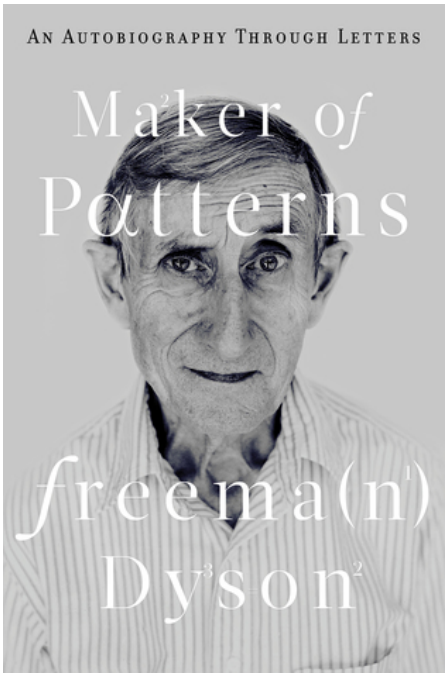

Maker of Patterns: An Autobiography Through Letters

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Having penned hundreds of letters to his family over four decades, Freeman Dyson has framed them with the reflections made by a man now in his nineties. While maintaining that “the letters record the daily life of an ordinary scientist doing ordinary work,” Dyson nonetheless has worked with many of the twentieth century’s most renowned physicists, mathematicians, and intellectuals, so that *Maker of Patterns* presents not only his personal story but chronicles through firsthand accounts an exciting era of twentieth-century science.

Though begun in the dark year of 1941 when Hitler’s armies had already conquered much of Europe, Dyson’s letters to his parents, written at Trinity College, Cambridge, often burst with the curiosity of a precocious seventeen-year-old. Pursuing mathematics and physics with a cast of legendary professors, Dyson thrived in Cambridge’s intellectual ferment, working on, for example, the theory of partitions or reading about Kurt Gödel’s hypotheses, while still finding time for billiards and mountain climbing. After graduating and serving with the Royal Air Force’s Bomber Command operational research section, whose job it was “to demolish German cities and kill as many German civilians as possible,” Dyson visited a war-torn Germany, hoping through his experience to create a “tolerably peaceful world.”

Juxtaposing descriptions of scientific breakthroughs with concerns for mankind’s future, Dyson’s postwar letters reflect the quandaries faced by an entire scientific generation that was dealing with the aftereffects of nuclear detonations and concentration camp killings. Arriving in America in 1947 to study with Cornell’s Hans Bethe, Dyson continued to send weekly missives to England that were never technical but written with grace and candor, creating a portrait of a generation that was eager, as Einstein once stated, to solve “deep mysteries that Nature intend[ed] to keep for herself.”

We meet, among others, scientists like Richard Feynman, who took Dyson across country on Route 66, Robert Oppenheimer, Eugene Wigner, Niels Bohr, James Watson, and a young Stephen Hawking; and we encounter intellectuals and leaders, among them Reinhold Niebuhr, George Kennan, Arthur C. Clarke, as well as Martin Luther King, Jr.

The “patterns of comparable beauty in the dance of electrons jumping around atoms” invariably replicate themselves in this autobiography told through letters, one that combines accounts of wanton arms development with the not-inconsiderable demands of raising six children. As we once again attempt to guide society toward a more hopeful future, these letters, with their reenactment of what, at first, seems like a distant past, reveal invaluable truths about human nature.

Maker of Patterns: An Autobiography Through Letters Details

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From Reader Review Maker of Patterns: An Autobiography Through Letters for online ebook

Christopher Stumm says

Interesting to read Dyson's real time perspectives of historical events, in the form of letters to his parents. Surprising how many things from the past remain relevant today.

Sarah Boon says

I enjoyed this book far more than I thought I would. I don't understand all the science, but it's fascinating to see the free movement of scientists around the world, sharing ideas and conversations and also being politically involved. It was the level of political involvement that impressed me, given how scientists today often say they shouldn't be involved in politics. And the relatively small group of international scientists who circulated between Cambridge, Princeton, Cornel, Los Alamos, etc. is fascinating.

Thomas says

I like collections of letters in general, and I enjoyed this one tremendously. Dyson is an interesting guy, and I liked learning a little more about his life via his letters. I wish there were some letters to other recipients (the letters in this volume are all to his parents and sister in England), but enjoyed it more than I expected.

Philipp says

> I do not have any great discovery like the double helix to describe. The letters record the daily life of an ordinary scientist doing ordinary work. I find them interesting because I had the good fortune to live through extraordinary historical times with an extraordinary collection of friends.

Freeman Dyson wrote some of my favourite essays and book reviews, mostly because he has got a way of thinking about things from a very, *very* big perspective. Luckily there's this new autobiography!

We get Dyson's letters starting in 1941, when he was 17 years old and starting university, and end in 1978, with a near death experience during a mugging, when Dyson was around 55. He is now 94 and still writing essays for NYRB.
These letters are structured like Goethe's The Sorrows of Young Werther - we only get Dyson's letters, the answers from his mother or sister are always omitted. I like that format, as I'm interested in that particular area of history, I wouldn't care too much about Dyson's family's opinions. You need to be acquainted with Dyson's life and the history of physics around 1920-1950 to get the most out of this book; there are many

comments in italics by 2016 Dyson explaining some of the names and references, but frequent jumps (some by 6 months or more) make it hard to tease Dyson's life history from these letters.

I don't know much about physics but I know more about the history of physics. *All* the big names appear here and had contact with Dyson - Feynman features extensively (Dyson paints him in a very positive picture) as does Oppenheimer, Dirac appears, as do Besicovitch, Pars, Hawking, Yukawa, W. T. (Bill) Tutte, Bethe, Teller, but also amazing non-scientists: Léon Motchane (rich industrialist in the 20s, then member of the French resistance (wounded in action), then PhD in mathematics at the age of 54 (!!!), then used his wealth to found IHES), T.S. Eliot (!!!), Stanley Kubrick, etc.

Some notes:

- If you're looking for a general intro to 'what it's like to be a scientist', do *not* go for this book. Dyson lived and worked through a peculiar and unique time in an extremely vibrant environment, that's the 0.0000001% of science. Since then science as profession has become much more streamlined, controlled, and evaluated. Dyson writes about a fellowship he received which included costs for 'a summer of travel' - nowadays that's unthinkable. Produce papers or perish, no time to bum around for a few months.

- I have to read more about Henry Moseley. Dyson credits Moseley for saving Dyson from being drafted: Moseley was a promising physicist who was killed in 1915, after which the British government drafted laws to exempt promising young scientists in any war. There's a whole book possible around what these laws made possible!

- Dyson, especially the young Dyson, was amazingly shrewd, self-confident, and clear-sighted. I have no clue how he managed to do that at such a young age (an academic family probably helped in understanding academic political structures), but sentences such as this one show you how well he grasped his situation and position, and how good he was at seeing the big picture:

> During the next five years, there is a gambler’s chance of my doing something substantial in this field, but only if I give it a lot of my time and attention. The important thing is to use this chance while it is here. By the time I am forty, the game will be played out.

That was in 1948, when Dyson was 25. I know scientists in their 40s who don't understand their position as well as Dyson did back then. Dyson was correct in that this particular field of science quickly 'dried out', bigger and bigger particle accelerators were necessary to get results.

- there are some wonderfully understated short scenes, Dyson got around!

> I had a telephone call from London, a film magnate called Roger Caras asking me to come to his studio to help them with a science fiction film called Encounter 2001. Stanley Kubrick, who directed Dr. Strangelove, is also doing this one.

or

> FEBRUARY 28, **1970** I was taking care of Stephen Hawking, a young English astrophysicist who came here for a six-day visit. I had never got to know him till this week. Stephen is a brilliant young man who is now dying in the advanced stages of a paralytic nerve disease. He got the disease when he was twenty-one and he is now twenty-eight, so his whole professional life has been lived under sentence of death.

- there are some concerns which you usually don't find in physics autobiographies. Dyson (quotes as 'having been brought up as a socialist') had an eye for social injustices. There is one letter complaining about the squandered life of a promising African-American scientist (Walter Macafee) who could have done so much more if he wouldn't have needed to work in poverty for most of his life, in 1948, when Dyson was 25:

> He is much older than the rest of us and has the handicap of his lost years. His story is an object lesson in the wastefulness of the discrimination policy.

Or this one:

> I heard King speak in Berkeley about fifteen years ago, before he became famous, and I always had a great belief in him. He was far and away the greatest and most far-sighted of the Negro leaders. I do not blame the negroes at all for rioting now. If I were black, I would be out in the streets with them.

(Apologising note in another letter by 2016-Dyson: 'In those days the word negro was used as African-American is used today.')
There's another wonderful passage where Dyson describes the advances made by Japanese scientists in the 50s and 60s, and how happy he is that some of the Japanese advances anticipated US inventions:

> If the scientists can say that even in this chosen field of physics America was anticipated, and indeed by a member of the much-despised race of Japanese, this will be a strong card to play against nationalistic policies.

- a wonderfully dry British humor:

> About ten thousand Princetonians came to watch and got in the way to some extent.

- it's interesting to see how fears can take hold of a society and then drop off completely, even their names

forgotten. Dyson lists a prime example in his explanatory notes:

> The “European situation” here means the fear that the rising population of Europe would be unable to feed itself. This fear was particularly strong in 1948 in England and in Germany. The expected disaster never happened, partly because birth rates remained lower than expected and partly because the Green Revolution made food production higher than expected.

Have you ever heard of the 'European situation'? I haven't.

- The final few sentences summarise well the kind of thought building Dyson operates in:

> [Young people] need to understand why science has failed to give us fair shares and social justice, and they need to work out practical remedies. This is not a job for scientists to do alone. It will need a worldwide collaboration of scientists with economists, political activists, environmentalists, and religious leaders, to lift science and society out of the swamp where we are stuck. Pure science is best driven by intellectual curiosity, but applied science needs also to be driven by ethics.

Recommended for: people interested in how great minds work, or those who are interested in the history of the *Knabenphysik*.

not recommended for: people who don't want to put in at least a little effort to first learn this history, or people who are not interested in this (to me!) highly exciting short time in science. I find that time so interesting - I don't think there's any other field of research where one or two decades of a flurry of research by very young people changed everything, it's like reading about a continuous explosion, like watching a 20 year long meteor shower.

Scott Kardel says

Maker of Patterns is an interesting autobiography written by Freeman Dyson, one of the top physicists of the Twentieth Century. His book is focused much more on his life (as told through his letters home) than his science. While some of his scientific work is discussed, there is much more about his relationships with people both in academics and his personal life.

Cosmic Jae says

The book provides a unique and intimate look into the mind of a theoretical physicist. Reading his letters makes me feel as if I was right there in the middle of the exciting new discoveries in particle physics in the 40s, 50s. While Freeman Dyson doesn’t go too much in-depth on the discoveries, you can still sense the thrill

and excitement of discovery.

Peter Reczek says

I enjoyed reading all the anecdotes that kept the pace of the book going but was a bit disappointed in coming away with a "Forrest Gump" view of all the important people Dyson knows rather than an understanding of how his mind works. The format of an autobiography through letters was a clever touch.

Bob says

Very interesting. He knew lots of cool people.

Leonard Kim says

3.5 stars. If you are interested in Freeman Dyson’s life and letters then by all means bump that rating up to 4 or 5 stars as this is obviously the book for you. I personally enjoyed this book but am trying to be mindful in my rating of those readers who may not know or care who Freeman Dyson is There is still something to gain from spending time with such an intelligent writer, but this is hardly an essential must-read for everyone.

MD says

This book uses the possibly unique approach of building an autobiography using the subject’s letters to his parents as the foundation. This provides for a story in which the writer doesn’t know how things will turn out as well as preserving the point of view of the time when the letter was written. Freeman Dyson has lived an extraordinary life surrounded by other extraordinary people. Ordinarily I don’t much care for autobiographies but I found this one riveting. If you are interested in physics you will probably find the glimpse into the day-to-day lives of the world’s preeminent physicists adds even more interesting. But even without that interest I found this journey from wartime England to postwar Germany and then US academia through the Cold War and beyond fascinating reading.

I read an ARC of this book which I received from the Goodreads first reads program.

R?hul says

Freeman Dyson is an English mathematician and theoretical physicist, of the generation after the likes of Feynman and Schwinger, who lived through many of the mid-20th century's momentous events. It was a time when theoretical physics was at the forefront of the world's imagination- from questions of energy security to war strategy to philosophy. Later years would prove much of this promise unrealized but the great physicists of the time still loom large in our imagination.

Dyson was an inspired mathematician, but also someone educated in the broad European tradition, speaking German & Russian, and reading Lev Tolstoy & Thomas Mann between solving theorems. Since leaving for Cambridge and for years later, Dyson kept up correspondence with his mother, writing eruditely about the luminaries he met and his ringside seat on events shaking the world. Letters from the early 1940s to the late 60s form the bulk of this book, with the earliest letters focusing most on his own education and work, then on the great scientists he worked with, and then matters of life & love. The letters were saved, at Dyson's direction, by his mother and are now published here with annotations and explanations.

Dyson studied at Cambridge with Hardy and worked with allied bomber command during the war, spent time in Germany with erstwhile enemies soon after, then was a student of Bethe at Cornell where he met Feynman and went on to join the Institute of Advanced Study in Princeton where some of humanity's brightest are paid simply to think. Dyson's interactions with endlessly fascinating scientists like Feynman and Oppenheimer, his views on the terror of the early days of nuclear weaponry, and work with the Federation of American Scientists (FAS) on some sort of international control of nuclear energy form some of the sections of most general interest. His insider's views of academia is a windown on how some results are driven by personalities rather than pure work, and how politics often impact the way credit is offered. For example, Dyson feels a rising nationalism in post-war American science with new homegrown theoreticians to supplement existing American dominance in experimental physics, and senses an effort by the Physics community to spread the credit of some new discoveries (with some scientific justification as well) to others. In Dyson's interactions with Feynman, Oppenheimer and Teller, one sees fierce disagreements but also an ability to restrict them to specific matters in a way that displays supreme self confidence and mutual respect. Oppenheimer comes across as a renaissance man, but also a tragic figure of many inconsistencies.

In extended breaks from the Institute, Dyson worked with General Atomics in California, first on the successful TRIGA reactor and then on the doomed Project Orion which attempted to propel spacecrafts with controlled nuclear explosions. The latter was hobbled by technical challenges, and crippled by the partial test ban treaty. Dyson's letters in this period are very interesting, written as they are without the benefit of hindsight. One might also notice some self-serving arguments that we are all prone to when we make personal decisions. Dyson's roles in the FAS and Project Orion contrasted with each other in the great test ban debates of the day.

To sum up, Freeman Dyson collects these beautifully written letters about a life lived in the thick of things in a time when Physics was at its apogee of promise, both for saving and for destroying humanity. Below are some quotes that resonated with me.

Having worked at the British bomber command, the young Dyson had the perspective soon after the war in his visit to Germany to write- *"I had killed enough Germans, and I wanted to make peace with the survivors. We all knew that the Germans had committed atrocities, and we had too. The victims who died in the camp at Bergen-Belsen were about as many as those who died in the firestorm at Dresden. I felt some personal responsibility for those who died at Dresden. To reach a tolerably peaceful world, we needed reconciliation more than we needed justice."*

About his adopted home of America and the relative friendliness that all visitors find here, Dyson wrote- *"Not that I dislike the Americans on the whole; it is probably in the long run a good thing that they live so much in the present and the future and so little in the past. The fact that they are more alone in the world than average English people probably accounts for their great spontaneous friendliness. I had heard this friendliness attributed to the size of the country and to people's loneliness in space, but I think the loneliness in time is more important."*

On a visit to a Princeton museum, Dyson gives an account of the Chinese Physicist Ning Hu- *"Ning Hu maintains that there are only two outstanding artistic achievements, and he places these two on an equal footing. They are, Western music and Eastern painting".* This reminded me of many conversations with Chinese colleagues I have had myself, of their view, sometimes expressed less directly, that their culture is distinct from and co-equal with the best in the west, and above all else.

An interlocutor tells Dyson- *"He also talked to Nehru. Nehru said it would be a fine thing for India to have nuclear reactors to power the new factories, because India has such poor roads and railways and they cannot transport enough coal from the coalfields. So he would like America to supply him with a reactor or two. This American said, "I just couldn't make the man understand that it's no good having factories if you don't have the roads to take away the stuff the factories make.""* Anyone with an interest in 20th century India would find this anecdote a pithy summary of the Nehruvian attitude and its mixed blessings for India.

When his wife Verena's decision to leave comes abruptly to Dyson, her writes beautifully- *"As Blake [1799] says in these lines which I have long known but never rightly understood till now,*
He who binds to himself a joy
Does the winged life destroy.
But he who kisses the joy as it flies
Lives in eternity's sun-rise."

On his experience listening to MLK's "I have a dream" speech at the Lincoln memorial by a fortuitous accident- *"From two till four they had the official speeches at the Lincoln Memorial. It was very effective to have the huge figure of Lincoln towering over the speakers. The speeches were in general magnificent. All the famous negro leaders spoke, except James Farmer, who sent a message in writing from a Louisiana jail. The finest of them was Martin Luther King, who talks like an Old Testament prophet. He held the whole 250,000 spellbound with his biblical oratory. I felt I would be ready to go to jail for him anytime. I think this whole affair has been enormously successful. All these 250,000 people behaved with perfect good temper and discipline all day long. And they have made it unmistakeably clear that if their demands are not promptly met, they will return one day in a very different temper. Seeing all this, I found it hard to keep the tears from running out of my eyes."*

On facing his mother's passing, Dyson writes evocatively- *"A close encounter with death teaches us important truths about human nature. We are not only social animals. We are also fighting animals. We may dream of universal brotherhood, but when the bugle sounds, we run bravely into battle. Battered and bruised in a surprise attack, I found myself unexpectedly reacting to it with calm courage and joy. I could handle it much better than I would ever have imagined. In every culture and every battlefield, from the Spartans at Thermopylae to the Jews at Masada, the men who died in battle are remembered and honored as heroes. In the battle of Princeton, George Washington rode his horse at the head of his troops, a conspicuous target for the British sharpshooters. He knew that an act of reckless bravery would make him a more effective leader of his country in the long struggle that lay ahead. In the future as in the past, reckless bravery will be honored, and fighters will be leaders. We must try as hard as we can to make peace with our enemies and get rid of weapons of mass destruction, but we cannot expect to extinguish the fighting spirit and tribal loyalty that are deeply ingrained in our nature. Perpetual peace is a worthy goal, but it is likely to remain out of our reach. A world of turmoil and violence is our legacy to future generations. They need to understand why science has failed to give us fair shares and social justice, and they need to work out practical remedies. This is not a job for scientists to do alone. It will need a worldwide collaboration of scientists with economists, political activists, environmentalists, and religious leaders, to lift science and society out of the swamp where we are stuck. Pure science is best driven by intellectual curiosity, but applied science needs also to be driven by ethics."*