

Mathematical luminaries of pre-independent India

KUMAR GANDHARV MISHRA

Central University of South Bihar, Fatehpur, Bihar 824236
Email: mishrakumargandharv@gmail.com

ABSTRACT

Among all the sciences, Mathematics seems to be the least talked, as the breakthroughs and discoveries in the world of mathematics are implicit and complex to communicate as compared to other sciences. Nevertheless, Mathematics (in an implicit way) plays the foundational role for development of other branch of sciences. As Indian scientists emerged on the global map during the last phase of colonial India, it becomes imperative to look at the development of mathematics during that period. Infact, in the 1920s Subrahmanyam Chandrasekhar (Nobel Laureate, Physics) got inspired by the mathematician Srinivasa Ramanujan. Such was the impact of Ramanujan, who proved to be a source of immense morale among the demotivated science aspirants in the colonial era. Apart from Ramanujan, there were other mathematical luminaries in different roles (Mathematicians, Administrators and Historians) who worked for the propagation of mathematics and development of mathematical sciences in pre-independent India. For example: mathematicians like Ganesh Prasad, K Anand Rau and T Vijayaraghavan made significant contributions in the field of pure mathematics; D R Kaprekar highlighted the field of recreational mathematics, and administrators and visionaries like Asutosh Mukherjee and V Ramaswamy Aiyar worked for the development of mathematical culture through institutions and societies. Credit also goes to historians of mathematics like Prabodh Chandra Sengupta, Bibhutibhushan Datta and Sudhakar Dvivedi who kept the ancient mathematics culture alive through their writings and inspired budding mathematicians to be aware of historical Indian contributions even in the colonial era. The paper is an attempt to highlight such luminaries in different roles. The paper talks about their contributions and their impact during the pre-independence period (especially around the beginning of the 20th century).

Keywords: Mathematics, Mathematical luminaries, Mathematicians, Pre-independent India

Introduction

What could mathematicians-scientists offer to India's struggle for freedom? How could they contribute to freedom? How could they participate in freedom movement? Was physical participation the only way to contribute to freedom movement? They could participate physically in the freedom movement; they could boycott the colonial hegemony and carry on their own work, they could bring fame to Indian identity through their work even in the colonial era which could be a morale win in itself, they could revive and propagate mathematics for the future generations through their funds, writings, translations and establishment of institutions like Indian Mathematical Society, and most importantly they could revive the Indian ethos through their work . But not everyone aspired to be a mathematician or scientist. The Macaulay education system was meant primarily to train Indians to enter the colonial bureaucracy as adjunct administrators under British rule, largely to serve the requirements of various government agencies and the judicial system. Higher education in India was not expected, therefore, to produce mathematicians, research scientists or creative academics (Dauben & Parikh, 2010). However, the beginning of the 20th century (the last era of pre-independence India) saw the emergence of some Indian names in the field of mathematics. Mathematics, especially higher mathematics evolved in India due to continuous efforts of various personalities.

This paper discusses such personalities under three roles: Mathematicians, Administrators and Historians. Though the roles can overlap, these personalities have been put under a particular role which appears more dominant. All such personalities under these roles have been hailed as luminaries in this paper. As several parts work in synchronisation behind successful working of a machine, similarly the mathematics culture evolved in pre-independence India due to synchronisation of various personalities. The stories behind development of such culture also depict the symbolism of Indian mathematics community in the freedom struggle. The luminaries under various roles have been discussed in the next section.



Mathematical luminaries in the role of Mathematicians

In this section, role and contributions of some mathematicians have been discussed in a chronological order. Apart from ancient Indian mathematics, one of the first incidents of an Indian work getting international attention can be traced back to the publication of paper ‘Four Vertex Theorem’ in 1909, written by Syamadas Mukhopadhyayaⁱ (Raghunathan, 2010).

Ganesh Prasad (1876-1935)

In the beginning of 20th Century India, Ganesh Prasad appears as one of the first important figures as a mathematician. Prasad had studied in Cambridge and Gottingen and after his return he taught at Benaras (Varanasi) (Dauben & Parikh, 2010) from 1905 to 1923. In Benaras, he also founded the Benaras Mathematical Society. He was also the first D.Sc. from Allahabad University (Dani, 2012). In 1923, he was appointed as the President of Calcutta Mathematical Society. He also endowed a fund to enable Calcutta Mathematical Society to award a regular prize for work related to history of Indian Mathematics (Dani, 2012). Prasad made contributions in the field of potential theory and summability of Fourier series (Dauben & Parikh, 2010; Dani, 2012). He wrote 11 books: *Great*

Mathematicians of the Nineteenth Century: Their lives and their works; Mathematical Research in the Last Twenty Years; A Treatise on Spherical Harmonics and Functions of Bessel and Lamé (to name a few) (Dani, 2012). Undoubtedly, he was one of the influential mathematicians of his era, who contributed not only in the field of mathematics but also worked for the popularisation of Indian mathematics through funds and societies.

Srinivasa Aiyangar Ramanujan (1887-1920)

The beginning of 20th century also witnessed the evolution of the genius Srinivasan Aiyangar Ramanujan in the world of mathematics. A lot has been written about the life story and mathematical achievements (Fellow of the Royal Society of London, Fellow of Trinity College Cambridge, numerous theorems, school prodigy, and relevance of his work in black holes) of the great Ramanujan. It would be unfair to discuss his mathematical achievements in a few sentences here. No doubt, Ramanujan overshadows his contemporaries and remains one of the tallest figures in modern mathematics. His life story from a small village in Kumbakonam to Cambridge is an inspiration. Credit goes to G H Hardy who identified this genius and called him at Cambridge. Ramanujan's life journey had a great impact on the then Indian scientific community. During the colonial era, Ramanujan's achievement could be understood as a great morale booster for science aspirants in India. In an era, when morale of the nation was down, Indian students and academicians needed some hero and Ramanujan emerged on the scene. Chandrasekhar Subrahmanyam (Nobel Prize for Physics, 1983) was inspired by Ramanujan's example – an example of total dedication to science (Vigyan Prasar (VP), 2022). He recalled an incident from his childhood in 1920, when he had first heard about Ramanujan from his mother when the news of Ramanujan's death was published in a newspaper. At that time, Chandrasekhar had no idea about who Ramanujan was and what scientific achievement meant (Kanigel, 1991, p. 329). According to Chandrasekhar “Within Indian mathematics, of course, Ramanujan's influence extended correspondingly deeper”, “that almost all the mathematicians who reached distinction during the three- or four-decade following Ramanujan were directly or

indirectly inspired by his example” (Kanigel, 1991, p.330). In Chandrasekhar’s words:

Kanigel (1991) writes how mathematician T Vijayaraghavan followed the footsteps of Ramanujan: “One brilliant young mathematics student at Madras's Presidency College, T. Vijayaraghavan, deliberately neglected his studies and failed his examinations, the more perfectly to follow in Ramanujan's footsteps. Such was Ramanujan's impact on India during the years after his death” (p. 330).

The movie *The Man Who Knew Infinity*ⁱⁱ (Brown, 2015) is based on the book by Robert Kanigel written on the life of Ramanujan. There are two scenes which depict what Ramanujan meant in the freedom struggle. One of the events is the selection of Ramanujan as the Fellow of Trinity College. It was an extraordinary achievement and the movie passionately depicts when the whole hall (a representation of colonial power) stood in respect of Ramanujan (an Indian) on a land which was the centre of colonial power. There is another scene in the beginning of the movie where Ramanujan accidentally runs on the grass in the centre of premises, in a rush to meet Hardy. He was scolded to get off the grass as it was meant for Fellows only. One day, Ramanujan did walk on the grass. Hardy makes Ramanujan walk on the grass to inform him about his selection as a Fellow of Trinity College. Before Hardy, Ramanujan was supported by Francis Spring, G.T. Walker, Ramaswamy Aiyar, Dewan Bahadur R. Ramachandra Rao and Narayan Aiyar (Iyer) who valued his work. Narayan Aiyar believed in Ramanujan’s potential so much that he asked Ramanujan to publish his works. Even, the pain and anguish of living under colonial rule was expressed by Narayan Aiyar in his conversation with Ramanujan. Here is a dialogue of Aiyar from the movie *The Man Who Knew Infinity*.

Ramanujan, listen to me, this work is too important to die with you. This must be published. If you an, Indian, are at the pinnacle with these formulas. then the British, even while they subjugate us must recognise that our brightest match is there. (Brown, 2015)

Dani (2012) writes that Ramanujan left a huge legacy inspiring generation of students in India by infusing romanticism in the pursuit of mathematics. Dinesh Singhⁱⁱⁱ in his public

lecture^{iv} ‘Triumph and Tragedy of Srinivasan Ramanujan’ brings out the never-give up approach of Ramanujan which inspired a lot of Indians. During the lecture, Singh(2018)says:

... I have read the writings of a generation of scientists that followed just after Ramanujan and all of them write, and I hope Dr. Kishan Lal will bear me out, a distinguished scientist himself, that this generation prior to us twice removed, they have repeatedly said that Ramanujan's example gave them hope and self-confidence, that is his biggest gift to India that he created this for us and what did India do in return do you know... (Singh, 2018)

P C Mahalanobis (1893-1972)

P C Mahalanobis was Ramanujan’s contemporary in England. Mahalanobis returned to India after completing his studies in statistics. After 1920, he started working on socio-economic and agricultural issues of India. In 1920-21, he studied the caste data for Bengal, with special attention to anthropometric constants in the Anglo-Indian sample, provided by Annandale, the director of Zoological and Anthropological Survey of India. His biggest contribution was the establishment of the Indian Statistical Society in 1931 which proved to be a centre of high repute in mathematical and statistical research. Mahalanobis contributed in the area of large scale sample surveys, multivariate analysis and D^2 statistic (Dauben & Parikh, 2010). He is also known for ‘Mahalanobis distance’ – a statistical measure gauging proximity between group populations. He also started an Indian journal: *Sankhya- The Indian Journal of Statistics* (Dani, 2012).

K Anand Rau (1893-1966)

Rau was born in Madras in 1893. Rau studied at Madras and also at Cambridge (Dauben & Parikh, 2010). He also worked with G. H. Hardy. Rau joined Presidency College, Madras in 1919 after returning India (Dauben & Parikh, 2010; Dani, 2012). A theorem named after him also appears in Hardy’s classic book *Divergent Series*. He produced some outstanding Indian students in the field of higher mathematics: T Vijayaraghavan, S S Pillai, K Chandrasekharan, M V Subbarao and V Ganapathy Iyer (Dani, 2012). Anand Rau was member of London Mathematical

Society and Indian Mathematical Society. He was also founding member of Indian Academy of Sciences (Dauben & Parikh, 2010).

A Narasingha Rao (1893-1967)

Rao belonged to a small-town Chidambaram (near Madras). He served as the founder editor of *Mathematics Student* (a journal of Indian Mathematical Society) from 1932-1950 (Dani, 2012).

R Vaidyanathswamy (1894-1960)

Vaidyanathswamy studied in Edinburgh and Cambridge. After returning to India in 1925, Vaidyanathswamy joined the University of Madras in 1927 after Banaras Hindu University (Dauben & Parikh, 2010; Dani, 2012). He worked in the area of algebraic curves, homogeneous forms and birational transformations. S. Pankajam^v and K. Padmavally^{vi}, known to be the first two women active in mathematics In India were students of Vaidyanathswamy (Dauben & Parikh, 2010). He also served as the editor of Journal of Indian Mathematical Society from 1927-1950 and also served as the president of the society during 1940-42. In 1947, he also wrote the first English textbook on topology – Treatise on Set Topology (Dani, 2012).

S S Pillai (1901-1950)

S S Pillai, a student of K Anand Rau, served as a lecturer at Annamalai University (1929-1941). He got recognition for his work on *Waring's Problem*. A conjecture related to finiteness of the number of integer solutions of exponential Diophantine equations is also named after him (Dani, 2012).

T Vijayraghavan (1902-1955)

Vijayraghavan was influenced by Ramanujan and Ananda Rau. He also worked independently as a student at the Presidency College, Madras. He was influenced so much by Srinivasa Ramanujan that he also skipped classes. Kanigel (1991) writes, "One brilliant young mathematics student at Madras's Presidency College, T. Vijayaraghavan, deliberately neglected his studies and failed his examinations, the more

perfectly to follow in Ramanujan's footsteps. Such was Ramanujan's impact on India during the years after his death”(p. 330). He also worked with G H Hardy. On his return he joined Annamalai University and then Aligarh Muslim University, where he worked with French mathematician Andre Weil from 1930-32. In a paper published in 1932, Vijayaraghavan had also disproved a conjecture by E Borel which drew a lot of attention. For this, he was also invited as a visiting lecturer by the American Mathematical Society in 1936. A class of numbers is also known after him as *Pisot-Vijayaraghavan* numbers or PV numbers (Dani, 2012).

Dattatreya Ramchandra Kaprekar(1905-1986)

Unlike other mathematicians, D R Kaprekar didn't work at university level, but his fascination for numbers made him an influential figure in the world of recreational mathematics. He is famous for his Kaprekar's Constant and Kaprekar's Number (named after him); Self-numbers or Swayambhu, Harshad Numbers and Demlo Numbers (MacTutor, 2022). Kaprekar had no postgraduate training in pure mathematics. He completed his graduation in 1929 from the University of Bombay and then worked as a school teacher in Maharashtra. He made several discoveries in the field of recreational mathematics. The one beautiful discovery from 1946 is that any number of four (decimal) digits, not all the same, will lead to 6174 (now called the Kaprekar constant), after (at most 7) repetitions of the (Kapurkar) process of 'Order, Reverse and Subtract'. For example, 0132 leads first to $3210 - 0123 = 3087$, then to $8730 - 0378 = 8352$ and then to $8532 - 2358 = 6174$ (Thakur, 2019). Kaprekar was also awarded the R P Pranjape^{vii} Mathematical Prize for an original piece of work in mathematics (MacTutor, 2022).

Apart from these mathematicians, other influential names include Nikhilranjan Sen (1894-1963), Rabindranath Sen (1896-1974), B N Prasad (1899-1966), Ram Behari (1897-1981), Hansraj Gupta (1902-1988), Sarvadaman Chowla (1907-1995), C T Rajagopal (1903-1978), R S Varma (1905-1970), S M Shah (1905-1966), Ganapati Iyer (1906-1987) and D D Kosambi (1907-66) and S S Shrikahnde (1917-2020) and S Minakshisundaram (1913-68).

Mathematical luminaries in the role of Administrators

So far, the paper discussed the work and achievements of Indian mathematicians. But, mathematicians also required a culture under which they could carry on their work. They also looked for their own Indian institutes and societies which could encourage and support their work. The foundation of Indian Mathematical Society in 1907 can be said to be one of the landmark events in the history of modern mathematics in India. At the same time, Calcutta Mathematical Society was founded in 1908. On the other hand, there was also an effort to 'counterbalance' the British hegemony through French entry. Here, the efforts of three personalities have been discussed.

V. Ramaswamy Aiyar (1871-1936)

In 1907, the Indian Mathematical Society (IMS) was formed. This was not due to efforts of mathematicians teaching in India, but due to efforts of V. Ramaswamy Aiyar (a civil servant, Deputy Collector at Gooty) (Dauben & Parikh, 2010). The society was known as 'The Analytic Club' till 1910 (Dani, 2012). When Aiyar used to work as an assistant to the Principal of Maharaja's College in Mysore, he was nominated for the membership of Edinburgh Society. According to Aiyar, this was the first incident when he ideated for a Mathematical Society in India based on the Edinburgh Society. There was political agitation in the country due to Bengal Partition (1905), but few people did try to contribute to industrial and intellectual development to make India great. Among those, Aiyar also asked himself 'Can I not be of some help in advancing the interests of Mathematics in India?', "The spirit of the times made me think seriously about the question. I wanted to form a Mathematical Society which might be something like the Edinburgh Society" (Excerpts from V. Ramaswami Aiyar's presidential address of 1926, IMS).

Soon, Aiyar arranged the list of faculty members from universities in Madras and Bombay and wrote to everyone and the result was encouraging. On 4th April, 1907, the formation of 'Analytic Club' was announced in Madras. Initially, the society started with 20 foundational members. Aiyar always seem concerned and passionate for mathematics in India. This is

reflected by his statements shared at the presidential address of 1926: when Aiyar saw a copy of the *Quarterly Journal of Mathematics*, he also began to wonder “How many such delightful bits, we in India may be missing by not seeing the leading journals. This made me more eager than ever to try to form a Mathematical Society”. Aiyar was inspired by such incidents to form a mathematical society. When the society was formed, one of the main goals was to collect journals and establish a reference library for mathematics. The club subscribed to various international journals. Dani (2012) writes on the importance of IMS membership which reflected its diversity and recognition across India.

The membership of the Club listed in the first issue, as also in latter issues of the journal shows a broad spread in many respects: locations of the members ranged all the way from Lahore and Amritsar in North, Trichinapally in the south and Rangoon in the east, many cities in (present) Maharashtra, Gujarat, Madhya Pradesh, Uttar Pradesh, Karnataka, Andhra and Tamilnadu; in terms of vocation the members included teachers and administrators of mathematics and education, engineers, students, as well as civil servants and other bureaucrats (Dani, 2012, p. 826).

No doubt, the IMS was a great platform(a non-profitmaking society) which connected different people from different parts of the country in the pre-independent India. The formation of IMS also helped creating mathematically inclined Indians, who also supported Ramanujan before his journey to Cambridge. Aiyar, who ideated the IMS, didn't become its first president. Infact, he served the IMS as president from 1926-30. Aiyar's sown seeds yielded great fruits and had long lasting impact in propagating mathematics culture among Indians during the colonial period.

Justice Asutosh Mukherji (1864-1924)

Asutosh Mukherji was a lawyer by profession and judge of the Calcutta High Court (from 1904). He was interested in mathematics and also took out time to write and publish papers on algebraic curves and differential equations. In 1906, he was appointed as the vice-chancellor of the Calcutta University. He undertook this opportunity to encourage research and support

mathematicians across India (Dauben & Parikh, 2010). He used his position to bring talented Indian mathematicians like S. Mukhopadhyay and N.R. Sen to Calcutta. In 1908, he established the Calcutta Mathematical Society (CMS) and served as its president till 1924. In 1909, the CMS started a journal, *Bulletin of the Calcutta Mathematical Society*. According to Dani (2012), the early issues of the journal show considerable contact with continental Europe, especially French, mathematics of that time, which is notable especially in the backdrop of the British colonial context of the era. Asutosh Mukherji also promoted research in the domain of ancient Indian Mathematics and Astronomy through proper utilisation of donation provided by Maharaja Manindra Chandra Nandy of Cossimbazar (Ramsubramanian, 2019, p.454).

Syed Ross Masood(1889-1937)

Syed Ross Masood (grandson of the founder of Aligarh Muslim University) was the Vice-Chancellor (February 1929-October 1934) of Aligarh Muslim University. He wanted to transform the university to a university of international reputation. According to him, the best way to do that was to counterbalance the British influence by creating a chair for French civilization (Dauben & Parikh, 2010). In 1929, Masood met the French mathematician Andre Weil^{viii} in Paris. Masood invited Andre Weil to contribute at AMU. Weil joined the Department of Mathematics and soon built up a new team of mathematicians, worked on drastic changes in mathematics curriculum at AMU. He also appointed T Vijayaraghavan as a faculty there, who was considered not eligible for the post of faculty as Vijayaraghavan had no diploma. He also appointed D D Kosambi (a Harvard fresher) as a faculty in the department. Weil also worked on the library system by introducing latest books (Dauben & Parikh, 2010). As a reaction against such changes, pamphlets in Urdu were distributed against Weil and Masood. They were criticized for importing French mathematics into India. According to the author of the pamphlet, only English mathematics was suited to Indian mind (Weil A, 1992 as cited in Dauben & Parikh, 2010).

Mathematical luminaries in the role of Historians

Could everybody read and understand mathematics in English during the colonial era? Were Indians aware of their ancient mathematical achievements which could fill them with a sense of pride and morale during colonial India? Some luminaries did contribute in this area and propagated modern mathematics and ancient Indian mathematics through their writings and translations. This section mentions their contributions as discussed in '*Ganitānanda: Selected work of Radha Charan Gupta on history of mathematics*' (Ramsubramanian, 2019).

Prabodh Chandra Sengupta (1876-1962)

P C Sengupta was born in Mymensingh district (now in Bangladesh). Prof. Sengupta served as a lecturer in mathematics at Chittagong College (1914), Bethune College (1916) and in Bengal Educational Service (1921). Sengupta worked in the area of Indian Astronomy. He translated the *Aryabhatiyam* of Aryabhata I (born 476 AD), Brahmagupta's *Khandakhadyaka* (665 AD). He also determined the dates of a number of events and works related to Indian history, culture and civilization by applying so-called 'astronomical method' (Ramsubramanian, 2019, p. 454).

Bibhutibhushan Datta (1888-1958)

Datta was born in Kanungoyapara village of Chittagong (now in Bangladesh). He completed his doctoral thesis on hydrodynamics (1920). He taught planetary theory at University Science College. Datta is famous for his work *History of Hindu Mathematics* (1935-38) in collaboration with Avadesh Narayan Singh. He also delivered lectures on "Contribution of the Ancient Hindus to Mathematics", to Allahabad University Mathematical Association and "The Science of Sulba" at Calcutta University (Ramsubramanian, 2019, p. 460-461).

Sudhakar Dvivedi (1855-1910)

Sudhakar Dvivedi was born in a village Khajuri, Varanasi. Dvivedi is known for having edited various ancient Indian works and adding his own commentary. He studied Sanskrit grammar

under Pandit Devakrsna. In 1883, he became the chief librarian of Govt. Sanskrit College Library, Benaras and later he was also appointed as a professor of mathematics. It provided him an opportunity to carry on his work as the library was equipped with several Sanskrit manuscripts. He edited and published the *Siddhanta-tattva-viveka* of Kamalakara (AD 1658). In 1889, he published the Sanskrit Commentary on *Pancasiddhantika* of Varahmihira (AD 600). He not only translated but also wrote textbooks in the area of conic sections, theory of equations, differential and integral calculus in Sanskrit. His famous Sanskrit work is *Dirghavrttalaksanam* (on Ellipse). He also wrote textbooks on modern mathematics in Hindi. His famous Hindi work is *Calanakalana* (on Differential Calculus, 1886), *Calarasikalana* (on Integral Calculus, 1895) and *Samikaranamimansa* (on Theory of Equations, 1897). In 1910, he published *A History of Mathematics in Hindi* (Ramsubramanian, 2019). “These efforts are commendable, keeping in view the difficulty of technical terminology to be used in Indian languages” (Ramsubramanian, 2019, p. 479).

M Rangacharya (1861-1916)

Prof Rangacharya was born in Melkote (then Mysore). He became a professor of Sanskrit and Comparative Philosophy at Presidency College, Madras. Prof. M Rangacharya is known for his English translation of *Ganit-Sar-Sangrah* (GSS) written by Mahaviracharya (Ramsubramanian, 2019).

Discussion and Conclusion

The mathematical figures discussed in the paper played an important role in establishing the essence of self-pride and morale in the mathematics community, scientific community as well as in common Indians during the colonial period. Indians owe a lot such luminaries due to whom the culture of higher mathematics was developed and institutions like Indian Statistical Institute and Tata Institute of Fundamental Research were established. In fact, it is not the lone effort of scientist or mathematician. Everyone has to make contribution under different roles.

Mathematicians the world over know of Ramanujan and his extraordinary talents. Nevertheless, the history of mathematics in India in the 20th century is not primarily the story of unusual exceptions..... but of the collective efforts of an entire nation to..... be even better mathematicians than their predecessors. (Dauben & Parikh, 2010, pp. 300-301)

Acknowledgements

I would like to acknowledge few sources, especially an article by S G Dani (India's Arrival on Modern Mathematical Scene) and another article by Joseph W. Dauben and Rohit Parikh (Beginnings of modern mathematics in India), which have helped immensely in understanding the development of modern mathematics in India and acted as a source of great information. While preparing this document from the lens of personalities under different roles, I have used and cited most of the information from these two articles. Another source *Ganitānanda: Selected work of Radha Charan Gupta on History of Mathematics*, by Prof K Ramsubramanian has been of great help.

Endnotes

ⁱ Syamdas Mukhopadyaya (1866-1937) was the first PhD in Mathematics from Calcutta University.

ⁱⁱ The movie was first released in 2015. It is based on the book on life of Ramanujan by Robert Kanigel. The movie stars Dev Patel as Srinivasa Ramanujan and Jeremy Irons as G.H. Hardy. Mathematicians Manjul Bhargava and Ken Ono collaborated on the movie.

ⁱⁱⁱ Professor and mathematician Dinesh Singh is the former President of Ramanujan Mathematical Society. He is also a former Vice-Chancellor of University of Delhi. His father, mathematician U.N. Singh also served as the President of Indian Mathematical Society (1977-79).

^{iv} The public lecture was delivered on June 1, 2018 by Prof. Dinesh Singh (then President RMS) at India International

Centre, New Delhi. The lecture was a part of the 33rd Annual Conference of the Ramanujan Mathematical Society, organised by University of Delhi.

^v A student of Vaidyanathaswamy at University of Madras published several results on logic and foundation of mathematics (1930-40) (Dani, 2012).

^{vi} K Padmavally worked on Analysis and Topology in 1950s (Dani, 2012).

^{vii} The first librarian of the Indian Mathematical Society, established at Fergusson College, Pune. He was the first Indian to achieve the title of Senior Wrangler, regarded as greatest intellectual achievement attainable in Britain.

^{viii} Andre Weil (1906-1988) was a French mathematician. He worked in number theory and algebraic geometry.

References

- 1 Ramasubramanian. K. (2019). Bio-bibliographical sketches of some historians of mathematics. In K. Ramasubramanian (Ed.), *Ganitānanda: Selected work of Radha Charan Gupta on history of mathematics*(pp. 453-521). Springer.
- 2 Brown, M. (Director). (2015). *The man who knew infinity*. United Kingdom.
- 3 Chandrasekhar Subrahmanyam. (n.d.). Retrieved January 18, 2022, from Vigyan Prasar: <https://vigyanprasar.gov.in/chandrasekhar-subrahmanyam/>
- 4 Dani, S. G. (2012). India's arrival on modern mathematical scene. *Resonance*, 17(9), 824-846.
- 5 Dattatreya Ramachandra Kaprekar. (n.d.). Retrieved January 18, 2022, from MacTutor: <https://mathshistory.st-andrews.ac.uk/Biographies/Kaprekar/>
- 6 Dauben, J. W., & Parikh, R. (2010). Beginnings of modern mathematics in India. *Current Science*, 99(3), 300-322.
- 7 *Excerpts from V. Ramaswami Aiyar's presidential address of 1926*. (n.d.). Retrieved January 18, 2022, from Indian Mathematical Society: <https://indianmathsoc.org/About-IMS.html>
- 8 Kanigel, R. (1991). *The man who knew infinity: a life of the genius Ramanujan*. New York: Washington Square Press.

-
- 9 Raghunathan, M. (2010, March 18). *India as a player in mathematics*. Retrieved from The Hindu: <https://www.thehindu.com/todays-paper/tp-opinion/India-as-a-player-in-Mathematics/article16574923.ece>
 - 10 Singh, D. (2018, June 12). *Triumph and tragedy of Srinivasan Ramanujan: Dinesh Singh (part 2)*. Retrieved from YouTube: https://www.youtube.com/watch?v=3G_BWnxDW_s
 - 11 Thakur, D. S. (2019). Kaprekar phenomena. *Proceeding of Ropar Conference, RMS-Lecture Notes Series No. 26*, (pp. 1-10).