

father writing those words late at night, sitting at his desk in the low light of a lamp, singing while he worked on The Second Law of Thermodynamics. And at that moment, she realized that he had always had what she never had—happiness. Her father had lived a life. Ellen let the notebook drop to the floor.

Weak with exhaustion, she fell back on the bed. Jake had been right. She had not amounted to much. And she was no longer young. Soon, her looks would be gone, and then she would have nothing. How had it all happened, the years? The years were so small. Tomorrow, she would need

to make final arrangements for the funeral. She would have to decide about the flowers and the music and whether to rent a car. She would have to ask Susan for money. And then the trip back to Cleveland, her receptionist job at the Cleveland *Plain Dealer*, the four rooms of her empty house. Now her head was pounding. For a while, she lay staring at the ceiling. Then she leaned over and picked up her father's notebook and put it beside her on the bed. She would keep it herself. She would keep it, she thought, while the clock ticked and ticked and Jake in the next room turned in his dreamless sleep. ■

From Science to Fiction

Whether he is talking about his old life as a theoretical astrophysicist or his newer life as a novelist, Alan Lightman invariably brings the discussion around to the notion of creativity. What Lightman realized as he moved from physics to fiction is that creativity has its own life, its own value, regardless of its source.

When he was immersed in research on radiation processes related to black holes, he had intense moments of discovery that all good scientists know. When he was writing *Einstein's Dreams*, an unusual work of fiction, he had intense moments of realization that all good novelists know.

"The creative moment feels exactly the same in both science and fiction writing," Lightman said. "For me, when you are in the zone, when you are in that magical place where you lose all sense of your body and all sense of your ego, and you're just in that creative world, the sensation feels exactly the same to me as a scientist or as a writer."

Lightman, 56, a professor of humanities and former senior lecturer in physics at MIT, wrote poetry as a child in

Memphis, Tennessee. At the same time, to the dismay of his neighbors, he built and launched small rockets. It was a blend of talents that continued through his undergraduate years at Princeton and his PhD work in theoretical physics at Caltech. As a postdoc in astrophysics at Cornell in the mid-1970s, he was publishing poetry in small literary magazines at the same time he was working on stellar dynamics and radiative processes.

In 1976 he became an assistant professor of astronomy at Harvard and a few years later took a position as a research scientist at the Harvard-Smithsonian Center for Astrophysics. He also coauthored science books, including the *Problem Book in Relativity and Gravitation* (Princeton U. Press, 1975), and *Radiative Processes in Astrophysics* (Wiley, 1979). As a scientist, he was, as he describes it now, "in the game."

Then, in his late thirties, Lightman came to another realization, not in a creative moment but in a slower dawning. As he describes it, "I could see to the end of my career and I could see what I would accomplish in physics—the magnitude of it, the importance of it—and I realized that I was not going to get better as a physicist. Just the opposite, in fact."

He was aware that most physicists do their best work at a young age. "If you look at the Nobel Prizes and the average age when the prize-winning work was done, for physics that average age is in the mid-thirties. Other sciences also peak at a rather young age, but in physics it's the youngest. So the question is, What do you do after you have reached your peak? I think many people just ignore it and keep working, keep up research. Others go into administration and start writing textbooks, or serve on national committees."

As Lightman became increasingly aware of his "early beginning of the end," he focused on creativity. How could he continue to be creative and at the same time do something that would allow him to get better with age? He began to shift his emphasis from physics to writing. He wrote essays for magazines, a well-regarded general science book called *Ancient Light: Our Changing View of the Universe* (Harvard U. Press, 1991), and, in 1993, the breakthrough book, *Einstein's Dreams* (Pantheon Books, 1993). It was fiction, science, and poetry blended into a small book that more than a decade later has been translated into 30 languages and is still in bookstores.

Lightman has written several more novels, each stepping farther from his roots in science. He has made the transition from scientist to writer. Early on he was "anxious about a possible loss of self-identity" as a scientist, but that has passed. He experienced the "natural sadness" about "leaving the game" of research, he said, but his scientific colleagues received his shift in direction "with sympathy."

Now, as a writer in search of creative moments, he says, "I feel like I'm getting better and better." "I have a lot to learn as a writer, and have a lot of surprises for myself in the future. Whereas, as a physicist I felt that by the time I was in my thirties I could no longer surprise myself in terms of what I was capable of doing."

Jim Dawson



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