



Sir James Thomason: Pioneer of Engineering Education at Roorkee in India

Sam Nesamony, Professor,

Department of Arts and Humanities,SGT University, Delhi-NCR, India.

Abstract

India's extraordinary demographic profile creates a compelling necessity for higher education, particularly engineering or technical education. Though engineering as a subject of study has been a part of Indian education system, the ways in which specific attempts were made to emulate European model of technical [Engineering] education in India has become an ingredient part of utilitarian considerations. This technical and technological development during nineteenth century, coupled with industrialization for the progress of India, not only catered to the Indian elites, particularly, the affluent sections, but also facilitated the commoners to stem up at large. The visionary efforts and the seminal role made by the British in the making of an eminent public engineering system in India, at par with European ways, needs to be critically explained and historically explored. This paper argues, James Thomason, an alumnus of Imperial College, London, who was appointed Lieutenant Governor, North Western Province of India, not only proved himself to be a popular administrator, but also established the first Engineering College in India at Roorkee in 1847. Thomason, who was a prodigious and proficient engineer himself, brought constructive changes in the administrative system, envisaged, visualized and articulated on the need for engineering education in India. This institution, commenced as 'The Engineering School,' idealized and developed Civil Engineering ever since its inception, and metamorphosized over a period of time into a flourishing institution, offered more than a hundred courses to thousands of students. The sudden and untimely death of Thomason, made the colonial government to rename the institution into Thomason Engineering College in 1853, the oldest engineering college in India, and the 'charming' name withstood for a record almost hundred years before Jawaharlal Nehru rechristened it into the first engineering University at Roorkee in independent India in 1949, before the Government of India through an ordinance, renamed this institution of national importance and eminence into IIT Roorkee in 2001. The study suggests that higher education in India, particularly engineering, which was unavailable for the Indians became a historical reality through the unflinching and indefatigable efforts of Thomason, coupled with many engineering works, including Ganga canal and others, became an indelible mark in the history of engineering education in India.

Key words: James Thomason, engineering education, technical and technological education, higher education



INTRODUCTION

India is a vast country with immense sources of people, language, culture, and knowledge, attributed to various forms of education. Education has been viewed as a remedy for all the ills of the human society since times immemorial, and this powerful tool was wielded by socio-cultural and religious reformers, missionaries, colonialists in India to address the entrenched rigid social order exacerbated by the caste system and superstitious beliefs, over the centuries. Even though it has been presumed that colonial officials, including Warren Hastings and others, abused India by amassing copious wealth of India, there were colonial officers of the highest ranks, who withstood for the people of India and their betterment. Among many such officers, one was Sir James Thomason, the Lieutenant Governor of North-west Province during the colonial era.

India's extraordinary demographic profile creates a compelling and impending necessity for higher education, particularly engineering and technological education. Even though engineering and technology have been a part of Indian education system for long, the ways in which specific attempts were made to emulate European model of technical education in India has become an ingredient part of utilitarian considerations. Engineering education attracted a great deal of attention ever since it was idealized that technical education became imminently needed in our Indian society, which has been on the recurring need because of the industrial development of India.

Thomason, being a revenue administrator in Punjab, envisioned the idea of technical education in India, and wanted to initiate training for civil engineers, who were employed in the large workshops and public buildings that were erected for the Upper Ganga Canal. Consequently, technical education on the lines of the Imperial College, London, was the idea came out in the mind of Thomason, and he did not wait, but plunged into action on establishing the college at Roorkee. The engineering college, which was established as an Engineering School in 1847, rechristened into Thomason Engineering College in 1853, immediately after the untimely demise of Thomason, and continued as a premier engineering college as it was renamed into University of Roorkee in 1949, and finally into IIT Roorkee in 2001.

JAMES THOMASON: LIEUTENANT GOVERNOR OF NORTH WEST PROVINCE

James Thomason was born at Shelford, near Cambridge, England on 3rd May 1804. He was yet in his early childhood when his father, Reverend T. Thomason, relinquished his insular charge in England, and came over to India with his family in 1808. The next six years of James Thomason's childhood were passed with his parents in Calcutta. In 1814, at the age of ten he was



sent to England, and in 1821 he went to Haileybury College where he distinguished himself in studies and carried of many medals and laurels. In December 1822 he returned to India, and was appointed Assistant Registrar to the Sudder Government at Calcutta. In September 1832 he took over as Magistrate and Collector at Azamgarh, and in 1843 he was appointed Lieutenant Governor of North-Western Province whose headquarters were at Agra. In recognition of his commendable services, he was appointed Governor of Madras in 1853, but before he took this appointment he died on 21 September 1853 at Bareilly, where he was buried. The Madras Commission on Public Works noted in 1854: “At present, alas, all hope of the regeneration of Madras is buried in the grave of Mr. Thomason (Quoted in Mittal, 2008).”

James Thomason was one of the prominent colonial officers, who was considered to be a good, able, learned and hardworking Englishman who came to India. He was deeply religious in attitude, charitable in disposition and sympathetic to humanity, he possessed a keen sense of discernment and judgment. Thomason was appointed Governor of The North-Western Province and Oudh, a geographical area stretching from Ajmer to Gorakhpur, a province consisted of thirty-one districts, but there were only eight Anglo-vernacular schools (Rao, 2013). Thomason, however, carried on the experiment by establishing rural primary schools in Urdu and Hindi rather than the prestigious Persian (Quoted in Tariq Rehman, 2011).

Endowed with a taste for mathematics and an engineering eye, Thomason was propitious and prodigious ever since his childhood, for, if he had not become a governor, he might have been a great civil engineer. Thomason assumed a decidedly more authoritative role in all public works undertaken or propose than a nonprofessional person would ordinarily be inclined to take. His astute, quintessential and speedy attitude attracted a great deal of attention among his fellow officers that made him a representative infer, champion of traditions, and a great helmsman among many others because he was primarily responsible for its establishment. Moreover, from a cottage industry of drawing and survey instruments, Thomason’s penultimate efforts yields tremendous achievement of making the college into a centre of excellence in engineering education.

IDEA OF ENGINEERING EDUCATION IN INDIA

India is known for her engineering work through kings and their kingdoms for millenniums. The Tamil Chola king, Karikalan, constructed a big ‘anicut’ across the widely spread Kavery river in his kingdom during the first century CE, which is still considered to be a marvelous engineering work. King Rajendra constructed one of the most popular temples, Brahadeeswara in Thanjavur in eleventh century. Similarly, the Mughal emperor Shahjehan constructed Taj Mahal, that has become one of the world wonders. And many temples are examples of our architectural and



engineering work in the past. However, it is still mysterious and inexplicable the method and engineering technique they adopted and employed to construct these temples, buildings and dams.

During the mid-nineteenth century, the colonial officials needed a large number of civil engineers to carry out their plans in irrigation, construction of railways, roads, dams, and other important works (Cuddy, 1980). Probably, the broader issues influenced Thomason and his advisors was that the necessity for some systematic training for civil engineers in India, or at least in North India, who came to serve in India from England. Apparently, they were looking for those trained engineers with magnificent skills in handling some of the quintessential projects, which needed immediate attention as there was no constructive and charismatic official to kick-start and implement.

The idea that finally to shape as a college of civil engineering at Roorkee and started germinating in the mind of James Thomason soon after he took over in 1843 as Lieutenant Governor of the North-Western Province. In a dispatch to the Military Board dated 17 January 1845, it was stated that “the Lt-Governor has long been anxious to raise up a body of native civil engineers, who might materially aid the efforts of the officers-in-charge of canals in the operation of surveying and levelling, and laying out water-courses, as well as in the preparation of maps and plans, and formation of estimates” (Quoted in *Petition*, 1867).

THE ESTABLISHMENT OF THE COLLEGE

The idea of establishing an engineering college went into the mind of Thomason with much enthusiasm and introspection. Thomason realized that Col. P.T. Cautley’s proposal for the construction of the Ganga Canal became a reality, so ultimately in 1847, even though there were stiff oppositions, he completely relied on the then Governor General Lord Hardinge to authorize the vigorous prosecution of the project as it was considered that the Engineering School will be of great help for the construction of Canal, where copious amount of civil engineers were needed for the completion of the work. Furthermore, the Saharanpur School, which was functioning at that time was too modest for the ever expanding and developing ideas of Thomason on the subject. It was however pointed out that since the objective of the college was to train public servants for a particular department of the government it was not fair to charge it on the general education fund.

In 1847 the site for an Engineering College was selected near a village situated about thirty kilometers of West-South-West of the ancient holy city of Hardwar (whose fame goes back from history into mythology) because a challenging feat of engineering was being accomplished there



in the shape of an aqueduct carrying a Canal over a river. The site for the College was chosen with remarkable judgment. An estate of about 142 hectares of fertile land lying to the east of the Ganga Canal and gently sloping towards the Solani River in the north was acquired. The emphasis throughout Thomason's dispatches between 1845 and 1847 was to raise a body of civil engineers from among the Indians, but the shape of the college that emerged from the prospectus was somewhat different though more comprehensive.

Thomason proved to be a constructive and charismatic officer when he selected and appointed a reliable and responsible Lt. R. Maclagen to be the first Principal on 19 October 1847, with orders to assume charge at Roorkee without delay. On 25th November the College Prospectus was issued through a notification of the N.W.P government, and the College started functioning on 1st January 1848. Three departments were opened initially, and the first Department was to train candidates for appointment to the newly established cadre of sub-assistant civil engineers, and was open to both Indians and Europeans. The duration of the course was two years. The Second Department was open only to European non-commissioned officers and soldiers, and trained them for the lower job of overseers for the department of public works. The Third Department was exclusively meant for Indians and provided instruction in surveying, leveling and drawing through Urdu medium for one year. Two types of students were stipulated in all the three departments, stipendiary and non-stipendiary. The amount of stipend per month per student in the First Department was rupees forty. In the Third Department the value of the stipend was rupees five, but after 1850, eight stipends where of rupees ten and the rest of rupees five. In the Second Department the students were to get their regimental pay and other advantages as with their crops or equivalent money.

THOMASON AND THE ROORKEE COLLEGE

The Engineering College, Roorkee, started as a pioneering school of engineering in the middle of the nineteenth century when, in Europe and America, no less than India, study of classics dominated the centres of learning, and engineering was considered nothing more than a trade practiced by artisans and beneath the dignity of the portals of a university. While Thomason was only the advocate and helper of the Ganga Canal, he was the originator of the engineering college at Roorkee. From the very inception of the college, Thomason was deeply impressed with the necessity for providing, for multitude of public works throughout the country, a staff of native engineer, possessing both professional knowledge and experience (Mittal, 2008). He dwelt at length on the requirements of the country-surveys, irrigation, application of waterpower, navigation, roads, bridges, railways-objects for all of which it was impossible to provide European engineering skill. With no tradition of civil engineering education in England, the



establishment of a school of civil engineering in India by Englishman in 1847 appears rather daring and challenging.

It is clear from records at the purpose of such a project was not a one-way flow of knowledge from English engineers to Indian youths. The English were the new to the job of constructing and maintaining irrigation works on the scale they were needed in India. To quote from the despatch again, “there are now entertained on this Canal establishment many ‘lallas’ in the charge of several works, both on the main channel and the lesser branches, who receive a small salary, partly from the government and partly from the zamindars, whose water-courses they make or keep in repair. Many of these men are very active and intelligent, but deficient in education and scientific knowledge, conscious of their defects, and desirous to remove them by application and study.”

The language obstacle was sought to be overcome with emphasis on both English and Hindustani as the ultimate aim was not the transfer of knowledge but exchange of knowledge. When the Governor General of India, William Bentinck, who supported the supremacy of English medium education throughout India, Thomason was in favour of establishing vernacular language schools supporting rural villagers of Punjab (Zahoor, 2018). The reforming Thomason shared that vernacular education was needed as a priority for the newly formed North West Province as he understood that the schools established by Macaulay were filled with boys ‘from a lower rank.’ As a result, minor English schools were abolished and instruction in English was confined only to the colleges (Allender, 2006). After abolishing the Anglo-vernacular schools, Thomason formulated, in 1843, a new scheme of vernacular education for the poor called the ‘halkabandi.’ As an effective means of controlling the rural poor, the power to appoint the school master was handed over to the local zamindar, and the responsibility of the government was limited to ensuring the headmasters. The standard of education in these government schools in the North West Frontier Province was so low that the boys who studied in these schools could not enter the government high schools, and it was concluded that the standards of these schools were lower than those of the pre-colonial pathshalas (Rao, 2013).

TEACHERS, STUDENTS AND CURRICULUM

During the early years of the college, the Engineering College, designed the curriculum and syllabus to offer theoretical and practical instruction in civil engineering with a view to train personal for employment in the public works of the country. Considering that till then the concept of an institution aiming to train persons to qualify for the profession of engineering was totally new and not fully appreciated even in England, and establishment of such an institution in



India was a farsighted and pioneering act. Even the students admitted in the college also were privileged citizens.

The Engineering College had recruited and appointed some of the excellent faculty in its role in teaching positions. In addition to the Principal, there were four more teachers appointed initially, and designated as Headmaster, Professor and Instructor of Drawing, Head Native Master and Assistant Native Master. Against the last two post were appointed Mannu Lal, a product of the Saharanpur School, and Behari Lal. The senior administrative and teaching positions in the College were held by Royal Engineers for over seventy years, while in its turn the College admitted candidates from the Army to its engineer and overseer classes and ran survey and signaling courses design especially for army men.

Unsurprisingly, during the early days of the college, the students were taught both in English and vernacular languages as it was at Delhi College and Agra Medical College, where the same kind of pedagogical system was used (Petition to the Viceroy, Quoted in Hassaan, 1959). Roorkee Engineering College and its successor, the University of Roorkee, have been quintessentially proved to be ‘torch-bearers’ like very few institutes, which designed new perspectives and new paradigms in the higher education arena during the nineteenth century apparently. The educational establishment of the Engineering College, including teachers and students, admissions and examination, lecture rooms and laboratories, hostels and playgrounds were well-prepared and planned as per the Imperial College, London, for, Thomason always wanted to prove his new institution in the model of his *alma mater*.

Since its inception, the college offered financial support and scholarship to those students who excelled in their academics, and also the scholars who were found to be deserving for the financial aid. All stipendiary students were completely supported financially by the government, and no tuition fee was charged. They were even paid travelling allowance for coming to Roorkee. For instance, the renowned civil engineer and philanthropist Sir Ganga Ram was one among the very few students who not only secured admission at Thomason College but also received a scholarship of rupees fifty per annum during early 1870s. Having earned his engineering degree with top scores, he became an apprentice in the office of Rai Bahadur Kanhaya Lal, the then chief engineer of Lahore, and went on to become one of the top civil engineers and shaped the architecture in the city through his work, and even earned the name ‘father of modern Lahore’ (Iqbal, 2022).



CONCLUSION

The social history of engineering education in India during the modern era has been a transition from the primitive towards modernity. Affecting the rigid social order of the society, the impacts of education started breaking up the old concept of society and introduced new factors of social change. The Anglo-vernacular education, introduced by the missionaries, through its developmental ideas overthrew the social and economic monopoly of dominant sections of the society making public spheres for Indians. As Barnita Bagchi and others argue, the history of education in the modern world is a history of transnational and cross-cultural influence (Bagchi et al., 2014) and Sabyasachi Bhattacharya suggests, the intellectual history of the encounter between two civilizations in colonial India – Western and non-Western, which offers a transnational approach (Bhattacharya, 2014). In this journey, the institutions of higher learning, which inculcate creativity, dichotomize pedagogy and committed teaching, are considered to be indicators of social change, transition and transformation, and entire development of the country. The establishment of modern schools, colleges and other institutions, permeated and perpetuated with a new transnational culture within education emerged, not only provided a medium for the acquisition of knowledge, but became a new object of pedagogical attention.

Contrary to the idea that only cosmopolitan cities in India make good institute and excellent academic environment, the then little town of Roorkee emerged almost a haven for Indian engineers. The engineering college became the first of its kind in Asia and one of the first in the world situated at the end of the first thirty kilometers of the Ganga Canal, which a century ago was a marvel of engineering with its aqueduct level crossing and super passage. In India there are many institutes of comparable standards but few of comparable history, many which turn out large numbers of young engineers and scientists, but few which leave such an abiding sentiment for itself in their hearts. Tim Allander, who worked extensively on education in Punjab and North west Province argues, during the mid-nineteenth century, the Governor General and his office in Calcutta vehemently refused for any other Engineering institution as they always preferred the graduates of Thomason's college, Roorkee. Even though Railway Technical Schools were established in North India, Thomason College was always given the priority (Allender, 2006).

Colonial Engineering education, which had its roots in European education, had to be into secular education, for the colonialists wanted more participation of young and intelligent boys from the elite and upper classes. The colonialists, with their vibrant attitude of democratization of education in India undertook the opening of the Engineering College, Roorkee to be an institution to a higher order and made it available to both British and Indian citizens. The large-scale participation of upper caste students in the institution further offered a green signal to Indian students to scale up on the ladder of success.



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