

# Cubed: The Puzzle of Us All

by Ernő Rubik



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REVIEWED BY OSMO PEKONEN

**R**ubik's Cube, the mathematically captivating object invented by the Hungarian architect and designer Ernő Rubik in 1974, is now middle-aged in human terms, but seemingly suffers from no midlife crisis. It is reckoned that over a billion people—or about every seventh member of humankind—have at least tried to solve it by now. Its creator, born in Budapest in 1944, recently turned 75 and decided to tell his life story in book form for the first time. He remains as puzzled as the rest of us by the qualities of the object that he made.

Hundreds of millions of copies of the Cube having been sold all over the world, the object has become a cultural icon and is likely to go down the generations as surely as, say, the Pythagorean theorem. (For that matter, I am not so sure whether one billion people could state the Pythagorean theorem.)

For a mathematician, the transformations of the Cube constitute a group of order 43,252,003,274,489,856,000 whose structure is well understood. Still, it was not until 2010 that mathematicians Morley Davidson, John Dethridge, Herbert Kociemba, and Tomas Rokicki, using about one billion seconds of processing time donated by Google, were able to prove that 20 moves always suffice to solve the Cube starting from any initial position, and that this number is optimal. The theoretically optimal set of moves, however, is so complicated that it does not provide a useful algorithm for the speed solvers, who typically use more moves but need only a few seconds to finish the job. Some of them have developed “Rubik’s wrist,” a repetitive strain injury comparable to tennis elbow.

Ernő Rubik has not suffered any physical or mental harm as a result of the Cube, but he marvels at how it has transformed his life, and the lives of so many others, as if he had been a sorcerer’s apprentice releasing a mischievous spirit that he could no longer control.

His father, Ernő Rubik Sr., also a well-known designer, specialized in aviation and was obsessed with creating the perfect glider; his mother was multitalented and agile, a pianist and a poet, who dreamed of becoming a physician. To have been born on July 13, 1944, in Budapest, as Ernő the younger was, was not optimal timing. The family experienced—and survived—the Nazi terror regime as well as the siege and bombardment of the city by the Red Army. After the war, the family business was nationalized, but unlike many other private entrepreneurs, Ernő Rubik Sr. was allowed to stay in the company that he had founded. Eventually, he fulfilled his dream: in the early 1960s he

developed R-26 Góbé, an optimal training glider that was internationally commercialized. In 1963, he was awarded the Kossuth Prize, Hungary’s most prestigious national award; his son received the same distinction in 2007 for an object much smaller than an airplane.

Ernő Rubik Jr. is tired of being asked how he invented his eponymous cube, so he bluntly answers, “I found a problem that captured my imagination and did not let me escape” (p. 6). As a matter of fact, it somewhat irritates him that while he did many other things in life, he is remembered only for the Cube. He has advice to those of us who would like to make a spectacular invention:

Close your eyes and imagine an object in as much detail as possible. It can be anything, but my advice is to pick something as simple as possible: a table, a chair, a coffee cup, a vase ... Become an ant and crawl over it and under it, examining its every angle and surface. Turn into a hummingbird and fly around it and fly over it. Finally, peek inside the object. Can you see the structure that holds it all together? (pp. 38–39).

Rubik’s Cube is the perfect puzzle. Anyone can immediately understand its interest as a game, and no instructions are really needed, yet for most people it represents a real challenge—not least for the designer himself. Indeed, having scrambled the Cube’s prototype for the first time, Rubik experienced fear, like a child lost in a forest, as he realized that he had no clue how to return the Cube to its initial position. “It was as if I were staring blankly at a secret code, which I myself had created but could not penetrate” (p. 71). Ultimately, Rubik became the first human being to solve the Cube, but it took him weeks to figure out how. He never wanted to become a speedcuber, and he feels awkward when questioned about his record time.

Realizing that the mysterious object might have some commercial potential, Rubik submitted an application to patent his invention on January 30, 1975, as a “three-dimensional logical toy,” but the bureaucracy of socialist Hungary took until October 28, 1976, to process the request. Finding a manufacturer was no less complicated, but at the end of 1977, a new product named *Bűvös kocka*, or “Magic Cube,” appeared in Hungarian toy shops. The best experts estimated that the Cube might sell at most 10,000 pieces in the first year, but only 5,000 were produced to start. Pretty soon, all Hungary was addicted, and by the end of 1979, 300,000 cubes had been sold in Rubik’s home country alone. Surprisingly, the capitalist giants dominating the international toy market were at first totally unimpressed.

David Singmaster became the Cube’s first major advocate among mathematicians. He first chanced upon it in 1978 during the International Congress of Mathematicians in Helsinki, to which a Hungarian educator had brought it. The mathematicians immediately realized what an excellent illustration of concepts of group theory the Cube provided for their teaching. An avalanche of mathematical papers and books, but still no commercial breakthrough, followed.

Enter Tom Kremer, a Holocaust survivor from Transylvania, who had settled in the UK and become a small-scale businessman with an interest in toys and puzzles. He saw the Magic Cube presented at the Nuremberg Toy Fair of 1979 and decided to introduce it to the US market, rebranding it “Rubik’s Cube” on the way. The rest is history.

For Ernő Rubik it all felt like a fairy tale come true. His first trip to New York in 1980 to promote the Cube was also his first trip to the West, his first overseas flight, and his first business trip at large. Moreover, he now held the coveted blue passport, which allowed him to travel to the West, instead of a red one, which was valid only for fraternal socialist countries. MoMA exhibited the Cube in 1981.

By 1982, when the first craze around the Cube was ebbing, Rubik found himself in a highly unusual situation in Hungary: he had some surplus money and could open a design studio of his own. He soon had a new house, and a new wife as well. However, because he had been educated in the socialist mind-set, where economic success was deemed impossible for anyone except some party bosses, it all felt very strange. Soon afterward, the Iron Curtain collapsed, and the former Eastern Bloc became the theater of a wilder form of capitalism than anything in the West, while Ernő Rubik maintained some of the tranquil attitude of his youth. He designed a number of other puzzles, constructed some houses, and created a foundation to help other inventors. Telling his story retrospectively, he sounds like a modest everyman musing about his weird destiny. He is reclusive by nature, and uncomfortable with the fame and honors showered upon him. In Japan, where thousands of fans lined up to get his signature, he felt like an animal exposed in a zoo. His philosophical reflections on fame, money, and success are highly interesting to read, since his midlife crisis—if there was any—coincided with a total transformation of the ambient Hungarian society.

The name Rubik is not common in Hungary, nor anywhere else. It has truly become the name of the Cube more than of a person, much like Kalashnikov, the other designer who came in from the cold. Not many a mathematician could imagine comparable fame, whatever he or she invented. Over the years, Rubik has compiled a collection of the thousands of manifestations of the Cube as a cultural icon, enough material to constitute a full-scale museum devoted to the Cube. “Increasingly, it seems as if the Cube had been waiting to be discovered, and I was the fortunate person who stumbled upon it” (p. 133). In some passages

of the book, the Cube appears as an autonomous living thing that may have possessed the life of its creator, but not entirely his soul.

For Ernő Rubik, his Cube is a perfect little thing in the sense of Saint-Exupéry: not because there is nothing to be added to it, but because there is nothing to be withdrawn from it.<sup>1</sup> One can say the same about the inventor’s autobiography.

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<sup>1</sup>Il semble que la perfection soit atteinte non quand il n’y a plus rien à ajouter, mais quand il n’y a plus rien à retrancher. – Antoine de Saint-Exupéry: *Terre des hommes*.