

Forbidden Fruit

The accumulation of Dr Laquedem's knowledge was too valuable to be lost. Now aged ninety, he was the most brilliant scholar of his generation, and had devoted his entire life to the proof of the Riemann hypothesis. After years of painstaking study, he believed that his proof was on the verge of completion, but his health was failing, and there was a danger that he might die before he finished his work.

This proof lay at the very outermost edge of human capability. As an undergraduate, Laquedem had been taken through his studies by the Head of the Faculty, and his prioritization over every student in the department continued through his PhD, until he outstripped his teachers. At that stage, he was widely believed to have the most complete understanding of Mathematics of any human on the planet. Laquedem possessed an unrivalled ability to perceive patterns, and in his 23rd year, was able to show that the Riemann hypothesis was provable. Over the next twelve months, he laid out a ground plan for the necessary steps to obtain the proof, a plan of assault on a previously unassailable object. For the next sixty-six years, Laquedem patiently moved forwards step by step, working in an elegant mathematical language of his own design.

As Dr Laquedem languished in his Set, an Emergency meeting of the College Council swiftly weighed all the available options, and dispatched Dr Eden to Iraq. He departed from the mounting block next to the Wren Bridge at sunset on Ash Wednesday, with the Master's finest Arabian mare, a small team of Junior Research Fellows, and a copy of the Pentateuch.

We waited earnestly in College as weeks passed, and Dr Laquedem's condition steadily worsened. All activity in the Mathematics Faculty ceased, as the entire Faculty strained to decode his notebooks, which had been copied assiduously by the scribes in the University Library. These efforts proved futile, and it seemed as though the greatest work of the age, the crowning intellectual effort of the University, was to be lost.

On Palm Sunday, the leg bone of a carrier pigeon was found beneath the encampment of the Roof Scholars, attached to which was a note from Dr Eden. It informed the College Council that he had been successful, and was returning to the College on a Phoenician trade-ship, the Master's mare having been killed by a Manticore in the Qandil mountains. There was now a constant vigil at the bedside of Dr Laquedem, who was deteriorating ever faster. During the night of Maundy Thursday, an Extraordinary Meeting of the College Council was called, and Dr Laquedem's still-breathing body was moved to the Ice-House in the Spinney, in order to buy Dr Eden more time.

As Dawn broke the next morning, the College awoke to find a beaked bireme moored to the Bridge of Sighs, and a small colony of peacocks on the Backs. There was no sign of the Senior Fellows at Dinner that day, and High Table remained deserted, populated only by the College silver. On the second day, the Manciple was instructed to send dinner to the Fellow's Garden, and the news spread that the Fellowship had erected a Yurt on the Bowling Green, in which they were now living and working. I, along with a few others, crept down the Broad Walk by the light of the Moon to discover what it was that Dr Eden had brought

back from Iraq. Each gate of the Garden was guarded by a Junior Research Fellow, and each carried a flaming sword, and the tips of their shoulders bulged beneath their gowns. Repulsed, we crept back to our beds, and slept lightly.

The next morning, I was woken early by the Cock's crow and stumbled blearily to the College Bathhouse, which was towards the back of College. As I passed the Ice-House, I noticed that the door was open, and that the chamber was full of dark water, lapping gently at the edges of the stone. Someone was standing in the Rose Garden up ahead, and as I approached, I recognized the familiar figure of Dr Laquedem, surrounded by a cloud of butterflies. His hunch had disappeared, and he was dressed all in white, glowing softly in the dawn light. I hurried back to my room, and told no one what I had seen.

The next few days were full of celebration for the College. A feast was held to celebrate the recovery of our most esteemed Fellow, and a week later, Dr Laquedem announced the proof of the Riemann hypothesis. As the mathematical community gradually digested the earth-shattering proof, Dr Laquedem's set was a near-constant site of pilgrimage. At all hours, light could be seen blazing from the windows of his New Court set, and the silhouette of the great mathematician was rarely stationary.

Over the next few years, the world, the Faculty, and the College awaited the next announcement from the foremost thinker of the age. But none was forthcoming. Laquedem's proof required such an exceptional mind, and such a comprehensive knowledge of mathematics, that very few mathematicians were able to comprehend his work, let alone develop it. As the years went by, Dr Laquedem was increasingly rarely seen, except at Compline. He attended this service without fail, and could be seen praying fervently in the Sanctuary, knuckles gripped on the rail, and head bowed before the magisterial figure of Christ Pantocrator.

On a summer's evening in my third year, I was discussing Epistemology with the Roof Scholars when I saw Dr Laquedem crossing the Backs, with a flaming torch in his right hand. Overcome by curiosity, I climbed down through the attics, and followed him through the Great Iron Gate that led to the Fellows' Garden.

The scent of attar of roses, sandalwood, and jasmine swept over me as I crept through the trellises, beneath the giant Cedars, and across the small brooks that riddled the Wilderness. On a small mound in the very centre of the garden stood a tree quite different from any of the others, glowing faintly in the moonlight. As I watched, Dr Laquedem calmly lifted his torch to the lowest boughs, and the Tree burst into a pillar of flame. The blaze spread rapidly, as the fruit swelled and burst in the heat, and the trunk spat fire onto the ancient oaks.

That was the last I saw of Dr Laquedem. Framed by flame, he set off into the world.

The Great Divide

When the clattering from the College Kitchens finally subsided, I crept down to the College Library, retrieved the ladder that I had hidden in the basement, carried it round to E staircase of Second Court, and shinned up through the trapdoor at the top of the stairwell. I made my way silently through the stifling heat of the attics, ducking under the beams that supported the roof, navigating by the moonlight that shone through where generations of clumsy students had dislodged the tiles from the roof. At the end of Second Court, I climbed up the small ladder, and found myself beneath the stars on the roof of the Old Library, a large flat surface that extended away into the darkness. Keeping close to the battlements for fear of Porters, I made my way slowly along the roof until I reached the river, and then climbed across the spindly rope bridge that bridged the gap between Second Court and New Court.

I paused in relief when I stepped onto solid lead again, and then worked my way carefully around the chimney stacks until I reached the large flat roof at the centre of New Court. I shuffled backwards against the empty clock face, and sat hunched there, holding my knees tight against my chest. Shortly before dawn, a light rain began to fall, and as the stars set and the sun pushed against the edge of the horizon, the great black shapes that had been wheeling above the tower gradually came into focus as they drifted down towards me.

They landed with a peculiar lightness in one great flock, wrapped their black gowns tightly around their naked bodies, dropped to all fours, and began to crawl across the roof, clinging to the raised gutters. I followed a little distance behind them until we reached their encampment, pitched improbably on the West side of the tower. They scuttled confidently across the gravity-defying assemblage of ropes and sheets of canvas, disappearing into holes in the structure just as the sun rose on the other side of the tower. I followed gingerly, clinging tightly to the ropes, and trying to ignore the way that they spun and twisted in the morning breeze.

With a great degree of relief, I swung myself into one of the canvas enclosures, took a starling from my bag, and offered it to the academics. Visitors were rare here, and it was thought wise to bring a gift to signal your good intentions. One of them snatched the starling from my hand, snapped its neck, clamped it between his pointed teeth, and beckoned me to follow. He led me through a labyrinth of dark canvas tunnels and dizzying rope walkways, stopping every now and then to gnaw at the starling. We eventually reached a tent perched on the very edge of the building, far from any others, and he gestured me onwards. I set off across the great open expanse, the rope swinging wildly beneath me, and dropped myself onto the floor of the tent, where I sat quietly and waited.

A patch of shadow, all joints and angles, detached itself from the roof, and climbed silently down to the floor. This was the great Henry Cavendish, leader of the Roof Scholars, and the reason why I had come to their encampment. I was producing a paper on the nature of academia, and had come to hear the famous story first-hand.

He was abnormally tall, and his ancient gown was carefully stitched onto the top of his long thin arms. His teeth were long and sharp, and his eyes had grown milky in his extreme old age. Each of his limbs stretched and flexed in a disturbingly inhuman way, and he moved slowly and gently, as if he was afraid that he might drift off at any moment, like a dandelion seed.

As I sat and listened, he began to relate in a papery voice the story of the Roof Scholars, the cautionary tale that was so well known to those who remained below.

In 1797, Cavendish and his team began working to calculate the specific gravity of the Earth, using a torsion balance that had been designed by John Michell a few years before. It was kept in the shed on his estate at Clapham Common, enclosed in thick walls of wood to shield it from outside interference, since the force that Cavendish hoped to measure was roughly that of a large grain of sand. For months on end, Cavendish crouched in front of the elaborate apparatus, using a pair of vernier calipers to measure deflections of one-hundredth of an inch.

In 1798, more than a year after the experiment began, Cavendish was ready to publish. Before doing so, he passed the paper informally around the Royal Society, whose members marveled at Cavendish's prodigious accuracy, and returned letters full of admiration for this remarkable achievement. Shortly after publication, Cavendish and all his research associates, along with the entire Fellowship of the Royal Society, were taken ill. The symptoms raced like a plague through the scientific community. Their faces swelled, and some form of motion sickness overcame them. Their eyesight and their balance worsened, and they became light-headed, and were unable to stand up without fainting. Slowly at first and then increasingly rapidly, scientists were transferred to their local hospitals, until eventually the entire body scientific was removed to Addenbrooke's Hospital on Trumpington Street in Cambridge, for ease of observation. The hospital quickly reached saturation point, as healthy scientists decamped to be closer to the greatest minds of the age; it was said to be the greatest convocation of scientists since the Abbasid Caliphate. Over time, it became obvious that the scientists were becoming rapidly lighter, not through loss of matter, but through diminished attraction to the Earth. As the patients became increasingly frail, both physically and immunologically, so did the Addenbrooke's nurses become increasingly familiar with Newton's *Principia*.

After months of research, the scientists ascertained that their disease was some unusual form of placebo effect, arising from their contact with Cavendish's paper. A Grace was initiated for submission to the Regent House, and all remaining copies of Cavendish's paper were collected and locked in a secure vault in the basement of the University Library. Almost a year after the publication, Francis Baily informed an astonished hospital of scholars that he had found an error in Cavendish's work, and the mystery was explained. Cavendish had calculated the specific gravity of the Earth to be 3.448 ± 0.033 , and that was his undoing; due to a simple arithmetical error, he had obtained the wrong number. Unfortunately for the scholars, Baily's discovery was not curative. The scholars determined to form for themselves a new research institute, and requested their gowns be brought to the hospital for the inaugural feast. On the morning of 21st December, 1799, the nurses

entered the hospital to find the night porters locked out, every window thrown wide open, and every bed empty.

The Scholars had flown the nest, and taken up residence on the roof of the Old Library at St John's. At first they occupied themselves primarily with attempts to undo their mistake, but gradually their attention shifted towards Epistemology. What was it, precisely, that had caused such a profound shift in their interaction with the Earth's Gravity? How could the act of reading have altered their material experience of the world?

Academia was profoundly disrupted by the Cavendish experiment. After giving up any hope of returning to their old life, Cavendish and his team began to practise a primarily apophatic academia. They were more than happy to declare 'the value of x is not y ', but could never be heard to state that 'the value of a is b '. They began to fear the power of their words, and became increasingly unable to communicate, for fear of worsening their condition. A rift developed between the Roof Scholars and those scholars who remained on the ground, who sought to harness the power of words, but to no avail. For whatever reason, however hard the earthbound scholars asserted anything, they could never seem to alter the nature of the world.

Ephemeroptera

I remember well the occasion on which Dr Hemerobius developed the obsession which was to consume his entire life. We were crossing the Bridge of Sighs the morning after the May Ball. As we reached the centre of the bridge, the water beneath us began to churn, and then, all at once, the surface puckered in a thousand places, as a great weight of mayflies broke through that thin film into a new world. There was a moment of stillness as they perched on the surface, and then suddenly the air swarmed with insects, a seething cloud of silken wings, twitching abdomens, and claw-like legs. My friend whipped out his notebook, and stood captivated in the centre of the bridge, sketching furiously as the air whirled around him, thick with motion.

From that moment on, he dedicated his entire life to the study of Mayflies. He was insatiable. At all hours of the day and night, he was to be found in the Old Library, devouring entomological textbooks. He wanted to understand every inch of their anatomy, every moment of their lifecycle, every flash of electricity in their nerve ganglia. He studied on freezing winter mornings, he studied on warm summer evenings, through great harvest moons that hung in the sky and drew us all to the hills south of Cambridge, and through Christmas, Easter, and Pentecost. Nothing could draw him from the library.

Within a matter of years, he was the world expert on mayflies. He had published countless papers, clarified the classification of an entire order, and was hailed as the greatest biologist of the age. Every year, he studied during the Winter months, when the Cam was frozen hard, and then embarked on an exhausting round-the-world tour between March and September, ensuring that he didn't miss a single hatching event. He generated piles of notes that accumulated in great heaps, and drifted across his set like dunes.

But none of this satisfied Dr Hemerobius. He produced an exhaustive study of the food webs within the Cam, and created a paper model that allowed him to extrapolate downwards and outwards through those webs. Thus, with the sight of a single pike, Dr Hemerobius was able to estimate how many rotifers were living in a given square foot of mud that year. The model grew ever larger as he became more insistent on accuracy. To him, the presence of a single unpredicted tadpole was a matter of the utmost importance. The model grew in size as well as complexity, until the walls of the Hall were covered in great rolls of paper, which Dr Hemerobius' team of researchers furiously edited in real time.

His next position was in the physics department. He obtained a large grant from the Ministry of Defence to develop a high-definition underwater imaging system. We tested the system by throwing a thousand pins from the Wren Bridge, and then retrieving them from a punt equipped with a large pair of tweezers. He became obsessed with the meniscus, and spent one entire summer lowering himself bodily into the swimming pool at Emmanuel College from a small crane, taking measurements on a pad of waterproof paper. One June, I took delivery of a parcel on his behalf, only to discover that it was full of Leonardo's drawings of eddies (I had been using it as a coaster for my coffee pot). The next winter, he spent days on end wrapped in a rug in a small canoe, sketching the flow of water at the weir, whilst one of the porters paddled furiously to keep the canoe steady. This activity was eventually prevented when the Cam froze, and Dr Hemerobius was the picture of despondence, until

he realized that the icy surface offered an unparalleled opportunity to study the flow patterns on a large stretch of river. He found a way to preserve these patterns on a roll of magnetic tape, and when the river next froze, my friend mapped the entire river from source to the Bridge of Sighs. Armed with this information, he built a scale model on the Backs. When the model did not melt in synchrony with the river, he realized that he must now turn his attention to weather and climate. He filled the Chapel with glass globes, and with careful application of mosses, blowtorches and varying combinations of gases, modelled the atmosphere of the Earth with an unprecedented accuracy.

As time went on, Dr Hemerobius built an ever more complete picture of the Cam, and all its constituent parts. His models, maintained by an ever-growing hoard of research students, grew in accuracy until it was said that the man could tell you anything that you wanted to know about the stretch of water in between the Wren Bridge and the Bridge of Sighs. And having built this extraordinary body of knowledge, my friend turned to prediction, with an unsettling degree of accuracy. He would lead us onto a bridge for the moment that a pike leapt out of the water, or for the first flight of a fledgling kingfisher. And every year he predicted, in a welter of manuscript covered in his neat copperplate, the moment at which the mayflies would break through the skin of the water.

The first year, his prediction was out by two entire days. He retired to his room in a foul mood, and wasn't seen for several weeks. As the years went by, his predictions grew steadily more accurate, until he was able to predict to the minute. On the morning of the mayfly swarm, he and his research students would gather on the roof of Third Court, and hold up great sheets of tracing paper, on which were marked the exact points at which each mayfly would break the surface. But the predictions were never entirely accurate. One year, Dr Hemerobius was frustrated by a brief shower of rain that he had failed to anticipate, which delayed the mayflies momentarily. Another year, a reveler from the May Ball fell into the water during the night, ruining months of calculation. The next year, the May Ball was cancelled, and punters were forbidden from the river a week in advance. And still the model was not entirely accurate.

Dr Hemerobius was now desperate. He had counted the number of his days, and determined that he had one more Mayfly swarm to watch. Distracted, he could be seen pacing round the courts, muttering to himself. His models were generally held to have reached the uppermost limits of possibility, the truest reflection of an organic system ever achieved by a human, and yet the error terms still frustrated him. The night before the final swarm, Dr Hemerobius put his pen down and his head into his hands, and wept briefly in frustration. He then gathered up his gown, and walked purposefully out of the Hall. I followed him at a distance, and shinned up the gardener's shed at Trinity, to watch as he made his way onto the Wren Bridge.

From within the depths of his sleeves, he produced one of the College's priceless 16th century saltcellars and, with a regretful underhand, dropped it into the water beneath the Bridge. As the saltcellar drifted rapidly downwards, there was a stirring on the base of the Cam, and out of a great cloud of mud, there slowly rose an enormous Koi Carp, glinting like beaten copper in the moonlight. The Carp floated lazily on the surface of the water, barbels twitching, whilst Dr Hemerobius gesticulated angrily at the river, speaking in an agitated

fashion. At the end of his monologue, the Carp paused for a moment, dipped its great head once, and then sank rapidly to the base of the river. Dr Hemerobius stared at the surface of the water for a moment, and then hurried off the bridge.

The next morning, the entire College lined up along the banks of the Cam to observe the swarm. The researchers crowded the roof of Third Court, great sheets of paper billowing like sails in the wind. I scoured the roof for any sign of my dear friend, but could not see him anywhere. And then it began. I had never, in all my life, seen a swarm like it. The Earth seemed to flex for a moment, and then a great shiver ran across the river. With a deep, rushing roar, the surface of the water began to boil, and suddenly erupted with motion, as a million mayflies burst into being through the filmy surface. Trout exploded out of the water in great, lazy arcs, returning with a mouthful of mayflies, and a cloud of squabbling herons, legs akimbo, descended to feed on them. Kingfishers whirred across the river in a blaze of blue and orange, and we simply stared, open-mouthed. The blizzard of mayflies, seemingly undiminished by the feeding frenzy, rose up in one black cloud, gathered itself for a moment, and then vanished down the river, with a noise like thunder.

I paused for a moment, stunned, and then ran up to Dr Hemerobius' room to discuss what I had just seen. The oak was open, and I burst through into his room, to find him slumped on his desk, facing the river. In his arms was a book quite unlike any other I had seen, and I gently pulled his body backwards into his large leather chair, and stared at the book in amazement.

It was small and thick, and appeared to be bound in coppery fish-skin. The title read 'A Compleat Account of the Mayfly Hatching between the Kitchen Bridge and the Wren Bridge, 1896'. I settled on the window-sill, and turned the thick parchment pages of the book with increasing wonder. Contained within those pages in a minute script was an exact account of the swarm, down to the detail of each individual mayfly. Each insect was given a page, which described in minute detail the exact specifications of the mayfly itself, its life history, and a precise mathematical description of how exactly it had left the water in 1896. There were a series of great fold-out pages which depicted the movements of the swarm in those few short seconds before it disappeared, plotting the trajectory of each individual insect. And there were pages full of descriptions of the trajectories of the trout, the blurring of the kingfisher wings, and the eye colour of each of the herons. The book was crammed full of graphs and equations, and lines and lines of Dr Hemerobius' fastidious copperplate, along with the most exquisite illustrations I had ever seen, rivaling even the Da Vinci manuscripts that he had studied so assiduously all those years ago.

And as I reached the end of the book, it slipped out of my hands, through the open window, and into the dark mud of the Cam.