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## nonfiction

The Calculus of Friendship

### The Calculus of Friendship by Steven Strogatz

You wouldn't guess it from the title, but <u>The Calculus of Friendship</u> is a genuine tearjerker. I defy anyone to follow the correspondence between mathematician Steven Strogatz and his high school calculus teacher Don Joffray (affectionately nicknamed "Joff") without getting just a little lachrymose. If you don't, check to see if there is a heart in your chest. If there is, ensure that it's not just a cold slab of stone.

The book is built around selected letters in a thirty-year friendship, during which time the roles of student and teacher were comfortably reversed. Actually, this reversal was taking place as early as Strogatz's high school calculus classes, and not only because he was a gifted mathematician even as a teenager. More significantly, Mr. Joffray's eagerness to be taught by his students was what solidified Strogatz's confidence in his abilities. The best teachers still consider themselves students, and Joff bridges the gap seamlessly. Energetic and receptive, he genuinely revels in being trumped by his pupils. As Strogatz notes early on, "one thing about him was unlike any teacher I'd ever had: he worshipped some of his former students. He'd tell stories about them, legends that made them sound like Olympian figures, gods of mathematics." In a speech about Strogatz's high school accomplishments, Joff "portrayed [him] as a mountain climber, ascending the mathematical peaks and then returning with tales of what [he'd] seen," which made Strogatz's work sound "generous and heroic." Joff's admiration is endearingly unabashed in each letter, and his enthusiasm for their mathematical dialog is infectious.

Their letters are almost entirely math-centric. Any life lessons are incidental, gleaned only after the friendship's

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longevity combined with Joff's age and condition had rendered them unavoidable. Up until that point, their relationship had been based solely upon a mutual joy in problem-making and problem-solving, with barely any attention paid to the often cataclysmic changes each man was undergoing personally. Sprawling equations and trigonometric drawings abound: any casual reader (which I am) will be lost in a maze of variables, graphs and complicated approaches. Half the time, I could barely understand the problems, let alone the solutions.

But the advanced calculus does not come at the expense of the book's charm or readability. For one thing, the jargon of any profession is fun to read, regardless of whether or not you can fully grasp it (for example, my brain was not going to have anything to do with "differentiating under the integral sign" but the letter about the process was one of my favorites in the book). And for every problem you need a degree to understand, there is another based on more conceptual grounds. A well-known puzzle from the "Ask Marilyn" column for *Parade* magazine was particularly riveting and troublesome:

"Suppose you're on a game show, and you're given the choice of three doors. Behind one door is a car, behind the others, goats. You pick a door, say #1, and the host, who knows what's behind the doors, opens another door, say #3, which has a goat. He says to you, 'Do you want to pick door number 2?' Is it to your advantage to switch doors?"

It looks simple. It is not. To be honest, it's still driving me a little nuts.

But before elaborating on the heart of *The Calculus of Friendship* -- Don Joffray -- I have a gripe. I wish I did not, and I'm aware that this is quibbling. The prologue ends with the sentence "It is a game they love playing together -- so often the basis of friendship between men -- a constant when all around them is in flux." A few pages earlier, Strogatz quotes his wife as she marvels at their math-focused correspondence: "'That is such a guy thing' she said, shaking her head." Well, it's not really, though. There are guy things, but liking math is not one of them. Nor is basing a friendship around shared knowledge of a discipline. Trust me, I hate making this point probably as much as you hate reading it. It's abundantly clear that these statements are innocuous -- in the course of the book, Strogatz references the work of his female colleagues as casually as his male colleagues. My problem with it, more than anything, is that it is *distracting*. It is a distraction, right up front, in the prologue. And I feel an odd duty to inform other quibblers that it is accidental, and does not repeat itself outside the opening pages.

Now that this half-foot hurdle is cleared, I can move on to remarking, probably too effusively, on the affability of the person to whom this book is a tribute. I wish more fictional characters resembled Don Joffray; he is much more understated and likable than our imaginary teachers, such as the bombastic, more complicated John Keating of *Dead Poets Society*. Who needs that? *The Calculus of Friendship* presents a teacher who is simultaneously accomplished, creative, inquisitive, idealistic, grounded and friendly, but who is also unfailingly modest. The range of his pursuits is indirectly proportionate to his humility. In addition to teaching calculus, he is an international whitewater champion, a jazz pianist, an avid athlete; post-retirement, he paints, he windsurfs, and he builds everything from birdhouses to boathouses. I laughed aloud when he mentions in one letter to Strogatz "Wreathmaking occupies much of my time" -- as if another hobby was really necessary.

But above all, Don Joffray approaches life with a calm acceptance befitting of a calculus teacher. After all, calculus, at its simplest (excuse the contradiction), grasps infinity by breaking it into smaller units. Strogatz portrays Joff as living in a corresponding fashion, moment-to-moment, dealing with life's sharper edges as they come. Joff begins the letter that catalyzed this book by writing, "Eek! I had a mild stroke." Many people would describe such an event as being a harrowing and depressing brush with mortality, but, naturally, Joff precedes the announcement with the word, "Eek!" as if he just spotted a mouse. After explaining that doctors said his heart was a little leaky, he jokes to Strogatz "I never had a boat that didn't leak." And in one of the book's most moving passages, Strogatz finally expresses condolences for the death of Mr. Joffray's son Marshall, over twenty years after his passing. Joff's response is heart-rending in its stark simplicity. He does not make Marshall out to be more than he was, even though it's clear that beyond parental love, he had enormous respect and admiration for his son. It was a great sadness in his life, and he explains it exactly that way: no additions or deletions.

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Strogatz is smart about the book's structure and gives most of his chapters titles that relate both to calculus and to life: "Relativity," "Infinity and Limits," and "Chaos" are good examples. The metaphors often work in elegant, unexpected ways, while thankfully never threatening the naked honesty of the book. Regarding his teacher-turned-student, Strogatz writes, "Jazz piano, windsurfing, whitewater kayaking -- all these balance the inevitable against the unforeseeable, the two sides of change in this world: the orderly and the chaotic, the changes that calculus can tame and the ones it cannot. He confronts them all, and not, like Zeno, with his mind alone but also with his heart".

I warn you about this passage now because it is one of a few that might result in you explaining, "no, no, there's just something in my eye, that's all. Why would I cry about the metaphorical implications of a function approaching a limit?"

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