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One Minute After

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Nanny

The stench of wasting disease and mortality blossomed from the object of their attention, and Doctor Virato wrinkled his nose. “Quite the exhibition, Hoovendorn. Rather gruesome, I would venture.”

The scene might have been lifted from a campy, no-budget horror film. A cage of rats stood at the rear of the laboratory, surrounded by the requisite collection of culture tubes, beakers, potions and gangly apparatus. No back-alley dumpster rats were these, though, as evidenced by pink skin and coats of white fur. Where that was still visible, anyway. Once likely cute, but now with skin sloughing off and putrescent ooze weeping from septic lesions, the creatures huddled together in abject misery.

Virato canted his head and stepped closer, kneeling to study a single rodent. A marked incongruity amid the group, this specimen spun the exercise wheel in a blur of motion, its pink nose bouncing like a coked-up bobble-head. He sniffed and pointed to it. “That one--- is it doped on amphetamines? I would surmise that its heart will soon burst.”

Professor Vernon Von Hoovendorn’s apparently-not-so-infectious enthusiasm clouded over with a scowl. “No, no, Virato, you know perfectly well what I’ve been working on. As a matter of fact, you are the first to bear witness to my results!”

Virato raised an eyebrow. “Which would be?”

Hoovendorn pointed to the wheeling rat. “There! Would you diagnose that as the final stage of a terminal cancer?”

Virato leaned further toward the cage, peering through the bottom half of his spectacles, and he harrumphed. “No, I would guess that particular rat is not yet done with this world. Until it blows an artery, that is...”

Hoovendorn hefted a binder of paperwork and waved it triumphantly “So! Finally you concede the merit of my work?”

Rising to his feet, Virato turned a blank expression on his colleague. “Hardly, Professor. A drugged-out rodent lends little credence to your supposed advances in biotechnology.”

Hoovendorn stabbed a finger toward the antic rat. “How can you deny the evidence that spins before your very eyes?” He thumped the document down. “Examine it, assess the lab-results! All the creatures were injected with equal mega-doses of cancerous cells, all at the same time. All are in the latter stages of terminal disease. All of them,” he beamed, “with the exception of Nanny!”

Virato snorted and extracted a kerchief to dab at his nose. “And how might that be? Your prior attempts have all failed miserably. What is so different now?”

“The difference is that I have further developed, and woven together, my prior techniques. My first attempts sought to deliver chemotherapeutic drugs via nanoparticles, the idea being to invade the cancerous cells in the style of a Trojan Horse. The synthetic polymers successfully delayed the growth of tumors, but the cancer ultimately reasserted itself.”

“Yes, so I recall. I also remember that the duration of the ‘delay’ you speak of bordered on being statistically insignificant.”

Hoovendorn huffed and shook his head, undeterred. “My next efforts focused on a more mechanical means of combating the tumor. I injected nanobots that were programmed to seek out the cancerous growth---to physically separate those cells from healthy tissue, and to then destroy them.” He smiled broadly. “You surely cannot label *those* experiments ‘statistically insignificant’”.

Virato nodded slightly. “That may be so. But still, you introduced no more than a relatively minor delay before the tumors reestablished themselves and proceeded to kill the test subjects.” He returned Hoovendorn’s smile with a smarmy variant. “I have great difficulty believing that you’ve developed a means of manufacturing functional devices at the atomic level, much less the ability to program them for specific tasks. And even if you had, how long does it take to create such a device, and how many would be required to combat millions of cancer cells?”

Hoovendorn smacked a palm on the tabletop, relishing the moment. “That is an *excellent* question, and you are looking at the answer.” He gestured toward the whirring rat. “I have accelerated my ability to produce nanobots, but you are correct in suggesting that I cannot manufacture the quantity necessary. So instead,” he waved a hand grandiosely, “I have created a new breed of nanobot. I have created *replicators!*”

Doctor Virato arched his brow. “Please, Dr. Hoovendorn. You cannot expect me to accept that claim? These so-called *replicators*, labeled *assemblers* by some, are the Holy Grail of the fledging science of nanotechnology. And just like the biblical legend, there is no concrete evidence to back it. You would have me believe that you can create devices, at the atomic level, that can in turn *recreate themselves?*”

Hoovendorn nodded fervently. “You must accept that, and even more. The replicators can not only recreate themselves, they can create dissimilar, purpose-built nanobots!” He swiped a hand down his face, wiping away a sheen of sweat. “At a core level I am a man of faith, Virato, but by my God, what I’ve accomplished feels almost like a sacrilege. Since I have perfected my technique, the replicators that I’ve created border on true *sentience*.” He leaned in close to Virato, peering intently.

“I believe this to be a first step toward a utopian social order; a development on a greater scale than our species’ transition from nomadic... to agrarian... to industrial. Humans will no longer concern themselves with menial activities. Nanobots will perform every task considered drudgery, and they will in fact be able to create natural resource via the manipulation of matter at the atomic level. They will recreate naturally-occurring materials, and they will create *new* resources and capabilities, things we have yet to even imagine!” He nodded to himself. “Perhaps this is the divine course that God has guided us toward...”

Virato had taken a step back during Hoovendorn’s fervent declamation, and he now pursed his lips and shook his head. “Those are some very dangerous suppositions that you bandy about, Doctor. Some would consider you a serious threat for a variety of reasons---ideological and political. You might be branded a false prophet, or worse, especially outside the accommodating clime of the University.” He shook his head again. “Professor Hoovendorn... Vernon. I would strongly advise you to not---” Virato broke off mid-sentence, and Hoovendorn followed the path of his widened eyes.

The wheel still spun, slowly now, but the rat was off it. The creature moved awkwardly, its head hanging low, dragging one rear leg as it turned circles within the cage. Its drooping snout caught on the floor grate, but it appeared that its brain did not relay that clue. Mindlessly trudging, the rat leveraged itself into a half-sideways rollover. Hoovendorn gasped as a gush of blood poured from its gaping muzzle and seeped from its ears, and a series of spasms wracked the creature before it froze rigid, eyes wide open.

Virato edged toward the exit.

“Perhaps my words of caution were unnecessary, professor---it would seem that your God is not ready for you to ascend his altar.” He smirked and disappeared out the doorway.

Hoovendorn sank into a chair, staring at the dead rat, feeling as though a fist, squeezing hard, had closed over his heart. His mind spun.

How can this be? The replicators were creating and carrying the chemo-polymers to any remaining lesions, and they were building worker nanobots to seek out and destroy the tumors even as they formed. The bloody, damned rat was strong, even stronger than before the dosing...

Frowning, he pushed to his feet and began to pace a line. *This was to be my crowning achievement!*

Late afternoon sun slanted in through high dormer windows as Hoovendorn let himself out of the lab. He walked to his office lost in thought, and he threw the deadbolt once inside, leaving all the interior lights switched off. Early evening shadows grew longer as he unlocked the desk and reached to the rear of the lower drawer, withdrawing the bottle of whiskey secreted there. His hands trembled as he poured a dollop, but by the third shot his agitation had begun to settle.

Snatching his head up from where it lay propped on crossed forearms, Hoovendorn blinked, disoriented, in the darkness. He fumbled for the desk lamp, squinting fuzzily at the clock. Two AM. Clicking his tongue at the bad taste, he lifted the near-empty bottle and swished a mouthful. Brooding, he rubbed his aching temples and reached for his notes, intending to flip through from page one. In short order he perused the listing of his preliminary assumptions, and his scan stopped cold at a single word.

Mutation.

Mutation! That's the answer!

He smacked the arm of his chair.

The rat's genome dictates a mutation rate several times that of a human, but I programmed the nanobots to watch for cancerous growth using research derived from human patients. And so---after the bots finished with the truly cancerous tumors, they didn't stop. They judged the rat's normal tissue, having an accelerated rate of mutation by human standards, as being cancerous. The nanobots simply saw the entire organism as a tumor, and so destroyed it!

Hands trembling, this time with excitement, he splashed liquor into the coffee mug and tossed it down. His mind raced.

It took nearly a year to develop the programming for the nanobots. Rather than start again from scratch, I could run my experiment on an animal that more closely matches the human genome. A chimpanzee!

He stood and began to pace.

But... primates are not readily available for research. Dr. Flavin spent nearly two years procuring the ape she uses for her psychological studies, and her work is totally non-invasive. Damn the animal-rights groups! It would take forever to acquire a test subject for my purpose. What, then, are my options?

He sat down, sipping from the bottle, and the unthinkable would not cease to prod at him.

I can not do it! It is unethical, illegal, and it would hopelessly taint Flavin's work.

But in truth Hoovendorn had little use for psychology---he considered it an ill-defined practice adopted by those who fared poorly in the hard sciences. His work in biotechnology, on the other hand...

He stashed the empty bottle and cracked open the door. The hall was empty, as it should be at two in the morning. He padded softly down the corridor to his lab and let himself in, and he went to the rear cabinet where he kept the serums locked.

As Department Chair he had a master key for the entire building. He had always felt it to be demeaning---lessening, somehow---to share quarters with the Psych Department. It had always irritated him.

Until now.

A soft snoring called his attention as he let himself into the Psych Lab, and he nervously fingered the long-needed syringe. But he had confidence the chimpanzee would suffer no harm, and Dr. Flavin would be none the wiser...

Shuffling determinedly along the sidewalk toward the Physical and Psychological Sciences building, Von Hoovendorn's head thudded like timpani stuffed with wet socks and manned by the relentless Energizer Bunny. He squinted into the morning sun and tugged down the brim of his fedora, and as he rounded a corner toward the building's frontispiece he became aware of a warbling, keening wail. He looked up to see Doctor Flavin stumbling down the steps, and he stepped in front and caught her by the shoulders as she attempted to flee past.

"Doctor Flavin! Antoinette! What's the matter, what has happened?"

Her eyes came into focus on him, and she clenched his lapels in both fists.

Ohhh... Doctor Hoovendorn! It's so horrible; an *abomination!* I do not understand how *anyone* could commit something so... so horribly atrocious!"

He shook her gently. "Commit *what*, Antoinette? What has been done?"

"They killed her! Slaughtered her! It is so *gruesome*. Someone broke into the lab and... and they gutted Sarah---right inside her compartment!"

Hoovendorn's eyes widened. "Sarah? Your chimpanzee?"

She nodded miserably, her voice catching. "Yes. I called campus security and... and they're on their way, but... I just couldn't stay. It's just so wrong... so terribly, terribly wrong!"

Vernon released the sobbing woman and began trotting heavily toward the stairway, and the timpani picked up its tempo. A lab assistant stumbled out the front doors and lunged to one side, retching over the banister railing, and Hoovendorn moved past, breathing the scent of gore as he approached the Psych lab.

By my God, what has happened here?

The body of the chimp stood rigid, a howl of agony frozen on her face, her fingers clamped tight around the cage bars. Her abdomen was split open low, with entrails spilled out. Hoovendorn narrowed his eyes, following the faintest trace of blood that trailed away toward the floor-set heating vent.

Chancellor Smithers rapped his knuckles on the desk, frowning. “No one has yet come up with a convincing explanation, Hoovendorn, but it is clear this must be the act of a demented mind.” He shook his head. “It is more than strange. The only interference that we normally encounter relating to lab subjects comes from the animal-rights faction, but I can scarcely imagine any of them committing an atrocity such as this---and certainly not upon the animal itself.” The Chancellor looked up to meet his eyes. “There are no signs of forced entry. The building’s badge reader shows that you left late last night, a few hours before the time of the ape’s death. Did you notice anything out of place?”

Hoovendorn cleared his throat. “Ah... no, Chancellor, I did not. But then, I was distracted with thoughts of my work. I paid little attention to anything else.”

Smithers sighed. “I would have thought as much.” He looked away, talking as much to himself as to anyone else. “We have little to go on, but for all its barbarity this act seems to have been carefully plotted. The municipal police had no great interest in the case, and they were quick to release the corpse to our School of Veterinary Medicine. The only clue we have is a statement from the autopsy report. Doctor Riley told me that the wound was very unusual; no sign of laceration. He said it seems almost as though the ape burst from within. The animal was a female, in her prime reproductive years. The wound seemed to center on her ovaries, which were literally stripped of all eggs.” He shook his head. “I’ve not heard of that one, but I would guess it’s a high-priced black-market item---perhaps like the horn of a rhino.”

Vernon nodded and excused himself.

Professor Hoovendorn stood at the lectern giving forth knowledge to his class, but he spoke mostly from rote as his thoughts ranged elsewhere. He dreaded the potential of what he had done, and the unknowingly prophetic words that he had spoken to Doctor Virato returned to haunt him.

Almost sentient...

His lecture was on the topic of bio-nanotechnology---a bleeding-edge avocation that he was coming to wish had not become his obsession. He droned on.

“...Consider the process of manufacturing, as practiced using modern-day technology. You might think of it as precise; the casting and milling of pieces to very close

tolerances, or the fitting of millions of circuits into tiny bits of silicon. But if you were to drop down to the atomic level, you would see that we are just haphazardly shoveling and piling great heaps of atoms about with bulldozers and dump trucks. At that level we can make no pretense of precision; we are simply approximating, on a scale that we can perceive via our macro-level senses, and via middling instrumentation.

“But imagine, now, if we could actually manipulate atoms. Atoms are, at our current stage of knowledge, the basis of everything that we know. When we become able to manipulate atoms at will, then we’ll be able to turn coal to diamonds---even more easily than did Superman.” He smiled absently at the requisite chuckle forthcoming from the student body. “We will be able to take the most basic resources, such as air and dirt and water, and convert them to vegetables, or to oil, or to things that we’ve not yet conceived. The alchemists of olden times sought to create gold from common materials, but they likely never dreamed of what we will one day accomplish.

He reached down to scratch an itch at his ankle. “At the atomic level, there is no gross waste. We would precisely rearrange atoms to---”

His gaze fell to his feet, and he blinked. A thin line of ants trailed over his shoe, and as he watched, some turned up his pant leg. But they were *not* ants. He stared incredulously.

They can not be my nanobots. Those would be far too miniscule to be visible, and they cannot exist outside the environment that I programmed them for---the bloodstream.

His eyes widened with realization.

They are aggregating! Building into functional macro-collectives!

Hoovendorn would not have imagined that he ever might wish to have ants climbing his leg, but he sincerely did so now. Because what he now watched was a tiny string of synthetic beings, most probably the ‘offspring’ of those he had created, who might very well be in the process of changing the course of human existence.

And they seemed to have come for *him*.

He felt almost a sense of relief; realizing that he would be the first to go---it would relieve him of the burden and the futility of attempting to explain the gross enormity of his error. But then the miniscule aggregations that had started up his pant leg abruptly reversed themselves, rejoining the line on the floor.

What?

His head jerked up as a screech erupted from the lecture hall. A young woman leapt from her chair and stamped her feet, screaming and sweeping her hands down her belly and her thighs. Almost immediately another woman jumped up, followed by another and then yet others. The first woman wore white, and when a red stain began to spread below her abdomen, Hoovendorn understood. He swallowed the knot of bile that rose from his stomach.

Eggs. They are after eggs, and that is why they rejected me. They seek to combine biological chemistry with their own non-organic composition, and they intend their genesis to progress in the same manner as does ours. Hoovendorn’s hands began to shake. Beloved God, please save us from what I have done.

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