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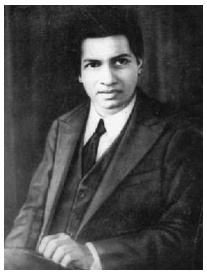
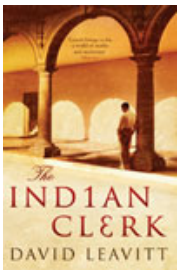
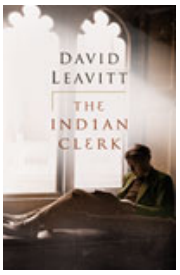
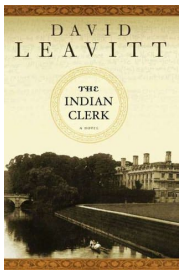

Srinivasa Ramanujan








David Leavitt

The facts: Srinivasa Ramanujan (22 December 1887 – 26 April 1920) is a self-taught Indian mathematician, working as a clerk in the Accountant-General's office at the Madras Port Trust Office. In 1912 he mails some of his results to three professors in Cambridge. G.H. Hardy is intrigued and asks his colleague E.H. Neville, who was teaching in Madras, to convince Ramanujan to come to Cambridge, which he finally did.

Somewhat lost in a foreign country, and plagued by health problems, Ramanujan lives in England through world war I. He returns to Madras in 1919 where he dies shortly after, at the age of 32.



E.H. Neville and G.H. Hardy

David Leavitt, being of American breed, obviously did a lot of research to write this novel. Although Ramanujan is the center around which the novel evolves, it is more about Hardy and the academic society in Cambridge, than it is about the "Indian clerk". Just as Ramanujan is encapsulated underneath, also the mathematics are somewhat shrouded away. Some formulas do appear now and then, but they are more like illustrations that interrupt the text, than they are elements in the story. For example Hardy is caught by the formulas in the letter of Ramanujan, or later when Ramanujan is in Cambridge, he is astonished by Ramanujan's remarkable formulas for the approximation of π like, and then the formulas follow without explanation.



Indian stamp

The Riemann conjecture is an exception and it is rather a leitmotiv in the novel. It floats through the story because Hardy is always hoping that Ramanujan could help him out in proving it. Leavitt's trick to explain about the conjecture is by telling about how Hardy, invited at a secondary school, explains the problem before a class of 12 year old schoolgirls. Ramanujan is however not really trained in giving proofs and his mind is difficult to canalize. He is producing long lists of mathematical identities, known to us by his notebooks[1]. Hardy recognizes some of these as known already, some are wrong, but others are astonishing breakthroughs. Ramanujan, being very religious, claims these were given to him in his dreams by a goddess Namagiri who "wrote the formulas on his tongue". This religious aspect plays also a role in the novel because Ramanujan first objected against traveling to England. Crossing the ocean was something not done. Besides religion, also his mother had a strong impact on his life, and it is only after she, and a priest, agreed that he finally has his hair cut, is dressed up in European style, and makes the journey.

The novel is not explicit about it, but it is somewhat suggested that Ramanujan in this English academic world was a bit of an exotic phenomenon, an Indian calculator, that many were curious about, or that makes as a great party attraction. Leavitt translates this as a romantic relation between Mrs Neville (Alice) and Ramanujan. When Ramanujan arrives in Cambridge, the Nevilles take him in their house and Neville's wife does everything she can to meet Ramanujan's vegetarian restrictions, much to the disliking of the rest of the household. A vegetarian goose is a compromise. Leavitt must have done quite some research on vegetarian cookery of those days, both in England and in India. When Ramanujan leaves the house to live in a college, Alice feels like he is taken away from her by Hardy. It is only later when she meets Ramanujan in London that her love for him shows explicitly.

The story of the Nevilles is a bit tragic. Eric Neville, being bad sighted, could easily refrain from fighting during the war, but he openly objected against the conflict, much to the dislikes of Alice. This pacifism is probably the reason why he is not re-elected as a fellow in Cambridge. Strongly disappointed, he had to move to a much smaller college in Reading.

This is another theme of the novel. The atrocities of WWI are not explicit, but it is clear that they influence the lives of the people whether they actively participate or not. For example Bertrand Russell, who is a dominating

[1] Five volumes edited by B.C. Berndt were published by Springer in the period 1985-2005 and two volumes about his "lost notebook" in 2005 and 2008.

personality at Trinity College Cambridge, is a manifest pacifist which caused his dismissal and later even imprisonment till 1918. Hardy did defend the viewpoints of Russell, but was left alone. He nevertheless left Cambridge to lecture in Oxford in 1919, and did only return in 1932.



Great Court of Trinity College Cambridge.

But this novel is actually about G.H. (Godfrey Harold) Hardy (7/2/1877–1/12/1947). Most of the story is seen through the eyes of Hardy, although most of it is written in the third person. There is also a second story line, when Hardy is lecturing at Harvard, many years later, in 1936, when he is invited, not for his own sake, but to tell about Ramanujan. We read about the lectures he didn't give, and in which he reflects upon his relation with Ramanujan.

Leavitt describes Hardy as a lonely, reticent, closeted, gay, cold fish, haunted by the suicide of his former partner Russel Kerr Gaye, who features as a ghost in the novel when Hardy is depressed. Some examples: As a child, Hardy wounded his sister Gertrude, which was the reason that she had a glass eye. This must have marked his relation with her. Nevertheless, when his mother is about to die, he is only occupied with his rendez-vous with a new friend in London, and leaves his sister alone to look after his mother. When he is about to meet Ramanujan for the first time at the Nevilles, he is on the verge of returning, not knowing how to behave.

Leavitt has a reputation for his gay novels and for rather explicit erotic scenes, but in this case he is rather restrained. He does sketch the secrets of the risqué society where homosexuality was somewhat tacitly tolerated, male couples living together, were invited as a pair at a party, while others, like Littlewood, the collaborator of Hardy, had a mistress that he visits every Friday afternoon in Treen in the South of England (which seems to have been impossible, given the train tables of that time).

There is a lot of name dropping in the novel. We already mentioned Bertrand Russel, who has a bad breath problem, and many other dons from Cambridge show up, like Keynes and Hobson (Hobson and Baker were colleagues of Hardy, to whom Ramanujan had addressed his letters in the first place, but they never reacted), but also Niels Bohr, Wittgenstein, and even D.H. Lawrence makes his appearance in Cambridge.



Bust of Ramanujan. A small replica is given to the laureate of the Ramanujan prize that is awarded by the International Centre for Theoretical Physics (ICTP, Italy) and funded by the Niels Abel Memorial Fund. The prize is given to a young mathematician of a developing country. A second Ramanujan prize is awarded by Shanmugha Arts, Science, Technology, Research Academy (SASTRA, India).

The health problems of Ramanujan have never been correctly diagnosed during his life. It was at some time said to be cancer, at other instances it was tuberculosis, or another type of infection. He stayed in different sanatoriums but never did really cure. At some time he even attempts suicide. Hardy forbids him to do this ever again, and Ramanujan obediently accepts. It is much later suggested that he suffered from a parasitic infection of the liver that he could have caught in Madras before he came to England. Leavitt however suggests that he got himself poisoned because he was cooking his *rasam*, a very spicy tamarind soup, in a pot that was eroded by the acid. Just before Ramanujan's return to India, Hardy managed to have him elected as a fellow of Trinity and as a fellow of the Royal Society of London. He was the youngest member ever elected.

Leavitt, being an American, has done some research also to be familiar with the world of academics in Cambridge, and if, as a reader you are not familiar, it might help to look up some terms too. For example, Hardy was a member of the *Cambridge Apostles*, a secret society centered at Trinity and King's. Hardy was also very much opposed to the *tripos* that were organized. These were tests (one could pass three of them to get the highest level, degree III). There was a strong competition because it was very prestigious to become a *senior wrangler*, that is the wrangles (somebody who passed the second degree exam) with the top score (Littlewood was a senior wrangler leaving a bigger gap between him and the second wrangler than between the second wrangler and the bottom scorer, called the *wooden spoon*). Perhaps Hardy being a fourth wrangler might have to do something with his aversion to it. Since 1909, the names of the wranglers are listed alphabetically and not by their score.

As a general conclusion: a novel about people, not so much about mathematics, and a bit long-winding, but interesting to learn about British society of that time, if you believe that an American can properly characterize it.

Adhemar Bultheel