

Central Weaving Institute, Banaras: A Cultural Encounter between the Native and the Modern Form of Instructional Practices

Prakrati Bhargava*

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Abstract

Handloom weaving was the most widespread industry in colonial India, next only to agriculture. A century ago India was the prime centre for trade of fine textile products. However, under the colonial rule it gradually transformed into a market for cotton-textile goods imported from Manchester and Lancashire. This also brought about technological changes in various processes of handloom weaving industry reflecting not merely a technological shift, but a cultural encounter where recipient already possessed a native system of handloom weaving. The present paper will examine the introduction of institutional mechanism of weaving industry on modern lines. The establishment of Central Weaving Institute in the heartland of weaving artisans 'Banaras', in 1912 is indeed a glaring example to modernize the weaving methods of artisans in United Provinces. Major focus will however be made on technological change in handloom weaving industry, followed by mapping of the efforts made by various agencies viz. provincial government or voluntary organizations to adopt and adapt the changes in handloom weaving in colonial India. Finally it will stress on the institutionalization of modern form of Weaving School at Banaras which was named Central Weaving Institute.

Key words: Banaras, Central Weaving Institute, Colonial government, Cultural encounter, Handloom weaving, Technological change.

1. INTRODUCTION

Weaving was practiced in India since ages and was extensively spread across the length and breadth of the country. The technological changes had to encounter resistance which was taking place in a society driven by its own socio-economic and cultural practices. Headrick (1998) pointed out that the process of technology transfer takes place in two forms; first the geographic relocation and the other in the form of cultural diffusion. Geographic transfer is marked by relocation of equipment, methods and experts from one location to another, while cultural diffusion signifies transmission from one society to another; of knowledge, skills and attitudes related to specific processes.

The cultural diffusion of technology may

encounters both resistance and support from the recipient society. Paul Bairoch distinguishes the forms of technology in the early and late stages of Industrial Revolution; machines and processes in the early stages of industrial revolution were simple which craftsman could understand, copy and improve, whereas by the late nineteenth century industrial technology was no longer within the reach of craftsman and needed the knowledge of engineering and science (Headrick, 1998, 11).

Cultural diffusion of technology demands a willingness to accept a change, a strong political cohesiveness and a common vision for future (Headrick, 1998). Technological change is mediated by an agent; if the agent is internal and within the community, the resistance would be

*Assistant Professor, School of Education, Central University of Himachal Pradesh, Shahpur, Kangra, Himachal Pradesh, Mob: 8894702337; Email: prakratifun@gmail.com.



Modernization of leather industry and chequered history of technical education in colonial Kanpur

Prakrati Bhargava¹

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Abstract

Modernization of industry in the western world was determined by application as well as the training of man for applying science in industry. The leather industry which was manufacturing at the cottage level did not resist this modernization. The leather industry in India employed the most depressed class of the Indian society. On the one hand, modernization of leather industry was determined by application of science, while on the other by the training of the workforce. The latter invoked political and social factors like state policy for technical education, receiving of technical education by artisan class and employment opportunity for the skilled workforce. By the late nineteenth century, Kanpur emerged as the prominent centre of modern leather industry in colonial India due to military needs of the British Indian army. The reasons for slow growth of science and technology in colonial India have been extensively examined by scholars but the configuration of industry at the local level, the role of social composition of the workforce in the modernization and the inception of technical education have been less examined. The present paper seeks to address the questions as to the factors which led to the emergence of modern leather industry in Kanpur; the nature of its organization and the relationship between leather industry and institutionalization of technical education for this industry.

Keywords Depressed class · Leather industry · Modernization of leather industry · Science and technology · Technical education

1 Introduction

The industrialization in the western countries, in the nineteenth century, stimulated the demand for technical education for training of skilled workforce. However, in the colonized countries, modernization of industries witnessed slow growth and so does the onset of technical education (Basu, 1974; Bhattacharya, 1998; Headrick, 1988; Kumar, 1991). In colonial India, the modernization of industries was limited to specific industries like cotton-textile, mining and steel. The modernization of industries in colonial India was dependent on technology and skilled workforce imported from the west. The configuration of industry at the local level and the social composition of the workforce played decisive role in its modernization as well as the inception of

technical education in colonial India. It is evident that the first institution for training the workforce for cotton-textile industry namely Victoria Jubilee Technical Institute was started in Bombay in 1875, whereas engineering colleges established by colonial government were largely catering to the needs of public works department (Headrick, 1988; Baber, 1996; Inkster, 2007). Besides cotton-textiles, other cottage industries like sugar, leather and oil etc. were slow in diffusing science and technology. The transformation of the leather industry from traditional to modern or not so modern forms has maintained the strong links with the social structures and its associated hierarchies being crucial not at the factory level but at the level of the industry as a whole (Roy, 1999). The leather industry was largely village based at the outset of nineteenth century, however, large tanning colonies were known to settle in or near some North Indian cities. Producing leather goods at the village level, India by the late nineteenth century, became the largest exporter of tanned hides and an importer of boots and shoes from Europe (Roy, 1999). The transformation of industry was felt not at the level of specialization but in the way

✉ Prakrati Bhargava
prakratifun@gmail.com

¹ School of Education, Central University of Himachal Pradesh, Dharmashala, Himachal Pradesh 176215, India

technology and organization in both tanning and leather working changed at the extent of new markets (Roy, 1999). The organization of leather industry in the urban centers involved transformation at the organizational level, diffusion of new techniques and technology, demand of new products and training the workforce.

By the turn of the nineteenth century, except for some industrial schools, colonial governments' efforts for technical education were largely confined to the Public Works Department, whereas in the native state of Baroda the mechanical, civil and chemical technology courses offered in Kala Bhawan produced a skilled workforce for the rapidly industrializing Bombay–Baroda–Ahmadabad textile axis (Raina & Habib, 2004). Nevertheless, Bengal Chemical and Pharmaceutical Works founded by P.C. Rây in 1900 was an industrial enterprise of a scientist whereas the vision of industrialist J.N. Tata for science education and research materialized at the Indian Institute of Science, Bangalore. The concern for self-reliance in science and technology leading to economic development underscore the efforts of Indians in their own capacity; countering the colonial idea of research and development for colonized Indians (Chakrabarti, 2004; Raina & Habib, 2004). The colonial state was reluctant to initiate technical education for industrial development but the Indian business community and princely states recognized the need for the technical education for economic self-reliance.

By the mid-nineteenth century, the military requirement of the British Army led to the development of modern leather industry at Kanpur which already had an agglomerate of leather working community (*camārs*) dating back to the establishment of East India Company's army cantonment in the city (Montgomery, 1849; Nevill, 1909). However, development of technical education for leather industry did not begin before the first decade of the twentieth century. The introduction of modern technology in the leather industry and institutionalization of technical education for this industry was shaped by varied factors like the ownership of the industry, dominating caste of the labour-force and the perspective of local business community. The case of leather industry in Kanpur presents a unique example where the leather industry was owned by Europeans who employed *camāras* (leather working community among Hindus) in the tanning process and upper caste Hindu community remained distant from this industry because of its association with flesh. Thus, the question of technical education for leather industry exemplifies the social determination of science and technology policy and how it shaped the policy of technical education at large. The present paper seeks to address following questions: what factors led to the emergence of modern leather industry in Kanpur? What was the nature of organization of modern leather industry? What was the relationship between modern leather industry and institutionalization of technical education for this industry?

2 The onset of modern leather industry in Kanpur

Traditionally, the leather industry comprised of flaying, tanning and manufacturing of leather products which was performed by tanners or product makers. The division of labour between flayers, tanners and product makers depended on region and in some cases, they merged; with the leather maker being a flayer cum tanner cum product maker whereas in other cases the division of labour between these categories was quite distinct.¹ This division of labour determined the social hierarchies of the respective community performing the work based on purity and pollution. The leather has traditionally been prepared from the pelts of the domestic and wild animals by processing it either with the bark or fruits of certain trees and shrubs or some mineral oils. These vegetable substances and chemicals are called tanning material. The tanning industry is thus dependent upon two things for its development: the green hides or hides in its raw state and tanning materials like *babūl* (*Acacia arabica*), the nuts of myrobalan (*Torminaliac hebula*) and in the south *avaram* bark (*Cassia auriculata*). Thus, in a number of cases, the industry was located near the forest or other areas producing tanning materials (Sharma, 1946). The tanning industry developed in India in the bark tanning belt of *avaram* (*C. auriculata*) running from Madras to Bombay and the other depending upon *babūl* (*A. arabica*) running from Sind in the west to Cawnpore (presently Kanpur) in the United Provinces in the East. The two biggest factories of India engaged in making boots and shoes were situated in United Provinces (Cooper Allen & Co.) and in Bengal the Bata Company at Batanagar near Calcutta. The Government Harness and Saddlery Factory, the only of its kind in India, was also located in Kanpur (Sharma, 1946, p. 163).

The history of leather industry in its commercialized form can be traced to the post-1850 period with the transformation of the quasi service-based production into goods produced for domestic and international market. The leather industry was extensively low, because footwear, which constituted the major chunk of demand for any leather industry was worn only by a limited number of people and demand

¹ The hide is removed from the dead animal by the flayer subsequently the tanner cured the hide; which is used by product maker (*mocī*) to produce leather goods. In the northern India these three functions were performed by *camārs*. The Madigas and the Chakkiliyans of the southern India were frequently leather-worker as well. In Gujarat, flayers and tanners merged but leather artisans (*mocīs*) were distinct. In the Deccan, flayers were the Mahars, tanning was done by the Dhors, and leather was the *camārs*' responsibility. See Sherring (1879). Hindu Tribe and Castes Vol. II. Calcutta, Chatterton. 1905. Monograph on Tanning and Working in Leather in the Madras Presidency, Guthrie (1910). Report on the Leather Industries of the Bombay Presidency. Bombay, and Roy (1999).



for other kinds of product such as garments and bags did not exist. It was the British Army's need at Kanpur that transformed cottage leather industry into the modern one, whereas Madras leather industry got spurt through its linkages with export markets. A French leather technologist De Sousa in Madras presidency improvised the tanning process by processing the vegetable tanned leather in myrobalan bath; this improved the quality of leather which was internationally accepted. De Sousa was probably the first tanner in the Madras Presidency who succeeded in processing skins that did not show any discoloration on exposure to air (Roy, 1999).

The presence of government arsenal and ordnance depot of East India Company Army in Kanpur created a huge demand for leather goods from the early decades of nineteenth century. The *camārs* flocked to the city to supply the leather goods to the arsenal. These industrious people not only assured uninterrupted supply of leather goods to the army but also provided the substitute to English goods. Montgomery observed:

Cawnpore is more famous perhaps for its leather trade than for any other. There are, including those in the cantonments, 308 houses engaged in the trade. The leather is prepared here, and carriage harness, and saddlery sent to all parts of India (Montgomery, 1849).

It was none other than British Military Official John Stewart who ventured in setting up first leather factory at Kanpur.² John Stewart was trained for the British Indian Army in England and was posted at Calcutta in 1853. During the Mutiny, Stewart was posted at Allahabad in the commissary of ordnance assisting the British Army with food, clothes and armaments (Yalland, 1994). Subsequently, he was transferred to the Cawnpore Magazine and his stay extended for three decades. During this period, the city transformed from a hamlet of *camārs* (leather working community) to one of the largest producers of leather goods in India (Yalland, 1994). In 1859, under the supervision of Stewart, a commissary depot for leather was set up at Kanpur to meet the shortage of leather goods felt during the mutiny (1857). The depot could be regarded as the first modern industry in the city and the prime objective of this depot was to improve the production of leather in quantitative and qualitative terms. Saddlers, trained in tan yards for leather technology were sought from England. The ample availability of raw materials viz. animal hide, skin and *babūl* bark for tanning proved conducive for effectively transforming this depot into the

Government harness and saddlery factory (Nigam, 1997a). By the 1880s, this factory had become the largest supplier of equipment for the entire British Army in the East (Yalland, 1994, p. 124).

John Stewart recognized the needs of the British Army that provided a ready market for leather goods, if produced at a commercial scale, given the local resources of raw material and skilled workforce. He thought of fusing the European methods of leather processing with the skills of native *camārs* and replaced the leather goods imported from England. In 1860, Stewart was selected by the Military Department of Government of India to organize and establish a factory for the supply of harness, saddlery and accoutrements locally to the army in India. Mr. Elisha Deacon, tanner was called from England (Yalland, 1994).

Further, Stewart went to England and Scotland and visited principal leather centers for collecting details of the processes in all branches of leather technology. The British government sent hundred hides to England to be experimented upon and Stewart met with leading leather firms like Messers Oastler and Palmer of Bermondey, Messrs Boase in Edinburgh, thus he visited nearly hundred firms in Britain (Yalland, 1994, p. 201). The industrial enterprise of the city of Kanpur was closely linked with the technological development in England. The entrepreneurs like John Stewart and Gavin Jones³ effectively established a relationship with the English tanning industry for the development of industries in Kanpur. They consequently set up conduits for the transfer of technology from England to the community of gifted leather artisans (*camārs*) in Kanpur.

Nevertheless, Stewart returned to Kanpur and was back at the factory. The leather workers were skilled in tanning hides using primitive methods of tanning but they had never heard of currying—a process which greatly improved the quality of the finished leather and of double English stitch. Meanwhile, as many as 2000 workers were employed, many bringing their children along with them to learn the trade. Stewart had become a business icon and hundreds of people sought to meet him at his residence with requests. The initiative undertaken by Stewart made him popular among the local populace as *Barra Mochee* (Big Shoe Maker) (Yalland, 1994).

² John Stewart was born in India in 1833. His father Major William Murray Stewart (22 Native Infantry) was adjutant at the Fort Chunar, and the Governor General's agent at Banaras and superintendent of the estate of the Rajah of Banaras.

³ Gavin Sibbald Jones was born on December 22, 1835 at Calcutta to John Benjamin Jones and Fenny Palmer. Benjamin Jones was the son of Leonard Jones who was in the service of East India Company, settled at Calcutta since 1790. Jones was from his very childhood interested in mechanical work, but the untimely death of his father and unsound financial condition of his family, lead him to be self-taught as an engineer, without any formal instruction from an engineering college. For a short duration he went to England and worked in a cotton textile mill and Great Eastern Railway (Yalland 1994, p. 152).



The factory was under the Ordnance Department and officers of this department were selected for their services in the factory after completing their training in leather manufacturing (Indian Industrial Commission, 1918). The war with Afghanistan and fear of Russia kept the harness and saddlery factory very busy. Reflecting on the working of his factory, John Stewart observed:

I have 4500 men working away in the Factory and we can't keep ahead of the orders. I have not seen India so excited since the mutiny (Yalland, 1994).

The magnitude of the work led to the expansion of the factory that involved the addition of the Blacksmith shop in 1882, additional tan yards in 1890–1891, followed by a bark grinding plant and brass and iron foundry by the turn of the century. Further, a machine shop was added in 1908–1909 and the factory was electrified by this time. The up-gradation of the tanning process and mechanization brought down the production costs (Sharma, 2003, p. 23).

William Earnshaw Cooper⁴ arrived in Kanpur in 1874 as managing partner of Begg Sutherland & Co.⁵ He subsequently joined the Board of Muir Mills. In 1879, George Allen⁶ and William Cooper set up a Cooper Allen & Co. trading in country products. The company completely replaced Indian merchants in cotton trade, and grabbed contracts to supply cotton to Muir Mills. George Allen was a veteran businessman and was awarded CIE in 1880. It was Gavin Jones' idea that Cooper Allen should start the Government Boot Factory for manufacturing army boots and appoint John Stewart as inspector. Gavin Jones suggested that they should secure army contracts and he would assist in the construction of the factory. George Allen, John Stewart, Gavin Jones and William Cooper formed an impressive group, three of whom knew India before 1857 and Cooper had gained experience by working in Muir Mills. In 1883, John Stewart was given extra charge of the Cooper Allen's Army Boot and Equipment Factory for supplying boots and shoes to the Indian Army (Nevill, 1909). The factory was situated on the banks of the Ganges, over an extended area of 37 acres, popularly known as Hazari Bangla (Watson, 1902). The European business enterprises provided

technical, business and managerial skills for inaugurating new enterprises, but were largely dependent on the British Army contracts for their products. The experience gained by British business community in cotton-textile industry led to the much needed social and cultural capital to venture into new industries like leather, sugar and many more, whereas, Indian business community of Kanpur was confined to trades and commerce rather than manufacturing. Moreover, monopolistic contract of British Army consignment galvanized the British business community into manufacturing enterprise (Bagchi, 1972; Bayly, 1983). Kanpur leather industries were exclusively dependent on British technology and this process was mediated by recruiting British technicians and managers at key positions.

Among the small firms, Foy Bros., established in 1872, became a leading footwear manufacturer by 1881. Edward Foy entered into an ambitious scheme in partnership with T.T. Bond, the Engineer-in-Charge of the Government Floor Mills, to set up the North West Tannery Company in 1892 with a capital of ten lakhs rupees, to compete with Cooper Allen.⁷ The firm manufactured a wide range of leather goods like bags, trunk and suit cases; articles made from crocodile skin was a specialty of the firm (Indian Industrial Commission, 1918).

The leather industry of Kanpur attracted Europeans who ventured alongside Englishmen. A.H. Creete,⁸ an Armenian started Creete & Company and Cawnpore Tannery in 1896. Creete & Co. did not enjoy the patronage of British Army supplies, which was mostly enjoyed by English businessmen, but his firm supplied leather goods to Mahārājās and the nobility throughout India. After a period of 8 years, Creete sold his company to Mr. William Stork, who along with Hafiz Abdul Karim and Hafiz Abdul Halim formed Stork Halim & Co. (Nigam, 1997a, 1997b). The Muslim businessmen came forward and invested in the leather industry. They became traders for European tanneries and successfully traded with many German trading firms and thus raised capital. The business entrepreneurs from Germany also chose Kanpur for investing in leather trade, G. Van Der Wense a merchant from Agra in partnership with two other Germans founded Vonder Wense Tannery at Juhi, Kanpur in 1900. However, the firm could not make great strides and was bought by Cooper Allen Co. (UICC, 1939). The first completely locally owned leather industry was founded in 1916, when M.A. Wasi started the United Provinces Tannery

⁴ William Copper was born in a farmer's family in Lincolnshire in 1843. At the age of 18 he landed in India and led by his farming background joined an indigo estate at Chuppra, District Sarun.

⁵ Henry Sutherland from Calcutta with Dr. Begg had taken over the Maxwell business and thus Begg Sutherland continued to trade as product merchant.

⁶ George Allen came to India in 1850, and worked as zamindar in Oudh and then joined a family firm Peake, Allen & Co. which was selling tooth powder, from London. Allen launched Pioneer (newspaper) in 1865 from Allahabad; *The Pioneer* had originally owned by a group of subscriber, but Allen purchased all the shares by selling his zamindari in Oudh. Yelland. p. 221.

⁷ Rai Bahadur Lala Baijnath. Some Leading Industries of Upper India. First Industrial Conference held in Banaras on December 1905, p. 136.

⁸ A.H. Creete was an Armenian who was born in Persia. He came to India in 1874 and initiated his business from Lucknow as Jeweler. He shifted to leather trade and finally started Cawnpore Tannery in 1896 (see Playne 1920).



Company at Jajmou, which later became the leather hub for tanneries. Wasi was engaged in the trade of raw hides since 1904 (UICC, 1939). Roy argues that the capital accumulated and business network established by Muslims of the city materialized in leather industry after the exit of Germans with the outbreak of First World War (Roy, 2014). However, the members of the *camār* community, who were extensively engaged in leather work since the time of East India Company, could not establish any enterprise on their own. The social capital enjoyed by Hindu upper castes and a section of the Muslims with their business relationships with Europeans offered opportunities in the leather enterprise in the city but this was not so in the case of *camārs* (Singh, 1998, p. 3).

3 Technological development and leather industry

By the third quarter of the nineteenth century, chemistry brought remarkable shift in industrial production in the west. The natural products were replaced by synthetic or chemical compounds, thus transforming various industrial processes. Tanning, one of the most significant processes in leather production, did not remain the exception as chrome tanning gradually substituted vegetable tanning. Professor F.L. Knapp, a German chemist in 1850s demonstrated the feasibility of substituting vegetable with mineral tanning. The application of Cr III in medical sciences for stabilizing the sutures and soaking it in glycerol, made it more pliable and softer. This was successfully applied for tanning skins and hides with Cr III in leather industry (Lampard, 2013). In 1877, Knapp produced chromate tanned leather but was not successful commercially. In 1880s, Christian Heinzerling patented a similar process in United States using a different combination of mineral input. Nevertheless, it was an American Augustus Shultz who patented 'two bath' chrome tanned process in 1884 on which chrome tanned industry began to flourish (Church, 1971). The chrome tanning process needed precision and scientific manipulation. The chrome tanning process is completed in relatively shorter period of time as compared to vegetable tanning thus lesser working capital is required. By 1900, three quarters of upper leather produced in USA was chrome tanned, however, by this time, Britain was gradually switching over to chrome tanning. H. R. Proctor, Head of the Leather Industries Department at the Yorkshire College attended Chicago exhibition in 1895, where he learnt about single bath chrome tanning process patented in America by Martin Dennis in 1892 (Church, 1971).

However, in India the provincial industries could not keep pace with the modern processes of chrome tanning although introduced in Madras by Alfred Chatterton,

Director of Technical and Industrial Inquiry, Madras Presidency. He made experiments with the assistance of an English expert to manufacture Indian chrome leather, and with their persistent effort, was successful in manufacturing Indian chrome leather. Chatterton moved ahead and set up the Government Chrome Tannery near Madras for manufacturing chrome-tanned leather to substitute imported leather from Europe and America (Chatterjee, 1908). The efforts of Chatterton reflect that India might have moved on the path of modernizing its industries, if proper technical and financial assistance was extended. Although Chatterton was pressing hard to modernize industry, the colonial government discontinued its efforts by closing Industries Department in 1910 to safeguard British commercial interests. It is interesting to note that British Chrome tanners in Kanpur upheld Madras Chamber's objection to the chrome tanning experiment of Chatterton (Tayabji, 1997). The influential relationships of British capitalists' class with the colonial government restrained the technology transfer at local level which impeded the diffusion of technology for industrial development.

Though the Kanpur leather industry organized leather manufacturing on modern lines by the second half of the nineteenth century for safeguarding military needs, yet it did not keep the pace and Madras moved ahead by adopting chrome tanning processes. Cooper Allen & Co. and the North West Tannery in Kanpur had introduced the footwear with the brand name 'flux' and this brand was quite popular throughout the country before the company adopted the new chrome leather. However, chrome leather was extensively used in the West in 1914–1918, but it was not until 1935, that a chrome-tanned boot was universally accepted in India (Cooper Allen & Co., 1943). Thus, by 1937 India was the largest supplier of chrome-tanned leather to the United Kingdom. The chrome leather (gold *muhar*) manufactured by Cooper Allen & Co. became popular in North Indian households (Cooper Allen & Co., 1943). The factory had a workshop, a laboratory and a highly specialized machine shop. These departments were equipped with modern plant and a full complement of machines for any kind of repair and maintenance. A laboratory was staffed with qualified chemists for carrying out investigation of routine work as well as for new applications. The factory imported plants and equipment from England together with chrome tanner to install the machines (Cooper Allen & Co., 1943). Evidently chrome tanned leather was used for boot and shoe upper whereas bark or vegetable tanned leather was used for sole leather, harness and the like. The chrome tanning was a new process not having any link with vegetable tanning. By the third decade of the last century, the tanning industry in western countries had completely switched to chrome



tanning, whereas, Indian leather industry was still using both the processes.

4 Leather industry and technical education

From 1870 onwards, schools for research and technology were established in Germany for imparting instruction in the application of science in leather industry. The first institution in Britain established for the purpose of furthering research in the manufacture of leather was 'Leather Industries Department' instituted at the Yorkshire College in Leeds in 1891 (Church, 1971). By this time, immigrant German tanners had built up considerable lead over the United States in this small but rapidly increasing branch of the trade. The American leather industrialist recognized the application of science in leather tanning. It was evident that chrome tanned leather had greater elasticity and resistance to water than vegetable tanned leather and its flexibility and light weight characteristics made it suitable for shoe upper and a few specific leather products. Robert Foederer, an American manufacturer stated 'our leather manufacturers must aim to be more than good mechanists; they must be practical and thorough chemists. The future of the leather industry is dependent entirely on skill and knowledge of chemical scientific principles' (Church, 1971).

In 1895, the Leather Seller Company in Britain organized a technical school for leather manufacturing at Harold Institute in Bermondsey and in 1909, the same company equipped and built the National Leather Seller College in London (Journal of Royal Society of Arts, 1910). In 1897, Professor Proctor Gordon Parker and Alfred Seymour Jones together formed the International Association of Leather Trades Chemists and published the journal *Collagium* dedicated to research on tannins. J.J. Fritch one of the pioneers of the chrome tanning industry in England and founder of Leeds Leather Industry Department stated to Professor Smithells 'the scientific method is invading the leather industry and will be increasingly important from now on' (Church, 1971). In England, the institute was predominantly staffed by chemists whereas, in Vienna, managers of leather industries joined the leather institute as faculty (Church, 1971).

Unlike the German Research Centre, the Yorkshire College lacked a model tanning plant and the annual report of 1909–1910 of the latter underscored the need for instruction in tanning based on experiment for strengthening the scientific and practical knowledge of the students. The difference in curricula of Leeds Department and Vienna Centre underlined greater practical orientation of latter where new inventions both domestic and foreign were examined and tested.

It is significant to note that in contrast with Germany and USA, British leather industry started recruiting chemists and undertook experiments in chrome tanning not before 1890s. Pointing to the late onset of chrome tanning in Britain as

compared to Germany; Church (1971) argues that in Britain, separation of tanning and finishing processes had a historical legacy, whereas, in Germany leather manufacturing firms were owned by tanning families with sound educational training. Thus the process of chrome tanning grew upon integrated enterprise. British light leather industry did not stand with American chrome tanning industry due to its relative backwardness of industrial chemistry rather than entrepreneurship.

Back in India, the optimal use of raw material and production of fine leather products necessitated the training of the labour. A.C. Chaterjee, while inquiring the industrial development of United Provinces in 1907, underscored the problem of this industry with regard to challenges faced by tanners and *mocīs* (shoe maker). On the tanning side, the village tanned leather was quite expensive owing to wasteful processes applied by the tanners whereas the shoe maker (*mocīs*) faced problems in dyeing the leather with artificial dyes. With the exception of sewing machine, all other tools were antiquated (Chaterjee, 1908, p. 99). Chaterjee suggested the government to start schools for tanning and leather working. While the former will impart instructions in new methods and technique of tanning, the latter will introduce new techniques of boot and shoe making, saddlery and harness with modern tools and appliances.

In 1915, institutions for industrial training in colonial India were classified as Technological Institute intended to instruct in the principles of science as applied to industrial art to produce masters and managers of industries and scientific advisers; technical or intermediate schools to impart some knowledge of scientific principles and machinery; and trade or craft schools intended to train artisans to follow their calling with dexterity and intelligence (Sharp, 1918).

While technical education had been institutionalized on a firm footing in the western world, the colonies were lacking in institutions of modern technical education, except for the engineering colleges administered by the Public Works Department for training civil engineers. Don Adams argues that the underdevelopment of technical education in Britain had its impact on educational institutions in India, many of which were imparting a literary education (Adams, 1970, p. 76). Any attempt to initiate technical education in the United Provinces was overlooked by various stakeholders' i.e. Public Works Department (hereafter PWD), European mill owners and railway workshops. On 15th February 1889, the senate of Allahabad University passed a resolution that the University should confer a degree to students who had passed a 3 year theoretical course at a properly constituted Engineering College or School.⁹ Nevertheless, the only

⁹ From A. Calvin, dated 8 September, 1890 Home Education A Proceedings December 1892 No. 50, Papers related to Technical Education in India (1886–1904) in Bhargava K.D. *Selections from Educational Records of the Government of India Vol. IV*, Delhi, GOI, p. 93.



college in the province for engineering education was Thomson Engineering College, Roorkee imparting instruction for recruits to the PWD. The proposal was sent to PWD, which was not prepared to hand over control of the college to the University and stated that the certificate conferred by the college is more alluring than confirming any degree from the University.¹⁰

The provincial government informed the Government of India that higher technical education was not needed in the province as the training imparted by railway workshops or the School of Forestry, Dehra Doon (Dehradun) or the surveying-instruction course imparted at the Patwari Schools were good enough to meet the needs of technical education in the province.¹¹ Subsequently, the provincial government undertook an inquiry to examine the need for higher technical education. It was pointed out that railway workshops, Thomson Engineering College, Roorkee and other workshops were imparting training up to the level of artisans and realized that the time had come for imparting instruction for higher classes in new mechanical industries which had been introduced by British entrepreneurs into their province. The reform of technical education required the development of courses for foremen and mechanics especially in connection with steam engine related technology, the railway workshops, iron foundry and in cotton spinning for mills established in the province. However, the employers of the mills stated that this required the establishment of Night Schools for elementary instruction in mechanics for artisans as employed in the railway and other workshops and there was no demand in province for native foremen mechanics.¹² The indifferent attitude of the European mill owners and disinterest of the provincial government did not embark on the development of technical education for industrial development.

In Madras Presidency, the Madras Industrial Conference (1908) proposed a leather trade school associated with a smack tannery. A leather expert was subsequently appointed who advised the government to start a tanning school on practical lines where tanning, currying and dressing were taught. Moreover, practical instruction stressed on the chemical analysis of every process involved in leather making. A Leather Trade School was accordingly started at Washermanpet. It was fully equipped with modern machinery and was run partly as a school and partly as a modern tannery. The school undertook research in the properties of various tanning stuff (Sharp, 1918).

Alfred Chatterton,¹³ as superintendent of leather department in Madras, established a chrome tanning department where instructions on leather work was also imparted. The chrome tanning department was initiated at a modest scale with the assistance of Rs. 2000 from Madras government to carry out experiment in chrome tanning. This department started production of chrome tanned leather goods and subsequently a boot and shoe department was added (Fifth Quinquennial Review, 1908). On the training side, practical rather than theoretical training was imparted, where in, the students had to work in the tannery through-out the day. The school attracted students from far flung places like Rangoon, Coorg and Gwalior. The Superintendent of Industries from the Gwalior state was sent by the king to study the working of the school. The school's prime objective was to popularize chrome tanning suited to Indian requirement and therefore there was no fixed educational qualification for admission (Fifth Quinquennial Review, 1908). Admitting the efforts of Chatterton, Chakrabarti pointed out that creative spirit of few colonial bureaucrats carved their way within general paternalism of colonial bureaucracy. Relative freedom enjoyed by top echelons pushed the state apparatus for workable reforms (Chakrabarti, 2004).

The first sincere effort for the industrial development and technical education in United Provinces owed to the organization of industrial conference at Nainital in 1907 by John Hewett, Lieutenant Governor of the province. While admitting the growth of modern industries in the province, the conference recommended that there should be a Technological Institute for the United Provinces, operating through its two branches, the Engineering branch being located at Roorkee and the chemical branch at Kanpur (RCHBTI, 1929). The conference also recommended the setting of industrial schools for various industries. With regard to leather industry, the conferences recommended that the government should start tanning demonstration schools to encourage the industry. The conference adopted a resolution that government should open a chrome tanning school for 'teaching boot and shoe making with improved tools being attached' (Rawat, 2012).

5 Technical education for leather industry

It was not until 1915 that the United Provinces' Government took any firm step in the setting up of any school for leather industry. The proposal to open a leather working school was discussed in a meeting held on 30th January 1915. The

¹⁰ Ibid, p. 94.

¹¹ Ibid, p. 95.

¹² Ibid, p. 105.

¹³ Alfred Chatterton (1866–1958) joined the Madras Education Service as a Professor at a College of Engineering, Madras. In 1908 Chatterton was made head of the Department of Industries.



Director of Industries proposed that the school will confine itself to the manufacture of boots, shoes and sundry articles excluding saddlery and harness, the latter being considered as separate trade (Industries Department, October 1915).¹⁴ Although the harness and saddlery industry was developed in Cawnpore, the government did not propose courses for the manufacture of these products.

The school was set up on an experimental basis on 4th January 1916 with five students. The instructions were primarily oriented towards manufacture of leather goods, thus the principal topic which were taught included Anatomy of the foot, Drawing, Last making, Improved method of measurement, Clicking and cutting with reference to the quality and value of different parts of hide, Fitting and closing, Bottoming, Finishing and Costing (Industries Department, 1915).¹⁵

The school stressed on practical work for instruction. The training imparted sought to cater to the general requirements of local and provincial trade and specially aimed to produce hand workmen. The school was soon popular as there was a huge demand for a skilled workforce for the leather industry. The number of students rose to 43 by 1917, out of these 43 students 16 were local and rest were from neighboring towns such as Saharanpur, Meerut, Aligarh, Mathura, Bareilly and Lucknow etc. (Industries Department File No. 180/1915). The students from United Provinces were provided free instruction whereas students outside the province had to pay Rs. 20 per month. The stigma associated with leather profession kept upper caste Hindus distant from the school as evident from the social class of the students enrolled in the school viz. Muslims–31, Leather working caste–3, Christians–8 and non-Brahmin–1 (Industries Department, 1915). Students belonging to wealthier classes were expected to start business of their own.

D.N. Rozdon, a Kashmiri Brahmin was appointed as the first Assistant Head Master of the school. He did not have any formal educational qualification but was a man of experience. As the manager of Rozdon Brothers of Amritsar, he was in the business of boots and shoes for eighteen years and had trained a number of technicians in this trade (Industries Department, August 1915).¹⁶ The school started with a post of Assistant Head Master acting as Head Master, three mistris and one clerk (Industries Department, October

1915).¹⁷ The state government was not interested in recruiting Rozdon for this post. The original scheme was to have a Head Master at an average salary of Rs. 400 to be recruited from England and an Assistant Head Master at an average salary of Rs. 150. The Director of Industries stated that he had been unable to obtain a suitable man in England and proposed that an Assistant Head Master should be appointed at a lower pay than that proposed for the Head Master. Rozdon was appointed as Assistant Head Master officiating as Head Master on a salary of Rs. 250 per month (Industries Department 180/1915). A managing committee was constituted to advise and assist the Head Master of the leather working school (Industries Department, April 1918).¹⁸

The school had undertaken a great deal of practical work and was fully equipped in the making of boots, shoes, holdalls, bed traps, belt, trunks, dak bags, and other miscellaneous articles which were generally supplied to government offices, and which also found a speedy sale among the general public which was taking a keen interest in the activity of the school. The government officials appreciated the work done by the students of the school. The sale of the goods produced by the school reached Rs. 163,629. The school also provided consultancy to leather goods manufacturers as and when required (Industries Department April 1918). However, the school did not impart instructions in tanning, as the local business community did not come forward to organize instructions in tanning on modern lines. It is worth mentioning that back in England the Leather seller's company in conjunction with the City of London County Council and the Borough Polytechnic Institute had a school for Leather Manufacture at Harold's Institute Bermondsey since 1895 (Journal of Royal Society of Arts, 1910).

6 Leather industry and higher technical education

The expansion of modern industries like cotton textile, leather, sugar, oil, paper and glass in United Provinces were stressing the need for the application of science in industrial production as well as training of workforce on scientific lines. There was a divergence of opinion among Indians and Europeans on the expansion of technical education for industrialization in the province. The proposal for a technological institute recommended in the Nainital Industrial Conference of 1907 was much debated among European

¹⁴ Mr. Pim to Rai Bishambhar Nath Bahadur in a council meeting of 5th October 1915 in File No. 180 of 1915, Industries Department, p. 4.

¹⁵ C.R. O'Malley, Esq. Officiating Director of Industries to Secretary to Government, United Provinces, No 7595/27–5, Cawnpore, (27.11.1917) in File No. 180/1915, Industries Department, p. 20.

¹⁶ From A.H. Silver, Director of Industries, United Provinces to Secretary to Government, United Provinces, No. 3883/27–5, 14th August 1915, Cawnpore.

¹⁷ Mr. Pim to Rai Bishambhar Nath Bahadur in the Council Meeting of 5th October 1915, p. 4 in File No. 180, Industries Department, United Provinces.

¹⁸ From Officer on Special Duty, Civil Secretariat, United Provinces to Director of Industries, United Provinces, No. 704/XVIII-180, dated 3rd April 1918, Industries Department, Allahabad, p. 26.



and Indian business community with regard to the specific industries for which courses would be initiated. The Indian members strongly supported the training in leather chemistry to improve the quality of Indian goods so that they could compete with imported goods (Industries Department File No. 415/211, 1911).¹⁹ Contrary to this, B.C. Burt, Deputy Director of Agriculture, was of the opinion that the Kanpur Institute should be a research institute in applied chemistry where facilities would be offered to students to study special branches of chemical technology and where lectures in courses would only be offered, if the demand arose. The views of Burt were in tune with European industrialists at Kanpur. In support of his views, he referred to the views of Upper India Chamber of Commerce (UICC, 1939, p. 15), which was strongly in favour of a research institute for technological research; pure and simple and for this purpose a staff of really competent, all-round commercial chemists was required. According to the representatives of the Woolen Mills Co., Kanpur, the prime areas for industrial research was the commercial use of the alkali deposit in the province and the study of leather chemistry.

The proposed scheme of Cawnpore Technological Institute framed in Nainital Industrial Conference of 1907, accepted leather with other industries like sugar, acid and alkali, dyeing and bleaching, printing, colouring for research and teaching on their chemical side. However, when the Secretary of State asked the local government to revise the scheme, it was specified that research in tanning material rather than leather chemistry for teaching should be included so that local industrialists could employ their own chemists (Indian Industrial Conference 18).²⁰ Subsequently, the Cawnpore Technological Institute which was started as a research institute in 1920 also incorporated teaching with research. It was decided on the recommendation of the representative committee that the institute would provide training for: (i) a research chemist in general applied chemistry; (ii) a technical chemist in oil extraction and refining; (iii) a technical leather chemist and (iv) a technical chemist for bleaching, dyeing and finishing textile (Richey, 1922).

The Institute was established in 1920 purely as a research institute with Dr. E.R. Watson as the research chemist to the Government of the United Provinces. In 1921, a teaching side was added to the institute with the opening of the General Applied Chemistry and Oil Technology section. Spencer Harcourt Butler, the Governor of United Provinces laid the foundation stone of the building on 21st November 1921.

In 1922, the Leather Section was added under the supervision of M.B. Hudlikar, which continued to admit students until 1931, when it was finally decided to discontinue this course on the recommendation of the Mackenzie Committee. The course imparted in the leather technology department included lectures on leather manufacture, principles of tanning and analytical chemistry as applied to the leather manufacturing industry, chemistry of tanning and other processes in the second and third year (Industries Department, November, 1924). During the period 1922–1928, nine students comprising seven upper caste Hindus and two Muslims had passed the course in leather chemistry. They either started their tanning industry or were recruited as leather chemist in various firms [Report of the committee on Harcourt Butler Technological Institute (RCHBTI, 1929)].

The teaching–learning activities of the institute laid thrust on individual training (as opposed to formal lecturing) and practical training in large scale plants simulating factory environment (RCHBTI, 1929). To further strengthen the practical training of the students, they were also sent to commercial factories in various parts of the country. Some difficulties were experienced in securing the training at the shop floor level in the United Provinces as the modernization of industries was not at par with the instruction imparted in the institute. On the one hand, it was possible through the personal influence of the Head of the Oil Department to arrange training in oil mills, on the other, it was much difficult for students to get access to leather and sugar factories (RCHBTI, 1929). The oil industry of the city was owned by Indians, whereas, prominent leather factories and most of the sugar factories were managed by Europeans. The factories were reluctant to accept the students for training as they did not want to reveal their trade secrets and students were just spectator inside the factories rather than engaged in any industrial operations. Moreover, many of the processes that the students were introduced to, were hardly found in any of the existing factories i.e., the processes taught in the general chemistry department.

Moreover, the committee appointed by United Provinces' Government to examine the progress of HBTI in 1932 recommended that until the financial position makes it possible to allocate additional budget to the Institute, the teaching and research was confined to three departments' viz. Sugar, Oil and General research department. The leather department was amalgamated with the general research department to form the leather section for which research work with reference to the needs of the native leather worker was to be carried out. Further, teaching was confined to the Sugar and Oil Departments, but the General research department imparted training in the methods of industrial research. Moreover, the staff of the General research department had to examine problems in leather technology along with sugar and oil technology (RCHBTI, 1932). The stigma

¹⁹ E. D. Elliott, 13 June 1914, File No. 415/211, 1911, Industries Department, United Provinces. p. 79.

²⁰ Minutes of Evidence taken before the Indian Industrial Commission 1916–1918. Vol. I Delhi, United Provinces, and Bihar and Orissa. London. pp. 202–205.



Table 1 Export of Indian hides

Country	1879–1884 (Percentage share)	1889–1894 (Percentage share)	1899–1904 (Percentage share)	1909–1914 (Percentage share)
United Kingdom	64	31.2	10.0	4.6
Italy	10.7	14.7	13.0	12.8
Austria	4.7	5.5	9.8	19.6
Germany		24.6	35.4	37

Source Report of the Hides Cess Inquiry Committee, p. 18

associated with leather industry kept the upper caste Hindus away from leather chemistry course whereas difficulty in providing practical training in local industries gave a reason to the review committee to discontinue this course from the institute.

Nevertheless, the Government Harness and Saddlery Factory, Kanpur like other ordnance factories in India had designed a training programme for the tanning trade. The tanning profession incorporates two processes viz. tanning and currying. The production of good leather demands a thorough training in either of the processes. However, considering the practices in India the tanner had to curry his leather on his own, thus it was noteworthy that a young man had sound knowledge of tanning and currying (RCHBTI, 1929). Lieutenant Colonel L.C. Larmour, Superintendent, Government Harness and Saddlery Factory Kanpur stated that the factory offered a 6 years course comprising 4 years tanning and 2 years currying. The course imparted sound understanding of chemistry of tanning through theoretical and practical experience. There were three important sections viz. leach house, lime yard and tanning pits proper for carrying out successful process of tanning. The prevalent practice in England and other western world was to attain specialization in either of these sections to become a professional tanner during his apprentice; however, in India an apprentice had to work through every section. The apprentice had to work alongside a workman, understand his labour and control labour. He was taught to select the green hides, carry out office routine, work out costs and select his material. He pointed out that the leather trade of the province was not excelling in the absence of practical training of tanners in the factories operating leather factories in the province (RCHBTI, 1929).

7 The fate of Kanpur leather industry

The India was a great supplier of raw hides and skins to England, continental Europe and USA since the later half of the nineteenth century. By the early decade of the last century, the trade shifted from England to continental Europe with the emergence of Hamburg as most direct channel for the trade of hides and skins. The Indian market was exporting 25

to 50% for hides as either dry salted or air dried and arsenicated collected from Northern India and exported through Calcutta Port. Germany had emerged as the largest market for Indian skins. The share of trade for different forms of skins was 6:4:1 with respective share of raw skins exported, tanned in the country and then exported and those tanned and finally consumed in the country (Report of the Hide Cess Inquiry Committee, 1930). Thus, by the third decade of the last century India remained a large market for raw hides and skins and was unable to harness the raw material with its full potential (Tables 1, 2).

The efficient use of raw material at the cottage level demanded the training of village artisans in the modern methods of currying and flaying. Further, there was notable decrease in the export of dressed hides and skins. This reflected that the local industry no longer had any share in the preliminary process of dressing the goods for export market.

Vatal in his inquiry of local industries in Kanpur, in 1924, observed that surplus hides from the city were exported to the countries like UK, Germany, Italy, Sweden and Norway (Vatal, 1924, p. iv). The leather goods manufactured in the city were not accepted by these countries as these were regarded as inferior and the countries had imposed a duty of 15 to 20% on leather goods, while hides were imported without such duty. Chrome tanning, which was established as more efficient process for tanning, was not used by the local industries except the Cooper Allen & Co. The Chrome leather manufactured by this firm became a brand and was popular as 'gold muhar' (Cooper Allen & Co., 1943). Due to the surplus supply of bark as tanning material for hides and skin, the most modern and up-to-date chrome tanning did not find favour with tanners (Cooper Allen & Co., 1943).

Table 2 Export of raw cow hides

Country	1926–1927	1927–1928	1928–1929
Germany	43.3	53.7	45.5
Italy	23.5	14.5	17.0
United Kingdom	4.6	9.2	4.21

Source Report of the Hides Cess Inquiry Committee (1930, p. 17)



Table 3 Enrolment in government leather institutes

Name of the Institute	Admission (1929–1932)		Pass (1929–1932)	
	Artisan	Non-artisan	Artisan	Non-artisan
Leather Working School Kanpur	13	106	6	61
Leather Working School Meerut (1921)	3	30	1	16
Tanning School, Fatehpur (1927)	7	5	7	3

Source Report of the Industries Reorganization Committee 1934, Allahabad

The organized industry was making huge profit by supplying military orders, while the village tanner had to struggle for the supply of raw hides and skins which were either exported or used by big industries. Moreover, local tanner incurred losses due to primitive processes in which large proportion of leather depleted in wasteful processes. Over liming, antiquated tools for finishing and removing the hair, inadequate attention given to bating, the actual tanning period was too short and the process was not properly graduated and very little attempt at currying were the major concerns (Vatal, 1924, p. iv).

The committee recommended that the provincial government should maintain institutions to assist local industries by undertaking research for industrial problems. The Committee had apprehensions with regard to fundamental research carried out in India. Three institutes in India namely Bengal Tanning Institute, Leather Tanning Institute, Madras and Harcourt Butler Technological Institute, Cawnpore were engaged in leather research. The committee felt that these institutes had inadequate staff and equipment for research. Evidently, Great Britain had four and Germany had three institutions where tanning and commercial research was done. The committee recommended that Cawnpore should undertake research in following areas: the preparation, cure and tanning (both bark and chrome) and finishing of air dried comparatively heavy stock and the manufacture (Report of the Hides Cess Inquiry Committee 1930).

The government felt that the existing system of training imparted by industrial schools was not conducive to the development of industries. The young men trained in these schools were not motivated for entrepreneurship. A committee appointed by provincial government to examine the development of industries in United Province in 1934 pointed out that provincial government had not provided adequate financial and human resources for the modernization of leather industry. Although government was promoting textile, glass and sugar industry by appointing expert for these industries but no expert was appointed for leather. Moreover, industries department was disproportionately spending money on leather working rather than leather manufacturing. The committee firmly stated that government had given very little support to leather processing because it is performed by most depressed and poor section of the society (Industrial Reorganization Committee, 1934) (Table 3).

The leather working schools were training very few artisans for local industries for instance a tanning school established in Fatehpur in 1927 had trained 35 students in 3 years (1932–1935), though, as already discussed, there was a dire need for training in the organized and unorganized sectors of the tanning industry. Moreover, mere technical training would not foster the spirit of entrepreneurship unless other economic factors like capital, infrastructure, tariff-policy are not addressed by the government. Rawat argues that the colonial government attempted to chamarrize leather industry by opening tanning schools in United Provinces, but failed to realize its objective. The officials had presumed that these schools should attract students from chamar caste but the enrolment figure in these schools reveal that artisan community were reluctant to attend these schools (Rawat, 2012).

The avenues opened to the skilled workforce were determined by the job opportunities available. The mill owners preferred apprentices trained at the workshops of Kanpur mills since their skills were valued over that of the students trained in technical institutions. It was observed that on the one hand, the students of the technical schools were too theoretical and too qualified to make good *mistries* and on the other, they possessed imperfect knowledge and were naive to be entrusted with the charge of machinery.

In contrast to this, the proponents of swadeshi viewed that technical education should be supplemented by sound general education. On the one hand, the effective programme of technical education would equip the student with practical and theoretical knowledge, on the other, general education would instill the spirit of initiative and enterprise (Habib, 2004). Hitherto, colonial models of technical education, the princely state of Baroda as early as 1890s had recognized the significance of training artisans for modern industries. This was evident from the enrolment of students from the artisan and cultivating classes in the Kala Bhawan (Raina & Habib, 2004).

In the British India, artisans were reluctant to attend technical schools opened by government due to inferior quality of instruction. The government did not provide up-to-date infrastructure and financial support to attract students from artisans' community. As the tanning profession is regarded as polluted occupation, the upper caste Hindu business community did not come forward to raise the demand to improve the quality of instruction in tanning. The artisans belonged



to the most oppressed section of the society; therefore, they did not come forward for technical education, nor the European business community took any interest in this regard. It is worth mentioning that, in England, Leather Sellers Company, since the last decade of the nineteenth century, were active in managing tanning institute for this profession, whereas, in Kanpur the European industrialist did not start any institution for Leather tanning in formal way.

8 Conclusion

The chequered history of technical education of leather industry in Kanpur underlined the close association of social perception and development of technical education. Aligning artisans' skills to the modern processes of tanning on the one hand, and promoting research in leather chemistry on the other, marked the needs of modern leather industry. As the tanning work was performed by most depressed classes of Hindu society, instructions in tanning processes neither found adequate attention by the provincial government nor by the local industrialists. Inadequate infrastructure and inferior quality of instructions kept the artisan class away from these schools. Moreover, government started leather working rather than tanning schools which was much needed to improvise the quality of finished leather. Difficulty in providing advanced practical instructions at the Technological Institute and slow pace of modernization of local leather industry was a major impediment in providing practical instruction to the graduates of Harcourt Butler Technological Institute. Moreover, the stigma with regard to leather industry and limited job opportunities did not popularize leather chemistry course among caste Hindus. The social linkages of local industrialist, Indian political class and leather working class shaped the technical education at different levels which further determined the advancement of local industry.

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