

TECHNO-SCIENTIFIC EDUCATION AND THE INDIAN NATIONAL CONGRESS (1885-1918)

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Abstract

This paper looks at the development of technical and scientific education in India. In this context the formation and the role of Indian National Congress are of special importance. From the beginning it carried out intense debates on the scope, character and relevance of such education for the development of the country. It held the industrial backwardness of the country responsible for the various evils in the Indian society. So whenever the government attempted to ignore in the technical, scientific and industrial education, the Congress leaders immediately tried to bring it to their notice and urged them not to do so. Also the leaders made repeated attempts to promote the development of various institutions for it. The issue of expenditure attracted importance in the resolutions. The various questions like: whether the urges and requests of the leaders had any impact on the government?; whether the efforts of the leaders helped in promoting techno-scientific education or not, are examined. The Indian Industrial Commission established after the World War I in 1916 by the government for the promotion of technical and industrial education is dealt in detail and the role of Madan Mohan Malaviya on it has been focussed.

Key words: Indian Industrial Conference, Indian Industrial Commission, Indian National Congress, Scientific Education, Swadeshi Movement, Technical Education

1. INTRODUCTION

Every civilized country has its technological institutes in numbers, and in almost every country except England the foundations of these institutes were laid in the earliest stages of technical education. In America, the Rernadaar Polytechnic Institute was established in 1824, the Massachusetts Institute in 1865, the Worcester Polytechnic in 1868, Lehigh University in 1866, the Steven's Institute in 1871. The Paris Ecole Polytechnique was opened in 1795, the similar institute at Vienna in 1815. The German Technological Institutes dates from the end of 18th century and beginning of 19th century. Brooswick 1745, Berlin 1799, Carlaruha 1825, Munich 1827, Drasden 1828, Stuttgart 1829. Japan commenced with higher technical sciences... Similar opinion

was held by the late Jamsetji Nusserwanji Tata (Dorab J. Tata 1916).

Modern techno-scientific education came to India as part of the colonial baggage. The British introduced it in parts and at a pace as per their requirements. The need for technical and scientific education was felt by Indians for a long time as it is a necessary pre-condition for industrial growth and the spread of scientific knowledge. The technical education can be seen or understood as limited to lower and middle level of training while the scientific education can be related to advanced, research based training.

The Indian National Congress (INC)¹ during the period under study (1885-1918) did not talk of scientific education under a separate

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heading rather whenever it talked about technical education; it included scientific and technical education. The INC from the beginning was enthusiastic regarding the problem of the Indians and hence was fast emerging as the 'most zealous vanguard' of Indian interests. Congress touched several problems. The INC always complained that the technical education provided, was of a lower quality and therefore demanded a higher level of scientific and technical education. But the English officials emphasized on providing only a certain amount of 'basic' technical education. The reason being the British officials believed that technical education was only meant to meet existing demands, and anything more would only flood the labor market with unemployed graduates². However, Indian nationalists had a much positive view of technical education and they argued that techno-scientific education was necessary for the industrial development of the country and therefore, linked this problem directly to the country's industrial backwardness.

'Technical education according to S.N. Pherwani, means the imparting of theory as well as practical working skill in a particular branch of industry'³. Scholars and historians (like Deepak Kumar, B.R. Tomlison and Aparna Basu) have however argued that under the British rule the teaching of technical, vocational and scientific education remained neglected. More emphasis was given to the study of literature, politics and philosophy. However, the serious attention began to be given to technical education after 1860s. After the Revolt of 1857, the British interest in the socio-economic development of India became lukewarm.⁴ Therefore, indigenous initiatives began as an alternative.⁵ Societies were organised to popularize science and promote its growth in various parts of the country. For example, in Bengal in 1875 the Indian League and in 1876 the Indian Association for the Cultivation of Science were established.⁶

The idea of providing technical education to the people of India was first mentioned in Sir Charles Wood's Educational Despatch of 1854⁷ and in the Indian Education Commission in 1882⁸, whereby the need was felt for giving the people an education of 'such a character as may be practically useful to the people of India in their different spheres of life'. In 1886, Mac Donnell, then the Home Secretary, on Lord Dufferin's recommendations prepared an elaborate memorandum setting forth the history of technical education in India, the actual conditions and the lines of future development. In 1888 the Government of India issued a resolution of education, in which it stated that 'since industries has not developed in India, it would be premature to establish technical schools on a large scale since this would only aggravate the problem of the educated unemployed'.⁹ It suggested that local government should undertake industrial survey and then decide which kind of special technical schools would be immediately useful.¹⁰ Again by the end of nineteenth century, Edward Charles Buck (Secretary, Department of Revenue and Agriculture, Government of India) was deputed by Government of India to enquire into the position and progress of practical and technical education in each province and submit a report with its recommendations. He emphasised on the need for vast improvement in the technical education. He pointed out that the primary education in the country is 'one sided', i.e., confined wholly to literary instruction without any practical training.¹¹ Therefore one can note that the consciousness existed in the country for the development of techno-scientific education and since second half of the nineteenth century, efforts were made to bring in technical and scientific education with emphasis on practical aspects.

2. EMERGENCE OF INC

The INC was formed in 1885 to focus on the Indian public opinion and to represent the

wants and wishes of the Indian people to the government. It provided the widest possible forum where Indians can discuss their grievances and raise demands. From time to time, INC took up the question of technical, scientific and industrial education. In response to the ongoing colonial exploitation and consequent poverty and general backwardness of the country, the following resolution was passed at the third session in 1887:

“That having regard to the poverty of the people, it is desirable that the government be moved to elaborate a system of technical education, suitable to the condition of the country, to encourage indigenous manufacturers by a more strict observance of the orders, already existing, in regard to utilising such manufactures for State purposes, and to employ more extensively than at the present the skill and talents of the people of the country.”¹²

One of the delegates, Mr. Kashinath Triumbuck Khare in the same session stressed the greater opportunities of employment to the people on the planning of industrialization. He raised the issue that if ‘factories and workshops are set up, they can provide means of livelihood to thousands of people’.¹³ The delegates of the INC criticized the government for imparting merely lower forms of practical training in the name of technical education and two of the delegates, namely, K.T. Telang and B.N. Seal reeled out data in support of their criticism. They looked to Germany and Japan as ideals. At the next session in 1888, the Congress urged the appointment of a mixed commission to enquire into the industrial condition of the country as a preliminary to the introduction of a general system of technical education¹⁴. The same request was reiterated in 1891, 1892 and 1893. The INC from 1893 onwards began to raise demand for the medical services also. The ninth session of the Congress asked for the constitution of a civil medical service of India, and to thus “raise a scientific medical profession in India by throwing open fields for medical and scientific works to the

best talent available and indigenous talent in particular.”¹⁵ The Congress leadership asked the Government for a more elaborate and efficient scheme of technical instruction and more funds for it. In 1894, it affirmed in an emphatic manner the importance of increasing public expenditure on all branches of education, and the necessity of establishing technical schools and colleges. It repeated the same request in 1895.

The Congress concern for science started in response to the immediate exigencies of life in the country, such as the necessity of getting rid of, or, at least, coping with, the situation created by poverty, disease and disasters like flood and famine (Sinha, 1991).¹⁶ In 1896 when a famine had broken out throughout India, it again urged that ‘the true remedy lies in the adoption of a policy which would enforce economy, husband the resources of the State, foster the development of indigenous and local arts and industries and help forward the introduction of modern arts and industries.’¹⁷ Again in 1898, it urged the Government to introduce a more elaborate and efficient scheme of technical instruction and allot more funds to it.¹⁸

As a result of these agitations towards the close of the nineteenth century, the Government of India decided early in the twentieth century to send selected Indian students to foreign countries and scholarships were awarded to them to acquire technical and industrial education.¹⁹ The GOI resolution on educational policy in 1904 stressed ‘the need to incorporate technical instruction of practical kind in schools, and to give an assistance in the form of scholarships to selected students to enable them to pursue a course of technical education in Europe and in America’.²⁰ Further in 1905, the local newspaper said that ‘the grant of scholarships by the GOI to Indian students to enable them to receive technical education in foreign countries is another clear proof of Lord Curzon’s affection for the people of this country.’²¹ In March 1904 an Association for the

Advancement of Scientific and Industrial Education of Indians was established for raising funds to enable qualified students to visit Europe, America and Japan to study science-based industries. Both Indian and Europeans gave donation to the Association.²² In 1905, 16 students were sent and the number kept on increasing.

Subsequently, in 1898, in the presidential address by A.M. Bose referred to the need for 'the establishment of a Central Scientific Laboratory for advanced teaching and research in India.'²³ He took the government to task for not only downgrading Indians but refusing even eminent British scientists of a Central Scientific laboratory for advanced teaching and research. But the cost was estimated to be around six lakhs of rupees, so the Government of India showed its inability to 'entertain so costly a scheme'.²⁴ In 1900, the disparaging remarks by the Surveyor-General, De Pree, about the native character, was brought to the notice of the Congress by N.G. Chandavarkar where S.N. Banerjee moved a resolution regretting the practical exclusion of natives from higher appointments in telegraphs, survey and other departments.²⁵

The development of science and technology continued to attract the attention of Congressmen from the beginning of the 20th century. This is evident from the fact that in 1900, it was decided to devote at least half a day at each session to the consideration and discussion of the 'industrial' problems of the country. The presidential address in 1901, D.E. Wacha pointed out that 'higher education must precede industrial development.'²⁶ At the Calcutta session in 1901, an Industrial Exhibition was organised. It drew the attention of ordinary delegates coming from distant parts of the country to the advantages of technological applications and new industries. It soon became a regular feature at Congress sessions. In 1904 the Congress asked for the establishment of at least one central fully equipped polytechnic institute in the country, with minor

technical schools and colleges in different provinces and repeated the urge in 1905. With the inauguration of Swadeshi movement, the agitation for industrialisation of the country was intensively carried out. Gradually a shift in the attitude of national leadership became noticeable. The nationalists wanted to control industry, education, scientific training and research. They wanted to do it with full utilization of indigenous talent and local resources. It wanted to substitute goods produced in the country for foreign goods consumed in day-to-day life. So, the *Swadeshi* movement which aimed at self-help and self-reliance further provided impetus to technical education and was appreciated in Congress sessions. The Congress formally joined the movement in 1906 and accorded its most "cordial support" to it.²⁷ From 1905 onwards an Indian Industrial Conference has met every year as an adjunct of the Indian National Congress. It repeatedly pressurised upon government the need for providing technical, industrial and commercial education throughout the country. It has also urged for various other measures for the encouragement of indigenous industries. But neither the recommendations and representations of INC nor those of the Indian Industrial Conference produced much effect. In 1906 it urged that having regard to the local requirements, primary education should be made free and gradually compulsory, all over the country, and the adequate provision to be made for technical education in the different provinces. It reiterated the same demand in 1908, 1909, 1910, 1911 and 1913.

One can notice that congress was fast emerging as an all-India organisation to cater the Indian interest. It touched several problems, be it related to education, industrial or scientific. With INC, the search for identity found a sound and solid expression (Deepak Kumar, 1995).²⁸ In fact, this period witnessed great agitation all over the country. The agitation, however, aroused the sentiment of 'economic nationalism' to the fullest

extent in the country and laid the foundation for later developments.²⁹

3. SWADESHI MOVEMENT

A movement can generate the basis of spirit for higher scientific discoveries and artistic creations. This happened during the Swadeshi days.³⁰ The partition of Bengal in 1905 caused dismay among the educated Indians and a political movement of boycott, *swadeshi* and national education began. It demanded boycott of British goods and the support for indigenous industry on economic ground while on educational ground, the realisation on imparting education on national lines was felt. The major concern was the development of 'science-based' industries without the evils of 'western industrialism'.³¹ A trend in Bengal's *Swadeshi* movement was identified by Sumit Sarkar which comprised of aggressive resistance and constructive *swadeshi*. While the aggressive resistance required political mobilization of people characterized by armed revolt and acts of terrorism, the constructive *swadeshi* focused on technical education and the onset of industrialization.³² This suggested that for the leaders economic recovery was the main goal and they wanted educated people to develop *swadeshi* enterprise.

The resolution for *Swadeshi* Movement was also supported by Lala Lajpat Rai. He said, 'it is impossible to make *Swadeshism* a success, unless you can have a good deal of technical education in this country'.³³ For this reason a number of technical schools, colleges and institutes along 'national lines and under national control' were established. The new technical schools grew out of two types of experiments in technical education. The first were the technical schools founded by missionaries in the Bombay and Madras Presidencies, and in the Upper and Central Provinces the syllabus included literary education and technical training in the minor trades. These institutions aimed to produce both

scholars and craftsmen which lead to their failure.³⁴ The second type was the industrial schools, confined to the city of Bombay. The school was designed to train artisans for the emerging industrial system, but the instruction provided in the school helped in creating technical professions. In 1906, the debate over medium of instruction began in Calcutta University.³⁵ Rabindranath Tagore, P.C. Ray and Goorodas Bannerjee advocated the use of vernacular in undergraduate courses while Asutosh Mukherjee, the Vice Chancellor of Calcutta University remained anglicist and convinced of the power of English language and western science. Reforms in teaching and research in postgraduate level was also undertaken.

In Bengal two institutions-the National Council of Education (NCE) (registered on 1 June 1906) with the efforts of Bipin Pal, C.R. Das, P. Mitra and others and the Society for the Promotion of Technical Education (SPTE) with the efforts of Tarak Nath Palik, P.N. Bose, Dr. Nil Ratan Sarkar, Aurobindo Ghose and others were formed. Both NCE and SPTE were formed with the same objective of promoting nationalism but they adopted different strategies for accomplishing their goal. This brought them in a conflicting position, which Benoy Kumar Sarkar has termed as '*Kultur Kampf*' or cultural war.³⁶ Thereafter, SPTE went on to set up Bengal Technical Institute (BTI) and NCE established Bengal National College (BNC) with a view to enable the students for independent careers in the field of crafts and industry. In the technical department of the Bengal National College, both theoretical and practical aspects were taught. More emphasis was given to practical work and workshop. For running NCE, BTI, BNC, endowments were coming from zamindars and legal professionals.³⁷ The manufacturing section of the college produced articles for the requirements of students and market. Exhibitions were organized by the college where the articles produced by the workshop were

displayed to encourage the students and common people towards the country made products. Such exhibitions were held from 2-19 January 1908, March 1909 and February 1910.

The *Swadeshi* movement spread to other parts of the country also. The National Council spread in Bombay and Madras Presidencies with the efforts of B.G.Tilak and Lajpat Rai. The Andhra National College was established at Masulipatam. The purpose was to make hand work in close association with the mind.³⁸ The leaders across the country believed that the dearth of higher technical institutions was a major cause of worry as it is important for industrial development of the country. The supreme objectives of establishing these institutions were the establishment of a three-dimensional system of education- literary, scientific and technical combined-conducted on national lines and under national control for the realization of the national destiny. Its initial success was appreciated by the INC in its 1906 session. Tagore at Pabna Education Conference congratulated the people for accepting responsibility of public instruction. In 1907, some leaders and industrialists started a college of engineering and technology at Jadavpur, Calcutta.³⁹ It is important to note that in 1910, the technical institute was amalgamated with the National Council. This survived to become Jadavpur Engineering College and later after independence Jadavpur University.

The *Swadeshi* period also witnessed the revival of handicraft industry and the resurgence and creation of a large number of industries. There were successes and failures and the latter was more numerous than former. It was both anti-colonial and national. People like Dr. P.N. Nandi (food-maker), Motilal Laha (weaver), Bechu Mistri (cutlery-maker), Dinabandhu Mukhopadhyay (engineer) and Uday Kumar Das (millowner) and many others who are less known gave their skill and lives to bring about industrial development of India along lines free from foreign control⁴⁰.

These were intended to be wholly swadeshi. They raised their own capital, managed their own affairs, tried to avoid dependence on foreign machines by making those themselves, had no foreigners in the Boards Directorate, and sold their products through *swadeshi* shops.

It is during this time that the Indian bourgeoisie community, in order to enhance their financial position set up its own independent organizations and associations like Marwari Chamber of Commerce at Calcutta in 1900, the Indian Industrial Conference at Bombay in 1905, the Indian Merchant's Chamber at Bombay in 1907 and the South Indian Chamber of Commerce at Madras in 1909.⁴¹ It demanded the opening of technological institutions, financial assistance from the Government for the rapid growth of industrialization etc. The INC showed the support and appreciation to these Indian efforts and emphasized on the necessity of similar efforts by Indians along with British efforts.

Although the *Swadeshi* movement failed, but it gave great inspirations for the growth and development of various indigenous institutes and a feeling of 'national' culture emerged among Indians. One of the reasons for its failure was the fact that they lacked commercial training and hence unable to seek profitable markets.⁴² The National Education Movement which was the part of *swadeshi* movement helped in setting up of a number of big and small institutions all over the country for the development of technical and scientific education so that the people could learn some basic skills and earn their living. In this respect the private efforts needs to be appreciated.

4. INDIAN INDUSTRIAL CONFERENCE

The Indian Industrial Conference was established in 1905 with the efforts of some Indian industrialists and the INC leaders. It has met every year as an adjunct of the Indian National Congress. It provided the forum to the leaders to criticize official policy of confining technical education to

lower level and it repeatedly pressurized upon government the need for providing technical, industrial and commercial education throughout the country. The first Industrial Conference presidential address by R.C. Dutt stated that a shift in emphasis is required and asked for modern industrial training.⁴³ It further recommended that a national polytechnic institute be established as well as one technical school in each province. One of the major recommendations of the Indian Industrial Conference to the Indian capitalists was the establishment of the weaving schools where boys can learn the use of such looms like spinning, dyeing, pottery, carpentry, manufacture of iron ware and brass work as a means of livelihood. The Conference also resolved to raise large funds for industrial education. It also proposed to establish trusts for the establishment of technological college. For this purpose the examples of industrially advanced countries like America, Japan and other European countries were to be followed. Along with this provincial committees were also to be established for the training of large number of students in the various industries which were profitable in India.⁴⁴

In its annual conference held on 30 December 1907 at Surat, the Indian Industrial Conference urged the provincial governments to conduct industrial surveys in their respective zones. Further it expressed its satisfaction over the industrial survey carried out in the United Provinces and a number of other provinces. The conference believed that such a process would facilitate the introduction of a sound system of technical education and the well-ordered development of local industries. It also urged the other Provinces and princely states to encourage technical education.⁴⁵ In 1908 the Ootacamund Industrial Conference recommended that technical education should be under the control of the Director of Industries.⁴⁶ This was done to ensure that technical education is directly linked to industrial growth. The Indian intelligentsia wanted

establishment of more polytechnics and engineering colleges. In 1910 Rao Bahadur R.N. Mudholkar introduced a Resolution in the Imperial Legislative Council for establishment of a Polytechnic Institute. But Curzon and Minto outrightly rejected this plea. This was the first time that the question of technological instruction came up for consideration in the Imperial Legislative Council.⁴⁷ In its session in 1909 the conference regretted that the proposal of the United Provinces government for the establishment of a technological college at Kanpur had not been sanctioned by the secretary of state.⁴⁸ Further in 1910 the Conference raised the demand that "the government should establish here at least one fully equipped polytechnic college for imparting the highest kind of instruction in the applied science and industrial arts".⁴⁹ In the same meeting the conference urged the Indian universities to open faculties of commerce to institute degrees in commerce and to affiliate commercial colleges.

In 1914 the conference urged the GOI to develop the Tata Research Institute as a well-equipped first class college of technology.⁵⁰ In the same year the conference appealed the GOI to revive the indigenous industries. It passed several resolutions for the same. In one of the resolutions it held that 'for this purpose it is necessary that the representatives of the people should obtain fiscal autonomy in regard to the imposition of duties both on exports and imports'. It continued that 'the state should aid the starting and pioneering of new industries through the establishment of a department of government for the purpose; and the government should, simultaneously with a policy of introducing free primary education- also impart technical, industrial and commercial education.'⁵¹

The Indian Industrial Conference in its subsequent sessions went on to recommend the establishment of technological faculties at the principal Indian universities. It was convinced that the progress and prosperity of the country

depended on the imparting of industrial and technical education. It further appealed for the gradual introduction of technical instruction in primary and secondary schools. The need was also felt to make student familiar with technical practices from a very tender age.

5. CHANGING SCENARIO

When the *Swadeshi* and National Education movement did not achieve the desired results towards industrial and scientific development under national control, the leaders began to look at the defects in the existing colonial system. Meanwhile World War I broke out in 1914. It revealed the industrial backwardness of the country. During this time Congress leaders began to give more attention to the cause of scientific and technical development. During the War years it remained constantly preoccupied with the question of India's industrial progress on modern lines. They pointed towards the need of State intervention for industrial development. It asked the government to immediately take effective measures to promote technical education and research and to create favourable fiscal and market conditions to facilitate industrial progress.⁵² According to a segment of the Indian intelligentsia, 'it was binding on the state to intervene in order to adapt the process of industrialisation to the Indian industrial climate'.⁵³ The resolution unanimously passed at the annual session held in 1914 laid down: "In view of the present exceptional circumstances and in order to promote the material prosperity of the country, this Congress urges that immediate measures be taken by Government to organise and develop Indian industries."⁵⁴

In 1915 a delegate, R.N. Mudholkar recalling the glorious past of India and lamenting her contemporary economic and industrial backwardness at the annual session of the congress stated that "thousands of years ago India was famed as the *Svarṇa Bhūmi* (the land of gold), it

would appear curious that the land should now be considered as one of the poorest countries in the world."⁵⁵ In the same session, another delegate, Sachindra Prasad pointed out that all talks and demands for self-government, equal rights, privileges and adult franchise would remain simply political shibboleths so long as industrialisation was not begun.⁵⁶ The demand for industrialisation and the chronic poverty of India continued to be emphasised in the subsequent sessions of the Indian National Congress. In the 1918 session Mavji Govindji Seth lamented that 'we are more in a condition of a economic slavery than political slavery... they came as traders into this country, and they traded and traded and still they are trading upon our weaknesses'.⁵⁷

Due to the constant demand, the government resolved to examine the question of a new industrial policy. In a dispatch to the Secretary of State in 1915, the Government of India argued that "after the War, India will consider herself entitled to the utmost help the government can afford to enable her to take her rightful place as far as circumstances permit as a manufacturing nation."⁵⁸ As a result an Industrial Commission was appointed in 1916. The Commission was convened under the chairmanship of Thomas Henry Holland and included Alfred Chatterton, F.H. Stewart, Madan Mohan Malaviya, Dorabji Tata, C.E. Low and Fazulbhoj Currimbhoj Ebrahim. The recommendations of the Commission, which included a note of dissent by Malaviya who was an important member of the Indian National Congress, were submitted in 1918. Its findings revealed several loopholes in the existing state of technical development and the government approach. The major outcome of the commission was that it tied technical education to industrial development and gave the government the responsibility for both. Sir Roper Lethbridge commenting on the Indian Industrial Commission said, "With the establishment of Indian Industrial Commission for the first time,

India will have her own real representatives, and not the mere dummy representative of the India office.”⁵⁹

The report emphasised on the absence of scientific and technical assistance and hence the need for government intervention in providing for the technical education. It argued that India has scope for industrial possibilities as it has ample supply of raw materials and manufactured articles necessary in the daily life of a modern civilised community.⁶⁰ It was argued that one of the major hindrances for industrial development was the reluctance of moneyed people to invest their money in industries. It was found that people in India preferred to lend their money on interest as money could be seen and was considered to be safe. Investing in industries would mean ‘no immediate prospect of a sufficient return’. Investment in industries was not encouraged.⁶¹ Countering this R.N. Mookerjee, J.D. Tata and Madan Mohan Malaviya said that the problem lies in the form of education. Citing the example of Japan, Tata pointed out that industrial education needs to be imparted from elementary stages so that an interest and endeavor could be generated among the students.⁶² It was also realized that to produce a class of men of a thoroughly practical turn of mind, it is necessary that the young Indian should be taken in hand at a much tender age.⁶³ Moreover, it blamed the official system of education for merely administrative needs and hence neglecting the practical character as access to workshops was denied to Indians. It was also pointed that the opportunity for gaining experience was not easy for Indians as they were appointed only as clerks. When Malaviya raised the issue ‘why Indians were not tried as assistants to Europeans?’ Mr. J. Donald answered this by saying that no suitable Indian was found to be appointed at higher levels.⁶⁴ Here the question arises: was it so? This is the time when Indians were coming back after getting training from Europe, America and Japan. In 1901, 100 students went abroad and

60 returned after completing their training.⁶⁵ Therefore, the nationalist leaders saw educational deficiencies as a problem of demand, rather than supply, brought about largely by the policies of ‘racial exclusion’ imposed by the colonial state and its allies in the expatriate business sector.⁶⁶

Further, the Report talked on the institution of state technical scholarships for study abroad. The Simla Educational Conference (1901) had dealt with technical and industrial education. The importance of using both hand and eye together was seen as vital for a better learning process. Almost immediately after the conference, the Government of India appointed a commission to report upon industrial education; but the report of the commissioners was never published. A more important outcome of the conference was the establishment by the GOI of scholarships to enable Indians to proceed to Europe and America for special training. The scholarships were of the annual value of £150 and were granted initially for a period of 2 years, which was normally extended. The average cost to the revenues to the GOI to each student who has completed his period of training was about £550.⁶⁷ In March 1904, an association was established in Calcutta for the advancement of the scientific and industrial education of Indians. Its main object was to enable properly qualified students to visit America, Japan and other foreign countries to study arts and industries. Under the scheme, over 300 students have been sent abroad.⁶⁸

The Report after talking about the grant of scholarships, pointed towards the defect in the system. It noted that there were some inherent defects in the scheme adopted. Although the educational institutions were opened to the Indian scholars but access to workshops was denied to them. So there was lack of sufficient practical knowledge. Secondly, the necessity was felt for providing the facilities required for the acquisition of practical experience. The evidence showed that the most successful scholarship holders have been

those who had some kind of previous practical experience and they could learn more in their course of study. But the scholarships have been frequently awarded to young men who had no previous practical knowledge of the industry which they proposed to take up. Further the Commission suggested that the scholarships should not be granted in those subjects for which India can provide adequate educational facilities. For example, in the case of mechanical engineering, it was held unnecessary to send students abroad as this subject was taught in India. Rather it was argued that the scholarships should only be granted to men who intend to take up some special branch of mechanical engineering which has not yet reached full development in this country. One of the shortcomings pointed out by the Commission was absence of any organization to ensure that the purposes were achieved nor any organized attempt was made to help the scholarship holders on their return to India. A need was also felt to make provision for scientific research in India and to develop a spirit of co-operation among all concerned, that is, men of science, men of business, working men, professional and scientific societies, universities and technical colleges, local authorities and government authorities for furthering the cause of industrial growth and development.⁶⁹

Although the recommendations of the Report were never accepted, but it remained one of the most systematic attempts to outline the making of an industrial society. Pandit Madan Mohan Malaviya, one of the important members of the commission had written a note of dissent. He had insisted on the extension of scientific and technical education in India as a 'cure for its chronic poverty and for its political regeneration.'⁷⁰ The dissenting note prepared by him largely represented the Congress views on the subject, especially on the question of industry, agriculture, transport, and science and technical education. Malaviya pointed that India was an

industrial nation prior to the coming of British and development was taking place earlier also. He said, 'little was done to encourage indigenous industries; less to promote technical education'. Further he regretted the country's backwardness in this field and attacked the government's policy. He stressed that the British model was inadequate to be followed and suggested specific measures for improvement. The new icons were Japan and Germany, and the new watchword was 'scienticized technology'.⁷¹ He believed that, "If the industries are to develop, and Indians to have a fair chance in the competition to which they were exposed, it is essential that a system of education at least as good as that of Japan should be introduced in India."⁷²

The INC whole heartedly welcomed the recommendations of the Industrial Commission. In 1918, it passed the following resolution:

"While generally welcoming the recommendations of the Industrial Commission and the policy that in future the Government must play an active part in promoting the industrial development of the country, the Congress hopes that in the practical application of this principle the object kept in view will be encouragement of Indian capital and enterprise and the protection of this country against foreign exploitation with the sole aim of making India industrially and economically self-contained and self-dependent."⁷³

Further the INC urged that Imperial and Provincial Advisory Boards should be constituted for promoting industrial development and also wanted that its members should include Indians elected by Indian industrial and trades associations and by Chamber of Commerce. Also it attempted to ask Government to establish Commercial colleges by giving substantial grants. Finally it urged upon the Government the urgent necessity of starting Industrial Banks.

In the meanwhile, Malaviya did not want his ideas on education and technical training to

be an idle talk. He continuously made efforts to put them into practice. As a result of his hard work, the Banaras Hindu University was established in 1916. This university laid great emphasis on science and technical education and R&D in its academic programme which included basic science and applied research.⁷⁴ But it is important to note that except for such endeavours made at the B.H.U., generally no significant measures were taken by the Congress to encourage fundamental research, which the scientists of the period demanded.

6. PROBLEMS FOR THE SPREAD OF TECHNICAL EDUCATION

It is well established that the system of education introduced by British East India Company from the beginning was geared mainly to the administrative needs of the country. Therefore it encouraged literary and philosophical studies rather than those of a more practical character. Along with this another reason for the low popularity of practical education was that the 'higher caste Hindus who were the first to take English education, had a tradition of pure literary and religious education, and were averse to manual or technical training.'⁷⁵ Although the efforts of Curzon in spreading the education was appreciated, but it was also realised that he was interested in developing technical and industrial schools and not higher technical education. The main reason for this was that British wanted Indians for labour and Europeans for supervision. It was argued that they didn't have faith in the ability of Indians and hence can't keep Indians at the higher level. Therefore the interest of the Indians in basic research was continually devalued by the colonial authorities.⁷⁶ The shortage of funds was another hindrance in the spread of scientific and technical education. Along with this lack of laboratory or practical work further deteriorated the condition. Technical and industrial schools were in a poor condition. The students coming out

of the schools and colleges were not capable of entering the industries as they were not adequately prepared. There was also the problem of absorption of men trained in higher technical institutions as the industries were not in large number. Hence, there was a high chance of increase in the number of unemployed as it was becoming difficult to provide employment to all getting degrees. An estimate shows that around 60 percent of qualified candidates remained unemployed or accepted subordinate posts.

The Maharaja of Kassimbazar blamed the British economic policy of free trade for providing unfair competition which 'practically killed all indigenous arts and handicrafts'. He continued that the government has so far not given equal patronage to European and Indian enterprises.⁷⁷ Mr. Karimbhoy Adamjee Peerbhoy has also drawn the attention of the Industrial Commission to the discrimination faced by Indians. He accused the Government of India of 'favouritism in Government contracts, of preferential treatment of European firms as against Indian firms in the matter of government supplies, and of playing into the hands of an influential official clique at Simla in respect of the control and regulation of Military requirement.'⁷⁸ Technical change in colonial India was mostly effected as a by-product of economic activities. Also more emphasis was attached to 'use' of knowledge than its 'transfer'.⁷⁹ It is important to note that the vast and varied terrain of India served as a 'laboratory' for experiments and hence it was 'a colony' within colony.⁸⁰ The British introduced technological 'projects' like telegraph and railways but these could not develop into a 'technology system'. For example technologically speaking, the railways engineers 'tested their skills and adapted their practice' in India, and hence the railways remained import-oriented. Therefore one can notice that too much emphasis was given to construction works and hence civil engineering received all patronage. Industry oriented branches, like mechanical,

electrical and metallurgical engineering could come only in 1930s that too because of the post-great war circumstances and the nationalist's demands.⁸¹

The promoters of science and technology in India had always looked to European model as framework. When Victorian England itself was lagging behind from its continental competitors in science education and research, how could its government have thought of imparting higher scientific education to its dependencies?⁸² Later on the nationalist leaders began to point to this deficiency and started looking to Japan and Germany as ideals to be followed in the field of science and technology.

7. CONCLUSION

The need for techno-scientific education was felt by the Indian intelligentsia and masses. Indian National Congress emerged as an active vanguard to promote Indian interest. Being an important political party of the time, it emphasised on the spread of education and urged and pressurised the government to provide it. The leaders of the INC had important roles to play in the nation's welfare in all aspects-political, economic and social. In its various sessions, it was actively discussing the various problems of the time. Technical, scientific, vocational and industrial education was regarded important for the growth and development of the country. The inadequate industrial development was regarded as the main cause for the backwardness of the country. This they pointed was because of the lack of institutions needed to provide the necessary training. Pointing to the necessity of establishing institutions for technical and vocational training, Dorabji J. Tata argued that 'technological institutions should be laid down in the earlier stages of technical education'. Quoting Sir Harcourt Butler, he points that in America, Paris, Germany and Japan the technical education preceded the industrial development of the

country. Further he pointed out that the technical institutions should be 'a sort of nursery and training ground to inculcate the spirit of original and specific research in different branches of science and industry, which might ultimately serve as means of the development and prosperity of the country.'⁸³ Hence, the governmental policies which hampered the growth of industries were criticized and demand for the provision of technical and scientific institutions was made. The INC laid great importance to technical and scientific education can be seen from the fact that from 1887 onwards, in most of the sessions, it talked of technical and scientific education. In the Congress sessions, the government efforts were praised and urge was made for more help.

But the question arises: why despite various efforts the scientific and technical education faced set back? Why the technical schools did not attract the masses? Was there little lack of emphasis in the Congress efforts?

It is true that from the beginning the congress focused on the issue of technical and industrial development. But apart from mere discussions in the various sessions no practical measures were undertaken by them. One of the major handicaps from which technical and industrial education suffered was the scarcity of funds. As within the limited budgets, it was not possible to equip the courses with sufficient materials. Also there was paucity of technical schools and whatever schools existed they were underdeveloped. Therefore the Indian students did not have adequate practical training which created difficulty in finding employment. Although discussion on inadequate funding by the government was made but no practical solution to it was offered. One cannot find any attempt on the part of Congress to make provision for establishing more schools or rectifying the problems inherent in the existing institutions.

The INC being an important political party could have done more efforts towards the progress

of techno-scientific education. But somehow it lacked the enthusiasm required for it. One of the reasons could be that being a colonized country, the priorities of the leaders during that time was different.

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