

Mandakini Thakur, 2022

Volume 3, pp. 40-56

Received: 3rd April 2022

Revised: 15th May 2022, 26th May 2022

Accepted: 31st May 2022

Date of Publication: 20th July 2022

DOI- <https://doi.org/10.20319/socv3.4056>

This paper can be cited as: Thakur, M. (2022). *Patterns of Everyday Technology: Small Machines Impacting Life in Colonial Punjab*. *Socialis Series in Social Science*, 3, 40-56.

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PATTERNS OF EVERYDAY TECHNOLOGY: SMALL MACHINES IMPACTING LIFE IN COLONIAL PUNJAB

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Abstract

Colonial Punjab in the late nineteenth and the first half of the twentieth century was characterized by considerable socio-economic changes brought up by mostly due to the introduction and adoption of new everyday life technologies which impacted the life of the average person in both urban and rural areas. This research article elaborates the impact of novel technology of electricity and associated items like the electric fan and bulb and everyday machines of bicycle, sewing-machine and typewriter on the colonial Punjabi society. The article reveals that within a short span of time, electricity and everyday machines successfully perforated all sections and made life easier and comfortable for the general public in colonial Punjab. The bicycle and sewing machine and typewriter empowered people in general and women in particular, making them move freely and also helping them to earn livelihood. The Indian reform organizations started advocating sewing machine for Indian women's upliftment. The successful assimilation of everyday western technologies was perhaps one of the best

positive outcomes of colonialism which gives credibility to the fact that technology when used for welfare is always progressive.

Keywords

Colonial Punjab, Technologies, Electricity, Bicycle, Sewing Machine, Typewriter

1. Introduction

Punjab was the one of the last province's to be annexed 'politically and administratively', by the British on 29th March 1849 (Grewal, R, 2009). As per the Report on the Administration of the Punjab and its Dependencies for the year 1892-93 (1931), the colonial Punjab included the kingdom of Lahore, the territories of East India Company lying between the rivers Sutlej and Jamuna and the princely states. Punjab as an administrative unit under the British was a large geographical entity which lay between 27^o-39' and 35^o-21' north latitude and 69^o-35' and 78^o-35' east longitude. According to Khilnani, N.M. (1951), immediately after the annexation, the machinery of government was set in motion by Lord Dalhousie by appointing a Board of Administration consisting of Sir Henry Lawrence as President and John Lawrence and Charles Mansel as members. Each member of the Board was assigned separate tasks according to their experiences and capacity and they were jointly made responsible for the formulation and execution of the policies. The Lawrence's devoted most of their energies to build a solid structure of government which in subsequent years gained Punjab a distinction as the model province of India. Singh, K. (2016) has asserted that far-reaching political, economic and social changes were introduced by the British to strengthen their hold over all branches of administration which included the establishment of a new administrative hierarchy which embraced every activity of the state. Economic interest of Great Britain changed the rural as well as urban pattern and established new trade lines to facilitate export system. The British rule in Punjab ended on 15th August, 1947 when India gained freedom. On the whole, from the start of British rule to its end, the development of Punjab was dominated by colonialism. Grewal, R. (1988) has assessed that in overall terms, the development brought about new changes and new daily life amenities, which were not seen previously.

During the colonial rule in Punjab (1849 to 1947), many western technologies were introduced in daily life which significantly impacted the local population. Among these, everyday life or household technologies of electricity, bicycle, sewing machine and typewriter

were introduced in the last decade of 19th century and early years of 20th century. These technologies were comparatively smaller to building of railways, metalled roads or bridges, but nevertheless, very significant in transforming the life of Punjabi people from every walk of life to a great extent. The principal objectives of this study are to:

- Analyze the impact created by the everyday household technologies of electricity, bicycle, sewing machine and typewriter in colonial Punjab
- Bring out the usefulness of small technological interventions as a positive aspect of colonialism.

The article is a part of my Ph.D thesis on ‘Technology and the Colonial Punjab: Impact on Society’ and it uses analytical, comparative and multi-disciplinary methodology to elaborate the technological aspects of everyday technologies and the resultant impact created by them in the colonial Punjab society.

The article has been divided into five parts. Part 1 is Introduction and Part 2 is review of literature. Part 3 elaborates the advent and production of electricity and introduction of everyday machines of bicycle, sewing machine and typewriter while Part 4 discusses the impact of these novel technologies and machines in colonial Punjab. The conclusions form the Part 5.

2. Review of Literature

A review of existing literature reveals that introduction of modern technology in the colonial Punjab and its impact has not received adequate attention of researchers. Only a few published works are available on the subject. Jaggi O.P (1984) has discussed the technologies introduced by the British in India in the second half of the nineteenth and first half of the twentieth century. Arnold D. (2013) has described the technological modernity in colonial India and importance of everyday machines. Kumar D. (2006) has explored the links between science, technology and the process of colonization in India. In recent years, Western Culture and European colonialism and its impact on modern society has been studied by Huang, G. (2019). Dissanayake, D. (2020) has discussed colonialism and commercial imperialism for commodities associated with daily life. Zhou, F. (2018) has asserted the influence of European colonialism on the history of human beings and its impact on economy in colonized areas. Alsumiri, M., & Althomali, R. (2017) has discussed the importance of small technologies like wind power to generate energy. while Daradkeh, Y. I., Gouveia, L. B., & Sen, S. (2018) have taken into

account the small scale technology of digital transformation which impact business models and economy.

3. Advent and Production of Everyday Technologies in colonial Punjab

The advent of electricity in British India was heralded by the Darjeeling Municipality in 1897 by the installation of a hydro-electric plant for generation of electricity from waters of a hill stream. During the next ten years, the two presidency towns of Bombay and Madras were electrified. Jaggi, O.P. (1984) has brought out that it was also about this time that the proposal to bring electricity to Lahore in colonial Punjab was first given. The Public Works Department in its publication *New Lights for Old* (1941) has reported that the British government took the initiative in 1908 for installing small generating plants in some of their buildings in Lahore. The technical equipment of one power generating plant consisted of four Bellis and Morcom triple expansion steam engine generating sets of 150 kilowatts each, four Babcock and Wilcox Patent marine type water tube boilers, together with all necessary auxiliaries. Electric plants were installed in the Government House, the Secretariat, the Central Jail and the Montgomery Hall and in a few buildings and hotels situated on the Mall Road in Lahore. As per Battye, B.C. (1936) The Times of India reported in 1913 that the Viceregal Lodge in Simla was supplied with electricity through 'dynamos'.

According to Rutnagur, S.M. (1912), in colonial Punjab, Siemens Brothers Company started hydro-electric installation works at Basantpur and Mautikhund on the banks of river Sutlej in 1912 from a fall of 550 feet for supply of electricity to Simla. The Hydroelectric Plant of Simla installed by Simla Municipality was of 1,250 KW capacity. The technology of producing electricity in hydroelectric plants was by converting hydraulic energy into electrical energy. For this purpose, great pelton wheels were rotated by water coupled to electric generators and electricity was generated at a pressure of about 5,000 volts. According to Jaggi, O.P. (1984 a), in addition to steam and hydroelectric power, electricity was also generated by diesel electric plants.

After experimenting with installation of small electric plants known as '*ghar ka bijlighars*', the British Government advertised for tenders to supply electricity to Government buildings (*New Lights for Old*,1941_a). According to Kaur, S. (2008), Lala Harkishan Lal, an enterprising industrialist, responded to the advertisement and decided to take up the matter of

electrification of Lahore by associating himself with Mr. James Currie of Messrs James Currie and Company to establish the Lahore Electric Supply Company in 1912 (New Lights for Old, 1941_b). There were only 98 consumers in 1913 with Lahore Electric Supply Company. But by 1941, the number of consumers increased to 40,000 in Lahore alone and there were about 20,000 consumers in other towns as well. During the First World War, the growing demand for power was met by installation of two steam-engine generating sets of 228 kilowatts each and one Babcock and Wilcox marine type water tube boiler, together with various accessories, which were brought from Calcutta. By careful direction, the Company was able to enlarge and extend its sphere of activity. By 1941, besides Lahore as many as 12 towns situated in other provinces of the country including Central Provinces, United Provinces, Sind and the North-West Frontier Province were supplied electricity by Lahore Electric Supply Company. It was the single largest power producing unit outside the Government Electric Supply Branch system. The Lahore Electric Supply Company in its Shahdara Power Station had a capacity of over 8,000 KW (New Lights for Old, 1941_c). According to Singh, G. (1996), the government provided licenses to Municipal Committees of Lahore, Amritsar, Simla, Jullundur, Multan, Rawalpindi and Gujranwala to generate and sell electricity from 1915 to 1925.

Work on the Uhl river Hydro-electric Scheme in Mandi for generation of electricity was started in 1926 and completed in 1933 (Power for Prosperity, 1958). This scheme was operated by the Punjab Public Works Department. The project was situated on the Dhauladhar range at elevation between 4000 to 6000 feet above sea level. Water was drawn from Uhl and the Lamba Dug rivers at Barot and was conveyed by a 3 mile tunnel designed for a full discharge of 600 cusecs. The tunnel fed steel penstocks which ran down the slope to the Shanan Power Station so as to utilize 1,800 feet of the total fall for the generation of electricity. The initial installed capacity of the Shanan Power Station was 48,000 KW. In 1939-40, it supplied power to sub-stations at Kangra, Pathankot, Dhariwal, Amritsar and Lahore (Thomas, P.J. 1948). The British government also initiated work on the Bhakra-Nangal Multipurpose Project in 1945. However, the scope of this project was completely altered after the partition of the country in 1947. At the time of the partition, there were 26 private electric supply undertakings in colonial Punjab (Power for Prosperity (1958_a)).

Bicycle was a pioneering technology as it was cheap, simple and an autonomous mode of individual transport compared to horses, carriages and railroads. By 1890's, British

manufacturers such as BSA, Rudge and Raleigh had started exporting bicycles to India. At the end of the nineteenth century, bicycle had become an integral part of the Indian middle class. Arnold, D. & Dewald, E. (2011) have commented that besides making people more self-reliant, the bicycles lend people a healthier image and enhanced their social status. Around 35,000 bicycles were imported by India in 1910 which increased to about 47,000 in 1920-21. Import of British bicycles continued even when local manufacture of bicycles started in the late 1930s (Arnold, D. 2013). As per the *Report of the Indian Tariff Board on the Bicycles Industry* (1946), the first factory for manufacture of bicycle in India was India Cycle Manufacturing Company Limited established at Calcutta in 1938.

The sewing machine was widely welcomed as a harbinger of change reaching even the remotest villages of colonial Punjab in the late nineteenth century (Mathews, B. 1937). By 1900, the sewing machines were visible in *bazaars* and roadside tailors. Feaver, G. (1992), has observed that during a tour of Indian villages in 1912, Sidney and Beatrice Webb, travelers, found lucrative market of sewing machines in Lahore and Amritsar. Out of the imported brands of sewing machines, Singer, an American brand, led the sewing machine market (Arnold, D. 2013_a).

Typewriter was an important innovative technology developed in the second half of the nineteenth century that served on a global scale to articulate a new sense of modernity (Arnold, D. 2013_b). According to Geo carl mares (1909), typewriters were used in colonial Punjab in the early decades of the twentieth century. Arnold, D. (2013_c) says that although the volume of typewriters imported to India never matched that of sewing machines and bicycles, yet it was a useful everyday machine which was accepted by the society. In 1913-14, 6,267 typewriters were imported and by 1928-29, the number increased to 21,487. The bulk of the machines came from Britain and United States. The most famous typewriter brand was American named Remington. In 1939, there were 62 branches of Remington in India. As per the *Industry Year Book and Directory* (1938), Remington typewriters were marketed by outlets located at Lahore, Amritsar, Rawalpindi, Multan, Lyallpur, Simla and Ambala in the colonial Punjab.

4. Impact of Everyday Technologies in Colonial Punjab

Electricity in colonial Punjab was introduced for the first time through small generating plants in Lahore in 1908. Electric lights that arrived in the form of a light glass bulb started

replacing the primitive oil lamp and people started appreciating this novel technology (New Lights for Old 1941_d). The first contract to supply electricity in Lahore was given to the Lahore Electric Supply Company which began with a small number of consumers in 1913 and then gradually gained large number of consumers by 1941. Besides electricity production by the private licensed companies, the government started providing licenses to the Municipalities to produce and sell electricity in colonial Punjab and also encouraged people to use electricity by giving demonstrations. The generation of electricity from water was also initiated in the colonial Punjab. Use of electricity led to the production and use of electric components like electric fans and bulbs, electric motors, lamps, wires and cables, secondary batteries, dry batteries and cells, distribution transformers and electric lighting accessories which provided employment to people engaged in factories, as depicted in the Table 1.

Table 1: *Employment in electric works factories in colonial Punjab*

Number of workers employed	
1901	1,477
1911	1,458
1931	2,032

(Source: *Census of India (1911), Punjab, p. 345; Census of India (1921), Punjab, p. 316; Census of India (1931), Punjab, p. 183.*)

Use of electricity in the colonial Punjab transformed the life of people and gave a boost to the economy. The oil lamp, the candle and the lantern and the “Punkhah” or hand-fan started getting eliminated (New Lights for Old, 1941_e). Darling, M.L.(1929), a civil servant in Punjab administration, while touring Punjab in 1926 came across houses in villages of Ludhiana and Jullundur where there were electric ceiling fans. Advertisements started appearing for electric bicycle lamps, electric bulbs, flash lights, Kirloskar electric pumps, loud speakers and Lalley generator set, which could help to run electric lights and fans (*The Tribune*, 17 December, 1922; *The Tribune*, 21 December, 1922; *The Tribune*, 10 March, 1936; *The Tribune*, 17 March, 1936; Talbot, I. and Kamran, T. 2016). Electricity provided new strength to the industry in colonial Punjab as the electric power driven motors reduced the production time and labour cost. As per *Census of India (1921)* report, by 1921, out of total of 414 factories in colonial Punjab, there were about 47 factories which had installed electricity powered motors. Thus, the introduction of

electricity in the twentieth century in colonial Punjab was an innovation that ominously changed the lives of Punjabis.

The bicycle had a very positive effect on society and economy of colonial Punjab. Firstly, it gave rise to spare parts industry. Ludhiana became a hub of manufacturing bicycle accessories and parts (Report of the Industrial Survey of the Ludhiana District, 1942). Secondly, employment was generated as a large number of cycle repair shops came up for repairing chains, breaks, forks and pumping-up tires. These were the street level practitioners of everyday technology (Census of India, Punjab, 1921 & 1931). Thirdly, cycles became convenient mode of travel and gave people a new sense of physical freedom and created new opportunities for social interactions. Men, women and children now moved freely in hill stations, cantonments and civil lines. As cycles were cheap, it was easy to buy and maintain them. Fourthly, the cycles became part of Indian middle class to build a healthier image. Cycle clubs came up as early as 1890s and many cities by 1910 started organizing activities like cycle racing. Fifthly, cycles gave rise to local entrepreneurship in late colonial period as exhibited by the cycle industry of Ludhiana. Sixthly, the bicycles helped in erasing social caste norms and gender inequalities. Many workers as well as office goers started using bicycles to go to work. As girls also started using bicycles to go to schools and colleges, they were able to leave homes alone without a male escort, which somewhat helped to loosen the grip of patriarchy. Seventhly, the bicycles came to be identified with state power as soldiers and police-man used bicycles to increase their mobility and effectiveness. Cycles also became a symbol of post-man and telegraph boy. They were accepted as the easiest mode of transportation by the lower as well as middle classes. Arnold, D. and Dewald, E. (2011_a) opined that in fact, the bicycle represented the kind of everyday machine, which although had originated in foreign lands, yet was accepted whole-heartedly by the Punjabis.

Sewing machines were rapidly accepted in the colonial Punjab as they passed almost effortlessly into everyday use without any significant cultural resistance. They represented successful technological implant requiring very little capital investment. It cost only about Rs. 200 to buy a new sewing machine. Therefore, it reached even the far-off villages. In the Lahore of 1910s, sewing machine in *bazaars* and road side tailoring shops was a familiar sight. In 1912, an Australian visiting colonial Punjab witnessed tailors working on Singer sewing machines in their tiny shops (Arnold, D. 2013_d). According to Darling, M. L. (1929_a), in 1921, in a village of

Lyallpur district, a sewing machine was brought by a village woman and by 1926, there were 8 sewing machines in the village. Arnold, D. (2013_e) viewed that sewing along with embroidery and dress-making were seen as suitable occupations for poor and female orphans. The missionaries advocated sewing for girls to prepare them for future lives as housewives. Making and mending family clothes became a part-time occupation for many women as it was considered a respectable form of women's home work. It provided them with an independent source of income. Sewing machine also became a tool of Indian women's upliftment. In literature produced by Hindu and Sikh reform organizations like Arya Samaj and the Singh Sabha, women were urged to take up useful domestic occupations like sewing to augment family incomes and to make their own clothes. The Dev Samaj also propagated the use of sewing machines for the women in the Nari Ashrams for education and training of women. The Dev Samaj College of Education at Ferozepore in 1942 promoted sewing and had a tailor master to train girls in high class tailoring work (Kanal, P.V.1952). Women Associations and Social Welfare Organizations started giving sewing machines as prizes to school girls and female college students as women could earn money remaining within the home. In 1920s, advertisements started appearing in newspapers and journals showing women happily working at their sewing machines. As a part of their emerging identity, sewing machines became objects which men gave to women as philanthropic gifts or as items of dowry. Due to the western influence, the Indian mode of dress was changing and this made the sewing machine useful (Arnold, D. 2013_f). By the early twentieth century, many tailor shops opened in Lahore, Simla and Amritsar. Lahore emerged as the fashion capital of colonial Punjab where shops started providing the services of tailors in the homes of customers too, as in many homes, women were not permitted to go to the 'bazaar'. Books describing the technical details of stitching and cutting as well as the latest styles of the European dresses from Europe also became available. Prominent tailoring shops that stitched western clothes in Lahore were Ranken and Co., Phelps and Leela Ram. Lok Nath in Simla specialized in making ladies coats in the 1930s and 1940s (Kaur, J. 2020). The sewing machine generated large scale employment. Large number of tailors soon started working with the sewing machines. In colonial Punjab, tailoring profession reached 6 percent of the total population in 1911. As per Census of Punjab (1911), the strength of tailors increased by 40 percent from 1901 to 1911 as the use of sewing machines increased due to more demand of finely stitched clothes. Arnold D. (2013_g) viewed that in Lahore, the number of

tailors and stitched cloths (uniforms) increased due to the presence of rail workshops and army cantonment. The increase in number of tailors, embroiders and dress-makers from 1901 to 1931 in colonial Punjab is depicted in the Table 2.

Table 2: *Strength of persons connected with dress making from 1901 to 1931*

Number of tailors, embroiders and dress-makers	
1901	1,08,963
1911	1,51,966
1931	2,15,311

(Source: *Census of India (1901), Punjab*, pp. 539-40; *Census of India (1911), Punjab, Part-I*, pp. 539-40; *Census of India (1931), Punjab*, p. 179)

Typewriters were everyday machines that articulated a new sense of modernity (Arnold, D. 2013_n). The usefulness of typewriter made it a necessary item of a modern office in colonial Punjab. As per records of Punjab Government Civil Secretariat, Revenue Department and Industry and Labour Department, Punjab (1910 & 1940), typewriters were used in Punjab Government Departments like Punjab Government Civil Secretariat, Revenue, and Industry and Labour Department. The Remington brand of typewriters were purchased for the Punjab Government by the Department of Commerce and Industry from the main headquarters of the manufacturer located in Lahore and Simla (Commerce and Industry Department, Government of Punjab. 1910 & 1911). Commercial firms and private employers also started using the typewriter. *The Tribune* and *Lahore Chronicle* (1922 & 1936) advertised for the sale of typewriters and growing need of typists (The Tribune, 6 May, 1940). In the twentieth century, getting a job especially in the Government office usually depended on having a recognized certificate from a typing school (Arnold, D. 2013_i). Many private typing schools were founded in the first half of the twentieth century to train people and British Government of Punjab too started many typing schools in Lahore, Amritsar, Simla, Montgomery, Sialkot, Jullundur and Ferozepore for training government officials and clerks (Proceedings of Commerce and Industry Department, March, 1910). Rai G. (1920) reported that typing schools started generating employment and even Hindu women started working as typists in offices.

5. Conclusion

The overall impact of everyday technologies of electricity, bicycle, sewing machine and typewriter was positive and these were accepted wholeheartedly and were able to transcend class, race, and gender in colonial Punjab. They made life easy and comfortable while also empowering people and women in particular. These small machines became objects of everyday use and played an important role in gearing the province towards modernity as they influenced the ways in which people worked, traveled and wore clothes. The limitation of research in the present study was the unavailability of data as there have been very limited studies on the subject. The usefulness of everyday life machines or small technologies should be explored and there is scope for researchers to explore innovations and technological advancements in colonial period to fully understand the patterns of modernity in human society.

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Arnold, D. (2013_e), *Everyday Technology: Machines and Making of India's Modernity*, pp. 70-79

<https://doi.org/10.7208/chicago/9780226922034.001.0001>

Arnold, D. (2013_f), *Everyday Technology: Machines and Making of India's Modernity*, pp. 37-38, 80-81: An example of usefulness of sewing machine is from memoirs of Prakash Tandon who worked in Punjab Irrigation Department. In 1918, when Tandon fell seriously ill, he decided to buy a Singer sewing machine, as he believed that Singer was a happy machine which exemplified love of singing. Therefore, Tandon linked the machine with well-being. Males began to wear shirts and cotton jackets especially in relatively prosperous provinces like Punjab. The calf length skirt worn by peasant women of the Banjara community in Rajasthan and Punjab started to give way to the better clothing like *salwar kameej*. Tailored jackets, blouses and chemises became part of the dresses of Indian women who were in direct contact with European teachers, doctors and missionaries. The respectable women of the society started preferring stitched bodice (*choli*).

Arnold, D. (2013_g) *Everyday Technology: Machines and Making of India's Modernity*, pp. 49-51.

<https://doi.org/10.7208/chicago/9780226922034.001.0001>

Arnold, D. (2013_h), *Everyday Technology: Machines and Making of India's Modernity*, p. 56.

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Arnold, D. (2013_i), *Everyday Technology: Machines and Making of India's Modernity*, p. 86:

The colonial rule increased the availability of literacy and education and favoured the extension of technical skills like typing to communities such as Christians, low-caste Hindus and Sikhs for their adoption in bureaucratic life.

Battye, B.C. (1936), *The Riddle of the Cosmos*, Hamilton: British Publishing House, p. 119: *The Times of India* in December 1913 reported, "The transport of heavy machinery along narrow hill roads, with severe gradients, exercised much ingenuity and patience, as only

- coolies were available for cartage, haulage, etc”.; *Census of India (1931), Punjab* Vol. XVII, Part-I, pp. 2,41.
- Census of India (1911), Punjab*, Report, p. 507: By 1911, there was hardly a tailor without a sewing machine in colonial Punjab.
- Census of India (1921), Punjab*, p. 64; *Census of India (1931), Punjab*, p. 215: The numbers of persons involved in repair and assembly of bicycles were 64 in 1921 which increased to 773 in 1931 in colonial Punjab.
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Census of India, (1921), Punjab, Part-I, Report, p. 368: 53 handlooms were also operated by electricity by 1921.
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Delhi: Government of India Publication; Government of India (1954).*Report on the Continuance of Protection to the Bicycle Industry*,p. 5. Bombay: Tariff Commission, Government of India Publication: The second industry was Hindustan Bicycle Manufacturing and Industrial Corporation Limited, Patna in 1939 and Hind Cycles

Limited, Bombay in the same year. All these industries manufactured complete bicycles except free wheels, chains, ball bearings and spokes which were imported from abroad. After 1946, three more units, i.e. Sen Raleigh Industries Limited of Asansol, T.I. Cycles of India Limited of Madras and Atlas Cycle Industries Limited of Sonapat started manufacturing complete bicycles.

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Jaggi, O.P. (1984_a), *Technology in Modern India*. (Vol X ed.). pp. 200-02: The native state of Patiala installed a hydro-electric station for city lighting, power supply and water works in 1912. The electric current was conveyed 18 miles from the generating station for which the machinery was supplied by M/s Siemens Brothers.

Kanal, P.V. (July 1952). *The Science Grounded Religion*. (Vol 46, No 7 ed.). Delhi: Panchal Press, pp. 1-2; *Gazetteers of India, Punjab, Ferozepore Supplement*, (1983), p. 147; *Annual Report of the Dev Samaj College for Women, Ferozepore, 1949-50*; 'The College for Women',

Kaur, J. (2020) 'How the British shaped shopping in Shimla', *The Tribune*, Chandigarh, 23 August, 2020.

Kaur, S. (2008) 'Perception of Science and Technology in Colonial Punjab and Delhi, 1849-1947', PhD. Theses, Chandigarh: Panjab University, p.101: Lala Harkishan Lal was an eminent industrial entrepreneur of British Punjab. He ventured into diverse industrial fields like banking, insurance companies, soap-making, brick kilns, saw-mills, ice factories, oil pressing, timber making, glass-making, match making as well as spinning and ginning mills.

Khilnani, N.M. (1951). *The Punjab under the Lawrence's, 1846-1858*. (Monograph No2 ed.). Simla: Punjab Government Record Office Publication, pp. 106-07,131: 'Henry Lawrence was assigned political and military duties of disarming the country, demobilization of the Khalsa army, defense of the frontier and re-organization of Punjab and several other regiments. He was also to apply balm and heal to the wounds of former Sikh aristocracy who were feeling the loss of their powers and privileges. John Lawrence was given the intricacies of finance and land settlement while Mansel was interested with

Judicial Department. He, however, did not stay long and was replaced by Robert Montgomery in 1851’.

Kumar, D. (2006), *Science and the Raj: A Study of British India*, New Delhi: Oxford University Press.

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Mathews, B. (1937), *India Reveals Itself*. London: Oxford University Press, p. 178.

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Public Relations Department, Punjab (1958_a). *Power for Prosperity: Development of Electricity in Punjab*, p. 2. Government of Punjab Publication.

Public Works Department, Lahore (1941). *New Lights for Old: A History of the Progress and Development of the Lahore Electric Supply Company over a period of first 28 years* (1941). pp. 9, 12, Government of Punjab Publication.

Public Works Department, Lahore (1941_a). *New Lights for Old: A History of the Progress and Development of the Lahore Electric Supply Company over a period of first 28 years*, p. 9: It also gave the assurance that the successful tenderer would be granted a license to supply electricity to the whole town of Lahore. The advertisement which appeared in a local newspaper on 25 September, 1910 was: ‘Electric Lighting of Lahore’ – “Tenders are invited from registered companies for the concession for the supply of electric power for lights and fans in Government Buildings at Lahore. Full particulars can be obtained from the Sanitary Engineer to Government, Punjab PWD, Lahore. Tenders will be received up to 1 March, 1911”.

Public Works Department, Lahore (1941_b). *New Lights for Old: A History of the Progress and Development of the Lahore Electric Supply Company over a period of first 28 years*, pp.10,15,42: They applied for the tender which was accepted on 7 July, 1911 and the initiative heralded a new landmark in the history of technology in Punjab. The arrival of electricity in Punjab, in the form of little glass bulb which replaced the primitive oil lamp, is reflected in the history of the Lahore Electric Supply Company.

Public Works Department, Lahore (1941_c). *New Lights for Old: A History of the Progress and Development of the Lahore Electric Supply Company over a period of first 28 years*, p.10: The electricity was produced by the Company at its Shahdara Power Station.

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