of course, the railways, like many other areas of national life, engaged the attention of the Department of Planning and Development as soon as it was formed, but that is not our immediate concern here.

**Roadways**

In the circumstances, the roadways held out a better opinion for the Raj. Large-scale road building in British India had begun in 1830 when the Grand Trunk Road and other projects were under-taken and the Public Works Department came into being.\textsuperscript{131} It is pertinent to point that a special care was taken in respect of Punjab as this area was the

\begin{flushleft}
\textsuperscript{126} *Ibid.*; also see NPC Series: *Transport*, 1949, pp. 227-228.
\textsuperscript{129} NPC: *Transport*, 1949, pp. 227-233.
\textsuperscript{130} *Report of the Technical Sub-Committee to the Subject Committee on Transport and Road Rail Relations*, New Delhi, 1943.
\end{flushleft}
frontier area and the British always remained vigilant to protect their interest so they had to maintain the roadways properly and keep them intact. Yet the importance of roads in Punjab could not be overemphasized. The Royal Commission on Agriculture rightly drew the attention of the government to the urgency of good communications in the context of agriculture and rural improvement in the country.\footnote{Royal Commission on Agriculture: Abridged Report, 1927-1928, n.p., 1928, p. 8.} In 1927, the Government of India appointed a Road Development Committee under M.R. Jayakar to advice on the development of roads. The committee emphasized the need of developing roads for the progress of the rural society.\footnote{Indian Road Development Committee: Report, 1927-1928, n.p., 1928, p. 8.} On its advice, a Central Road Fund was created in 1930. This Fund was used for construction and improvement of internal roads necessary for the prosecution of the War, for which other larger sums came also from other sources. A great deal of construction and improvement of bridges, particularly in Madras, Central Provinces, and Punjab and of surfaced roads were also financed from this fund. From 1930 to 1945, the mileage of surfaced roads increased from 57,000 to 70,000, an increase of 23 per cent in 15 years. In 1945 there were approximately 1,45,000 miles of earth roads in the charge of different public authorities but still in a very poor state, making up 2,15,000 miles of roads of all sorts. Not unexpectedly, there were glaring disparities between the development of roads in India and the advanced countries of the world. While 75 per cent of all traffic was carried on roads in the USA, similar to those in other developed countries, in India it was not even 10 per cent.\footnote{Asiatic Review, April, 1947, p. 152.}

**Motor Transport**

In the meanwhile, motor transport had steadily increased on Indian roads, especially in and around the towns. The War added to the number of the automobiles, particularly of the heavy vehicles. There were 5,000 army vehicles before the War but the number reached 50,000 in 1942. This tenfold increase in the number of vehicles may be attributed mainly to the establishment of the South East Asia Command in India. In 1943, thousands of special chassis (in parts) were obtained from the USA and Canada under the Lend-Lease arrangement. These were assembled by Indian workmen. Thus, by January
1945, there were 2.5 lakh military vehicles in use in India. The need for mobility which contributed to the Allied victory in the African campaign and the urgency of mechanization of the fighting forces brought into focus the demand for various types of motor vehicles and of trained personnel to drive and maintain them. As a result, training centres and workshops were soon established in the cantonments. So, by 1945 there were 2.5 lakh motor drivers-cum-mechanics in the army. Such training centres were started in every province. Many business firms took interest in automobiles and collaboration with foreign companies was made, but these endeavors remained confined only to import of vehicles, or their assembling in the country.

**Shipping and Inland Water Transport**

Though India had a long tradition of shipping in the past, it had slowly declined during the British period. However, with the rise of nationalism and increasing commercial activities around the World War I, indigenous business houses showed interest in it and the Scindia Shipping Company was established in 1919. The World War II did not better the conditions of Indian shipping. Soon after the War commenced, all the 28 ships of 1.4 lakh GRT, belonging to 11 Indian shipping companies, were commandeered for War purposes; while foreign ships left Indian ports for better trade prospects elsewhere with the result that India’s export trade started choking her docks. About half of Indian tonnage was destroyed or lost during the War, and by 1945 it had been reduced to a low figure of 75,000 GRT only. However, the exigencies of the War obliged the government to occasionally do something to strengthen and modernize the sea transport of the country. The American Technical Mission visited the Indian ports and offered suggestions on how to develop shipping so that it could aid the Allied War

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135 Commerce, 15 January, 1944.
137 Ibid., pp. 117-120; also NPC: *Transport*, 1949, p. 223.
Several other committees discussed the subject with reference to their own areas of study. Later, a Port Development Committee was set up in February 1945, which emphasized the importance of improving, expanding and modernization the general facilities at the major ports.

The neglect of inland water transport was a clear example of the colonial indifference to the local welfare. Before the railways came to India, inland water transport was highly developed. The railways proved fatal to this cheap indigenous mode of transportation, although it remained popular in certain parts of south India. In Madras, the Godavari Canals were important highways for water transport, which provided a cheap and ready made access to all markets. So was the case in eastern India. The largest seaport of the country Calcutta depended considerably for its trade both ways upon its waterway communications. About 25 per cent of the merchandise which flowed into Calcutta from the rest of India was water-borne of which no less than 63 per cent came from Assam alone. About 32 per cent of the exports was carried by water and of this 72 per cent went to Assam. The total water-borne traffic of Calcutta amounted to approximately 45,00,000 tons of which 34 per cent was carried by inland steamers and 66 per cent by country boats. In 1945, passengers carried by the steamer service in East and West Bengal numbered 1,04,00,000. The NPC sub-committee on transport estimated that altogether the amount of boat traffic over government maintained channels was in the neighbourhood of 250 million ton miles per annum—barely one percent of the pre-War goods traffic by the railways. Thus, even at the end of the War, water transport formed an insignificant part of the country’s transport services.

**Air Transport and Aviation**

Compared to shipping and water transport, aviation received a better deal. The first flying club in the country had begun operations in 1928 and by 1933 there were seven of them. These clubs performed the dual function of promoting amateur flying as

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142 NPC, *Transport Services*, 1949, p. 244.
well as training professional pilots and ground engineers. After the outbreak of the War, for two years all flying clubs were used for giving elementary flying training to the candidates for the Air Force. In this way 516 persons were trained, of whom 364 were accepted for commission. As the Imperial War progressed, all civil flying was suspended and the resources of the clubs were used for defense, such as army cooperation for anti-aircraft practice and other similar activities.\footnote{Progress of Education 1937-1947, Vol. I, p. 175.} Keeping in view the fact that aero planes were the fastest means of transport, hence crucial for the War, the government agreed to allow the assembling of aircrafts in India,\footnote{Linlithgow Papers: L.S. Amery to Linlithgow, Letter No. 22, 20 May 1940; No. 24, 5\textsuperscript{th} June 1940; No. 36, 5\textsuperscript{th} October 1940; No. 42, 3\textsuperscript{rd} December 1940; No. 30, 27\textsuperscript{th} June 1940; and No. 55, 27\textsuperscript{th} November 1940, in Letters Secretary of State, Vol. V, at India Office Library and Records (IOL&R), London.} airstrips were constructed and flying clubs organized.\footnote{Reports of the Progress of Civil Aviation in India (Government of India, Delhi) for the War years.} In 1939, there were only 12 civil aerodromes with adequate staff and facilities in the country. During the World War II, the Defense Department took over the control of all civil aerodromes and the services of all Air Traffic Controls Officers were loaned to the Air Force. By the end of the War, there were several hundred aerodromes and 2,000 yards of paved runways. Gradual transfer of aerodromes and the staff to civil aviation began in 1945.\footnote{NPC: Transport, 1949, pp. 258-259.}

The enormous demand for aircrafts during the War forced the government to explore the possibility of manufacturing them with the country, but the Imperial Government in London did not respond favorably. India’s resources were considered too meager for it and the British government did not want to spare technical hands to India as they were needed at home.\footnote{India Office, Economic and Overseas Department to Air Ministry, 27\textsuperscript{th} March 1940, I.O. Library, L/E/8/1711; and Amery to Linlithgow, No. 693, 6 June 1940, IOL, L/PO/465.} Lord Linlithgow’s proposal to shift to India a couple of aircraft factories from Britain in the light of the increased enemy threat there, met with the same fate.\footnote{Linlithgow to Amery, telegram 910-S, 7\textsuperscript{th} June, 1940, IOL, L/PO/465.} The authorities in India, therefore, had to fall back on the plan of
Walchand Hirachand to form an aircraft company with public and private capital. While the official hitch was going on, Walchand formed the Hindustan Aircraft Company with a capital of Rs. 45 lakhs (4.5 million) at Bangalore. The Government of India and the Government of Mysore became equal partners contributing Rs. 25 lakhs each. An American entrepreneur, W.D. Pawley, who had been manufacturing aircraft in China for six years, was associated with the venture. India’s first plane came out for a test flight in July 1941. Assembled in India, this was a Harlow, low-winged, single-engine monoplane with the same characteristics as of later-day fighters and bombers. With the advent of the system of Land Lease in 1942, it was, however, found undesirable to have any element of private enterprise in this concern of vital importance to the conduct of the War in Asia. So, the Government of India bought out its private partners at heavy premium and took over the entire management in its own hands. Finally, on the recommendations of the Grady Mission, production of aircraft was completely stopped at this factory to concentrate on repairs.

Meanwhile, research and training facilities in aviation and aeronautics had been set up at the Indian Institution of Science at Bangalore. A post-graduate course in aeronautical engineering was introduced there in December 1942. Its Department of Aeronautics was equipped with a wind tunnel subsidized by Government of India and with apparatus for structural research. Thus, the Institute developed into a centre for basic aeronautical research in the country. Later, facilities for aeronautical communication service for training of operating and technical personnel were provided at the Civil Aviation Training Centre at Saharanpur in U.P. The Survey of India worked on preparing aeronautical maps. Connected with aviation, meteorology came into some prominence

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151 GOI, Department of Supply to Secretary of State for India, telegram 2394, Simla, 6 July, 1940, IOL, L/PO/465.
during this period. Meteorological observation had a long history in India, which, like several other subjects, was a part of data feedback for research in the metropolis. Military operation and aviation, no doubt, added importance to it in the course of the War,\textsuperscript{156} but beyond that not much was done to promote it as a science for other purposes.

Parachute was a crucial component of air flying. So at the instance of the Department of Supply of the Central Government, the possibility of producing parachutes indigenously was explored. Materials and facilities for their manufacture being available, a special factory for their fabrication was put up in the middle of 1942, which came into full production by the end of the War. A scheme with a capital cost of Rs. 18,50,000 (1.85 million) provided by the British Government was also launched in order to multiply India’s filature silk reeling capacity by changing over from the hand-reeling to machine-reeling method.\textsuperscript{157} Later, in order to look into the problems and prospects of promoting aviation in the country as an industry as well as a means of transport, the United Kingdom Aircraft Mission visited India in March 1946. It made an intensive survey, visiting the related establishments at Barackpur, Poona and Bangalore, together with the Ordinance Factories at Kanpur, Kasipur and Jabalpur. Acting on its recommendations, the Government of India decided to establish a national aircraft industry in the country, with the aim of achieving within 20 years complete self-sufficiency for building aircrafts required for the Royal Indian Air Force as well as for civil aviation.\textsuperscript{158}

**Telecommunications**

Telegraph had been an important tool of imperial control in India up to the World War I.\textsuperscript{159} The growing need for faster communication gave a boost to wireless and broadcasting from the 1930s, more so during the World War II.\textsuperscript{160} But here again, though

\textsuperscript{156} *Hundred Years of Weather Service, 1875-1975*, 1976; also see *Annual Report Meteorological Survey of India*.

\textsuperscript{157} NPC: *Transport*, 1949, pp. 255-256.


\textsuperscript{160} *Progress of Broadcasting in India: Report by the Controller of Broadcasting*, Simla 1940; and H.R. Luthra, *Indian Broadcasting*, New Delhi, 1986.
the administrative steps led to the introduction of these systems in some cases and expansion in others, R&D was the missing component of the state initiative, and the elements of local welfare entered the government policy only late. Radio witnessed unprecedented expansion as both sides of the belligerents used it as a means of propaganda and education of the people. Radio broadcasting had begun on 5th May 1932 in India. Lionel Fielder of the BBC was appointed as India’s first Controller of Broadcasting in 1935 and the service was named All India Radio (AIR) in 1936. As the War escalated, a separate Department of Information and Broadcasting was setup in 1941. Meanwhile, the number of licenses rose from 10,872 in 1933, to 92,782 (an increase of 753.40 per cent) in 1939 and to 2.5 lakhs (an increase of 169.45 per cent) listening sets in 1945. Initially, radio sets were imported (including 40,000 from the USA under the Land-Lease) but later the government initiated measures to have them produced indigenously.\footnote{Commerce, 6th December 1947, pp. 102-108.}

The relatively small number of radio sets in India did not stand in the way of influencing the Indian population through propaganda by the Axis Powers. In March 1942, the Punjab Government registered a growing receptivity of the population for radio broadcasts of Axis Powers and considered step against owners of radio licenses.\footnote{Johannes H. Voigt, India in the Second World War, pp. 109-10.} This, along with other technical needs of the War encouraged electronic industries in India.\footnote{For details, see S.C. Aggarwal, History of Supply Department (1939-1946), 1947.}

II

The Unionist Party, after forming the Government emphasized on the development of industry based on agriculture as well as the cottage industry in order to solve the problem of unemployment in rural and urban areas of the Punjab on one side and on the other to meet the requirements of the elite countries during and after the World War II. However its principal aim was to improve the economic condition of peasantry and to enable them to develop agriculture to meet the demands of the market. The motives of this party were clear from the statement of one of its members Sir Chhotu Ram, which was made in the general meeting of the Indian Chamber of Commerce on May 1, 1937. Even the Indian Industrial Commission (1916-18), high-lightening the worth of the cottage industries
stated one of the most striking features of Punjab industrial life as the vitality of the old domestic industries." The main cause for it seems to have been, as was also explained by this Commission and V. Anstey that the ruralities still depended for most of their needs and supplies on the local cottage industries, as the means of communication linking village with cities had not been developed. Hence, the machine made things did not enter into the lives of the villagers. Besides, the Punjab Government also had been making tall promises of this kind since long, but never fulfilled them. To substantiate its declaration of 17th August, 1939, the British Government had announced, “we can not measure the excess of strength which as industrialized India will bring to power of the empire, but we are sure that it will be welcome after the War.....” He remarked: "The prosperity of the Province and the need to solve the problem of unemployment and needs of the market are certainly pointer to this direction. Industrialization seems to be the promising solution. If we convert our raw materials into the finished goods, we can multiply the income of the agriculturist class into lakhs; if not for all, we can provide employment to most of the educated youth." In the same way, it was realized by its leadership that in order to solve the problem of unemployed in rural and urban areas, independent as well as auxiliary industry for agriculture should be encouraged in the state more than before. “Until we do something for the industrialization in the Punjab we cannot achieve that standard of prosperity which we consider essential for the comfortable and easy life of the people in the state,” once again observed Sir Chhotu Ram stressing upon the agro-based industry in 1935. The Unionists' Party demanded, once more, that all the Government aided industries in Punjab should be linked with agriculture so that in the coming War the food requirement could easily be met.

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While expressing their views on industry, without concealing their leanings towards agriculture, the Unionists many times pleaded in the Punjab Legislative Council that despite the rural attitude of their party and preference for agriculture, it had a soft corner for promoting the industries.\(^{168}\) This view was not due to the fact that it had decided to promote the urban occupations more, but the Unionists thought that the progress of industry could add to the prosperity of the agriculturists as well. These views found expression in one of the statements that were made in the Punjab Legislative Council in 1939. One of the best solutions to the problems of the peasants was that the state was completely industrialized and the Unionists assured the house that their Government would leave no stone unturned to industrialize the Province rapidly.\(^ {169}\) This way Punjab could bear the burden of the coming War. It was obvious that when India was involved in the War, Punjab was bound to assist the British Government of India in all of its needs.

Perhaps it was due to this reason that it was said that although most of the industrialists were non-agriculturists, yet there was no conflict between the interests of the two. That was the reason why Government announced many concessions for the establishment of industries in the Province. It was believed that the Government announced these concessions keeping in mind the requirements of the approaching War in September 1939. Even though Unionists, the staunch supporters of the Land Alienation Act (1900), they gave two more concessions to it. Firstly, the statutory agriculturists who wanted to set up industry, could mortgage a part of their land with the Industries Department in order to have loans, and this part of the land was declared exempted from the said Act.\(^ {170}\) Secondly, they exempted those plots of land from the preview of this Act as were needed for setting up industries on it. For this purpose, the Government accordingly, advised the industrialists to apply to the Deputy Commissioner and Director of Industries under Section 3 of the Act.\(^ {171}\) Thus, it is clear that Government's chief

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\(^{171}\) At the same time it was made clear to the industrialists that any misuse of this concession would not be tolerated, Vide. *Ibid.*, Vol. I, 12.7.1938, p.1360; also Vol. X, 27.10.1939, p. 232.
objective was to industrialize the Province of Punjab mainly to boast the agriculture. However, the Government had to face the following problems to put its plan into action.

1. At this time the industrial laws were harmful to the industry itself. These laws rather destructed the industrial growth. Sir Chhotu Ram became a minister for the first time after the introduction of the dual government (Diarchy) in the Province. At this time industry was a reserved subject under this system. Though, state was given autonomy in 1937, even so under this system also, there were a few indirect obstacles in the way of the development of industry; for example, control over the tariff system was in the hands of the central government.

2. The state income was meager as it was not possible to spend much on the industrialization of Punjab. The famines further gave a set back to the process of industrialization of the state, for a sum of Rs. 2.70 crore out of the total income of Rs. 11 to 12 crore was spent on the relief work, during the period 1939-45.

3. The capitalists were not desirous to invest on industry, for they found it more profitable to lend money to the agriculturists.

4. The economic consequences of the World War I had not yet subsided when the economic depression and thereafter the World War II hit the industry. The War had a very adverse effect on the industry because the machinery could not be imported during this period. That was the reason why Government's plan of installing the glass and textile industries could not be implemented in Punjab.

Despite all these handicaps the Punjab Government made a remarkable contribution in the industrialization of the Province, which may be studied under three heads:

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172 In order to promote cottage industries, Provincial Department of Industries was set up in 1920. Vide. Punjab Administration Report: 1919-20, p. 83; also Mitra's Indian Annual Register, Year 1940, Vol. I, p. 188; also Punjab Legislative Assembly Debates, Vol. XVII, 13.1.1941, p. 120; Punjab Budgets with detailed estimates for the years 1937-38 to 1940-41.


The Provincial Industries Department under Sir Chhotu Ram, was working so efficiently in 1937-39 that the Punjab Legislative Council and the Industries Committee lauded it. They inspected the functioning of the Arts and Crafts Depot which besides working very properly, was earning a lot of profit. Industrial achievements during this period were as follows: First of all, in 1937, was established a modern tannery in the public sector with dual object. The first object was that it should be a model for all the tanneries in the Province, and more so for the small tanneries in the rural areas. The second object was to save the money spent on sending trainees to England to study tanning. It is noteworthy to mention that the production of hides in the school went up from 25 to 100 per day within a short span of year.

Six new industrial training institutions were set up in this Province at the cost of Rs. 30,000/-. In this way, the number of these schools in the province rose to twenty two; and two thousand students received training in these institutions. These institutions were important in themselves, for they had been set up in order to promote the cottage industries and to benefit the rural masses. Each institution had a Head Master, two artisans i.e. one drawing teacher and one language teacher. Thus, these institutions, besides imparting technical training also helped in eradicating illiteracy. During the same year some leading members of the Unionist Party such as Sir Chhotu Ram with some Government officials traveled Multan, Amritsar, Lyallpur, Sialkot, Rawalpindi, Jalandhar, Hoshiarpur, etc. to find out the possibilities of promoting industries all the

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more. They encouraged the rich and offered them all possible help if they decided to invest in the development of industry.\(^{181}\)

In the beginning of 1937, the significant achievement of the Government was the establishment of an Engineering College to meet the demand of industrial and commercial classes. The Chief Engineer, Asbury was sent to Thomas Engineering College, Roorki to have a thorough study of the plan. He declared in the Punjab Legislative Council that the Engineering College would be opened in 1937 itself.\(^{182}\) In spite of the meager allocation of fund of 8,47,000 rupees for the industrialization of the Province for the whole year i.e. 1937-38. The capitalists were assured that their government would make available more funds and thus consider their two demands sympathetically: (i) Credit by the Government to the industrial banks; and (ii) The purchase of the shares by the Government of the newly established industries.\(^{183}\)

During the period under review the most important achievement of the Punjab Government was to get through in the Punjab Legislative Council the Mandi Hydro-Electric Scheme in the Public Sector despite the stiff opposition by Sir Gokal Chand Narang and Prof. Ruchi Ram Sahni.\(^{184}\) The aim of this scheme was to produce 36,000 kw electricity and to provide it to the industrialists and the farmers at the rate of 7.3/4 paise per unit after they had got tube-wells installed. The scheme, because of the efforts of the Unionist Government was completed in 1933-34 at a cost of Rs. 6.25 crore.\(^{185}\)

The Unionists during the period, 1937-46, generally criticized the industrial policy of the British Government. In 1935, Sir Chhotu Ram had expressed in the Punjab Legislative Council that the industry in the Punjab was being ignored in such a way as


was not done in any other developing country. Despite the indifferent attitude of the
government he suggested to it to establish cottage industry in the rural areas of the
Province.\(^{186}\) According to him: (i) It could prove to be a permanent solution to the
financial hardships of the agriculturists as well as the rural masses who with the help of
the cottage industry, could increase their income during the lean period as well as at the
time of natural calamities such as the failure of crops; and (ii) these industries could
lessen the burden on the soil.\(^{187}\) His views were perfectly in order. Similar views had
been expressed by many specialists as well as some other societies. For instance, the
Committee appointed by the Punjab Government to review the recommendations of the
Royal Commission on Agriculture had expressed similar views.\(^{188}\) While endorsing the
view, the Royal Commission had expressed that most of the agriculturist families were
bound to agriculture only due to the absence of any other occupation. They produced
food not only for their own consumption, but to meet the requirement of the market and
also the British Government looking to the urgent need during the course of the World
War II. The only solution it recommended was that they should have been engaged in
cottage as well as big industries. In the same way, M.L. Darling, wrote: "without this
second string (rural cottage industry), to his bow, the Punjab peasant proprietor must
always be in debt."\(^{189}\)

At the same time, some Unionist leaders pressurized the government to set up co-
operative societies which on the one hand could supply the raw material to the village
cottage industries, and on the other, buy the finished goods.\(^{190}\) According to the Unionist
Government, these societies were essential to make the cottage industries profitable.
These societies were needed for most of the craftsmen to buy the raw materials on credit

\(^{186}\) *Punjab Legislative Assembly Debates*, Vol. XXVI, p. 182.


on which they had to pay interest up to 37 per cent per annum.\textsuperscript{191} It was due to the efforts of the Unionist Government that the Marketing Board was established to promote the sale of the products of the cottage industry. Its head office was located at Amritsar, with its branches at Multan, Jalandhar and Hoshiarpur.\textsuperscript{192} Consequently, the Government recommended the establishment of the industries for producing rope, nivar, socks, basket, leather, etc., for they promised much profit with less investment. It also recommended that cottage industries such as cheese making, tailoring, dyeing, calico printing, carpentry, pottery, poultry farming, etc. should also be introduced in the rural areas of Punjab.\textsuperscript{193} This will not only feed the villagers but at the same time it would help the British to supply in plenty to meet the needs of the soldiers who were fighting in various sectors during the World War II.

Though the Punjab Government left no stone unturned for the progress of industry in the Province, but at the same time it did not want that the industrialists should betray the government. That was the reason why it objected to certain provisions of the State aid to Industries Act in 1935, and suggested certain amendments in the proposed Act.\textsuperscript{194} Although the industries Minister, Gokal Chand Narang, turned down Chhotu Ram's proposals, his basic principles for the process of industrialization of the province, that should have been adopted, can be summed up as follows:

i) There was no provision for giving representation to the peasants and workers on the proposed Board of Industries, provided in the bill;\textsuperscript{195}

ii) The bill was silent on the issue that while deciding aid to the industries, preference would be given to those industries which were agro-based and consumed the other raw material available in the Province;\textsuperscript{196}

\begin{itemize}
\item \textsuperscript{191} Report of the Punjab Provincial Banking Enquiry Committee, 1929, p.30.
\item \textsuperscript{192} Report on the Working of the Industries Department (Punjab), 1936, p. 29.
\item \textsuperscript{194} Finance Department, Year 1935, File No. 22(24)-F.D./1945, N.A.I., New Delhi.
\item \textsuperscript{195} Ibid.; Punjab Legislative Council Debates, Vol. XXVII, 29.12.1935, pp. 1233 and 1238; Punjab Government Gazette (Extra-ordinary), 25.1.1936, pp. 11-16 (In principle the members of the treasury bench were in favour of the legislation of such a bill. This bill was passed as the Punjab State Aid Industries Act (1935) and replaced the Punjab Industrial Loans Act (1923). The former Act came into force on March 7, 1936.
\end{itemize}
iii) This bill assured a minimum net return instead of gross return on the capital invested by the industrialists in the industries. In this way, there was an ample scope for the misuse of this provision;\(^{197}\) and

iv) The bill did not determine the limit of profit to the share holders from the government aided industries during the normal times.\(^{198}\)

If the last provision had been amended suitably, it would have lessened to a fairly large extent the responsibility of the Government with regard to its guarantee to minimum return. It is pertinent to point out that Sir Chhotu Ram, as the Development Minister of the Punjab from 1937 to 1940, got amended the above Act and removed most of its draw backs during this period. He put in to practice his industrial views, but while doing so, he had to decide two things: Firstly, whether the additional funds available were to be spent on the expansion of the cottage industries, both rural and urban or on big industries. About the additional resources, he said in the Punjab Legislative Assembly on June 22, 1937, "The major share of the additional resources required for any serious plan of expansion and development will have to be found from fresh taxation. Their burden will have to be put on the prosperous section of the society, for levying new taxes on the poor and the farmers will make the problem of poverty all the more acute."\(^{199}\) He, therefore, mobilized additional funds through the Punjab Urban Immovable Property Tax (1941) etc.\(^{200}\)

About the distribution of funds, the Punjab Government announced that it could not give preference to the big industries in the Public Sector over the village cottage industries. He admitted in the House that the Government could not save more than rupees two crore annually even after drastically cutting down its expenditure as well as making deductions from the salaries of the employees. The amount was much lower than

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\(^{197}\) Ibid., p. 992.

\(^{198}\) Ibid., p. 1102; Punjab Government Gazette (Extra-ordinary), ending December, 1935, pp. 47-54.


\(^{200}\) Ibid.
required for the fullest industrialization of the Province.\textsuperscript{201} Under the circumstances when the state Government was not authorized to levy taxes on large scale on the urban population, and the Secretary of State for India did not permit any big load for the industrialization, for it would have an adverse effect on the British industries (although the people of Punjab were ready to give loan to the Government) The Punjab Government invited the industrialists to invest in free or big public sector industries. It promised essential technical know-how and legal protection to them.\textsuperscript{202}

The Unionists' ideas on capitalism can properly be understood only in this context. In Chhotu Ram’s words, "I have never supported the idea of finishing capitalism." However, he certainly wished to eliminate evils of capitalism. He was in favour of putting an end to the exploitation on the part of the capitalists.\textsuperscript{203} He, who was committed to safeguarding the interests of the industrial laborers, opposed the Punjab Hours of Work Bill, the Punjab Fixation of Minimum Wages Bill, the 'Printing Presses Control Bill' and 'Punjab Maternity Bill.' All these bills were meant for the welfare of the laborers. His opposition can properly be understood in the light of the overall interests of the laborers and the state.\textsuperscript{204} There were two main reasons for his opposition to these bills:

i) Over 40 per cent of the industries in the province were not working well. After the passage of the above bills, the burden on these industries would have increased and they might have reached the verge of closure. There was no


hope of setting of new industries in the Punjab. Consequently large number of laborers might have been thrown out of job.\textsuperscript{205}

ii) In order to enforce these laws strictly, a large number of Inspectors, Magistrates and other officials, would have been recruited\textsuperscript{206} leading to an expenditure of \textit{lacs} of rupees. The Punjab Fixation of Minimum Rates of wages alone needed a Joint Board and two Magistrates in each district.

In relation to the Punjab Hours of Work Bill, an amendment was proposed in the Factory Act, 1934 of the Central Government, through this Act, sixty-hours per week for seasonal occupations and fifty two to fifty six hours per week for other trades had been fixed for all the Provinces. A similar proposal was given regarding the Fixation of Minimum Rates of Wages Bill, for making a law of this type on the part of the Central Government would have led to the minimum possibility of the private investment being diverted to other States from the Punjab.\textsuperscript{207}

Several Unionists had opposed these bills due to certain unfavorable conditions. Had he visualized any hope of prosperity of the industries in Punjab, he would not have only supported but also helped these measures. Participating in the debate over the Punjab Fixation of Minimum Rates of Wage, clarifying the ideas of the Unionists, he said, "Dr Gopi Chand Bhargav and others should wait patiently to implement this bill till the situation of industrialization in the State improved. At that time we shall like to see that our laborers, instead of rupee one, received rupees two per day as wages."\textsuperscript{208}

The Punjab Government for the development of industries encouraged the individual capitalists to invest their capital in this field. It assured the capitalists that it would plead with the Central Government to implement the tariff system in such a way as it might be beneficial for the development of industries in the Punjab. In this way, their competition with the foreign production would be less than before. Keeping this view in

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mind, the Punjab Government in 1938, advised the Central Government to give due representation to the industrialists, producers and consumers in the Tariff Board.  

In 1937, the Unionists Government, once again assured the industrialists that the Punjab State Aid to Industries Act would be implemented liberally. It kept its promise in word and deed. Thus on the one hand, the Government made provisions in the budget for the guarantee of minimum profit and on the other he gave loans to the industrialists liberally.

Another step taken by the Unionists in this direction during 1937-44 was raising the budget of the Industries Department. In 1940-41 it was raised by about 183 per cent and in 1944-45 by about 272 per cent in comparison with that of the year 1933-34. Even then, considering it to be small it established a special treasury in the department in 1937. In 1937-38 alone, a sum of rupees one lac twenty thousand was disbursed as loans for the development of the hosiery industry in Ludhiana district alone. Consequently, the number of hosiery mills went up from 16 in 1934 to 62 in 1939 and 115 in 1945. At the same time, in order to encourage the industrialists to set up their units in the Province, the amount in the budget was raised to 500 percent.

When in 1937, an all India Industrial Fair was organized, the Punjab Government for the Industrial progress of the Province, went to the extent of discouraging the exhibition of any such foreign product as could stand in competition with the Indian products. In order to give more encouragement to the indigenous goods, Sir, Chhotu Ram in 1939 directed all the departments of the State Government that the indigenous goods, particularly produced within the province should

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210 During the period 1933-36, Sir G.C. Narang was the Minister Incharge of Industries, Punjab. Vide. Report on the Working of the Industries Department, Punjab, 1939, p. 20; Punjab Legislative Assembly Debates, Vol. XII, 11.3.1940, p. 329.


212 This conclusion has been calculated from the figures cited in Punjab Legislative Assembly Debates, Vol. VIII, 20.3.1939, p. 439; also see Report of the Indian Tariff Board on the Woollen Textile Industry, Delhi : 1935, p. 346.

be given preference over the imported goods. The Provincial Store Purchase Department was also opened and given it full freedom to purchase goods from the local industries for the needs of the Government. The commercial castes exploitation of the agriculturalists could no longer be attacked because of the need for their cooperation in fighting the war. Hindu and Sikh businessmen profited enormously from a new source of Government patronage in the form of civil supply contracts.

The Unionists' Government was the first one which, for the development of the both-private and public sectors, undertook a district and industry-wise survey of the province in 1938-39 and then in 1944-45. The Punjab Government invited the noted economist Prof. K.T. Shah to prepare a detailed plan for the industrial development of Punjab. The recommendations of this plan proved to be very valuable. The Government confirmed it in one of its statements on March 7, 1941. Some of the other important achievements of the Punjab Government included the establishment of an Industrial Research Fund, setting up of Industrial Museum on district level and opening of a designing section at Mayo School of Arts. They benefited all the local industries greatly. The Industrial Research Fund worth rupees one lac fifty thousand which was the first experiment of its type in the country was set up in 1939 looking to the urgency of the possible needs which might come forth with the commencement of the World War II. In the same year, the Industrial Research Laboratory at Shahdara started working. The Secretary of the All India Village Industrial Association, Mr. Kamarappa, in a letter written in April 1939, to the in-charge of the laboratory Dr Sarin, praised the useful work done by it, on the one hand, the Industrial Museums gave publicity to the industrial

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products of the Punjab, on the other. The Designing Section of the Mayo School of Art helped in preparing designs for the proposed industries.\textsuperscript{219}

For the industrial development of the Punjab Province, trainees were also sent abroad for receiving training in the modern industrial technology. In 1938-39 alone, a sum of rupees ten thousand was earmarked in the budget for this purpose.\textsuperscript{220} Hence, the details given above made it clear that the Punjab Government were in favour of encouraging industrialists. But at the same time they suppressed their corrupt ways ruthlessly. They put an end to the wrong tradition followed since the time, Sir Gokal Chand Narang was the minister of Industries Department that the government could start a new industry with its own investment, but when it started earning profit, it would be sold to some industrialists, but many industrialists jointly would purchase it even without paying a reasonable price. The Government amended Section 24 of the State Aid to Industries Act also. According to this a joint Hindu family was condoned from the responsibility of repaying the debt taken by the head of the family.\textsuperscript{221} Another evil in those days was that the then industries were being expanded in an unsystematic manner. The new industries were being set up in an unplanned way. As a result of this the laborers had to live in slums. Moreover, it was creating an unhealthy competition. In order to remove these vices the Unionists Government got the factories (Punjab Amendment Act), 1940 passed, by which such old industries as well as the new ones to be set up as were run by power and employed forty or more persons came under an effective control of the Government.\textsuperscript{222}

As is clear from the table given below, due to the efforts of Unionist Party, the number of the factories in the Province rose every year tremendously, which provided

\textsuperscript{219} Ibid., Vol. XV, 23.1.1941, p. 204 also Vol. III, 8.3.1938, p. 578; Punjab Administration Report; 1901-02, p. 179.


\textsuperscript{221} Ibid., Vol. XVII, 13.3.1941, p. 127.

\textsuperscript{222} A. Mukhtiairi, op.cit., p. 117; Punjab Legislative Assembly Debates, Vol. XI-A, 2.2.1940, pp. 55,63; also Vol. XIII, 19.4.1940, pp. 915, 931 and 966.
employment to a large number of people. The number of the factory workers rose from 53,327 in 1934 to 63,268,72268 and 78302 in 1937, 1938 and 1939 respectively.223

Progress of Factories 1936-39224

<table>
<thead>
<tr>
<th>Year</th>
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</tr>
</thead>
<tbody>
<tr>
<td>No. of factories registered</td>
<td>71</td>
<td>98</td>
<td>47</td>
<td>81</td>
</tr>
<tr>
<td>No. of factories unregistered</td>
<td>23</td>
<td>22</td>
<td>22</td>
<td>51</td>
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<tr>
<td>No. of the registered factories at the end of the year</td>
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The Unionists' Government made remarkable achievements particularly in the field of cottage industry. It introduced the traveling demonstration parties which, in fact, were mobile industrial schools. They imparted training to men as well as women in different crafts. Some of such parties as were active from 1937 to 1941 have been mentioned in the Punjab Legislative Council debates. As a result of the training imparted by them, the income of the artisans went up considerably. In Hissar daily wages of weavers and spinners was one anna before getting the training, rose to four annas and eight to nine annas225 respectively. Another important outcome of these demonstration parties was that many people, inspired by the new technical education, set up their own factories. For instance, a rich man, impressed by the new technique of preparing Ammonium, Chloride opened his own factory at Kaithal.226

In this connection, it is noteworthy to mention that the Unionists emphasized the need for raising the number and the standard of the industrial schools. This party

224 Factories actually working numbered 747, 748, 780 and 800 in 1936, 1937, 1938 and 1939, respectively. Vide. Punjab Legislative Assembly Debates, Vol. XI-A, 2.2.1940, pp. 53 and 537 (Statistics for this table prepared from the Annual Reports on the Working Department, Punjab for the years 1936-39).
225 In 1941, there were in all 24 demonstration parties, and a sum of Rs. 26,040 was allocated for the salaries of their staff. Vide. Punjab Legislative Assembly Debates, Vol. XII, 18.1.1941, p. 18; also Vol. IV, 25.3.1938, p. 264.
suggested the opening of a commercial section in each industrial training school to make them self-dependent. Its suggestion was implemented in the Government Hosiery School Ludhiana at a cost of rupees forty thousand.\footnote{227} The success of this proposal stood vindicated by the fact that this school earned a profit of rupees ten thousand during the first five months.\footnote{228} In this direction, another important contribution of the Unionists' was the establishment of a school for the training of weaving and knitting at Kulu. In order to encourage the people of this place it held a prize winning competition in weaving and knitting on the day of Dusehra festival annually.\footnote{229}

For the development of the cottage industries, another step was taken to raise the number of the co-operative industrial societies in which the most important were the weaving societies. These weavers earlier used to buy thread from merchants (banias) at a high rate of interest and then sold the finished clothes to the same merchants at low prices. Now, thread and tools were available to them from the societies at reasonable rates. They could also sell their products to the societies at fair prices. They could get money in advance for their products, and without any surety, could get the necessary articles also in advance.\footnote{230} Besides, they could also borrow small amounts of money. In 1937-38, weavers in Panipat town alone were given Rs.6,500/- as loans. As stated earlier, Marketing Boards with their depots at Amritsar, Multan and Hoshiarpur were set up for their benefit.\footnote{231} In the beginning, for want of funds, the Government had to depend upon the capitalists for the initial investment, as a result of which the profit went to the pockets of the capitalists, but in 1941, the Government for the purpose arranged a sum of Rs.


\footnote{228}Ibid., Vol. VIII, 13.3.1939, p. 439.


\footnote{230}Ibid., Vol. IV, 25.3.1938, p. 264; Vol. XVII, 17.3.1941, p. 128.

\footnote{231}Ibid.
50,000 so that their profit could be reinvested on their development and expansion.\textsuperscript{232} The Unionist Party did one thing more in this direction. It opened sales depots one in Shimla in 1937-38 and another at Murru in 1938-39 for the sale of the cottage industry products. These depots were under the control of the Central Depot in Lahore.\textsuperscript{233} Efforts were made to encourage poultry and bee keeping industry as well. Thus, the bee - keeping projects - one each at Nagrota in Kangra district and the other in Kullu Valley were started. For the revival and benefit of the pottery industry, a Central Agency was set up at the cost of Rs.60,000/-.\textsuperscript{234}

Remarkable progress was made in the field of industrial training for women as well. The Government sanctioned grants and scholarships to the Women Industrial Training Institutes, as a consequence of which the number of the trainees marked a steep increase. The number from 200 in 1920 went up to 1400 in 1937 and 2015 in 1939 and 3050 in 1942 and nearly 4000 in 1945.\textsuperscript{235} The increase in number was due to the big amount of money made available by the Punjab Government. The amount which was Rs. 6000 in 1920 was increased to Rs. 79,000 in 1940 and 1,58,000 in 1945.\textsuperscript{236}

Another outcome of the efforts of the Unionist Government was the amendment in Section 17 of the State Aid to Industries Act 1940. Its purpose was to extend its field to the cottage industries, whereas earlier it was meant to help research for other industries only.\textsuperscript{237} It again went to the credit of the Punjab Government which arranged Rs.30,000/-


\textsuperscript{234} \textit{Punjab Legislative Assembly Debates}, Vol. XII, 11.3.1940, pp. 330-31.

\textsuperscript{235} \textit{Punjab Legislative Assembly Debates}, Vol. XII, 11.3.1940, pp. 330-31.

\textsuperscript{236} In 1941, there were in all 24 demonstration parties, and a sum of Rs. 26,040 was allocated for the salaries of their staff. Vide. \textit{Punjab Legislative Assembly Debates}, Vol. XII, 18.1.1941, p. 18; also Vol. IV, 25.3.1938, p. 264.

\textsuperscript{237} \textit{Ibid.}, Vol. XVII, 13.3.1941, p. 18.
in 1941 to sanction loans to the poor unemployed, eager to start industries.\textsuperscript{238} A major headache for the unionist Government was the shortage of consumer goods. The diversion of resources to war production and the curtailing of the imports of ordinary consumer goods were the root cause of this intractable problem. Its first impact was felt in the towns.\textsuperscript{239}

The Punjab Government's efforts led to a remarkable industrial development of the Punjab. The Government Weaving Factory, Shahdara, which during the period of Gokal Chand Narang’s ministry had been running in loss of Rs. 60,000/- every year, earned a profit of Rs. 56,000/- in 1940.\textsuperscript{240} The state run industries, although most of them were in the cottage industry sector to a large extent, met the developmental needs of the Government. For instance, the Central Workshop, Amritsar, produced the article needed for the \textit{Haveli} Project.\textsuperscript{241} The Government industrial schools produced the articles, partly needed to meet the requirements of the Defense Department.\textsuperscript{242} The Defense Department praised their quality, in its report of 1939.\textsuperscript{243} The Punjab was the only Province to have the privilege of producing blankets on handlooms. Expressing similar views Prof. K.T. Shah also wrote that druggists and silky, silver and gold embroidered woolen garments produced in this province were very well-known in foreign countries as well.\textsuperscript{244} The industrial progress of Punjab is revealed from the fact that the number of the woolen mills rose from 3, which employed 1559 workers in 1925 and 2666 in 1939.\textsuperscript{245} The number of cement factories went from one in 1920 to 3 in 1933, and 7 in 1942 and 11 in


\textsuperscript{239} Ian Talbot, \textit{Punjab and the Raj (1849-1947)}, p. 146.

\textsuperscript{240} \textit{Ibid.}, Vol. VIII, 13.3.1939, p. 439.

\textsuperscript{241} \textit{Ibid.}, Vol. IV, 25.3.1938, p.26; also 311-32.

\textsuperscript{242} \textit{Ibid.}, Vol. IV, 25.3.1938, p.26; also 311-32.


\textsuperscript{244} \textit{Ibid.}, Vol. IV, 25.3.1938, p.264; Vol. XVII, 17.3.1941, p. 128.

\textsuperscript{245} \textit{Ibid.}
1945. The prizes won by the Punjab in different exhibitions also reveal the keen interest taken by the Unionists Party and its government in the industrial development of the province. For instance, Punjab was awarded the first prize for its exhibits in the exhibition in Delhi. It won four medals and two certificates at Karachi also.

The Industrial development of Punjab during the period under review drew the attention of other States' Governments as well. In a statement to The Tribune, Vishvanath, the Prime Minister of Orissa said in December, 1937 that in the field of industrial development, Punjab was marching much ahead of any of the other States ruled over by the Congress. The Industry Minister of Bombay had also expressed similar views that “there was no doubt about it that Punjab Government had played a laudable role in this direction especially during the regime of the Unionists”. Thus it may be concluded that the efforts of the Punjab Government were appreciated not only by the people of Punjab but by several important men of other States also. This too displayed the importance of the agriculture based industry which could make the agriculturists, non-agriculturists, moneylenders and the industrialists prosperous. However, after independence, the Centre Government had not given due and sufficient attention to the required industrial development in this Province.

Here, it becomes pertinent to cite some achievements in the field of industry in the province of Punjab during the period under review. So attempt has been made to present the evolution of industry in two regions i.e. Hoshiarpur and Jalandhar in particular. The reason is obvious of selection these areas because of two reasons i.e. (i) the government paid more attention and the private enterprises spent more and secondly the manufactures of these two areas met the requirements of the market of that time. Of course, Ludhiana

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246 Annual Report on the Working of the Co-operative Societies in Punjab, 1930, p. 48; also of 1938, p. 7; also of 1939, p.42.


was another most significant centre of industry to supply woolens and other clothes, but it has not been taken up as one can do independent work on the development of industry in this reason. However, it is to be noticed that this industry did help the British masters during the course of World War II. From April 1939, the Purchase Department of the Punjab Government replaced the Central Agency of the Indian stores Department or the main purchaser of supplies. It dealt in contracts for the supply of items as tents, hardware, textiles, leather good and machinery to the tune of Rs. 50 Lakh a year.\textsuperscript{250} The Hindus business class gained the most from the growth of lucrative government civil supplies contracts. Baldev Singh’s entry into the cabinet created wartime bonanza for the businessmen.\textsuperscript{251}

It is a well known reality that the economic development of a region/state depends upon the conditions of agriculture, industry and trade. Industrial progress and trade are the backbone of sound economy of a region. We find that before period for our study there were no Industries in large number in Punjab as well as in India. Since then a small modern industry section slowly emerged in the Punjab economy. It expanded in the forth and fifth decade of the twentieth century out of the sheer necessity arising from the World War I and II.\textsuperscript{252} The war created demand for blankets and other wollen materials. The mills could not meet the demand. The Govt. Supply Department turned towards handloom wollen industry. Handloom weaver benefited from the increased demand from the civilian market for blankets, tweeds and rugs. Moreover, the cessation of imports from Italy helped the handloom weaver further.\textsuperscript{253} The post-war development plan registered the declining trend in the handloom industry.\textsuperscript{254} In 1939, the number of cotton spinning and weaving mills increased to 13 mills, 2,252 looms, and 86,748 spindles.\textsuperscript{255} The post-war Development Plan had suggested to set up a special spinning plant to turn out the cotton yarn.\textsuperscript{256} Imports of worsted yarn led to the establishment of small worsted

\begin{footnotesize}
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\item \textsuperscript{250} \textit{The Tribune}, 27.9.1940.
\item \textsuperscript{251} Ian Talbot, \textit{Punjab and the Raj (1849-1947)}, p. 152.
\item \textsuperscript{253} \textit{Report on the Panel on Woollen Industry}, Government of India, department of Industries & Supplies, nd. 15, 24.
\item \textsuperscript{254} Govt. of Punjab, \textit{Post-War Development Plan Punjab}, Lahore 1946, p. 77.
\item \textsuperscript{255} \textit{Statistical Abstracts of British India (1930-31 to 1939-40)}, pp. 620, 626-29.
\item \textsuperscript{256} Govt. of Punjab, \textit{Post-War Development Plan of Punjab}, p. 77.
\end{itemize}
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poor loom weaving mills in Amritsar and hosiery knitting factories in Ludhiana. The war cut off supplies of yarn. It was imported from the UK and Australia to keep the industry alive.\footnote{Report of the Panel on Woollen Industry, p. 11.} Member of hosiery factories increased from 42 in 1937 to 62 in 1940.\footnote{Statistical Abstract of British India (1930—31 to 1939-40), pp. 59-93.} In 1941, Ludhiana alone exceeded 100 hosiery factories.\footnote{Report of the Panel on Hosiery Industry, p. 1.} Till 1945, a problem of hosiery machines and availability of persisted.\footnote{Ibid., p. 2.} Before the advent of British rule in India the Punjab had a handicraft industry. But after the decline of handicrafts, the era of modern industry began. It is believed that modern Indian industry started in the last quarter of nineteenth century, as evidenced by the growth of tea, coffee and jute industries.\footnote{D.R. Gadgil, Industrial Evolution of India, Calcutta, 1942, p. 34.} That was when attempts were made to introduce the factory system in several industries, notably by Europeans. For example reeling machinery had been introduced in silk fibers in the East India Company. But most of the other attempts had met with failure. Thus before the fifties of the nineteenth century there was almost total lack of factory industry in Punjab.\footnote{Ibid., p. 34.} The number of silk factories increased from four in 19356 to eights in 1945.\footnote{Govt. of India, Report of the Panel on Artificial Silk and Rayon Industry, Department of Industries and Suppliers, Simla, 1947, p. 33.} Industrial progress is the backbone of sound economy of a region. From that point of view the Punjab came pretty low. There were not many factories in Punjab till the beginning of the twentieth century.\footnote{Hoshiarpur District Gazetteer, Lahore, 1904, p. 150.} It was only after the World War I that the industrial activity made its beginnings in this region. The chief manufacturers of the province of Punjab by 1947 were cotton, fabrics, ivory or bone and copper inlay works, decorative furniture, shoes and glass work etc.

The Unionists Government in 1939-40 again assured the industrialists that the Punjab State Aid to Industries Act would be implemented liberally. It kept its promise in word and deed. Thus the Government made provisions in the budget for the guarantee of
the minimum profit and also gave loans to the industrialists liberally.\textsuperscript{265} During 1937-44 the budget of the Industries Department was raised. In 1940-41 it was again raised by about 183 per cent and in 1944-45 by about 272 per cent in comparison with that of the year 1943-44. Yet, considering it to be small it set up in 1939 a special treasury in the department.\textsuperscript{266} The Post-World War plan had earmarked Rs. 4.99 crore for the development of industries.\textsuperscript{267} A sum of \textit{rupees} one \textit{lac} twenty thousand was disbursed as loans for the progress of the hosiery industry in Ludhiana district alone in 1939-40. As a result, the number of hosiery mills went up from 16 in 1934 to 62 in 1939. The amount in the budget was raised to 500 percent to encourage the industrialists to establish their units in the Province.\textsuperscript{268} When in 1937, an all India Industrial Fair was organized, the Punjab Government for the Industrial progress of the Province of Punjab, went to the extent of discouraging the exhibition of any such foreign products as could stand in competition with the Indian products.\textsuperscript{269} To give more encouragement to the indigenous goods in 1939 directed all the departments of Punjab Government that the indigenous goods, particularly produced within the State should be given preference over the imported goods. The War created ‘an excellent opportunity of capturing export market’ of glass industry in the Punjab. The number of glass factories in the Punjab rose from three in 1939 to six in 1944, producing 6,600 tons of glass ware in 1945.\textsuperscript{270} In the post-war phase, hosiery, surgical instruments and sports goods industries had the fight against heavy odds owing to the restrictions on the export of their products. The industries had to pass through a phase of ‘a cute strain and distress’ A large number of markers were thrown out

\textsuperscript{265} Report on the Working of the Industries Department, Punjab, 1939, 20; Punjab Legislative Assembly Debates, Vol. XII, 11.3.1940, 329.


\textsuperscript{267} Government of Punjab, Post-War Development Plan Punjab, Lahore, 1946, p. 74.


\textsuperscript{270} Govt. of India, Report of the Panel of Glass Industry, pp. 30-31.
of employment. The Provincial Store Purchase Department was also opened. It was given free hand to purchase goods from the local industries for the Government requirements. In 1938 survey of the State the Union Government the first one which, for the development of the both-private and public sectors was undertaken district wise and industry wise. The Punjab Government invited the noted economist Prof. K.T. Shah to prepare a detailed plan for the Industrial Development. The recommendations of this plan proved to be noteworthy, which the Government confirmed in one of its statements of March 7, 1941. In 1939 Industrial Research Fund worth rupees one lac fifty thousand was set up. It was the first experiment of its type. The same year, Industrial Research Laboratory was started at Shahdara. The Secretary of the All India Village Industrial Association, Mr. Kamarappa, in a letter written in April 1939, to the in-charge of the laboratory Dr Sarin, admired the useful work done by it. The Industrial Museums gave publicity to the industrial products of Punjab. The Designing Section of Mayo School of Art helped in preparing designs for the proposed industries.

In Punjab Province for the industrial progress, trainees were also sent abroad for getting training in the modern industrial technology. In 1938-39, for this purpose alone, a sum of Rs. 10,000/- was earmarked in the budget. Hence, the detail given above tells that the Punjab Government favored and encouraged industrialists, but at the same time they suppressed their corrupt ways with strong hands. It put an end to the wrong tradition that the government could start a new industry with its own investment. But when it

272 Ibid., Vol. X, 2.11.1939, 439; also Vol. XVII, 17.3.1941, 127.
273 Ibid., Vol. II, 16.3.1938, 846; Vol. XI-A, 2.2.1940, 55; Vol. XVI, 7.3.1941, 253; India Year Book: 1940-41, 593.
276 Ibid., Vol. XV, 23.1.1941, 204 also Vol. III, 8.3.1938, 578; Punjab Administration Report; 1901-02, 179
began to earning profit, it would be sold to some industrialists; many industrialists jointly
would purchase it even without paying a reasonable price. It also amended Section 24 of
the State Aid to Industries Act. According to this a joint Hindu family was freed from the
responsibility of repaying the debt once taken by its head.  

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industries were being set up in an unplanned way was evil in those days. Consequently,
the workers had to live in slums. It was creating an unhealthy competition. To remove
this evil, the Government got the factories (Punjab Amendment Act), 1940 passed. Then
such old industries and the new ones were to run by power and could employ forty or
more persons. These came under an effective control of the Government. The efforts of
the Punjab Government resulted in the rise of number of factories every year
tremendously in the Province. The number of factories under the Factories Act increased
from 132 in 1900 to 1191 in 1943 with 1,32,480 male workers. That provided
employment to a large number of men. The number of the factory workers rose from
53,327 in 1934 to 63,268 in 1937 to 72,268 in 1938 and 78,302 in 1939 respectively.
The table given below will make this fact clear:

Table Showing the Progress of Factories: 1936-39

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The Punjab Government made remarkable contribution in the field of cottage
industry. It introduced the traveling demonstration parties. These were, in fact, mobile

278 Ibid., Vol. XVII, 13.3.1941, 127.
279 A. Mukhtiari, op.cit., 117; Punjab Legislative Assembly Debates, Vol. XI-A, 2.2.1940,
55,63; also Vol. XIII, 19.4.1940, 915, 931 and 966.
281 P.L.A.D., Vol. XII, 11.3.1940, 325,26; The Indian Labour Year Book, 1946, 10.
282 Punjab Legislative Assembly Debates, Vol. XI-A, 2.2.1940, 53 and 537. Annual Reports
on the Working Department, Punjab for the years 1936-39)
industrial schools. They gave training to men and women in different crafts. Some of such parties as were active from 1937 to 1941 are cited in the Punjab Legislative Council debates. As a result of the training given by them, the artisans’ income went up sufficiently. In Hissar, daily wages of weavers and spinners was one anna before getting the training, rose to four annas and eight to nine annas\textsuperscript{283} respectively. One more important result of these demonstration parties was that a large number of men, encouraged by the new technical education, founded their own factories.\textsuperscript{284} In this connection, it is worth mentioning to State that the Punjab Government stressed the need for raising the number and the standard of the industrial schools. It also suggested the opening of a commercial section in each industrial training school. It was to make them self-dependent. Its suggestion was carried out in the Government Hosiery School, Ludhiana at a cost of Rs. 40000/-\textsuperscript{285} The success of this proposal stood vindicated by the fact that this school earned a profit of Rs. 10000/- during the first five months.\textsuperscript{286} In this direction, the Government’s another notable achievement was the setting up of a school for the training of weaving and knitting at Kulu. To encourage the people of this place it held a prize winning competition in weaving and knitting on the day of Dusehra festival every year.\textsuperscript{287}

For the development of the cottage industries, another step was taken. It was to raise the number of the co-operative industrial societies. In that the most notable were the weaving societies. The weavers earlier used to buy thread from merchants (banias) at a high rate of interest; then sold the finished clothes to the same merchants at low prices. Now, thread and tools were made available to them by these societies at reasonable rates.

\textsuperscript{283} Punjab Legislative Assembly Debates, Vol. XII, 18.1.1941, 18; also Vol. IV, 25.3.1938, 264.
\textsuperscript{284} Ibid., Vol. XVII, 13.3.1941, 18
\textsuperscript{286} Ibid., Vol. VIII, 13.3.1939, 439; Ibid., Vol. IV, 25.3.1938, 26, 311-32
\textsuperscript{287} Annual Report on the Working of Co-operative Societies : 1920-21, 31; also of 1939, 38-39; Punjab Legislative Assembly Debates, Vol. VIII, 20.3.1939, 439
They could also sell their products to the societies at fair prices. They could get money in advance for their products, and without any surety. They could get the necessary articles also in advance.\textsuperscript{288} Besides, they could also borrow small amounts of money. In 1937-38, weavers in Panipat alone were given Rs. 6,500/- as loans. As stated earlier, Marketing Boards with their depots at Lahore, Multan, Amritsar and Hoshiarpur were set up for their benefit.\textsuperscript{289} In the beginning, for want of funds, the Government had to depend upon the capitalists for the initial investment. Consequently, the profit went to them. In 1941, the Government for the purpose arranged a sum of Rs. 50,000 so that their profit could be reinvested on their development and expansion.\textsuperscript{290}

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  \item \textsuperscript{288} Ibid., Vol. IV, 25.3.1938, 264; Vol. XVII, 17.3.1941, 128.
  \item \textsuperscript{289} Ibid.
  \item \textsuperscript{290} Annual Report on the Working of the Education Department, Punjab : 1938-39, 74; also of 1935-36, 62; Punjab Legislative Assembly Debates, Vol. VIII, 1613, 1939, 20.3.1939, 861
  \item \textsuperscript{291} Annual Report on the Working of the Co-operative Societies in Punjab, 1930, 48; also of 1938, 7; also of 1939, 42
  \item \textsuperscript{292} Punjab Government Gazette (Extra-ordinary), 20.12.1938, 626; Punjab Administration Report : 1925-26, 24-30; Punjab Legislative Assembly Debates, Vol. XII, 11.3.1940, 331
  \item \textsuperscript{293} Punjab Legislative Assembly Debates, Vol. XII, 11.3.1940, 330-31; Punjab Legislative Assembly Debates, Vol. XII, 18.1.1941, 18; also Vol. IV, 25.3.1938, 264.
\end{itemize}
\end{footnotesize}
the efforts of the Punjab Government was the amendment in Section 17 of the State Aid to Industries Act, 1940. Its objective was to extend its field to the cottage industries, whereas earlier it was meant to help research for other industries only. It also goes to the credit of the Punjab Government which arranged Rs. 30,000/- in 1941 to sanction loans to the poor unemployed, who wanted to start industries.\(^{294}\)

The Punjab Government's efforts led to a tremendous industrial progress of Punjab. The Government Weaving Factory, Shahdara, had been running in loss of Rs. 60,000/- annually, earned a profit of Rs. 56,000/- in 1940.\(^{295}\) The state run industries, though most of them were in the cottage industry sector to a large extent, met the developmental needs of the Governments. For example, the Central Workshop, Amritsar, produced the article required for the *Haveli* Project. The Government industrial schools produced the articles, partly required to meet the requirements of the Defense Department.\(^{296}\) The Defense Department praised their quality, in its report of 1939. Punjab was the only Province to have the privilege of producing blankets on handlooms. Expressing similar views Prof. K.T. Shah also wrote that druggist and silky, silver and gold embroidered woolen garments produced in this Province, were very well-known in foreign countries also. The industrial progress of the Punjab is revealed from the fact that the number of the woolen mills rose from 3, which employed 1559 workers in 1925, to 5 in 1939, employing 2666 workers.\(^{297}\) The number of cement factories went from 3 in 1933 and 5 in 1939. The prizes won by the Punjab in different exhibitions also showed the keen interest taken by the Punjab government in the industrial development of the State. For instance, the Punjab was awarded the first prize for its display goods in the


exhibition in Delhi. It won four medals and two certificates at Karachi also. Despite this, cloth, iron, cement, sugar, Kerosene all became virtually unobtainable in the villages.

The Industrial progress of the Punjab during the period under review drew the attention of other States' Governments. In a statement to The Tribune, Vishvanath, the Prime Minister of Orissa said in December, 1939 that in the field of industrial development, the Punjab was marching much ahead of any of the other States the Congress ruled over. The Industry Minister of Bombay had also expressed similar views that "there was no doubt about it that the Punjab Government had played a laudable role in this direction." The requisitioning and rationing of grain helped the trading classes. The Hindu and Sikh businessmen were free to make large wartime profits. As a result if inflation, the industrialists and the war contractors made huge profits. In 1941, the Hindu and Sikh business class had disrupted commercial life for two mouths in protest against the passing of the General Sales Tax Act and the Agricultural Produce Market Act. The General Sales Tax Act aimed to distribute the burden of taxation more evenly between the rural and urban population. It aroused great opposition. It taxed all traders who had an annual turnover of over Rs. 5,000. The traders formed a beopasi mandal to fight. It organized hartals in the region’s main towns. The Industries in the Punjab were dependent on agricultural products, pressing and bailing. These were mainly seasonal. The post-war Development Plan, Punjab, regarded ‘the Punjab industrially


302 R. Palme Dutt, India Today, p. 182.


backward' province in the context of large scale industries. There is a considerable decline in industrial activity after the end of World War-II as the demand created by military fell down with the end of hostilities. The factories were not in a position to switch over the production for civilian needs owing to the acute scarcity of raw materials. The concerns manufacturing surgical instruments were paralyzed due to fall in government demand and restrictions place upon the export of their products. However, export of sports goods from Sialkot continued. Foundries at Lahore remained busy in 1945-46 with the manufacture of oil expellers and those at Batala with agricultural implements. Match factories worked to full capacity. Rubber factories began experimenting an various goods for civilian use. Scarcity of cloth remained very acute. The demand for products of handloom weaving industry was fairly heavy but the industry was hamiting by the shortage of yarn. Supplies of coarse cloth from the cotton mill industry were very scarce. Despite demand for hosiery goods, production failed to increased on account of scarcity of yarn. In Ludhiana alone, the value of blocked-up stocks in September 1945 was estimates at Rs. 75 Lakh. In July 1945, the surgical instruments industry was paralyzed due to absence of government orders and restrictions imposed on the export of surgical goods. About 40 percent of factories closed down. The Batala foundries were busy with the agricultural implements which were in brisk demand. The Imperial War not only influenced the trade, commerce and industry but also political life in Punjab. It created contingencies, in which political parties began taking advantages. The developments in the Akali Dal and the Muslim League were noteworthy and significant.

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307 Ibid., p. 3.
309 Ibid., p. 16.