

A Tale of Two Titans

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Measuring the World
Daniel Kehlmann
 (Translated by C B Janeway)
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I picked up the book thinking that it was a non-fictional book about the measurement of the Earth. A few pages into the book, I realised it was on the borderline between fiction and non-fiction. Then I read that the book was hailed in Germany as the pioneer of a new genre – of intellectual novels – and that it was a bestseller in Germany, having pushed away many luminaries off the shelf. I was curious and read on.

At the heart of the book are two lives: Carl Friedrich Gauss (1777-1855) and Alexander von Humboldt (1769-1859), the two stars of science in eighteenth century Germany. Gauss was a mathematician and a physicist whose work on number theory, differential geometry and magnetism helped develop these topics – one of the units of magnetic fields is ‘gauss’, named in his honour. Humboldt came from a rich family, went on expeditions, and was one of the first to describe the topography of South and Central America. They had met once and corresponded thereafter, and their

intertwined lives motivated Kehlmann to write the book.

In a way, Gauss and Humboldt were completely unlike each other, and a study of these two scientists shed light on the multitude of temperaments of scientists; there are many different aspects to research, and different people with different temperaments find and do what suits them best. There is no unique or preferred way, except being honest to the truth and keeping one’s integrity; it does not help to boast about one’s way of doing science and be dismissive of others’ (as many scientists often do!).

Gauss was from a poor family and never left Germany, whereas Humboldt, a Prussian aristocrat, went around the world. Gauss liked to work in isolation and stayed away from academies and conferences, whereas Humboldt took delight in organizing them. Humboldt excelled in descriptive sciences, and Gauss was a master of analysis.

Kehlmann describes Humboldt’s experiences in vivid terms. He grew up an indefatigable observer, taking measurement of everything in sight, and recording them meticulously. In Central America, he discovered, with the help of the botanist Aime Bonpland, the connecting channel between Orinoco river and Amazon, and realised for the first time that Mayans were excellent astronomers, and scaled up the highest peak known at that time (the news of Himalayas being the tallest came when he reached home).



Halfway across the world, Gauss was working out the celestial path of a newly discovered asteroid (Ceres – now called a dwarf planet), and wondering about curvature of space, if parallel lines ever meet. The juxtaposition of their parallel lives shows the many sides of scientific research, an insight that enriches Kehleemann's book.

Later, Gauss undertook a difficult experiment to determine the curvature of the world by finding out how the sum of three triangles made by points on the surface of the Earth differed from one hundred and eighty degrees (which is the case in plane, Euclidean geometry). At the same time, Humboldt was painstakingly mapping the continents and taking measurements of height, temperature, analysing soil and trying to find out the nature of volcanoes. The title 'Measuring the World' is therefore well justified.

Kehleemann has cleverly woven into the narrative the socio-political scene in Europe at that time, at the time of Napoleonic wars. Here too are the dissonances between the two characters: Gauss was resolutely on the Prussian side and proudly declared that Napoleon spared Gottingen because of him. Humboldt was more diplomatic about it and managed to please both Napoleon and Prussia, and even the Russian Tsar into sponsoring his exploratory trips.

Kehleemann has also put in the minds of Gauss and Humboldt their dreams of what the future might look like, and here, the author has an advantage of looking back in time and

knowing what the future (the present for us) holds. These parts sound a bit too omniscient for comfort, but it is interesting no doubt to compare the present day situation with that in the past.

One of the most touching parts of the book is the interaction between Gauss and Humboldt. In Kehleemann's imagination, they talk past one another, vaguely aware of what the other is saying but clinging on to one's own words. In the final years of their lives, we find Gauss becoming a domestic tyrant, disrespectful of his own family members, while Humboldt is shown to succumb to his own celebrity, a victim of the fellowships and awards he is showered with. These aspects of a scientist's life are wonderfully sketched here. We also see a young Gauss visiting an old Immanuel Kant, hoping to convince him of his new ideas which Gauss thinks only a living legend like Kant would understand. But he finds Kant too old and senile to even try to understand. Scientists are human beings after all, and it is a reminder of the pitfalls of glorifying the people in science more than science itself.

However, some readers may find the prose style too breezy for the gravity of the matter. The easy style of writing has made the book a bestseller, but to some, it may appear a bit shallow. Kehleemann does not, however, compromise on the scientific issues – his descriptions and brief explanations are lucid, although they are not always very deep. But the reader can always delve into the topics and find out for oneself.



Another issue with the book is the romanticization of the process of scientific research, and giving too much importance to individuals – here Gauss and Humboldt – as opposed to the scientific enterprise itself. At times, we hear of ideas coming to Gauss's mind like a bolt from the blue, whereas real ideas always come to a prepared mind. Gauss must have been thinking of the problem so much that a solution appears to him like a flash. This sort of portrayal of scientific research is risky

in that students may get an overly romantic idea of what research means.

The book is otherwise an interesting read, and it will certainly stimulate most readers' interest to learn more about the works of Gauss and Humboldt, and wonder how scientists think and feel about what they do.

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