Pure delight

Littlewood's Miscellany. Béla Bollobás, ed. Cambridge University Press, Cambridge, 1986. 200 pp.

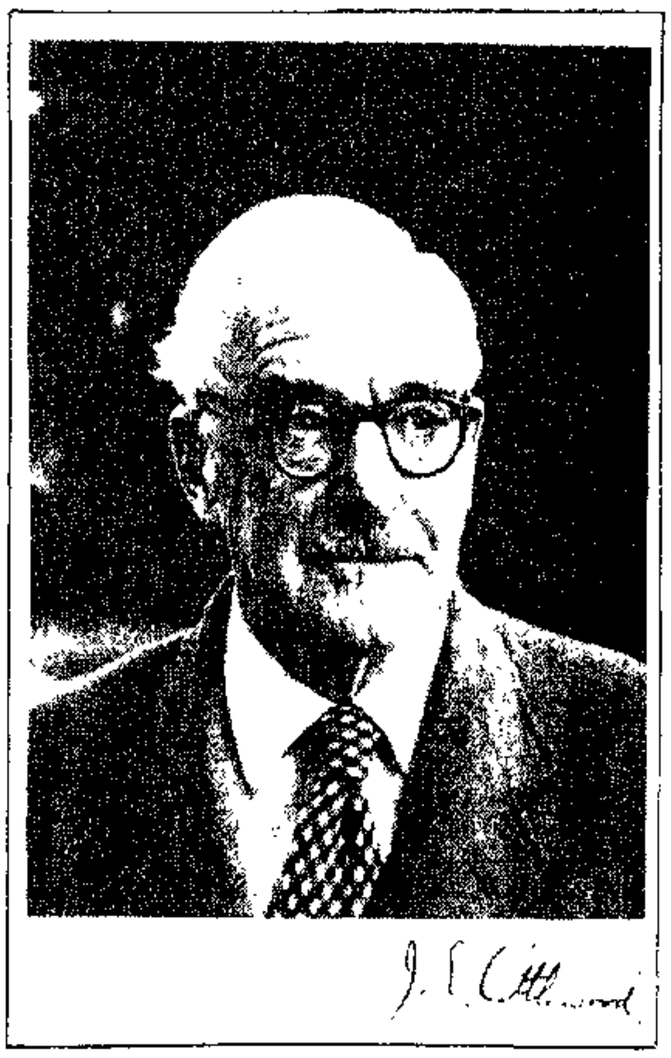
Littlewood's Miscellany first appeared in 1953 as *A Mathematician's Miscellany*. The original book, written for the 'intelligent amateur', only enjoyed modest success despite the rave reviews that it received ('This admirable book overflows with what G. B. Shaw calls the gaiety of genius', 'For many of us this is the book of the year!', etc.). Puzzled by this lack of success Littlewood concluded, rather in the manner of an *haut professeur*, that 'the loftier the intellect, the more the appreciation; the dim deprecate it'.

But as the years went by, the stern professor became a lovable old gentleman. And Littlewood decided to add new chapters to his *Miscellany* that would please both the lofty and the dim: charming anecdotes about friends and fellow mathematicians, nostalgic recollections of academic life, and endearing advice and *bons mots* from an 'old bloke'. Unfortunately the expanded version never got published in Littlewood's lifetime. The new *Miscellany* only appeared in 1986, about a decade after Littlewood's death, and largely due to the initiative of Béla Bollobás. But the wait has been worthwhile. Apart from the four new chapters, the new *Miscellany* also contains a marvellous 22-page foreword by Bollobás.

Indeed, one would be well advised to start reading *Miscellany* with Bollobás' foreword, however great the temptation might be to jump to pure Littlewood. The foreword is essentially a brief mathematical biography of Littlewood's life laced with personal anecdotes. The fact that Bollobás is himself an outstanding Greek-British mathematician is an added advantage. Bollobás' comments on the Littlewood–Hardy collaboration are particularly valuable (little is known about what made this immensely successful team click). And then Bollobás also had the benefit of being around when Littlewood got into his charmingly wicked moods. When a young painter once asked Littlewood if he could 'have the pleasure of painting you when you are 100', he was told, 'Why not? You look pretty healthy!' (Littlewood died at the age of 92.) *Miscellany* is full of such vignettes and we meet a Littlewood full of intelligence and good sense. There is, of course, much more in the miscellany than personal anecdotes: examples of 'beautiful mathematics', an essay on probability theory (a trifle disappointing), a comment on Fermat's Last Theorem, an illuminating discussion on how to express very large numbers, the full story of the discovery of Neptune, a review of Ramanujan's collected papers, and quaint recollections of Littlewood–Hardy.

Littlewood and Hardy were, as is well known, quite inseparable for over thirty years. The team produced some of the best mathematics of the century and is, even today, reckoned to be the finest example of collaborative work in mathematics. How did they do it? One has often searched Hardy's *A Mathematician's Apology* for some clues. But Hardy gives little away and would much rather talk about Hobbs and Bradman than Littlewood. (In his foreword to *Apology* C. P. Snow suggests that Hardy chose to be deliberately secretive on this subject.) Littlewood too does not explicitly discuss the association (he may have considered it too personal), but we do encounter, instead, some delightful Hardy memorabilia: 'Hardy took a sensual pleasure in calligraphy, and it would have been a deprivation if he didn't make the final copy of a joint paper'; 'Hardy liked to end the day's work feeling that the last idea had some hope in it. To me it is most repugnant to be enjoying possibly false hopes'; 'Hardy's passionate Cambridge loyalty had mellowed. He still wanted a Cambridge victory by an innings and 200, but no longer wanted the Oxford Captain to be hit in the stomach by the fast bowler'.

In his review of Ramanujan's collected papers, Littlewood has warm praise for Ramanujan, although not the hyperbole that Hardy reserved for his protégé. Talking of some of Ramanujan's mathematical results, he writes: 'The beauty and singularity of his results is entirely uncanny. Each of the positive integers appeared to be his personal friend.' About Ramanujan's contributions he is more ambivalent: 'Substantial and original as they are, they must take second place in general interest to the romance of his life and mathematical career.'



About what Ramanujan might have been he asks tantalisingly, 'What do you think would have happened if Ramanujan had come into touch with Euler at the right moment?' There is also an interesting anecdote about how Ramanujan was nearly denied the Trinity fellowship in 1919. Although he was already an FRS by then, a section of the electors still tried to block Ramanujan's election by expressing 'grave doubts' about his mental state. One elector was even more honest: he wasn't 'going to have a black man as fellow'! Finally, of course, Ramanujan did get elected, and English fair play triumphed yet again.

Indeed, time and again *Miscellany* offers glimpses of an imperial England with its old-world charm and value systems. There are references to lush green cricket fields, windows opening out to the sea, 'reflections' over a little bridge in pouring rain, sermons on how to relax on poetry and philosophy 'fortified by strong coffee', and charming tales of philosophical discussions at Cambridge ('Russell suddenly asked, "You don't like me, Moore, do you?" Moore replied, "No." This point disposed of, the discussion proceeded as before.') There are several such narratives in the book where Russell, Einstein, Hardy, Haldane, Weyl and many others are momentarily, but most pleasurably, reborn (but where is Wiener?). Examples: 'All Bertrand Russell said about their meeting (apart from how wonderful Einstein looked, and his wonderful eyes) was that Einstein told him a dirty story.

I said that Einstein was well known for consummate tact in adapting himself to his company'; 'Einstein in a lecture said, "This has been done elegantly by Minkowski; but chalk is cheaper than grey matter, and we will do it as it comes."'; 'When Hermann Weyl became a professor at Zurich, his class of a hundred odd dwindled to one, Mrs Weyl. He later pulled himself together and was most impressive'.

The book also abounds with Littlewood's own homilies: 'I have often thought that a good literary composition would be to compose a piece in which all the normal misuses of words and constructions were at first sight committed, but on consideration not'; 'Perfect numbers certainly never did any good, but then they never did any particular harm'. Littlewood's rumination on the tame mosquito is quaintly touching: 'I suddenly became aware that a mosquito visited me each night at 6.30. It did not ever bite; but one day I killed it. And then I experienced a slight, but perceptible, pang of grief, and guilt.'

Littlewood's Miscellany is therefore great fun all the way. The text is occasionally uneven, and no effort has been made to string all the pieces together. But then that's exactly how one defines 'miscellany': a collection without a natural ordering relation. Ever the rigorous mathematician, Littlewood opens his narrative by citing this definition! Rather surprisingly, the book also contains a few typographical errors. But there is no error quite as startling as what happened to Littlewood's σ. Encountering the text 'thus σ should be made as small as possible' in a mathematical proof, Littlewood's printer scoured the whole of London to print the smallest $\cdot$ ever seen!

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HISTORICAL NOTES

Srinivasa Ramanujan

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When I think of Indian science at its best, two names spring foremost to my mind—the towering figures of Raman and Ramanujan. Both were born a hundred years ago on the banks of the river Cauvery, and both were from poor middle-class stock. But when they grew up, they did things which made the world sit up and take note. The former was an experimental physicist *par excellence*, who won for India the Nobel Prize; the latter was one of the greatest mathematicians of the twentieth century. When the mathematicians of the world made a bust of Ramanujan, one copy of which was presented by the Nobel Prize-winning astrophysicist Prof. S. Chandrasekhar and Mrs Lalitha Chandrasekhar to the Indian Academy of Sciences, S. Chandrasekhar wrote:

> . . . as a companion to the bust of Raman so that the bust of the greatest physicist of India could be along with that of the greatest mathematical genius of our times who happened to be an Indian.

I do feel greatly honoured that I have been invited to speak about Srinivasa Ramanujan here. It would have been more appropriate for this talk to have been given by a mathematician, but it is too late for that now.

I feel very happy today, for I have seen the house in which Ramanujan lived (it is a pity that Ramanujan's house is still not a national monument; but this is not surprising in India); I visited the school which introduced him to mathematics, and mingled with the children there. I saw the river Cauvery, the life stream of the south flowing through the town (but sadly polluted). I admired the exquisite 19th century buildings (now alas falling into disrepair) of the college in which Ramanujan had to suffer so much scholastic ignominy. But I could visualize how beautiful the city must have been a hundred years ago!

Nothing "is as tedious as a twice-told tale", says Shakespeare. At this conference, the tale of Ramanujan has been told not just twice, but several times. My own account will be based on things told to me many years ago and now recalled from memory. Fortunately there is a tradition here that the oftener one listens to the tales of valour and achievement of our heroes, the more merit the listener acquires!

Sometime ago, I corresponded with a set of Ramanujan

Ramanujan's house in Kumbakonam

Lecture delivered at the Ramanujan Centennial International Conference (15–18 December 1987) at Kumbakonam. Reprinted with permission from the *Proceedings*, © Ramanujan Mathematical Society.