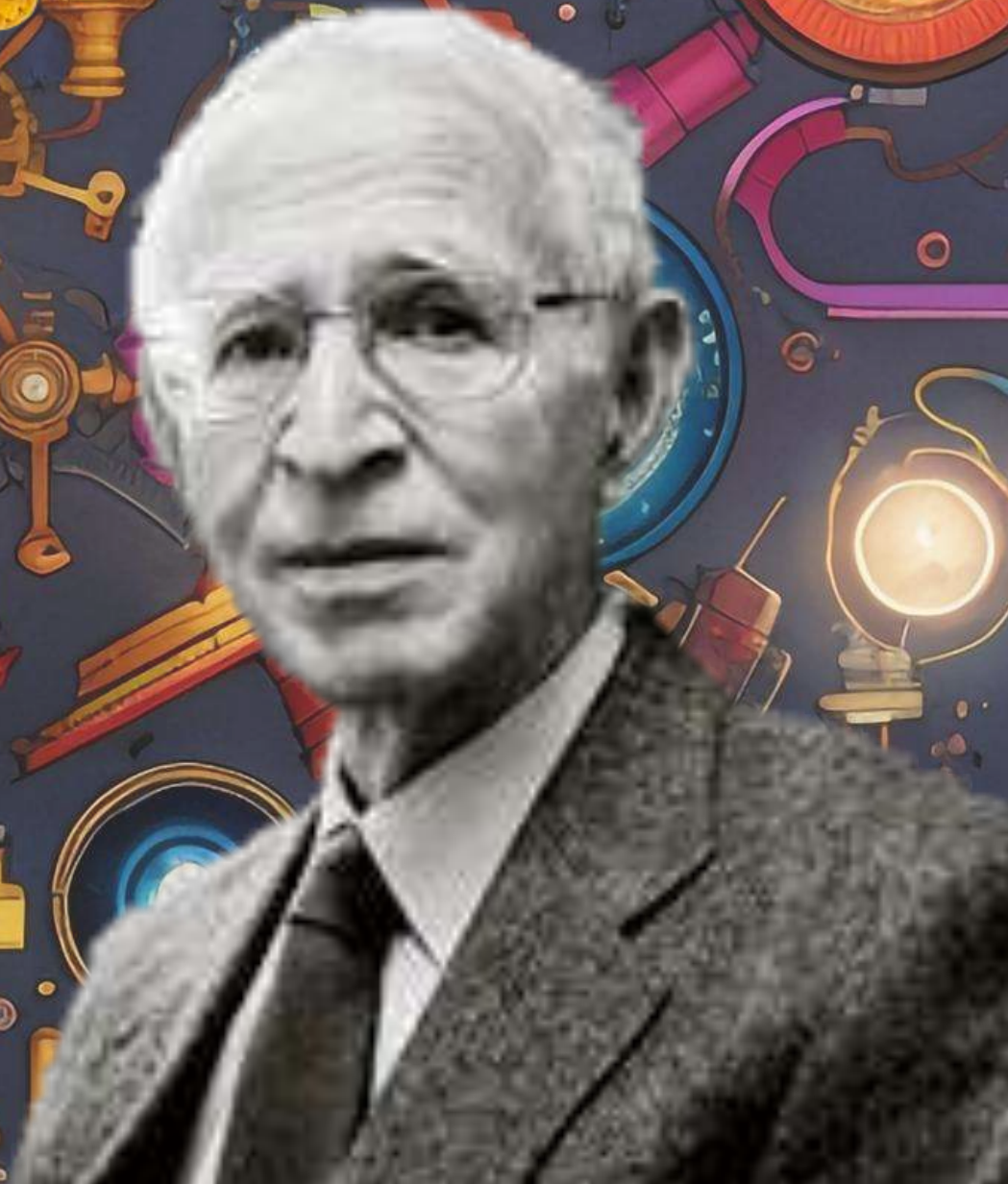


South African Inventors, Bright Minds and Other Science Heroes

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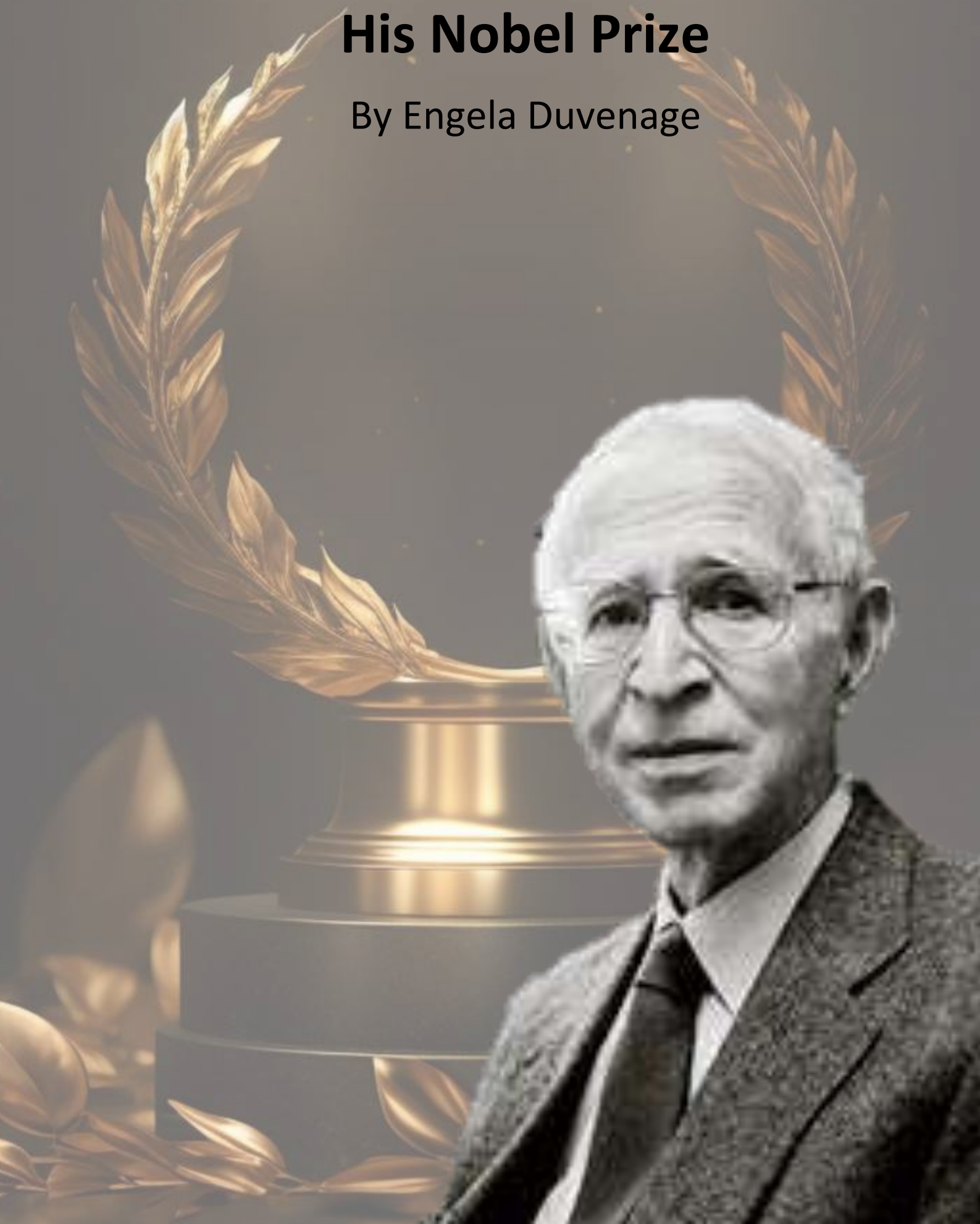


Aaron Klug



The Inquisitive Kid And His Nobel Prize

By Engela Duvenage



Aaron Klug was an active boy with a keen interest in the world around him. When he wasn't playing cricket, he was exploring the woods near his parents' house in Durban. He liked solving mathematical puzzles and riddles.

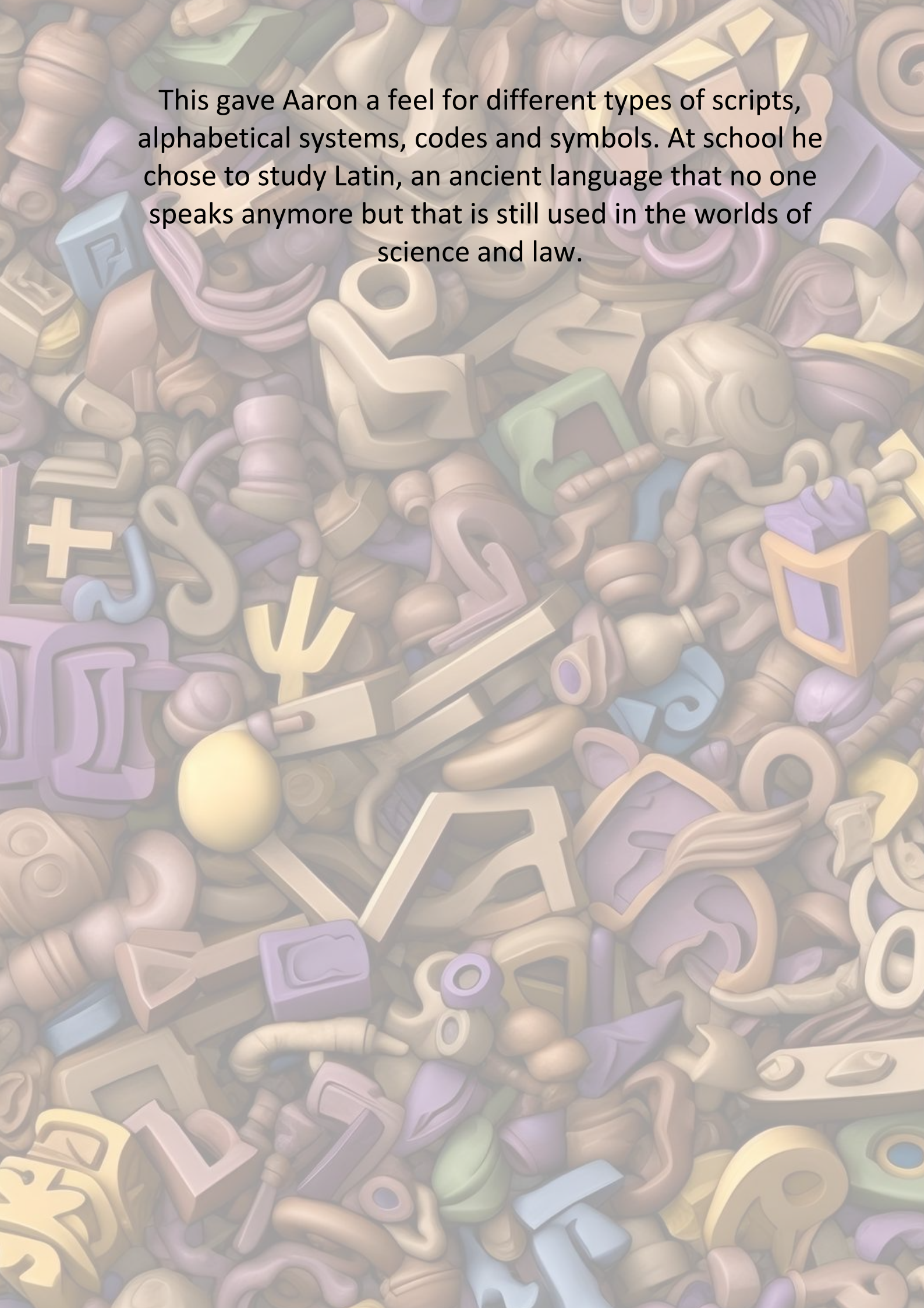


Aaron was only two years old when, in 1928, he moved with his parents from Lithuania in Eastern Europe to South Africa. They settled in Durban, where family of his mother, Bella, already lived. His father, Lazar, found a job in the local leather industry.



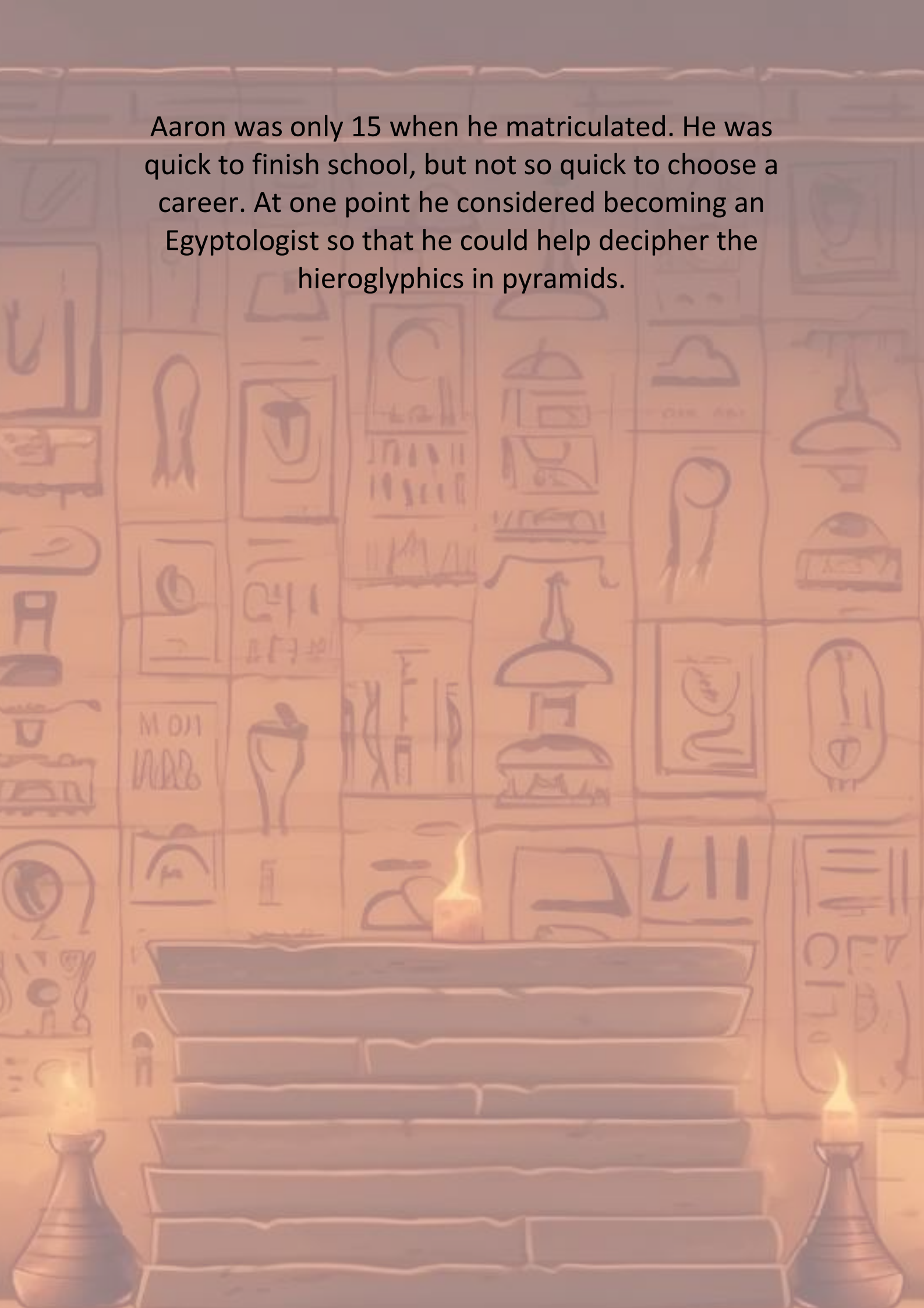
Because Aaron's family was Jewish, he learned how to speak and write Hebrew. Instead of the ABCs of English, the language has its own script of 22 letters. It is written from right to left on a page, and not left to right as is the case with most other languages.

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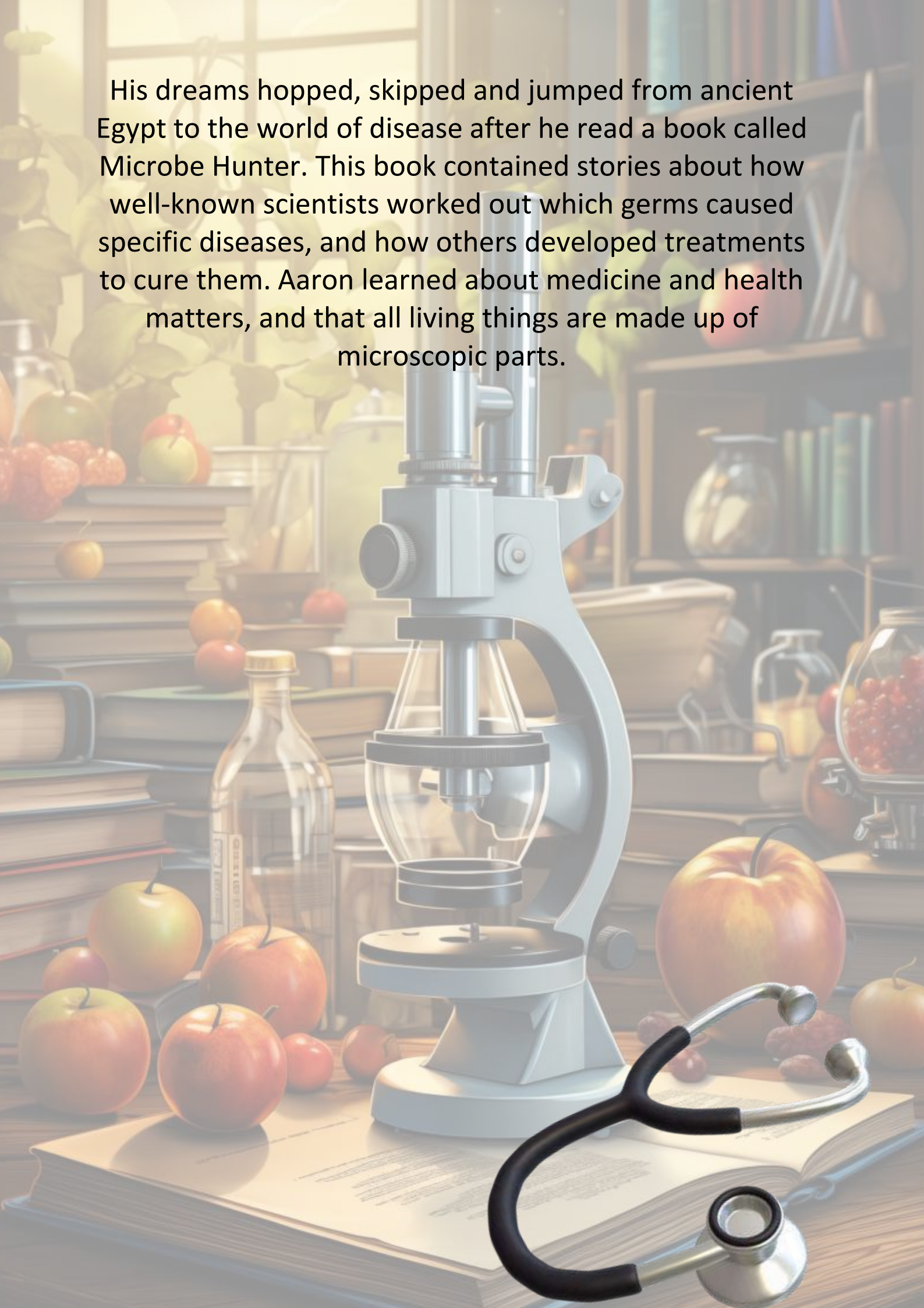


This gave Aaron a feel for different types of scripts, alphabetical systems, codes and symbols. At school he chose to study Latin, an ancient language that no one speaks anymore but that is still used in the worlds of science and law.

Aaron was only 15 when he matriculated. He was quick to finish school, but not so quick to choose a career. At one point he considered becoming an Egyptologist so that he could help decipher the hieroglyphics in pyramids.



His dreams hopped, skipped and jumped from ancient Egypt to the world of disease after he read a book called Microbe Hunter. This book contained stories about how well-known scientists worked out which germs caused specific diseases, and how others developed treatments to cure them. Aaron learned about medicine and health matters, and that all living things are made up of microscopic parts.

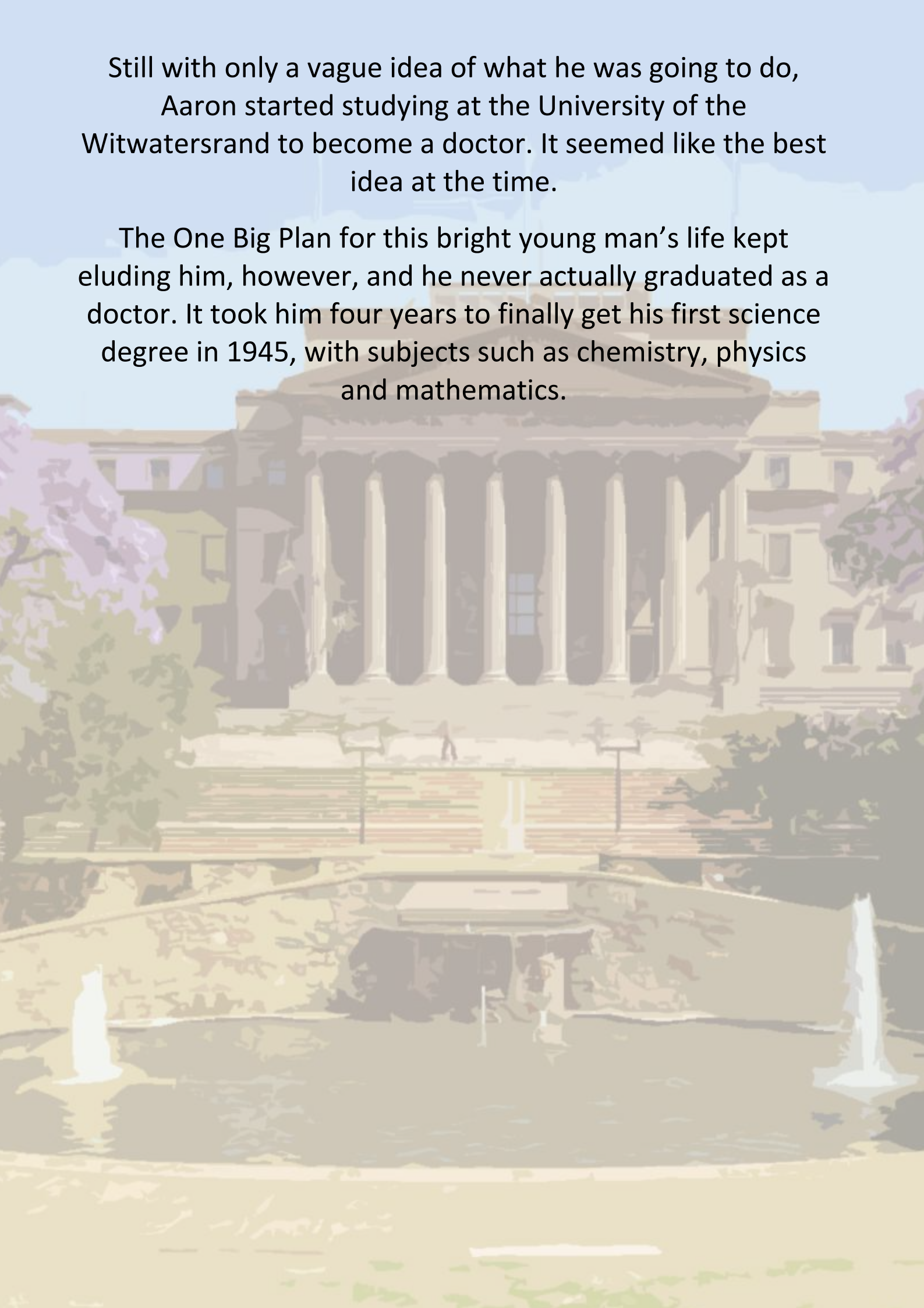


He excitedly tried to explain to his family what he was learning: 'There are so many unresolved medical mysteries that are just as difficult to decipher and solve as hieroglyphics. I'm going to study microbes and find out all I can about the tiniest of viruses, bacteria and cells on Earth.'



Still with only a vague idea of what he was going to do, Aaron started studying at the University of the Witwatersrand to become a doctor. It seemed like the best idea at the time.

The One Big Plan for this bright young man's life kept eluding him, however, and he never actually graduated as a doctor. It took him four years to finally get his first science degree in 1945, with subjects such as chemistry, physics and mathematics.



In 1946, he obtained a master's degree from the University of Cape Town and began teaching physics. He used X-rays to study the composition of different types of materials and matter. On weekends he often hiked up Table Mountain.



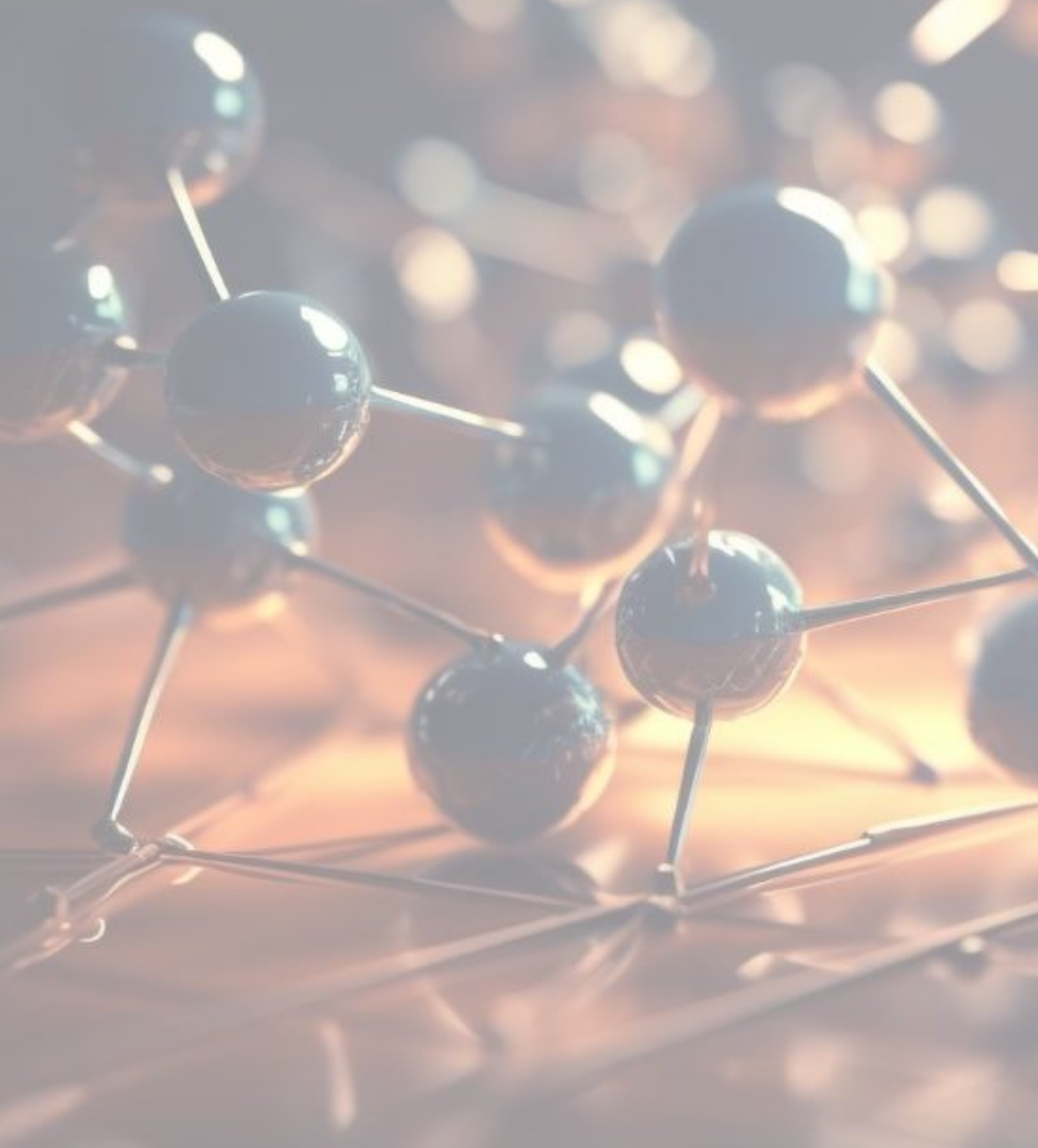
In 1949, he received a scholarship to study in England, where he lived until his death in 2018. In 1953, Aaron completed his doctorate in physics at the University of Cambridge. Aaron found his life's calling through a lucky meeting with scientist Rosalind Franklin in 1953. Rosalind was studying the structure of deoxyribonucleic acid, commonly known as DNA. Her work contributed to the discovery that DNA is made of two helix strands.



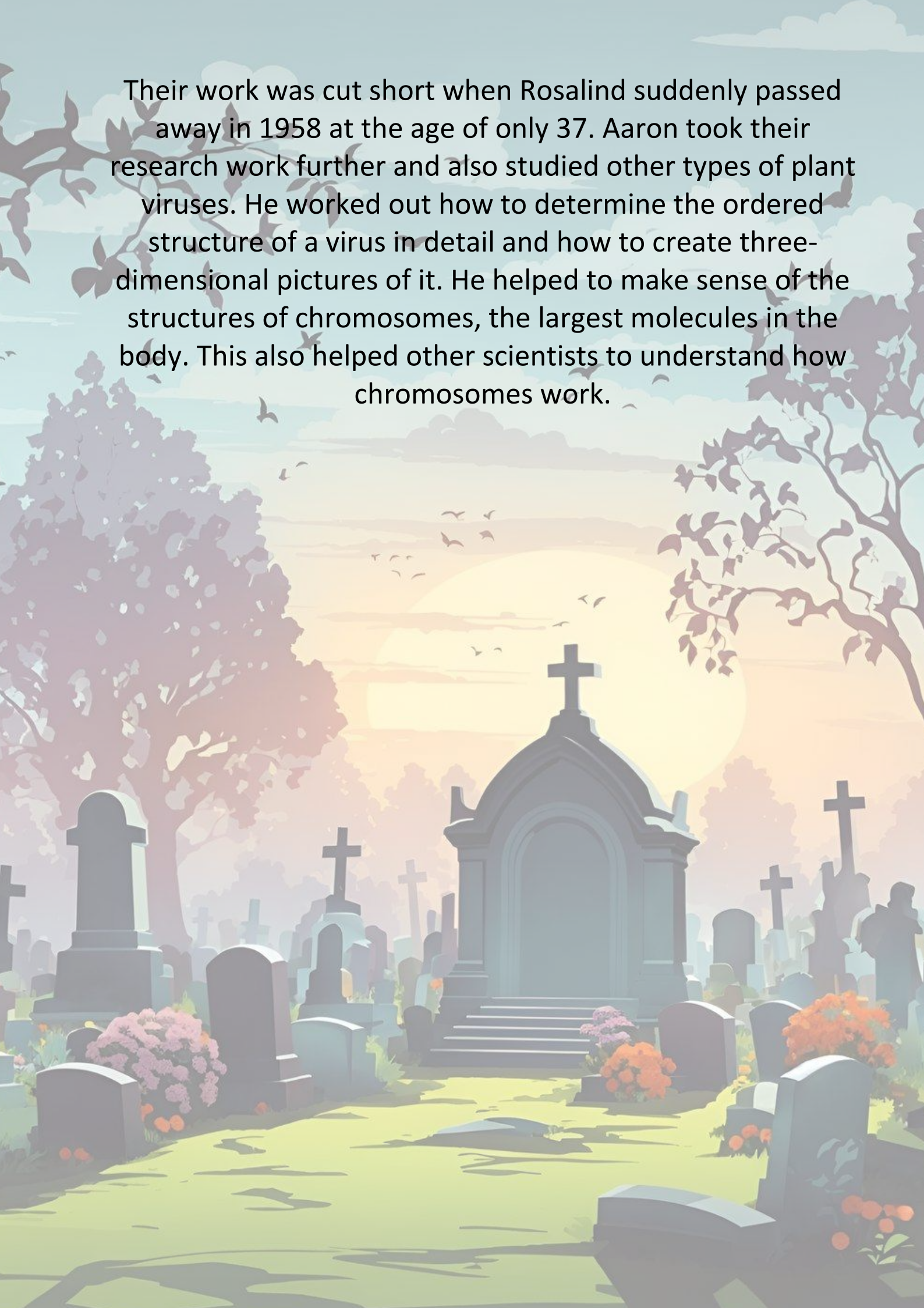
'I might be a physicist now, but at one stage I was also a medical student. I really don't have an issue with blood, spit, or other bodily fluids. I'm the perfect guy to help you with some of the experiments you want done,' Aaron suggested.



He got the job, Rosalind used X-rays to study the tobacco mosaic virus. It was the first virus people knew of that attacked plants. Aaron used his love of numbers and solving puzzles to help her make sense of what the X-ray images showed about the structure and composition of the virus.



Their work was cut short when Rosalind suddenly passed away in 1958 at the age of only 37. Aaron took their research work further and also studied other types of plant viruses. He worked out how to determine the ordered structure of a virus in detail and how to create three-dimensional pictures of it. He helped to make sense of the structures of chromosomes, the largest molecules in the body. This also helped other scientists to understand how chromosomes work.



Other scientists have since used electron tomography to take two-dimensional digital images from different angles of the pieces of which membranes, muscle fibres and chromosomes are made. Thanks to clever computer programs, these images are all combined into three-dimensional digital images that can be rotated on a computer screen and viewed from all sides.



Thanks to his sense of curiosity and wonder about the world, Aaron became an excellent scientist. He worked at the University of Cambridge for 50 years, until he retired in 2012. He served as president of the Royal Society, one of the world's most prestigious clubs for scientists. In 1988, Queen Elizabeth II of Britain knighted him, and he could subsequently use the title 'Sir before his name.

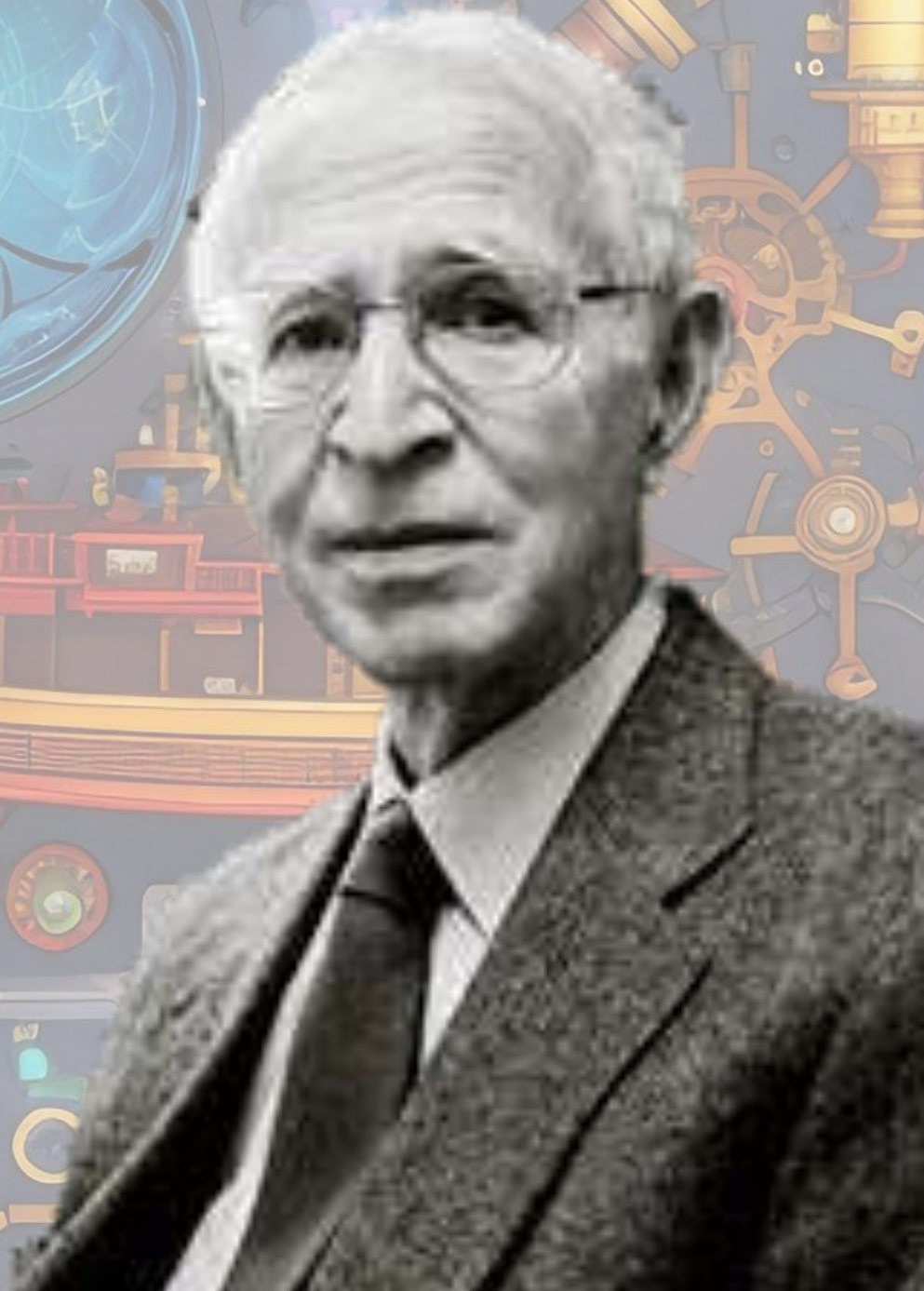


About Professor Sir Aaron Klug



Born: 11 August 1926, Zelva, Lithuania. **Died:** 20 November 2018, Cambridge, England. **Matriculated:** Durban Boys' High School, 1941.

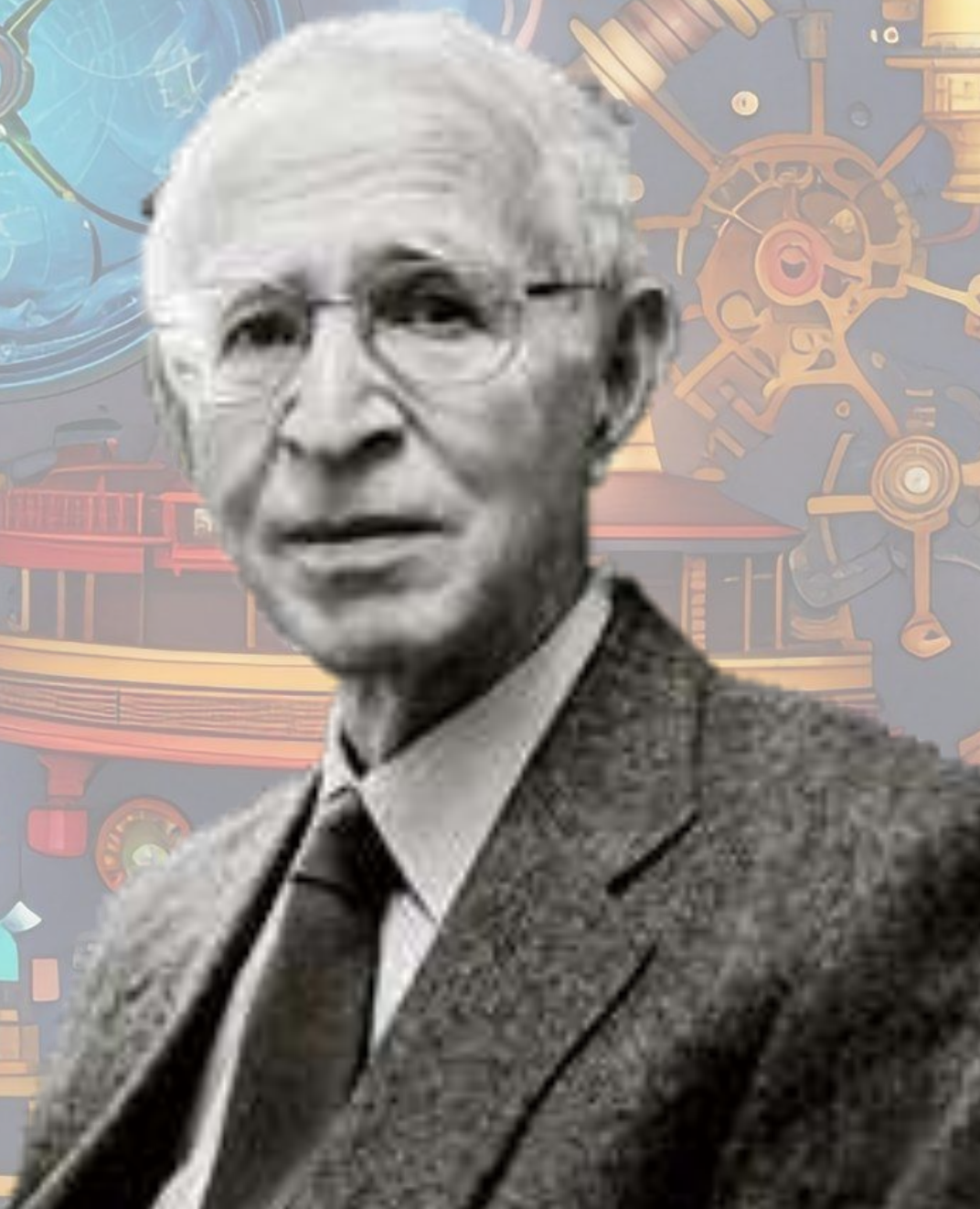
Close shave. Aaron studied in Cape Town at the same time as another South African Nobel Prize winner, Allan Cormack. On a hike together, Allan once saved Aaron's life, by grabbing hold of him moments before he fell off a cliff.



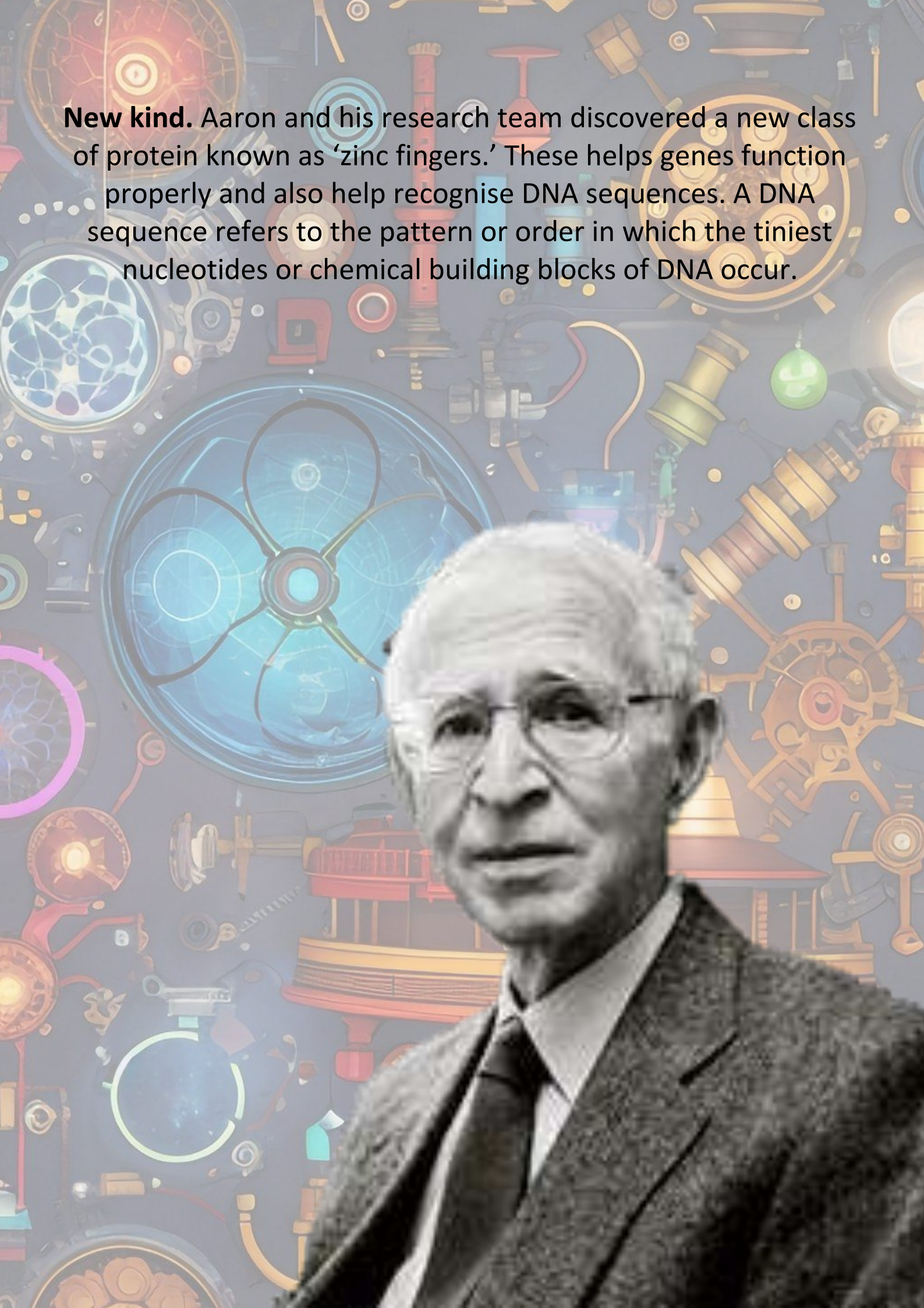
Brain studies. One of many medical mysteries that Aaron worked on was Alzheimer's disease. This brain condition causes older people to lose their memory. He realised that their brain cells are irreversibly killed when a very small molecule called tau collects in their brains.

The basics. The molecules in all living organisms and even some viruses are called DNA. Each species' recipe makes it unique.

Each person's DNA is also unique. It contains genetic information that is carried over from one generation to another. This includes specific facial characteristics such as the shape of a nose, or whether someone is likely to develop the same diseases as other family members.



New kind. Aaron and his research team discovered a new class of protein known as 'zinc fingers.' These helps genes function properly and also help recognise DNA sequences. A DNA sequence refers to the pattern or order in which the tiniest nucleotides or chemical building blocks of DNA occur.





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