

All That Fall

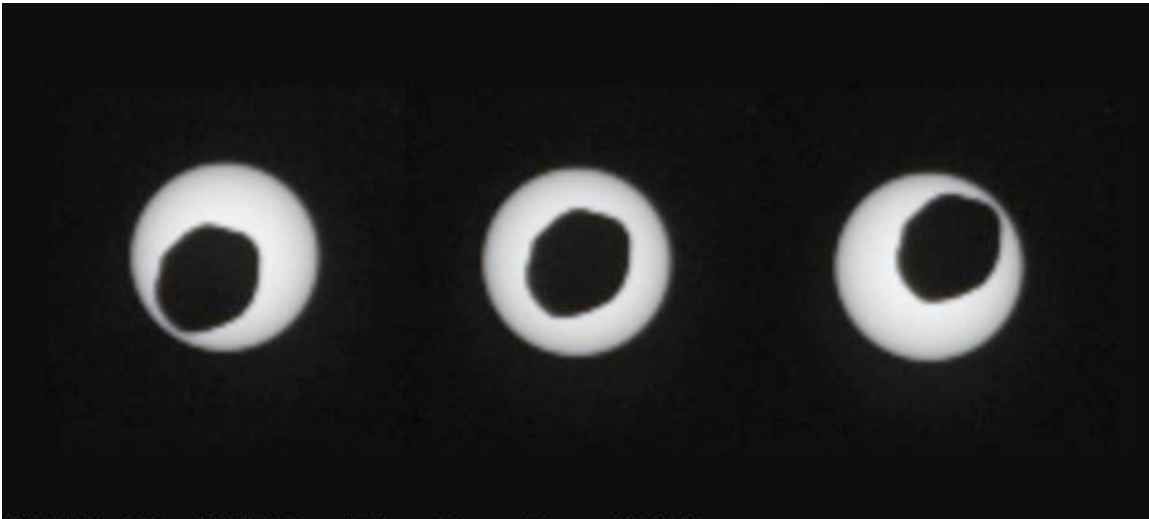
[Nathan Hollywood]

I am looking only at the wall's reflections of the dying heavenly fires

Anna Akhmatova, *The Voice of Memory*

I. (Red)

In 1726, one hundred and fifty years before they were discovered, Mars' two moons were predicted to exist in the novel *Gulliver's Travels* by Jonathan Swift. Without any scientific knowledge of astronomy, and at a time when no telescope was powerful enough to detect them, Swift predicted not only the moons' existence, but their size, distance from Mars and orbital periods, to an astounding degree of accuracy. In his narrative it is the inhabitants of Laputa, a levitating island, who discover the moons. Among their other sciences, the people of Laputa had learned, out of constant panic that the sun will go out, to distill sunbeams from cucumbers and, furthermore, to mix paints by smell. The two moons were in due course first sighted by Asaph Hall in 1877 at the United States Naval Observatory in Washington, D.C. He named the larger, inner moon Phobos, and its brother Deimos; their names mean, respectively, *fear* and *dread*. Due to its orbital velocity, which is twice the speed of Mars' rotation, Phobos orbits the planet twice every Mars day. Appearing in the west, its shadow trails across the Martian deserts and fades



beyond the eastern horizon. Its grotesque potato-like shape is owed to its being made up of several

large monoliths that have merged gravitationally. Its surface is shrouded in a thick cloak of regolith dust, approximately 100 metres deep. Compared to other moons in the Solar System, Phobos is relatively small, being approximately the same mass as Mount Everest. Recently NASA's Curiosity rover captured images from the surface of Mars, of this strange moon in transit across the face of the Sun. Phobos is thought to be almost one-third hollow and to contain large cavernous voids. Its make-up is a composition of carbonaceous chondrite, containing traces of ice water and organic compounds. Because the moon is falling at an increasing speed towards Mars, it is believed that it will eventually either collide with the planet or be torn apart into a ring, similar to that of Saturn. This will take place in approximately 50 million years, a time scale well beyond any human concerns, but nevertheless a persistent fall towards oblivion.

II. (Yellow)

Between 1889 and 1890, during the final year of his life, Vincent van Gogh produced a small series of paintings depicting butterflies, a creature he felt a deep affection for because of their mastery of transformation. The most recognised of these paintings is perhaps the *Emperor Moth*, which he produced while in the Saint-Paul Asylum at Saint-Rémy. He found the moth in the garden and painted it set against blooming arums, writing in a letter to Theo of its red sheen that somehow rearranged itself through the spectrum into an olive green. "To be able to paint it," Vincent wrote, "I had to kill it, and that is a shame with such a beautiful creature". The chrome yellow paint he used in his butterfly series contained a pigment that was derived from crocoite, a mineral, which, at that time could only be found in the mountains of eastern Siberia. Mined out of the darkness and obscurity, this mineral creates a beautiful impression of vitality languishing in the garden of light. A fine example of this is his 1890 painting *Poppies and Butterflies*, depicting two butterflies completely unaware of their transformation, resting their wings, which have perhaps grown heavy with sunlight. Of this capacity to transform he wrote to his friend Émile Bernard: "Since nothing confutes the assumption that lines and forms and colours exist on innumerable other planets and suns, we are at liberty to feel fairly serene about the possibility of painting in a better and different existence, an existence altered by a phenomenon that is perhaps no more ingenious and no more surprising than the transformation of a caterpillar into a butterfly. The existence of the painter-butterfly would be played out on the countless celestial bodies which, after death, should be no

more inaccessible to us than the black dots on maps, symbolising the towns and villages in our earthly lives.” In the last line, it seems, Van Gogh defies time’s unending plight of destruction with the concepts of reformation and metamorphosis, charting the soul’s corporeal labyrinth, beneath the stars, towards an exit through which we may perhaps meet an unexpectedly familiar aberration.

III. (Blue)

During his summer holiday in Duino, on September 5th, 1906, while his wife and daughter were out basking in the blue Adriatic waters, the eminent physicist Ludwig Boltzmann took a rope from the window casing in the Hotel Ples and hung himself, exiting unceremoniously, and without a suicide letter or any other note of departure, in an action directly aligned with his theories concerning the universe’s lack of predictability and the physical world’s tendency towards total disorder, seeming also to have occurred at a time when nobody could have understood so fundamentally as well as he, the mathematical formula behind the mechanics that made his action irreversible. Over the previous decade, Boltzmann had laboured tirelessly to defend his ideas against the almost unanimously belligerent physics establishment of anti-atomists. Boltzmann reasoned that only the atomic model could explain the physical world. His theories concerned the existence of atoms and their implications in the statistical theory of the second law of thermodynamics, which Boltzmann declared, is why entropy¹ always increases in a closed system. For this he was ridiculed by the dominant anti-atomists of his time and his work was ignored. Feeling humiliated and defeated Boltzmann attacked his opponents on the grounds of Lamarck’s theory that organisms transfer bad characteristics to succeeding generations, claiming that his peers must also overcome similar deformities of thought. Less than two years after Boltzmann’s death, the French chemist Jean Baptiste Perrin produced undeniable evidence confirming the existence of these invisible particles. His grave in Vienna’s *Zentralfriedhof* bears his formula $S = k \log W$. In a brief optimistic aside, Boltzmann once proposed that in an infinite universe, assuming it contains a

¹ $S = k \log W$. The universe tends towards higher entropy. Increase in entropy is the increase in disorder. The reason walls fall but do not un-fall is because there can be almost infinite re-arrangements made to a pile of rubble that would allow for it to appear unchanged, where as a wall has very few possible variations because of its highly ordered state. For that reason the odds of a pile of rubble reforming into a wall are extremely unlikely. This is what gives time its arrow. From an outsider’s perspective the surface of our universe would appear jagged and tilting into one long collapse of entropy. Along its sloping surface we would see fractals, smaller and smaller structures collapsing, from galaxies, to solar systems, planets, mountains, rocks, sand, particles. All human efforts exist somewhere within this spectrum of collapse.

finite number of particles, endlessly jostling and colliding, that everything must, in some immeasurably distant future, reform spontaneously out of the chaotic haze, appearing precisely as it is now; every ray of light, every thought, every speck of dust, nothing changed. We would reappear, many trillions of years after our deaths, with all our memories, perfectly reformed to the exact detail, and continue living in a seemingly unaltered universe, all these tiny collapses miraculously undone and a universe re-ordered.