Journal of Scientific Temper
Vol 12 (2), April-June 2024, pp. 44-62
DOI: 10.56042/jst.v12i2.8784

The Urge to Establish Science-Based Swadeshi Industries: Struggle and Contribution

HIMANKI DABRAL[1,2], RAMESH KUMAR SINGH[2] AND ANU SINGH[2,3*]

[1]Department of Genetics and Plant Breeding, School of Agricultural Sciences, SGRRUniversity, Dehradun - 248007, Uttarakhand, India.
[2]Samvetan Society for Social and Scientific Research, Dehradun -248001, Uttarakhand India.
[3]School of Biotechnology, Jawaharlal Nehru University, New Delhi-110067, India.
*E-mail:classicsingh@gmail.com

ABSTRACT

India had a stable economy during Pre-colonial period accredited to self-sufficient agriculture, prospering trade, and rich traditional handicraft. Whereas during the colonial period India witnessed a massive change in its economic structure. The economic policies of British rule transformed India into a supplier of raw materials and consumer of finished industrial products manufactured in Britain. This strategy in turn leads tan o enormous loss of income and increased dependency on Britain rather than the up-gradation of systematic modernization of the domestic economy. With the growing urge to free India, the thought of economic independence was also instigated by 1890, which gained huge strength with the launch of the Swadeshi Movement in 1905 to boycott British goods and manufacture indigenous goods. Among various swadeshi industries, science-based industries like pharmaceuticals and chemicals were also nudged by the swadeshi movement. This was the time when the foundation of several Indian ventures like Bengal chemical, Margo soap, and pharmaceuticals was laid down that massively pushed the Indian economy and provided employment to Indians, moreover, this self-dependency accelerated the Independence Movement of India. Remarkable growth was observed in these swadeshi chemical and pharmaceutical industries Post-Independence due to the production of diverse product ranges and reformed government schemes, guidelines, and policies. Most of these industries still have great contributions to the present-day Indian economy. The present study

aims to elaborate on the history of the establishment of swadeshi industries in the colonial time, the advancement achieved after independence, and their contribution to the present Indian economy.

Keywords: History, colonial rule, swadeshi industries, economic growth

Introduction

During the 19th and 20th centuries, the middle class of India became interested to be westernized and they started joining British institutions. The British planned to create an Indian population having black color with English tastes to employ them in the British system. With the understanding of modern science, Indians started working in the field of British-sponsored science and soon realized that they were treated as manpower only. The scientific capabilities of Indians were challenged when some of them realized the spirit of "swa" and decided to become "self-reliant" in the field of science. This vision gives rise to modern scientific research in India while creating a challenge to British domination. The pioneers in pre-independence India who lead the universality of science and its importance for society include Jagadish Chandra Bose, Prafulla Chandra Ray, Chandrashekhara Venkat Raman and others.

The term "Swadeshi" is made up of two Hindi words "Swa" which means self and "Deshi" which means indigenous, signifying the products produced by a country itself. This term has been defined in different ways by leaders in India during the past century. The definition given by Mahatma Gandhi addressing a conference in Madras in 1916 states, swadeshi is the "spirit in us which restricts us to the use and services of our immediate, to the exclusion of the more remote" (Pal, 2016). However, in a political perspective, swadeshi refers to making use of our own native institutions, while in order to improve the country's economy we should use products that are produced by our own neighbouring industries (Appadorai, 1974). Almost all the given definitions during the past century establish that we should produce and use our own goods i.e, "Make in India" and "Self-Reliant India". On September 25, 2014, the Indian government relaunched this "Make in India" program with a vision to encourage people to manufacture goods within the

country and transform India into a manufacturing hub in the 21st century (Mitra, 2019). In 2020, the Indian Government redefined swadeshi as "Vocal for Local". In the past century, Gandhi was known as a prominent advocate of Swadeshi, but it was only the announcement of the partition of Bengal by Lord Curzon that leads to the establishment of the Swadeshi Movement of Bengal (1903-1908) which was a major step of India's freedom struggle against British colonial rule[1].The main objective of the boycott of British goods was to affect the economy of colonial rule and to revive indigenous Indian industries. Many visionaries and leaders realized that economic independence was as important as political freedom, and it was necessary to make India industrially self-sufficient (Banerjee, 2011). However, all the pharmaceutical and chemical industries were owned by the British people, and therefore, it was not possible to boycott British medicine and chemicals which became a huge concern of the Swadeshi movement. This motivates Indian scientists and social leaders to establish science-based swadeshi pharma and chemical industries in India, beginning a new revolution. Acharya Prafulla Chandra Ray a renowned scientist was one of the pioneers who built Bengal Chemical and Pharmaceutical Works Ltd. in 1901 in Kolkata (Chakraborty, 2012). Similarly, Khagendra Chandra Das an Indian entrepreneur with his knowledge of pharmaceutical science enlightened young minds around new technologies and found value in a traditional indigenous raw material 'Neem' that led to the development of two famous products Margo soap and the Neem toothpaste (Barua, 2020). The formation of various indigenous science-based industries not only played a big role in the freedom movement but also made a significant contribution to the Indian economy. This journey of self-reliant India started during the freedom struggle and continued after independence even it can be quoted that the swadeshi movement form the genesis of today's **"**Make in India" initiative which leads to the development of the socio-economic status of the population and contribute in building nation's economy. It is a time to review the history of this swadeshi movement from its beginning till today and towards the future. Though a number of different small scale and largescale industries were established during

this time, this article is focusing on formation of science based swadeshi industries, their struggle and contribution in establishing the Indian economy.

Pre Colonial period

Before the emergence of the British government, India had an independent economy (Hindu, 1860). During pre-colonial period India was worldwide famous for its handicrafts, cotton textile-like muslin and the finest quality was malmalshahi, silk textile and other stone work industries. There were several established centers of textiles industries as indicated in Table 1. These products had high demand globally due to the finest quality material used by fine craftsmen. Indian metallurgy work was an extraordinary craft famous worldwide, India was the first to smelt zinc on the basis of ancient alchemy during 12th Century AD (Figure 1). One of the great examples of finest craftsmanship in ancient India was manufacturing of Wootz steel by Tamils of Chera Dynasty which was used to make famous Damascus swords of yore (Naik, 2019). One of the famous French travelers of the seventeenth century during his visit in Bengal described Bengal as a leading exporter of cotton, rice, sugar and silks (Table 2). It produces a huge quantity of wheat, grains, and vegetables for their own consumption and is characterized by an endless number of canals for irrigation and navigation and is richer than Egypt and flourishing trade (Hindu, 1860), (Table 2).Traditional health system was also well established where cataract surgery and plastic surgery was performed in ancient India, however, due to religious beliefs the basics of anatomy were not well studied. From the ancient vedic era to pre -colonial times India had contributed remarkably to the world of science starting from zero to binary system to atomic theory. That was the time when India was known as “Sone kiChidiya" and preferred as a capital for science and business.

Table 1. Centers of Textile Industry during pre-colonial India

S.No.	Textile Centers
1.	Dacca and Murshidabad in Bengal
2.	Patna in Bihar
3.	Surat and Ahmedabad in Gujarat
4.	Jaunpur, Varanasi, Lucknow and Agra in U.P.
5.	Masulipatnam and Visakhapatnam in Andhra
6.	Bangalore in mysore and Coimbatore and Madurai in Madras
7.	Multan and Lahore in the Punjab

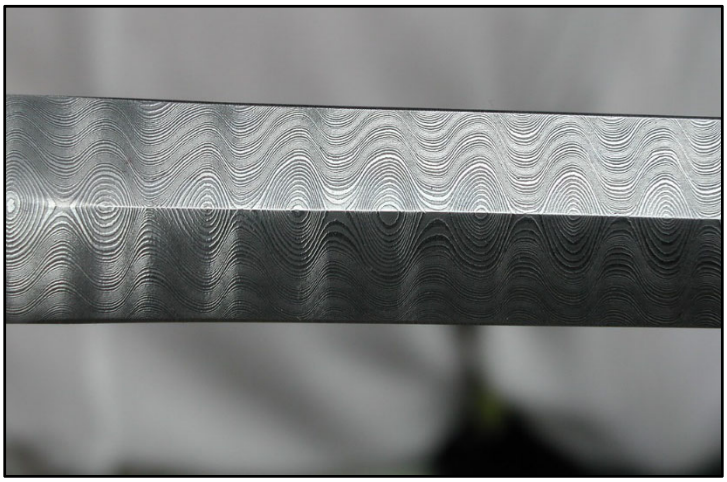


Figure1. Wootz Steel World Famous Indian Metallurgy Work

Source:flickr.com

Table 2 — List of Imported and Exported Commodities during Pre-Colonial period

Commodities	
Imported	Exported
Dried fruits, Dates, Wool, Rose water from Persian Gulf	Wheat, Sugar, Pepper, Indigo, opium, rice
Coffee, gold, Drugs and Honey from Arabia	Cotton textile, Raw silk
Tea, sugar, silk from China	Precious stones
Woollen cloth, metals like copper, iron, lead and paper from Europe	Drugs

Colonial period

In 1600 British East India Company started conquering India, this conquest started when Robert Clive defeated Nawab of Bengal in 1757. Britishers ruled India over a century from the decisive Battle of Plassey in 1757 to 1857 when India fought a war of Independence. Indians got defeated in this war and in 1858 Queen Victoria assumed the responsibility of direct rule over India. Science was one of the major factors that helped the British to rule over India. Historians claimed that science existed even before the establishment of British colonies but the British intentionally excluded the rich scientific and cultural heritage that already existed in the ancient Indian civilization. The agenda of the British towards science in Pre-independence India was motivated by their political and commercial interests. In the colonial times science was used as an imperialist tool for utilizing the resources of India for the commercial development of Europeans, with incidental benefits to science. The scientific abilities of Indians were questioned and they were employed for the sake of cheap labor only. The main objective of colonial rule of Britishers in India was to reduce the country to being a raw material supplier for Great Britain's rapidly expanding modern industrial base. During precolonial times agriculture was the source of income of 85% of the villagers in India, which suffered stagnation and unusual deterioration due to the introduction of land settlement systems, especially the zamindari system by the colonial government. In order to overcome losses suffered by farmers at their field some farmers shifted their cultivation from food crops to cash crops, but due to deteriorated soil condition, lack of drainage facility and lack of financial resources of small farmers and tenants to invest no progress was made in the agriculture production (Hindu, 1860).

Similarly, the British government promoted systematic de-industrialization in India through their policies. The primary objective of their policy was to make India producer and exporter of raw material for upcoming modern industries in Britain as well as the importer of the finished goods from Britain giving maximum economic advantages to their home country. The British government started implementing their policies

during the last decades of the eighteenth century and first decades of the nineteenth century (Chakraborty, 2012). This trade was further intensified by opening of Suez Canal used as highway between India and Britain, they produce large export surplus but that surplus was utilized by British government for payments incurred in Britain that led to drain of Indian wealth (Figure 2). Gradually, indigenous handicrafts industries and the market of other locally made goods declined and resulted in the dependency on the import of British manufactured goods, this situation led to massive unemployment and became a fundamental cause of poverty of Indian people (Mitra, 2019). Further between 1757 and 1857 several political changes occurred, bureaucracy was introduced and all the handicrafts were destroyed. It was reported that in the year 1880, Indian customs revenues were only 2.2 per cent of the trade turnover, which is the lowest among countries. If India had been politically independent the textile industries would have been started earlier. In the 1850s first textile mills were started by Indian capitalists in Bombay with the help of a British trading company, similarly, the first jute mill was started in 1854 in nearby areas in Calcutta which was regulated by the colonial government. No jute industries increased between the years 1879 to 1913 as compared to cotton textile industries and most of the jute produced was exported (Indian Economic Development, 2020). Then, Tata Company established its first Indian steel plant in the year 1911 at Jamshedpur in Bihar but its sale had not occurred before the First World War. But it was the swadeshi movement in 1905 that gave a boost to industries in India.

Figure 2. Suez -canal trade highway between India and Britain. Source:picryl.com

Swadeshi movement: The vision of economic independence during colonial period

The idea to revive traditional crafts and use indigenous goods was induced during 1820 -1857 which is known as the Proto-Swadeshi movement. The anger was expressed in one of the articles published in 1822 in Indian magazine Chandrika Samachar that complained against the British government for not providing training to ayurvedic medical practitioners and indigenous medical facilities. This was followed by the promotion of use of indigenous products instead of imported ones by the Indian intellectual Gopal Hari Deshmukh in 1849 (Chandra, 2016). Gradually, the idea became an action during 1857 -1890 in Bengal and known as the early swadeshi movement. This is the time when national feelings were generated in Hindus via starting "Hindu Mela" in 1867 to popularize Indian products among the population. Several leaders like Nabagopal Mitra and Rajnarain Bose (Figure 3) made extensive efforts in order to inculcate swadeshi temperament and spirit of self-help among people of India (Hindu Mela (1860). Historians have reported that during the last decades of the nineteenth century (1890-1903) the whole movement became political where several

announcements explaining the effect of foreign imports on hand made indigenous products were made and boycott of foreign goods started (Bayly, 1986). In 1896 when the British government imposed excise duty on manufactured Indian cloth, swadeshi became a national cause.

Figure3.Shri Nabagopal Mitra and Shri Rajnarain Bose

Source: https://en.wikipedia.org/wiki

However, it was in 1905 when this agitation was set up as a national movement after the announcement of division of Bengal province and its enforcement by Lord Curzon. During the nineteenth century Bengalis started going to Britain to study law and medicine and later educated Bengalis were employed in various sectors of the British government. Gradually, Bengalis understood the diplomatic British policies and started raising their voices against the injustice of colonial rule. The disagreement intensified between Bengalis and Britishers therefore, to cut the rising voices of nationalism the British government decided to partition Bengal (Mitra, 2019). This weakened the Bengalis by dividing into two minorities one is Muslim majority in East Bengal while Oriya and Hindi speaking people in the western part, this division raised Hindu-Muslim conflict.

This anti-partition agitation initiated an instrumental protest against policies of the colonial government in the form of the spirit of "swadeshi" (Buy Indian) in Bengal covering all classes and spread across India. During the initial phase of the movement against partition, press campaigns were conducted

(Mitra, 2019). The swadeshi movement stimulated anti-British force against colonial government by burning foreign made clothes, non-attending lawyers in courts, students not attending school and colleges, and had joined several social societies. Students had burned books made up of foreign paper, propagated swadeshi sentiments among villagers through swadeshi songs and lectures which alarmed the British officials (Banerjee, 2011). The idea behind Swadeshi was to build India self-reliant through constructive work and ultimately challenge colonial rule through boycotting British goods affecting them economically. Leaders like Naoroji, R. C. Dutt and Gokhale drew connections between India's forced dependence on British manufacturers and its poverty (Naik, 2019). With the revival of traditional craft and developing indigenous small-scale industries based on modern western lines, education was also promoted. But the major bottleneck at the peak of the movement came when people were not able to boycott British medicines and chemicals. During the colonial period all the pharmaceutical and chemical industries were owned by Britishers which became a huge concern of the protest against colonial rule. This is the time when Indian visionaries, scientists and social leaders felt the urge to establish science-based swadeshi small scale pharma and chemical industries in India. The idea was also to run these small ventures by family members to provide self-employment for sustainability along with utilizing swadeshi products, thus creating pressure on colonial rule. Science based swadeshi industries started a new revolution in colonial India and helped in overcoming the bottleneck of self-reliance in the field of medicine and chemicals. Some of the remarkable initiatives in this direction includes establishment of India's first chemical factory "Bengal Chemical Works" by a renowned scientist Acharya Prafulla Chandra Ray in 1892, establishment of Swadeshi Bhandar by Rabindranath Tagore in 1897 and Lakshmi Bhandar by Sarala Devi in 1903. The other ventures like Lakshmi Cotton Mills, Mohini Mills and National Tannery were also started (Naik, 2019). Similarly, Khagendra Chandra Das an Indian entrepreneur found value in a traditional indigenous raw material 'Neem' to generate products (Barua, 2020). The formation of various indigenous science based industries not only played a big

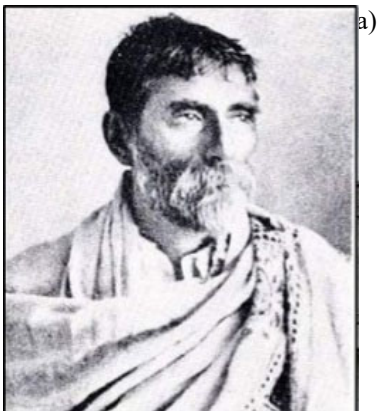
role in the freedom movement but also made a significant contribution to the Indian economy.

Swadeshi Industries established by Acharya Prafulla Chandra Ray

Acharya Prafulla Chandra Ray was actively involved in educational reforms, industrial development, employment generation and poverty alleviation. Nationalism was inculcated in him in Metropolitan College for higher studies by his English teacher (Banerjee, 2011). He was highly interested in chemistry and went to Presidency college to study chemistry. Later, in 1882 he went to Britain, where he earned his Bachelor degree in sciences in 1885 and D.Sc in 1887 for which he got the best thesis award. He returned to India in 1888 and the next year received a position at the Presidency College in Calcutta. Soon**,** he felt that financial independence is equally important for the people of India as the political freedom from colonial rule. He realized that 'science' is the instrument for national reconstruction and envisioned a glorious India through an indigenously developed science and making India Industrially sufficient, especially in the field of pharmaceuticals and chemicals. He convinced Indian people that conducting scientific research of industrial application was of utmost importance and students must be educated in the field of research and industrial development. His remarkable efforts in building research foundations in chemistry was well recognized all over the world by his publication of mercurous nitrite. To raise the diminishing spirit of Indian scientists Acharya Prafulla Chandra Ray wrote the book, "History of Hindu Chemistry" (Figure 4). For the exchange of ideas among researchers he created the Indian Chemical Society and released the first Indian Journal named Journal of the Indian Chemical Society (Pal, 2016).

Acharya Prafulla Chandra Ray was the man behind the first swadeshi chemical industry during the colonial period and led to the foundation of "Bengal Chemical Works" in 1892. His vision and dedication inspired many doctors to join hands and supported him for the establishment of his company. In 1901 this company was converted into a limited company and renamed as Bengal Chemical and Pharmaceutical Works Ltd. (BCPL) (Figure 3).

a)

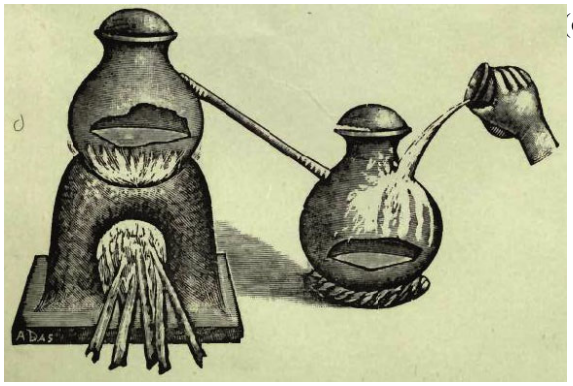


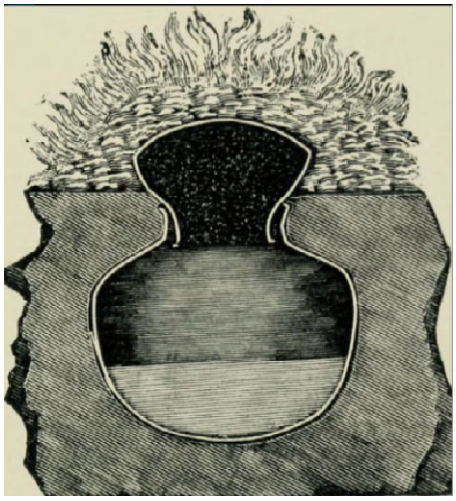
(b)

Source: picryl.com

Source: commons.wikimedia.org

(c)





(d)

Source: flickr.com

Figure 4. (a-d) Acharya Prafulla Chandra Rayand his Bengal Chemical and Pharmaceutical Works Ltd. And pictures from the book "A history of Hindu chemistry".

It was a step ahead towards the freedom struggle of India, and laid the foundation of several other industries including the Calcutta Pottery Works, Bengal Enamel Works, National Tannery Works, Bengal Steam Navigation Company, etc. Due to the remarkable contributions of Acharya Prafulla Chandra Ray he later known as the "Father of Indian Chemistry". Gradually, BCPL manufactured diverse chemical and pharmaceutical products which competed and replaced many British products and became a leading chemical and pharmaceutical company of our country. He also assisted revolutionaries in preparing explosives. So, the British administration literally recorded his name as a 'revolutionary in the garb of a scientist'. The Swadeshi movement motivated our people to learn science and begin industrialization of the country. An Association for the Advancement of Scientific and Industrial Education of Indians was formed in 1904 with the aim to send qualified students to Europe, America and Japan for studying science-based industries. Today, Bengal Chemicals is a trusted name in the field of Home Products, Pharmaceuticals and Chemicals with a rich heritage for more than 100 years giving annual turnover of Rs 50-100 crores (Pal, 2016).

Swadeshi industries developed by Khagendra Chandra Das

Shri Khagendra Chandra Das was the revolutionary entrepreneur who established science based swadeshi industry during colonial period and contributed remarkably in boycotting British manufactured chemical products. During childhood he was brought up in an environment heavily influenced by swadeshi sentiments. He completed his graduation from Stanford University in chemistry in 1910. Soon he became the forerunners of the original “Make in India " movement and associated with the Indian Independence league in California Branch. He pursues the intensive course in Japan university to learn the new technologies of pharmaceutical and chemical industry business. Upon his return, he started focusing on Ayurveda, started exploring chemical properties of indigenous raw material such as neem which become the foundation of his Swadeshi venture Calcutta chemical company in 1916 (Banerjee, 2011). He produced neem-based soap in 1920 marketed under name Margo soap derived from **“Margosa”** and also produced neem toothpaste (Figure 5). He was sure that such indigenous products would dismantle monopoly of British products. He was a great supporter to the ideals of entrepreneurship and provided seed capital for various ventures pre-independence and post-independence till he died in 1960.

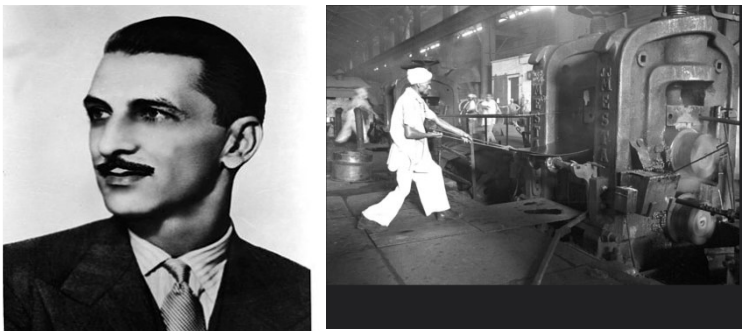
In 1988 this brand attained top-five position with a market share of 8.5% under the ownership of his son. Then the company also created a talcum powder marketed under the name Lavender Dew. While neem toothpaste and Margo soap stood that time and generated their swadeshi market, these became a leading fast-moving consumer goods product brands in the international market in late 20 centuries. In 2011 the company went to the stable hands of Jyothy Labs Ltd. (Ujala) (Subramani & Agarwal, 2011). With growing demand, the company expanded by creating distribution offices in all major cities in the country and setting up additional manufacturing plants in Tamil Nadu. After 100 years of its establishment today, this company has a turnover of 1,800 crores and continuously contributes to the Indian economy with the essence of swadeshi.

Figure 5. Shri Khagendra Das.
Source: Wikipedia

Swadeshi Industries developed by Tata Group

Tata group has indirect involvement in the swadeshi movement as they did not participate in the mass protests but contributed to making India economically independent during early swadeshi. Jamsetji Tata was a strong supporter of Swadeshi who believed that economic independence was a prerequisite for political freedom (www.tata.com). He started a trading company in 1868 with a capital of Rs 21,000, today's well-known Tata Group. Then, in 1869 he purchased an oil mill and converted it into a cotton mill (Alexander mill) later, renamed as cotton mill. Subsequently, in the year 1874, he decided to establish the Central India Spinning, Weaving, and Manufacturing Company in Nagpur. Tata established a new cotton mill named "Empress Mill" in 1877 and in 1885 he formed another company. He decided to purchase Dharamsi Mills in 1886, which he renamed Swadeshi Mills to mark the initiation of the Swadeshi movement. But he was unable to pay the profits to its stakeholders from this company and its product was rejected by China. With exceptional confidence, belief, and the sacrifice he utilized private funds from the bank and made a trust for his family which he offered as a guarantee to the bank, then, he purchased modernized machinery. His dedicated efforts gave him success after ten years when his Swadeshi's yarn got the highest price in the east market and became competent with Lancashire's cotton mills yarn. Tata had a vision to make India

as a primary manufacturer of cotton cloth, India eventually became an exporter country. He wanted India to be the sole maker of the fine cloths for which the primitive weavers of India were famous. His vision of having indigenous industries run by Indian people motivated others to become entrepreneurs and generated a large number of employments. His swadeshi industry not only revived Indian cotton textile industry but gave an international fame which was lost due to British policies.



Source: Tata.com Source:flickr.com

Figure 6. Jehangir Ratanji Dadabhoy Tata and Tata Iron & Steel Plant Jamshedpur.

During his trip to Manchester to purchase machinery for the textile industry he attended a lecture by Thomas Carlyle which inspired him to build the world's best steel plant in India (Subramani & Agarwal 2011). But he could not make it during his life under colonial environment and British policies. Later, after his death his son Dorab and cousin RD Tata established Tata iron and steel company in remote areas of Sakchi in the year 1907 with joint efforts (Figure 6).After that three hydroelectric entities, Tata Hydro-Electric Power Supply Company (in 1910), the Andhra Valley Power Supply Company (in 1916) and the Tata Power Company (in 1919), were established. This venture supplied tons of steel to construct railway lines to supply troops during the first world war (1914). Similarly, in 1943 during the second world war Tata company developed 110 varieties of steel and produced 1,000 tons of armor plate and chemical toluene for making explosives (Wacha, 2010). After that a strategic partnership was initiated between

Tata group and Indian armed forces and a then TELCO (Tata Engineering & Locomotion Company) in Jamshedpur was built in 1945. It's more than 100 years since the establishment of Tata group but the spirit of swadeshi still runs in the heart of Tata group. Today this group represents a large global enterprise with many companies operating in more than 100 countries and employing over 800,000 people. In the year 2020-21, the revenue of Tata companies was 103 billion dollars (INR 7.7 trillion). Tata has immensely contributed in generating the economy of India pre-independence and post-independence and the journey to establish India as an industry-sufficient country is still going on(www.tata.com).

Conclusion

The thought of "Self-reliance" in the field of science during British rule encouraged Indian scientists, activists and patriots to establish our own scientific institutions, laboratories and industries. A very important aspect of the endeavor of the Indian scientists and entrepreneurs in connection with the freedom struggle was their emphasis on social harmony and equality, rationalism, secularism and universalism. Acharya Prafulla Chandra Ray said once, 'no political renaissance is possible without the full development of the intellectual (scientific) and industrial resources of the country.' The galaxy of leading lights of Indian science along with other visionaries, leaders and entrepreneurs initiated a vigorous and creative struggle in the domain of science to achieve swatantrata. Our legendary visionaries laid the foundation for the development of science based swadeshi industries to be utilized for national resurrection and reconstruction. However, the journey of swadeshi and developing science based industries never really went away, it's still going on. It just took a short break for a couple of decades, one on either side of the beginning of the new millennium. The spirit of Swadeshi movement forms the base for the genesis of today's 'Make in India' and "Vocal for Local" movement becoming the recognition of inherent strength of Indian entrepreneurship. However, being more strategic the government wanted to promote foreign investors to invest in small entrepreneurs in the country through this initiative and brought their latest technologies. This will help in reviving the lagging manufacturing sector, generate

employment and stimulate the growth of the Indian economy. This will also allow more Indian entrepreneurs to invest in the developmental sector to foster economic growth. According to various studies it has been observed that the main reason for the focus of the government sector on building manufacturing companies is that it has a huge impact on the country's economy by creating several jobs, investment, and innovation thereby raising the economic standard of the country. India is expecting to raise the manufacturing sector by 12 to 14% by the end of 2022 and to generate 100 million jobs, increase manufacturing share of GDP by 25% and to build up the global competition of the Indian manufacturing sector. Compared to other developed nations like USA, UK, Germany, and Japan, India is going late on this idea which had been utilized by these nations since ages, that is why today these countries are self -reliant in all fields of science. Therefore, encouragement of this sentiment in Indians is very important and needed for the country to become self-sustaining in every field.

References

1 Appadorai, A. (1974). *Documents on Political Thought in Modern India*, Oxford University Press, New Delhi 2,547.

2 Bayly, C. A. (1986). *The Origins of Swadeshi (Home Industry):Cloth and Indian Society,* 1700–1930,Cambridge University Press, London.

3 Banerjee, S. (2011). Acharya Prafulla Chandra Ray: an epitome of scientific attitude and human values. *Breakthrough*, 15 (1), 12-24.

4 Bipan, C. (2016). *The Rise and Growth of Economic Nationalism in India*, Har-Anand Publications Pvt. Ltd. India.

5 Barua, A. (2020). Proudly Swadeshi, This Neem Soap Was A Pioneer of Indian Manufacturing in 1920. Retrieved January 28, 2022 from https://www.thebetterindia.com/234389/swadeshi-movement-freedom-struggle-margo-soap-history-make-in-great-india-manufacturing-ana79/.

6 Baul, D. (2022). The Swadeshi Movement. Center for Policy Research, Institute of Lifelong Learning, University of Delhi, New Delhi.

7 Bengal chemicals and pharmaceuticals, Department of Pharmaceuticals, Ministry of Chemical and Fertilisers, Government of India. Retrieved June 15, 2022. From https://pharmaceuticals.gov.in/bengal-chemicals-pharmaceuticals-limited.

8 Chakraborty, S. (2012). Preserving P C Ray for Posterity from the Perspective of the Library & Information Science Profession, *Calcutta University Journal of information Studies,* 14 (1), 1-9.

9 Chandra, B. (2016). *The Rise and Growth of Economic Nationalism*. Har-Anand Publications Pvt Ltd. India.

10 Hindu Mela (1860). *Banglapedia.* Retrieved June 15, 2022 from https://en.banglapedia.org/index.php/Hindu_Mela.

11 *Indian Economic Development* (2020). NCERT. Retrieved January 27, 2022 from https://www.ncert.nic.in/ncerts/l/keec101

12 Maddison, A. (1971). Class Structure and Economic Growth (1st ed.) Taylor & Francis Group.

13 Mitra, P. (2019). Partition of Bengal, Swadeshi Movement and the Role of Rabindra Nath Tagore. *Journal of Research in Humanities and Social Science*, 7(1) 37-42.

14 Nehru, J. (1946). The Discovery of India, New York, p.299.

15 Naik, S. (2019).Genesis of 'Make in India': A study of Swadeshi Movement in India*, International Journal of Innovative Research in Technology,* 6(1), 1002-1005.

16 Pal, S. (2016). Science and Tech Discoveries Ancient India Gave the World. Retrieved January 28, 2022 from https://www.thebetterindia.com/63119/ancient-india-science-technology/.

17 Pal, S. (2016). The Little-Known Story of How Jamshedpur Played an Active Role in Both the World Wars. Retrieved January 27, 2022 from https://www.thebetterindia.com/77957/jamshedpur-tatanagar-tata-steel-world-wars/).

18 Pai, N. (2021). A Brief Economic History of Swadeshi, *Indian Public Policy*. 2(4), 42-58.

19 Srinivasan, R., Tiwari M., & Silas S.(2006). *Our Indian Railway: Themes in India's Railway History edited*(I st ed). Foundation Books.

20 Subramani, H & Agarwal S. (2011).Jyothy buys 50.97% stake in Henkel India.". Retrieved April 19, 2014 from https://www.livemint.com.

21 The Tata Group Leadership with Trust Retrieved January, 2022) from https//:www.tata.com.

22 Wacha, D. E. (2010). *The Life and Life Work of J.N. Tata* (1915). Kessinger Publishing.

Sources of Figures (Available in public domain or under creative common license)

23 https://www.flickr.com/photos/albert_straub/5298728826

24 https://picryl.com/media/suez-canal-2

25 https://en.wikipedia.org/wiki

26 https://picryl.com/media/prafulla-chandra-ray-before-1944-4ecd10

27 https://www.flickr.com/photos/publicresourceorg/27407649992

28 https://www.flickr.com/photos/internetarchivebookimages/14576798959/in/photostream/

29 https://en.wikipedia.org/wiki/K._C._Das_(chemist)

30 https://en.wikipedia.org/wiki/Tata_Group#/media/File:J.R.D._Tata_(1955).jpg

31 https://www.flickr.com/photos/publicresourceorg/27407649992