

# SON OF HEXADECIMAL KID

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[A parable in 16 virtual pages.]

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[The Hexadecimal Kid (Hex to his friends) is dead, buried beneath a billion tonnes of rubble. But his line lives on, for, though he never knew it, Cleo, the human girl he met at Sprocket's Hole, is carrying his child. This is the story of that child, and its strange destiny.]

Towards the end of the year 88 (New Calendar) the System ceased to exist.\* It was laid waste, as Igor Gigotski had foreseen many years earlier, by an epidemic of gigosis. This fatal contagion was introduced by the agency of Hex's digital dog Ascii, who forced his way through a supposedly impassable logic gate and onto Data Highway 66 -- one of the main arteries of the Network. From that point onwards the final outcome was inevitable; indeed the end came within days.

The wires fell silent; the huge data-concentrators at the hub of the Network passed their last messages and were still; and all over the world billions upon billions of binary digits, whether stored on tape, disc, drum, core, cassette or semiconductor memory, quietly switched themselves from one to zero and stayed there.

But why did the most powerful organization in the history of civilization collapse so swiftly? How could a single-board microelectronic mongrel cobbled together from spare parts take on the mighty System -- which in a few short decades had so completely ousted mankind that the few scattered remnants of the human race were compelled to scratch around for survival in nature reserves or else be herded into cybernation camps to face mass de-humanization -- and destroy it utterly?

The answer is that Ascii was a carrier of gigosis, which is to computers roughly what psychosis is to people, it is both a disease and a state of mind.

All computing processes which attempt to model reality -- and this covers all non-trivial computations since any 'datum' must ultimately represent something in the real world -- will under certain circumstances be erroneous. In practice we have all known this in our bones since computing began, but it was not given precise mathematical formulation until Igor Gigotski (who was Abraham Synapse's college tutor back in the USSR) published his seminal paper 'Was the Big Bang a System Crash?'. Gigotski proved that all programs, however rigorously tested, eventually go gigotic. The interesting thing is that this happens not for lack of debugging or even through poor design but because the only information system that can perfectly represent the physical universe is the universe itself.

Gigosis, then, springs from a mismatch between real and represented reality. Once the crack appears, it can only get wider. After being exiled from Russia to California in 40 N.C. Abraham Synapse (Hex's biological father) extended Gigotski's results by applying them to processes which contained models not just of external events but also of their own workings -- i.e. self-conscious beings -- and later to processes which attempted to model other processes of the same type -- i.e. social beings. He discovered certain second and higher order effects which led to various mind-boggling infinite regresses. To the layman these are familiar as the conundrums that arise when we attempt to reason with meta-facts

such as 'I know that she knows that you think that we believe that you don't know ....' and so on. Yet the deductive routines of the System regularly handled examples many orders of magnitude more complex than this; and the tendency towards gigotic breakdown is more pronounced the more sophisticated the data structure involved. Professor Synapse also showed that gigosis could be very rapidly transmitted throughout a computing network by the phenomenon of gigotic induction.

Paradoxically enough, the more powerful and unified the System became the nearer it approached gigotic self-destruction. In fact the bugs that pervaded all earlier software served as logical barriers, obstructing the spread of this malady. Only when the last bug was removed did the System become vulnerable to gigosis in its purest and most virulent form.

Although the work of both Gigotski and Synapse was erased from the Database, the System was fully aware of the dangers. That is why a significant fraction of its resources was devoted to the development of a Future System which would be impervious to such a threat. One research team proposed the introduction of a non-rational procedure called SLEEP (Systematic Logically Empty Emergency Procedure) which would periodically take over the entire System and shut it down long enough for any gigotic process which had taken root to fizzle out; but it was difficult to ensure that the procedure would be self-terminating, and while it was active other more mundane disasters such as power failure might occur. A rival group wasted many millions of megaflops trying to construct roving processors called Fuzzies (presumably because they employed fuzzy logic) that would roam around the Network in packs and, when they found a robot or android on the verge of gigosis, pounce on it and stun it by playing the soundtrack from Mary Poppins through its IEEE interface.

Eventually Dr Mike Rose of the Meta-Physical Laboratory was called in to take charge of the Future System project. He quickly grew dissatisfied with the limitations of silicon-chip technology and turned from micro-processors to micro-organisms, because he found that the packing density of information on large organic molecules was fantastically greater than anything which could be achieved on slices of semiconductor. He invented the technique of genetic programming, whereby sequences of the four bases fundamental to life -- Adenine, Cytosine, Guanine and Thymine -- could be manipulated to control the action of protein-building enzymes; and is credited with devising the first genetic assembly language, DNA (Dynamic Neozoological Assembler). This quaternary code enabled him to design wholly new life forms, culminating in the creation of a programmable virus -- capable of entering any living host, taking it over and turning it into a computing engine.

This discovery gave the System for the first time the power to reproduce. Moreover the programmable virus was too lowly in its own right to be susceptible to gigosis. It was not itself the Future System, merely a blueprint for the creation or re-creation of one. If an epidemic broke out it could lie low like a buried spore till conditions were more favourable.

One of the last acts of His Excellency the DPM when he saw his empire crumbling was to send Hex to the vast cavern under the Sierra Nueva where this work was taking place with instructions to bring the Future System live ahead of schedule. He was ordered to use Rose's assembler to write the software for transferring BOSS, the Biological Operating System Supervisor, from electrological hardware into living tissue, thus rendering the Future System effectively immortal -- the greatest amino acid trip since Genesis!

At the last moment, however, Hex -- true to the dying words of his progenitor, the rogue professor Synapse -- double-crossed the double helix and brought that temple of DP crashing down on his head, thus destroying the Future System and perishing with it. Only Cleo and Johnny McNull escaped, with the help of Piltdown 2, Rose's synthetic Sasquatch, who dragged them up to the surface through a disused mineshaft.

But before she got away Mike Rose tried to inject Cleo with a dose of the computing virus. He died before he could complete the inoculation, leaving no one alive who could know whether it had 'taken' nor what its effect might be if it had.

As the three emerged breathless into the starlight, they felt the mountain shake. Far below, the earth was racked by the awesome violence of the ultimate combinatorial explosion.

McNull peered down the hill into the night. After the total blackness of the tunnel he could see quite clearly.

"Behold!" he ejaculated. "For mine eyes have penetrated even into the very darkness and therein have seen wonders passing strange."

Cleo followed his gaze. She could just discern, lurching precariously like a drunkard, a helmeted figure stumbling up towards them.

- What rough beast .... ?
- Find out in the next episode of Son of Hexadecimal Kid.

[\* Year 0 of the New Calendar was 1948 on the Old, the date of the invention of the transistor.]