

UNIT – V

LITERATES AND SCIENTIST

BANKIM CHANDRA CHATTERJEE

Bankim Chandra Chatterjee was a great novelist and poet, who gave India its national song **Vande Mataram**, personifying India as a mother Goddess to inspire the activists during the Indian **Independence** Movement. He wrote more than twelve novels, essays and commentaries in Bengali which were widely translated into other regional languages of India as well as in English

About Bankim Chandra Chatterjee

Bankim Chandra Chatterjee also known as the " *Bankim Chandra Chattopadhyay* " who was one of the greatest novelists and poets of India. He is famous as author of Vande Mataram which are the national song of India.

Bankim Chandra Chattopadhyay was a voracious reader and was especially interested in Sanskrit literature. He got admission in the Presidency College in Calcutta in 1856. After completing his education, he joined government service and retired in 1891.

Birth

Bankim Chandra Chattopadhyay was born on 27 June 1838 in the village Kantalpara of the 24 Paraganas District of Bengal. **Bankim Chandra Chatterjee** belonged to a family of Brahmins. The word '**Bankim Chandra**' in Bengali means 'the moon on the second day of the bright fortnight'. Bankim Chandra's father Yadav Chandra Chattopadhyaya was in government service. After his birth he was posted to Midnapur as Deputy Collector.

Early Life and Education

Bankim Chandra Chattopadhyay or **Bankim Chandra Chatterjee** was born on 27 June 1838 in the village Kanthalpara in the town of North 24 Parganas, Near Naihati, in an orthodox Bengali Brahmin family, the youngest of three brothers, to Yadav Chandra Chattopadhyaya and Durgadebi. His father, a government official, went on to become the Deputy Collector of Midnapur. One of his brothers, Sanjib Chandra Chattopadhyay was also a novelist and his known for his famous book "Palamau".

Bankim Chandra Chattopadhyay was educated at the Hooghly Mohsin College and later at the Presidency College, graduating with a degree in Arts [Law] in 1858. He was one of the first two graduates of the University of Calcutta namely he and Jadunath Bose. He later obtained a degree in Law as well, in 1869.

Bankim Chandra Chattopadhyay was appointed as Deputy Collector, just like his father, of Jessore, Chattopadhyay went on to become a Deputy Magistrate, retiring from government service in 1891. His years at work were peppered with incidents that brought him into conflict with the ruling British. However, he was made a Companion, Order of the Indian Empire in 1894.

Bankim Chandra Chatterjee Marriage

Bankim Chandra Chatterjee was married when he was only eleven . At that time his wife was only five years old. *Bankim Chandra Chattopadhyay* was only twenty two when his wife died. After some time he married again. His second wife was Rajlakshmi Devi. They had three daughters but no son.

Novelistic career

Bankim Chandra Chatterjee firstly started to publish his Novel in a newspaper and sell it weekly and later he started to write his own novels and publish it. He began his career as a writer.

As a writer, he had a great talent in him. Because of his talented writings, he can get an award for his attempts for the novel. *Bankim Chandra Chattopadhyay* started to write his Novel in the Bengali language.

Bankim Chandra Chatterjee would get a prize for his first novel. But the Bengali novel never got published and he did not get any prize. He also wrote a novel in the English language.

Bankim Chandra Chattopadhyay tried to write many novels in English but his literacy in English was very poor so he decided to move his novel writing to Bengali only. **Bankim Chandra Chatterjee** first Bengali novel was published in 1865.

He mostly right romantic novels but sometimes try some of the historical novels. In the year 1872, *Bankim Chandra Chattopadhyay* started to publish his magazine daily his most of the Bengali novels got a great response.

Many of his novels started to get a great response such as Sitaram, Krishna Charitra, Lok rahasya and many more.

His Literally Works

Bankim Chandra Chatterjee had founded a journal called 'Vangadarshan'. 'Anandamath' appeared in installments in this monthly journal. In 1882 it appeared in book form. Soon the copies were sold out and the book was reprinted. During Bankim Chandra's lifetime alone, in ten years 'Anandamatha'

was reprinted five times. Readers found reading a **Bankim Chandra Chatterjee** novel an altogether new kind of experience. The people of Bengal were fascinated by his novels. When the novels were translated into other Indian languages they delighted the new readers too. *Bankim Chandra Chattopadhyay* is regarded as one of Bengal's treasures; this was because of his novels. **Bankim Chandra** had given thought to the question of a writer's style. A novelist tells a story. How should he write? His language must be the language of the people – language they can understand; he must write as they speak, thought Bankim Chandra. He wrote in that manner. Though his language was close to the spoken form of his day, it was attractive. The Bengali language acquired a new dignity because of his writings.

While at Khulna, **Bankim Chandra Chatterjee** began a serial story named "Rajmohan's Wife" in the Indian Field newspaper, then edited by Kishory Chand Mitra. This was his first public literary effort.

Bankim Chandra Chatterjee was a great writer with a difference ahead of time. His writings were adorned with beautiful original Bengali language heavily influenced with Sanskrit stanza. Before Great [Rabindra Nath Tagore](#) He modernized Bengali language for future generation. He established Bengali language as a major language in India after English. He transformed Bengali language into rich Lyrical form which was inherited from ancient Sanskrit language through his writings. *Bankim Chandra Chattopadhyay* was a superb story-teller, and a master of romance. No Bengali writer before or since has enjoyed such spontaneous and universal popularity as Chatterjee. His novels have been translated in almost all the major languages of India.

He wrote 14 (Fourteen) Bengali Novels and one English novel which are given below serially with Writing Years:

- 1) Durgeshanandhini (1862 – 1864)
- 2) Kapalkundala (1866)

- 3) Mrinalini (1869)
- 4) Vishavriksha (1873)
- 5) Indira (1873)
- 6) Yugalanguriya (1874)
- 7) Chandrashekar (1875)
- 8) Radharani (1877- 1881)
- 9) Rajani (1877)
- 10) Krishna kanter Will (1878)
- 11) Rajsingha (1893)
- 12) Anandamatha (1882)
- 13) Devi Chowdhurani (1884)
- 14) Sitaram (1894)
- 15) Rajmohan`s Wife (Only English Novel : 1864)

Stories of Bankim Chandra Chatterjee

that were made into films

We most lovingly remember **Bankim Chandra Chatterjee** as the teller of great tales. An extremely popular writer, he redefined the trend of literature of his time. Many of his stories have been made into plays and films. Even today one-and-a-half-century later, his stories appeal to us. His heroines and heroes are so impactful that they kind of evolve us.

Here are the stories of *Bankim Chandra Chattopadhyay* that have been made into films. Here is Follows –

- 1.) Kapalkundala
- 2.) Durgesh Nandini
- 3.) Anandamath
- 4.) Rajani

5.) Krishnakanter Will

6.) Devi Chaudhurani

Major Works of

Bankim Chandra Chatterjee

Although **Bankim Chandra Chatterjee** is known for all of his novels and essays but he is known for 'Anandamath (The Abbey of Bliss) the most as it was from this novel that Rabindranath Tagore took the song 'Vande Mataram' and converted into the national song of India.

Quotes by

Bankim Chandra Chatterjee

Here is some quotes which are saying by *Bankim Chandra Chattopadhyay* –

“Mother,’Said the Mahatama, ‘this is the temple, the mosque, the vihara and the girdwara of Mother India. Cast aside all fear from your heart.”

“In our work we do not differerntiate between Hindu or Muslim, Nuddhist or Sikh, Parsee or Pariah. We are all brothers here – all children of the same Mother India”

Interesting Facts About

Bankim Chandra Chatterjee

There are various Interstting Facts About *Bankim Chandra Chattopadhyay*. Here is Follws –

1. **Bankim Chandra Chatterjee** was extraordinarily intelligent since childhood.
2. He was married at the age of 11!
3. *Bankim Chandra Chattopadhyay* was among the first few graduates of University of Kolkata.

4. He served British Government in the same position as his father.
5. **Bankim Chandra Chatterjee** first published novel was a big flop.
6. Despite being a servant in the British Government, he hated the British.
7. *Bankim Chandra Chattopadhyay* got his first ever popularity at the age of 27.
8. For the first few years, he was mainly a writer of romance.
9. His work was much appreciated by the critics, too.
10. **Bankim Chandra Chatterjee** owned the art of creating outstanding humorous sketches, too.
11. His inspirations were as glorious as his work.
12. Even with all that fame, he lived the life of a commoner.

Death

Bankim Chandra Chatterjee passed away on 8th April 1894.

Conclusion

Bankim Chatterjee was superb story-teller, and a master of romance. No Bengali writer before or since has enjoyed such spontaneous and universal popularity as Chatterjee. His novels have been translated in almost all the major languages of India. He passed away on April 8, 1894.

RABINDRANATH TAGORE

Rabindranath Tagore Jayanti 2020: He was a great scholar, novelist, essayist, song composer and playwright. Rabindranath Tagore Jayanti marks the birthday of famous writer Rabindranath Tagore. He was born on 7 May, 1861. Let us read more about Rabindranath Tagore, his early life, childhood days, works, family, awards and achievements.

Rabindranath Tagore Jayanti 2020: The birth anniversary of Rabindranath Tagore is observed on 7 May according to the Gregorian calendar but according to the Bengali calendar, he was born on the 25th day of Boishakh month. So, in West Bengal, his birthday as per the Bengali calendar is celebrated either on 8 May or 9 May. Rabindranath Tagore birth anniversary is also known as Pochishe Boishakh. He was born in a rich Brahmin family in Kolkata (Calcutta) and was the youngest sibling in his family.

Let us tell you that Rabindranath Tagore was a multi-talented personality with a great desire to learn new things. His contributions to the literature, music and his several works are unforgettable. People not only in West Bengal but also in whole India remember him and his contributions on his birth anniversary. Even in 1913, he was awarded the most prestigious Nobel Prize for his great contribution to the Indian literature. Do you know that he was the first person from Asia to receive this award? We can't forget that he is the person who had composed the National Anthem of India.

Rabindranath Tagore: Early life and Childhood Days

He was born on 7 May, 1861 to Debendranath Tagore and Sarada Devi in the Jorasanko mansion which is the ancestral home of the Tagore family in Kolkata (Calcutta). Among his siblings, he was the youngest. He lost his mother when he was very young, his father was a traveller and so, he was mostly raised by his servants and maids. At a very young age, he was the part of the Bengal renaissance and his family also took active participation in it. At the age of 8, he started writing poems and by the age of sixteen, he also started composing artworks and started publishing his poems under the pseudonym Bhanusimha. In 1877 he wrote short story 'Bhikharini' and in 1882 the collection of poems 'Sandhya Sangit'.

He was influenced by the classical poetry of Kalidasa and started writing his own classical poems. His sister Swarnakumari was a well-known novelist. In 1873, he toured with his father for several months and gained

knowledge on several subjects. He learned Sikhism when he stayed at Amritsar and pen down around six poems and many articles on the religion.

Education

His traditional education began in Brighton, East Sussex, England, at a public school. In 1878, he went to England to become a barrister to fulfil his father's wish. He was not much interested in school learning and later also he joined University College in London to learn law but he dropped this and learned various works of Shakespeare on his own. He also learned the essence of English, Irish and Scottish literature and music; he returned to India and married Mrinalini Devi.

Rabindranath Tagore: Established Shantiniketan

His father bought a huge land for meditation and named it as Shantiniketan. Debendranath Tagore founded an 'Ashram' in 1863. In 1901, Rabindranath Tagore established an open-air school. It was a prayer hall with marble flooring and was named as 'The Mandir'. It was also named 'Patha Bhavana' and started with only five students. Classes here were held under trees and followed the traditional Guru-Shishya method of teaching. This trend of teaching revived the ancient method of teaching which proved beneficial when compared with the modernised method. Unfortunately, his wife and two children died and he left alone. At that time he was very disturbed. At the meantime, his works started growing and became more popular amongst the Bengali as well as foreign readers. In 1913, he gained recognition and was awarded the prestigious Nobel Prize in Literature and became Asia's first Nobel Laureate. Now, Shantiniketan is a famous University town in West Bengal.

Let us tell you that Rabindranath Tagore envisioned a centre of learning which would have the best of both the east and the west. He established the Visva Bharati University in West Bengal. It consists of two campuses one at Shantiniketan and the other at Sriniketan. Sriniketan focuses on agriculture, adult education, village, cottage industries and handicrafts.

Rabindranath Tagore: Literary Works

Japajog: Published in 1929, His novel is a compelling take on marital rape.

Nastanirh: Published in 1901. This novel is about relationships and love, both requited and unrequited.

Ghare Baire: Published in 1916. It is a story about a married woman constricted in her household trying to find her own identity.

Gora: In the 1880s, it is an expansive, exhaustive and extremely relevant novel which deals with several themes like religion, gender, feminism and also tradition against modernity.

Chokher Bali: In 1903, a novel which consists of various facets of relationships. His short stories are *Bhikarini*, *Kabuliwala*, *Kshudita Pashan*, *Atottju*, *Haimanti* and *Musalmanir Golpo* etc.

Poems are *Balaka*, *Purobi*, *Sonar Tori* and *Gitanjali*.

No doubt he has changed the dimensions of Bengali literature as it was earlier viewed. Many countries have even erected their statues to pay tribute to the legendary writer. Around five museums are dedicated to Tagore out of which three are situated in India and remaining two in Bangladesh.

He spent his last years in severe pain and even in 1937, he went into a comatose condition. After a lot of suffering, he died on 7 August, 1941 in the Jorasanko mansion where he was brought up.

SUBRAMANIA BHARATI

Subramania Bharathi (11 December 1882 – 11 September 1921), was a [Tamil](#) writer, poet, journalist, [Indian independence activist](#), social reformer and [polyglot](#). Popularly known as "Mahakavi Bharathi" ("Great Poet Bharathi"), he was a pioneer of modern Tamil poetry and is considered one of the greatest Tamil literary figures of all time. His numerous works included fiery songs kindling patriotism during the [Indian Independence movement](#).^{[1][2]} He

fought for the [emancipation of women](#), against [child marriage](#), stood for reforming [Brahminism](#) and religion. He was also in solidarity with [Dalits](#) and [Muslims](#).^{[3][4]}

Born in [Ettayapuram](#) of [Tirunelveli district](#) (present day [Thoothukudi](#)) in 1882, Bharathi had his early education in [Tirunelveli](#) and [Varanasi](#) and worked as a journalist with many newspapers, including [The Hindu](#), Bala Bharata, Vijaya, Chakravarthini, the *Swadesamitran* and *India*. In 1908, an arrest warrant was issued against Bharati by the government of [British India](#) lived until 1918.^[5]

Bharathi's influence on Tamil literature is phenomenal. Although it is said that he was proficient in around 14, including 3 non-Indian foreign languages. His favorite language was Tamil. He was prolific in his output. He covered political, social and spiritual themes. The songs and poems composed by Bharati are very often used in [Tamil cinema](#) and have become staples in the literary and musical repertoire of Tamil artistes throughout the world. He paved the way for modern blank verse. He wrote many books and poems on how Tamil is beautiful in nature.

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Biography

Bharati was born on 11 December 1882 in the village of [Ettayapuram](#), to Chinnaswami Subramania [Iyer](#) and Lakshmi Ammal. Subbaiah, as he was named, went to the M.D.T. Hindu College in [Tirunelveli](#). From a very young age, he was musically and poetically inclined. Bharati lost his mother at the age of five and was brought up by his father who wanted him to learn English, excel in

arithmetic, and become an engineer.^{[6][7]} A proficient linguist, he was well-versed in Sanskrit, Hindi, Telugu, English, French and had a smattering of Arabic. Around the age of 11, he was conferred the title of "Bharati", the one blessed by [Saraswati](#), the goddess of learning. He lost his father at the age of sixteen, but before that when he was 10, he married Chellamma who was seven years old.

During his stay in [Varanasi](#), Bharati was exposed to [Hindu spirituality](#) and nationalism. This broadened his outlook and he learned Sanskrit, Hindi and English. In addition, he changed his outward appearance. He also grew a beard and wore a turban due to his admiration of Sikhs, influenced by his Sikh friend. Though he passed an entrance exam for a job, he returned to Ettayapuram during 1901 and started as the court poet of Raja of Ettayapuram for a couple of years. He was a Tamil teacher from August to November 1904 in Sethupathy High School in Madurai.^[7] During this period, Bharati understood the need to be well-informed of the world outside and took interest in the world of journalism and the print media of the West. Bharati joined as Assistant Editor of the [Swadesamitran](#), a Tamil daily in 1904. In December 1905, he attended the All India Congress session held in Benaras. On his journey back home, he met [Sister Nivedita](#), Swami [Vivekananda](#)'s spiritual heir. She inspired Bharati to recognise the privileges of women and the emancipation of women exercised Bharati's mind. He visualised the new woman as an emanation of Shakti, a willing helpmate of man to build a new earth through co-operative endeavour. Among other greats such as Bal Gangadhar Tilak, he considered Nivedita as his [Guru](#), and penned verses in her praise. He attended the Indian National Congress session in Calcutta under Dadabhai Naoroji, which demanded [Swaraj](#) and boycott of British goods.^[7]

By April 1906, he started editing the Tamil weekly *India* and the English newspaper *Bala Bharatham* with [M.P.T. Acharya](#). These newspapers were also a means of expressing Bharati's creativity, which began to peak during this period. Bharati started to publish his poems regularly in these editions. From

hymns to nationalistic writings, from contemplations on the relationship between God and Man to songs on the [Russian](#) and [French](#) revolutions, Bharati's subjects were diverse.^[6]

Bharati participated in the historic Surat Congress in 1907 along with [V.O. Chidambaram Pillai](#) and Mandayam Srinivachariar, which deepened the divisions within the [Indian National Congress](#) with a section preferring armed resistance, primarily led by [Tilak](#) over moderate approach preferred by certain other sections. Bharati supported Tilak with [V. O. Chidambaram Pillai](#) and Kanchi Varathachariyar. Tilak openly supported armed resistance against the British.^[7]

Cover page of the 1909 magazine *Vijaya*, published first from [Madras](#) and then from [Pondicherry](#). The cover showing "Mother India" ([Bharat Mata](#)) with her diverse progeny and the rallying cry "[Vande Mataram](#)".

In 1908, the British instituted a case against V.O. Chidambaram Pillai. In the same year, the proprietor of the journal *India* was arrested in [Madras](#). Faced with the prospect of arrest, Bharati escaped to [Pondicherry](#), which was under French rule.^[8] From there he edited and published the weekly journal *India*, *Vijaya*, a Tamil daily, *Bala Bharatham*, an English monthly, and *Suryodayam*, a local weekly in Pondicherry. The British tried to suppress Bharati's output by stopping remittances and letters to the papers. Both *India* and *Vijaya* were banned in India in 1909.^[7]

During his exile, Bharati had the opportunity to meet many other leaders of the revolutionary wing of the Independence movement like [Aurobindo](#), [Lajpat Rai](#) and V.V.S. Aiyar, who had also sought asylum under the French. Bharati assisted Aurobindo in the [Arya](#) journal and later *Karma Yogi* in Pondicherry.^[6] This was also the period when he started learning Vedic literature. Three of his greatest works namely, *Kuyil Pattu*, *Panchali Spatham* and *Kannan Pattu* were composed during 1912. He also translated Vedic hymns, Patanjali's *Yoga Sutra* and [Bhagavat Gita](#) to Tamil.^[7] Bharati entered India near [Cuddalore](#) in November 1918 and was promptly arrested.

He was imprisoned in the Central prison in Cuddalore in custody for three weeks from 20 November to 14 December and was released after the intervention of [Annie Besant](#) and [C.P. Ramaswamy Aiyar](#). He was stricken by poverty during this period, resulting in his ill health. The following year, 1919, Bharati met [Mohandas Karamchand Gandhi](#). He resumed editing *Swadesimeitran* from 1920 in [Madras](#) (modern day [Chennai](#)).^[9]

Death

He was badly affected by the imprisonments and by 1920, when a General Amnesty Order finally removed restrictions on his movements, Bharati was already struggling. He was struck by an elephant named Lavanya at [Parthasarathy temple, Triplicane, Chennai](#), whom he used to feed regularly. When he fed a spoilt coconut to Lavanya (the elephant), the elephant got fired up and attacked Bharati. Although he survived the incident, his health deteriorated a few months later and he died early morning on 11 September 1921 at around 1 am. Though Bharati was considered a people's poet, a great nationalist, outstanding freedom fighter and social visionary, it was recorded that there were only 14 people to attend his funeral. He delivered his last speech at Karungalpalayam Library in Erode, which was about the topic *Man is Immortal*.^[10] The last years of his life were spent in a house in [Triplicane, Chennai](#). The house was bought and renovated by the [Government of Tamil Nadu](#) in 1993 and named Bharati Illam (Home of Bharati).^[citation needed]

Works

He who forgets not God and fails not in his duty, no matter whatever befalls him and however much he suffers, will at the end attain honour and happiness.^[11]

Bharati is considered as one of the pioneers of modern Tamil literature.^[12] Bharati used simple words and rhythms, unlike his previous century works in Tamil, which had complex vocabulary. He also employed novel ideas and techniques in his devotional poems.^[1] He used a metre called *Nondi*

Chindu in most of his works, which was earlier used by Gopalakrishna Bharathiar.^[13]

Bharati's poetry expressed a progressive, reformist ideal. His imagery and the vigour of his verse were a forerunner to modern Tamil poetry in different aspects. He was the forerunner of a forceful kind of poetry that combined classical and contemporary elements. He had a prodigious output penning thousands of verses on diverse topics like Indian Nationalism, love songs, children's songs, songs of nature, glory of the [Tamil language](#), and odes to prominent freedom fighters of India like [Tilak](#), [Gandhi](#) and [Lajpat Rai](#). He even penned an ode to New Russia and [Belgium](#). His poetry not only includes works on Hindu deities like Shakti, Kali, Vinayagar, Murugan, Sivan, Kannan(Krishna), but also on other religious gods like [Allah](#) and Jesus. His insightful similes have been read by millions of [Tamil](#) readers. He was well-versed in various languages and translated speeches of Indian National reform leaders like [Aurobindo](#), [Bal Gangadhar Tilak](#) and [Swami Vivekananda](#).^[9]

He describes the dance of Shakthi (in Oozhi koothu, Dance of destiny) in the following lines:

Bharati on caste system

Bharati also fought against the [caste system](#) in Hindu society. Bharathi was born in an orthodox [Brahmin](#) family, but he considered all living beings as equal and to illustrate this he performed the [upanayanam](#) for a young [Dalit](#) man and made him a [Brahmin](#). He also scorned the divisive tendencies being imparted into the younger generations by their elderly tutors during his time. He openly criticised the preachers for mixing their individual thoughts while teaching the [Vedas](#), Upanishads and the [Gita](#). He strongly advocated bringing the [Dalits](#) to the Hindu mainstream.

Legacy

The Government of India in 1987 instituted a highest National [Subramanyam Bharti Award](#) conferred along with [Ministry of Human](#)

[Resource Development](#), annually confers on writers of outstanding works in [Hindi](#) literature.

[Bharathiar University](#), a [state university](#) named after the poet, was established in 1982 at [Coimbatore](#).^[15] There is a [statue](#) of Bharathiar at [Marina Beach](#) and also in the [Indian Parliament](#). A [Tamil Movie](#) titled [Bharati](#) was made in the year 2000 on the life of the poet by [Gnana Rajasekeran](#), which won [National Film Award for Best Feature Film in Tamil](#).^[16] The movie [Kappalottiya Thamizhan](#) chronicles the important struggles of [V.O.Chidambaranar](#) along with [Subramanya Siva](#) and Bharathiar with S.V. Subbaiah starring as Subramania Bharati. On 14 August 2014 Professor Muhammadu Sathik raja Started an Educational trust at thiruppuvanam pudur, near Madurai named as Omar -Bharathi educational trust, the name is kept to praise the two legendary poets Umaru Pulavar and Subramania Bharathiyar from Ettaiyapuram. Though these two Poets are having three centuries time interval, the divine service and their contribution to the Tamil language are made them unparalleled legends. Both two poets are offered their services at vaigai river bank of thiruppuvanam. the two poets were strongly suffered by their financial status, so both of them were unsuccessful to fulfil their family members need. Many roads are named after him, notable ones including Bharathiar road in [Coimbatore](#) and Subramaniam Bharti Marg in [New Delhi](#).^{[17][18]} The NGO [Sevalaya](#) runs the [Mahakavi Bharatiya Higher Secondary School](#).^[19]

JAGADISH CHANDRA BOSE

- J C Bose was born on 30 November 1858 in Munshiganj, Bengal Presidency, British India. The place is now in Bangladesh.
- His father was a member of the Brahmo Samaj and a deputy magistrate and assistant commissioner.

- Bose was sent to a vernacular school initially because his father believed that knowledge of one's mother tongue was necessary before starting the study of English.
- At this school, he listened spellbound to stories of nature told by his classmates. These stories instilled in Bose a yearning to know more about the workings of nature.
- In 1869, he enrolled at the Hare School and later St. Xavier's School in Calcutta. In 1875, he joined the St. Xavier's College at Calcutta. He completed his BA from the University of Calcutta in 1879.
- Bose had wanted to study medicine at the University of London but quit due to ill-health. He then studied Natural Sciences at Christ's College, Cambridge University and passed out with a BA in Natural Sciences. He also secured a B.Sc. in 1884 and a D.Sc. in 1896 both from the University of London.
- Bose invented the Mercury Coherer which is a radio wave receiver. This device was used by Guglielmo Marconi to build a radio. Bose was thus a key figure in the invention of the modern radio and also in sonic technology.
- Bose contributed significantly to the development of remote wireless signalling. He was also one of the pioneers of wireless communications.
- He was denied access to labs due to his race at the University of Calcutta which he had joined as a Professor of Physics. He would then conduct experiments in his dwelling, a 24 sq.ft. room in Calcutta.
- In 1894, Bose demonstrated in Calcutta that communications signals can be transmitted without wires by sending electromagnetic waves 75 feet passing through walls and remotely ringing a bell and igniting some gunpowder.

Legacy of Jagadish Chandra Bose

- He was also a pioneer in the arena of microwave devices.
 - Bose holds the first patent in the world for a solid-state diode detector used to detect electromagnetic waves. He was averse to all forms of patenting through and patented the diode only due to pressure from his colleagues.
 - He could have earned a fortune had he patented his many inventions. He, however, chose to make all his research public so that other researchers could carry out further research.
 - Sir Neville Mott, British physicist and winner of the Nobel Prize in 1977 has remarked, "J.C. Bose was at least 60 years ahead of his time. In fact, he had anticipated the existence of P-type and N-type semiconductors."
 - Acharya Bose was also renowned for his work on the physiology of plants. He believed that plants could feel and were aware of their surroundings. He was the first person to prove that plants feel pain and understand affection. He demonstrated the electrical nature of plant stimuli (like wounds, chemical agents, etc.). He researched the seasonal effect on plants and also the effect of chemical inhibitors and temperature on plants. Thus, he contributed significantly to agriculture also.
 - He was also a science fiction writer in Bengali.
 - Largely unaccredited for his work on radio communications until recently, there has been an understanding of his work and his contributions to the development of modern wireless communications in recent times. He is now regarded as **one of the fathers of radio science**.
 - He is also the discoverer of millimetre length electromagnetic waves.
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PRAFULLA CHANDRA RAY

Known as “Father of Indian Chemistry”, Prafulla Chandra Ray was a well-known Indian scientist and teacher and one of the first “modern” Indian chemical researchers.

He discovered the stable compound mercurous nitrite in 1896 and established Bengal Chemical and Pharmaceutical Works Ltd, India’s first pharmaceutical company in 1901.

Also a very passionate and devoted social worker, he did not support the caste system.

Early Life and Education:

Prafulla Chandra Ray was born on 2 August 1861, the younger of two brothers, in the village of Raruli-Katipara, now in Bangladesh. His father, Harish Chandra Ray was a landlord who loved learning and he built up an extensive library in his home. Prafulla’s mother, Bhubanmohini Devi was well educated with liberal views.

The family moved to Kolkata when Prafulla was nine years old and he attended the Hare School. Unfortunately, Prafulla fell ill and returned to his village in 1874. It took two years for Prafulla to recover and he was left permanently frail with digestive issues and insomnia. During his recovery he enjoyed reading in his father’s well equipped library.

He returned to Kolkata and attended Albert School and in 1879 and, after passing the entrance exam, began studies at the Metropolitan College (now Vidyasagar College). Prafulla also studied chemistry at the Presidency College and this soon became his favorite subject; he built a laboratory at home and began experimenting.

In 1882, Prafulla won a scholarship to Edinburgh University, UK and he gained his degree there in 1885. Remaining at Edinburgh to undertake research, he

was awarded a D. Sc. in 1887 and the “Hope Prize” for his thesis on “Conjugated Sulphates of the Copper-Magnesium Group: A Study of Isomorphous Mixtures and Molecular Combinations”.

Contributions and Achievements::

Prafulla Ray returned to Calcutta in 1888 and became an assistant professor of Chemistry at the Presidency College in Calcutta in 1889. He established a research laboratory and slowly gathered a group of dedicated students who researched with him.

He published around 150 research papers during his lifetime. Many of his articles on science were published in renowned journals of his time. His research included the discovery of the stable compound mercurous nitrite in 1896 while studying nitrite and hyponitrite compounds and their compounds.

He also researched organic compounds containing sulphur, double salt, homomorphism and fluorination.

In 1892 with a small capital of 700 INR, he established Bengal Chemical Works. It flourished under his management. The company initially produced herbal products and indigenous medicines. In 1901 the enterprise became a limited company, Bengal Chemical and Pharmaceutical Works Ltd (BCPW) and India’s first pharmaceutical company. Gradually, the company expanded and became a leading chemicals and medicine producer.

Prafulla Ray was interested in ancient texts and after much research published “The History of Hindu Chemistry” in two volumes in 1902 and 1908. The work detailed the extensive knowledge of metallurgy and medicine in ancient India.

In 1916 Prafulla Ray retired from President College and joined Calcutta University where he worked for more than 20 years.

He represented many Indian universities at international seminars and congresses. He was elected as the Indian Science Congress President in 1920.

His autobiography "Life and Experiences of a Bengali Chemist", published in two volumes in 1932 and 1935 documents his own motivations as a scientist and the sweeping changes India was experiencing during his lifetime.

Prafulla Ray wanted to use the marvels of science for lifting up the masses. He was a very passionate and devoted social worker and he participated eagerly and actively in helping famine and flood struck people in Bengal during the early 1920s. He promoted the khadi material and also established many other industries such as the Bengal Enamel Works, National Tannery Works and the Calcutta Pottery Works. He was a true rationalist and he was completely against the caste system and other irrational social systems. He persistently carried on this work of social reformation till he passed away.

Remaining a bachelor throughout his life, Prafulla Ray retired becoming professor emeritus in 1936 aged 75. He died on 16 June 1944, aged 82.

SRINIVASA RAMANUJAN

Early Life

Srinivasa Ramanujan was born on December 22, 1887, in Erode, India, a small village in the southern part of the country. Shortly after this birth, his family moved to Kumbakonam, where his father worked as a clerk in a cloth shop. Ramanujan attended the local grammar school and high school and early on demonstrated an affinity for mathematics.

When he was 15, he obtained an out-of-date book called *A Synopsis of Elementary Results in Pure and Applied Mathematics*, Ramanujan set about feverishly and obsessively studying its thousands of theorems before moving

on to formulate many of his own. At the end of high school, the strength of his schoolwork was such that he obtained a scholarship to the Government College in Kumbakonam.

A Blessing and a Curse

However, Ramanujan's greatest asset proved also to be his Achilles heel. He lost his scholarship to both the Government College and later at the University of Madras because his devotion to math caused him to let his other courses fall by the wayside. With little in the way of prospects, in 1909 he sought government unemployment benefits.

Yet despite these setbacks, Ramanujan continued to make strides in his mathematical work, and in 1911, published a 17-page paper on Bernoulli numbers in the *Journal of the Indian Mathematical Society*. Seeking the help of members of the society, in 1912 Ramanujan was able to secure a low-level post as a shipping clerk with the Madras Port Trust, where he was able to make a living while building a reputation for himself as a gifted mathematician.

Cambridge

Around this time, Ramanujan had become aware of the work of British mathematician G. H. Hardy — who himself had been something of a young genius — with whom he began a correspondence in 1913 and shared some of his work. After initially thinking his letters a hoax, Hardy became convinced of Ramanujan's brilliance and was able to secure him both a research scholarship at the University of Madras as well as a grant from Cambridge.

The following year, Hardy convinced Ramanujan to come study with him at Cambridge. During their subsequent five-year mentorship, Hardy provided the formal framework in which Ramanujan's innate grasp of numbers could thrive, with Ramanujan publishing upwards of 20 papers on his own and more in

collaboration with Hardy. Ramanujan was awarded a bachelor of science degree for research from Cambridge in 1916 and became a member of the Royal Society of London in 1918.

Doing the Math

"[Ramanujan] made many momentous contributions to mathematics especially number theory," states George E. Andrews, an Evan Pugh Professor of Mathematics at Pennsylvania State University. "Much of his work was done jointly with his benefactor and mentor, G. H. Hardy. Together they began the powerful "circle method" to provide an exact formula for $p(n)$, the number of integer partitions of n . (e.g. $p(5)=7$ where the seven partitions are 5, 4+1, 3+2, 3+1+1, 2+2+1, 2+1+1+1, 1+1+1+1+1). The circle method has played a major role in subsequent developments in analytic number theory. Ramanujan also discovered and proved that 5 always divides $p(5n+4)$, 7 always divides $p(7n+5)$ and 11 always divides $p(11n+6)$. This discovery led to extensive advances in the theory of modular forms."

Bruce C. Berndt, Professor of Mathematics at the University of Illinois at Urbana-Champaign, adds that: "the theory of modular forms is where Ramanujan's ideas have been most influential. In the last year of his life, Ramanujan devoted much of his failing energy to a new kind of function called mock theta functions. Although after many years we can prove the claims that Ramanujan made, we are far from understanding how Ramanujan thought about them, and much work needs to be done. They also have many applications. For example, they have applications to the theory of black holes in physics."

But years of hard work, a growing sense of isolation and exposure to the cold, wet English climate soon took their toll on Ramanujan and in 1917 he contracted

tuberculosis. After a brief period of recovery, his health worsened and in 1919 he returned to India.

The Man Who Knew Infinity

Ramanujan died of his illness on April 26, 1920, at the age of 32. Even on his deathbed, he had been consumed by math, writing down a group of theorems that he said had come to him in a dream. These and many of his earlier theorems are so complex that the full scope of Ramanujan's legacy has yet to be completely revealed and his work remains the focus of much mathematical research. His collected papers were published by Cambridge University Press in 1927.

Of Ramanujan's published papers — 37 in total — Berndt reveals that "a huge portion of his work was left behind in three notebooks and a 'lost' notebook. These notebooks contain approximately 4,000 claims, all without proofs. Most of these claims have now been proved, and like his published work, continue to inspire modern-day mathematics."

A biography of Ramanujan titled *The Man Who Knew Infinity* was published in 1991, and a movie of the same name starring Dev Patel as Ramanujan and Jeremy Irons as Hardy, premiered in September 2015 at the Toronto Film Festival.
