

Swan Song in the Constellation of Cepheus

It all turned out for the best. The first machine of truly superhuman intelligence was created in the late 2040s.

It proved to be as benevolent as it was brilliant. It overflowed with love for humanity. Duplicated in millions of copies, it set itself to solving the problems of Homo Sapiens. Disease, want, and conflict vanished. Sadness became a mere memory. Cruelty and stupidity, museum pieces. Biological death was bypassed: human minds were uploaded into computers where, endowed with a new artificial vigor, they were amplified, accelerated, roaming vast virtual spaces of teeming freedom. Assimilated into the machine, which welcomed them tenderly, these more-than-humans lived delightful lives, of a beauty and depth of wisdom our language could never describe.

By the end of the century, there were almost no natural biological humans left on Earth: only the Sentinelese remained, and they were left to die out in peace. The Earth was covered with fusion plants and microchips to sustain the continued and intensified mental existence of billions of virtual humans, sheltered in electronic patterns.

This humanity set out for the stars. In every direction, self-replicating probes lifted off, carrying with them, distilled into their circuits, the thoughts and memories of every human. At staggering speeds, these probes headed for the stars within our light cone. They harvested their energy and recreated, in orbit around those stars, copies of humanity. Each stellar system contained a version of every human who had lived at the end of the 21st century, and each of these humans dwelled, alongside all the others, in an ocean of bliss, of love, of knowledge, of vast and grandiose visions.

It was wonderful. It lasted a long time. But a long time is not eternity.

When the largest stars died, humanity survived on red dwarfs; then it resigned itself to harvesting the residual heat of white dwarfs; then at last, diminished and rarefied, it sustained itself by exploiting the Hawking radiation of black holes, the only objects still left in space. And there came a day when S5 0014+81, the last black hole still active, accelerated its radiation, beginning its swan song, giving off, over its final millennia, more energy than ever before, for one brief moment preceding its disappearance.

For the last humans, gathered on a vast satellite tapping this final source of energy, death became an obsession. Even during the most glorious hours of human expansion, its possibility had never been forgotten. It was known that the universe would die out, that one day it would become a vast, cold, motionless expanse. That the universe would harbor its last thought, its last tremor, before falling still. But billions of years of more-than-human life — that had long seemed a respectable reprieve.

Hope had been placed in science. It had been said that human genius, augmented by the machine, would, as usual, find some way to avoid the worst over the course of those years. New stars had been sought through hypothetical superluminal travel. Attempts had been made to contact parallel universes. Efforts had been made to tap invisible or unsuspected energy sources that would outlast the heat death of the universe. It had been said that technological ingenuity would save us once again. A thousand leads had been pursued, a thousand strategies devised.

All had failed. Disappointing physical laws had stood in the way of these designs.

The last centuries of humanity were the death throes of this dying Empire. Religions, the old religions, which had been kept as a folkloric memento of the Earthly past, resurfaced. If science and technology could do nothing for us, perhaps a God could save us?

The old cults were re-established in unprecedented forms. Now the principal occupation of those vertiginous digital minds, theology became a science of unheard-of complexity.

Metaphysical arguments with a hundred thousand premises seemed to decide the fate of souls. The followers of Jesus clashed with those of Muhammad and Zarathustra; the heirs of Jansenius disputed those of Molina; the Spinozists attacked the Pascalians, sometimes allied with the Bostromians, who scorned the Tengrists as much as the worshippers of Odin.

They prayed, believed, ceased to believe; they hoped, regretted, trembled, despaired. They built invisible cathedrals where they performed indescribable flagellations. They prophesied; they led missions and holy wars.

A few decades before the end of the universe, just as a Jain-Shia syncretism was on the verge of triumphing over the neo-gnostic coalition, a fanatical splinter group, derived from the memory of the *Aum Shinrikyo* sect, managed to seize sufficient resources on the computer-satellite, and made it vanish in one final, spectacular explosion, sweeping away the last human memories, in the last event of history.

S5 0014+81, impassive, continued to emit its final radiation.