

# The First Copy

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*This story drew inspiration from Asimov's "The Last Answer" and "Nightfall" as well as from the work of Robin Hanson, an economist.*

The Copy with NP address 123.8.10.10.450.8, more informally known as James Van der Berg 5.7.66.9, was excited. His artificial body trembled slightly in an involuntary frisson. His lips would have curved into a victorious smile, if he had any. (He rarely interacted physically with any other Copies. Artificial lips were an unnecessary cosmetic feature.) James had, after many months of searching, found a Copy that had been present at the Beginning, or rather a Copy of a Copy of a Copy.... At the end of a long chain of Copies was an Organic long dead, but whose consciousness was preserved, and who may be the only remaining witness to the most important moment in human history.

James thought of the apprehension he had felt before his first Copy had been made – an amalgam of breathless anticipation and fear. That was not entirely accurate: He had not felt that at all. He had not even been born, so to speak. It was his Organic counterpart, a man named James Van Der Berg, who had felt these things. James, the Copy, had had so much life experience since then that that period of his life – just twenty-two years long – had become a vague collection of memories and impressions. He remembered playing Soccer on a wet field, his father breathless. No simulation seemed to match the intensity of that memory. James looked around his apartment, a half square meter collection of rooms in a large nexus center housing about a billion Copies much like him. Not for the first time he longed for more than the artificial daylight, which was adjusted to a sped-up day-night cycle for psychological well-being. He longed for a wet field of grass.

James's excitement was not to be dampened, however. He set aside his longings, focused on the fame he was about to achieve, the long-sought answers about to found. He sent a message to the Copy with NP address 88.737.81.844.34.7, requesting an interview.

James took a kind of breath, a reflex that still remained from his Organic memory, now pointless, except that it still helped calm his mind. He entered the address and waited for an answer. Shortly a room presented itself to his vision, his awareness of his physical surroundings cut off by the simulation input. This virtual meeting place was necessary

as James did not have clearance (or funding) for travel – most Copies did not and some had bodies not even remotely Organic. The room was plain with only two chairs, bare white-plastered walls and a wooden parquet floor. A glitch in one of the parquet tiles – it flickered in and out of existence – marked the room as a simulated environment, a polite courtesy that James was glad his host had observed. The austere aspect of the room left him chilled, however. At the other end of the room a wooden door opened and a man entered. James's contact had chosen as avatar an old but distinguished black man. He had rheumy eyes that seemed to discharge wisdom as he walked slowly and purposefully, without showing any signs discomfort, to the nearest chair.

"It's an honor to meet you," James said when the old man was near and held out his hand. James's well-manicured, soft hand felt postiche against puffy wrinkles and blue vanes.

"Likewise," the old man replied.

"Shall we get started? I will record the interview if that is acceptable." James hoped his eagerness, and his anxiety, were not apparent. Even in a digital simulation, it was hard to hide feelings. The old man nodded and indicated a chair.

"You are Isaac Greenberg 1.1.1.1.1.1, is that correct?"

"Yes."

"The first Copy of the first Copy of the.... I don't meet many of those," James said with some amusement. "When were you first Copied?"

"In the very early days," the old man replied, his voice hoarse but commanding. "Commercial copying hadn't even been available yet. But they wanted to keep Isaac Greenberg's expertise – I, he, had been involved in the development of human copying. It seemed a fitting memorial for a dying man." The last sentence was spoken somberly and the old man had broken eye contact.

"What can you tell me about how Copying started?"

For a moment the old man's eyes brightened and James saw a hint of the ambition of a young man.

"It wasn't always spelt with a capital C, I can tell you that." The old man straightened and turned his eyes to James, becoming more serious. "In the late 21st century Artificial Intelligence was not so much an area of research as a goal. Everyone wanted to know if machines could be, for all intents and purposes, human. Many thought that, to do that, they needed to understand the brain, the human brain. But they were wrong. The brain is too complex to understand. We still don't quite understand it. If we did, we could get rid of the need for this visual illusion, of the need to breathe, to imagine ourselves to be breathing."

"At least we seem to have sorted out hunger."

"Oh, we have now. But the earliest Copies, if they were hungry when they were Copied or a glitch made them hungry, they stayed hungry and often grew hungrier, to the point where they felt like they were starving. It's ok to be hungry for a few hours. But do you know what it's like to be hungry for days, months... years?"

"I suppose I don't. What happened to those Copies?" The old man shook his head.

"Well, eventually, they figured out simulated eating, of course. But before that many of the copies just stuffed whatever they could into their mechanical bodies. It didn't work. And they couldn't commit suicide."

"Why not? I understand suicide is fairly common today."

"Today we give control of the nexus to each Copy. Complete control. In those days, the nexus could not even fit into a mechanical body. Back then just storing one nexus required a massive substrate, like the ancient Eniac computer that took up a whole hall. And there were no deletion protocols. Some of the copies managed to disconnect their bodies though, which made things worse."

"Worse, how? Could they not be reconnected?"

"Have you ever been stuck in the dark?"

"Yes, certainly, but I'm not afraid of the dark."

"Have you ever been stuck in the dark unable to feel your body, unable to move, unable to use any of your senses?" The old man leaned closer, a maniacal look in his eye. "Unable to scream? Unable to be sure you even still exist?"

James looked horrified. "We have protocols to prevent such a thing now, of course," he said, reassuringly, perhaps more to himself than to the old man, merely continued with his explanation.

"You know the Organics had this thing called 'locked-in' syndrome. A person was stuck in his body, unable to move or communicate, but his mind completely active. What those first Copies experienced was worse, infinitely worse."

"What happened to them?"

"Many had to be shut down. Put down."

James shuddered. It was hard to think of Copies being euthanized. It hardly ever happened, now. The old man was staring into the distance, his hands trembling lightly. James decided to change the topic. "You were telling me earlier how it was not necessary to understand the brain."

"Yes. The singularity could be achieved far more quickly by just mapping the brain and knowing how each little part worked."

"Singularity?"

"The point at which the first machine intelligence indistinguishable from human intelligence was created," the old man explained matter-of-factly, then continued. "If you know what every little bit does, every neuron of every kind and every kind of neurotransmission, you can, with sufficient computing power, and the right inputs and outputs, simulate the brain."

The old man shook his head. "No. Tell me, Mr Van Der Berg, do you understand love?"

James made as if to answer but the man continued, making it clear the question was rhetorical.

"After hundreds of years of Copying, we still don't understand love. Still, hearts are broken, and people choose to dabble in doomed monogamous courtship. You see, the emergent properties of a complex system are far more complicated than its individual parts. There are too many interactions to understand. It's like trying to understand the universe just by knowing what leptons and quarks and bosons are."

The old man seemed excited. The youth had returned to his eyes.

"What was your role in this... revolution?" James asked.

"I was a researcher. My PhD was in Neurobotics, which helped with the understanding of cells and transmissions in the brain."

"Can you tell me about the first Copy?"

Greenberg relaxed in his chair, his gaze moved up and his eyes drifted, in seeming recollection. "I suppose that technically the first copy was of *C. elegans*."

"Who was that?" James asked.

"A nematode. A worm. Simplest brain they could find. Took them years to get it right. I wasn't around. But after that things went fast."

"How fast?"

"There was a mouse within a few years, then a chimpanzee. There were some mistakes with the first few chimpanzee Copies, which is why it took another decade just to get permission to even think about human trials."

"What kinds of mistakes?"

"I only have second hand knowledge, but I suppose you understand that it's not really enough to *copy* the brain. You need to give it inputs and outputs. The senses, of course, moving limbs, as well as *feeling* those limbs, signals from the body like hunger. All things taken for granted now, of course."

"That's what the mechanical bodies were for. And our current simulation."

"But this is hundreds of years later. Those first bodies created for the chimpanzees were crude. We really had no idea what to connect where, no more than some general guesses in any case. And it was too expensive to try to recreate every possible input and output."

"What happened?"

"It was basically torture. The animals were distraught. They would try to move and nothing would happen or there would be excruciating pain. Even, after much trial and error, when we had workable bodies, they were just too different to flesh and bone for the animals to get used to them. The problems were made worse by the fact that the early brain scanners were far from perfect. One small error could lead to a Copy with a debilitating brain defect."

James shuddered. His existence was in part due to the horrors experienced by these creatures. Chimpanzees were now extinct, but he understood they were *almost* human.

"Was there a public outcry?"

"Yes, some animal advocacy groups made a fuss. But the *animals* weren't being harmed. And the Copies, they were just machines. There was no concept yet that a machine could be alive, could feel."

"But still, the research was delayed?"

"Human experimentation was delayed," the old man corrected. "The research continued. Eventually a company was willing to take up the first human trials. It was a massive risk, though."

"Why?"

"There was no guarantee that it would work and the initial investment was gigantic, with viable returns only a decade or more hence. If it worked, but along the lines of the Chimpanzee trials, the PR implications would have ended the company. There were already moves toward strengthening the ethics of AI research, which could have delayed human trials indefinitely."

"So the world almost didn't have Copying? Earth may still have been populated by Organics but for a fluke?" James asked incredulously.

"No, I don't think so. The singularity was inevitable," the old man explained, like a professor to an eager student. "If it did not happen with Copying, it would have happened some other way. Organic humanity was determined to make itself obsolete."

"When did you enter the evolution of Copying?"

"I, or rather my erstwhile Organic counterpart, was hired as an assistant just after doing my PhD in Neurobotics. They had successfully rerun the chimpanzee trials and wanted a successful human trial before going public officially. The mistakes of the first chimpanzee trials couldn't be repeated.

"What can you tell me about the first human Copy?" James asked, leaning closer, his anticipation at its climax. This was, after all, the question he had come to ask.

"They had found a volunteer in the department, one of the lead researchers. Eccles, Garth Eccles. Brilliant and on a quest for immortality, and greatness. He regrets his hubris now, I can tell you."

"Why? What happened?"

"Mistakes and some bad luck. After the nexus was activated, the connection to the mechanical body was lost and a failsafe to deactivate the Copy failed. That was the bad luck."

"You mean to say the Copy woke up in darkness of the kind you described earlier, without any sensation at all."

"Exactly, even though Eccles thought he was prepared for the possibility, his mind was not. It was not made to be able to cope with such nothingness. Four minutes of it, an eternity to his mind. Random neurons fired, causing visions; fear overwhelmed him, but his heart wouldn't beat and this made it worse. His panicked mind forgot all reason and tore itself apart."

"Did he recover?"

"When he was finally reconnected, his mind was placed in a malfunctioning husk of a body with a massive tether to the nexus and only the necessary connections for function. Of course he couldn't understand this, seeing the confusing body as a mere extension of his ordeal."

"Wasn't this exactly what you had wished to avoid?" James asked.

"Shouldn't you have taken more precautions?"

"In hindsight, perhaps. But with Eccles' Copy in a fit they couldn't make the needed adjustments to the mechanical body. They couldn't even communicate properly as it seemed the hearing inputs were not aligned. There just was no way to reason with him."

"Why did the body need adjustment?"

"The connections would always have needed adjustment. We were only at the beginning of our understanding of the human brain's ins and outs. We took far greater care than with the chimpanzees, but still could not hope to have gotten everything exactly right. And every human brain is different – there would always need to be adjustment for the specifics of the individual. Unable to communicate with Eccles, unable even to reassure with some touch, we could not make these adjustments." James was silent for some seconds. Then he asked, "What did do?"

"While the support staff prayed –"

"You mean they tried to communicate with some divine being?" James interrupted. "Why?"

The old man turned his eyes on James. They were penetrating, searching.

"When were you first Copied, Mr Van Der Berg?"

"Around 2400. In the Netherlands."

"Ah, yes," the old man replied, knowingly. "By then Copying had been around some time and religion had all but vanished, except for that group of Organic fundamentalists who had abandoned the planet to its so-called 'judgement'."

"Were you religious?"

"Heavens, no. I found religion absurd. No scientist trying to copy the human brain could think otherwise. To succeed, which we did, would invalidate entirely this idea of a 'soul'. You look confused, Mr Van der Berg."

"I am somewhat. The soul is surely just the embodied personality of the individual."

"That is how we have come to understand it, but in the 2100s, it referred to something divine that survived the body even after death and could live forever, going to heaven in some belief systems. If there was a soul, something more to human nature than the mind, Copying would have failed."

"Amazing. To have witnessed the collapse of religious belief. You have a remarkable story."

"I am not the only witness to *that*," the old man said with a hoarse laugh, followed by a loud cough.

"That is true. What did you do while the others were praying?" James admitted and continued his previous inquiries.

"After repeated adjustments to the connections and continued attempts at communication, we eventually deactivated the Copy," the old man said, resignedly.

"That must have been disheartening," James said, thinking of the few Copies he had heard of that had to be deactivated, something now done only in extremis.

"Yes, Dr Eccles, the Organic Dr Eccles, was in quite a state. Our funders were about ready to withdraw."

"Was he not also concerned for his Copy?"

"That too. But deactivated the Copy could feel no harm," the old man said matter-of-factly. To James it felt callous.

"How did you succeed in keeping the program going?" James asked.

"I hardly know. I believe our contract allowed some room for error. To give up would in any case have left a gaping hole in the company balance sheet. And there was no shortage of volunteers who knew the risks and were willing to sign comprehensive liability waivers."

"Were all these volunteers from the program itself?"

"Yes. No one was more committed to the project's success."

"Did you also volunteer?"

"You mean, did the Organic Isaac Greenberg volunteer to be Copied?"

"Yes, he most certainly did. Eccles was his hero. He would have done anything to keep the program going."

"But did he... did they... did the Organics really appreciate the pain they would put the Copies through?"

"I don't know. In principle they should have. Enter the scan and you don't know if you're going to come out as the Copy or the original. These were intelligent, sophisticated

men and women. They should have understood. But they made Copy after Copy. So many had to be deactivated." The old man looked down, his eyes seemingly fixated on a spot on the blank floor.

James, too, was lost in thought. It was some moments before he said.

"I didn't realise our kind was born out of so much pain. I expected something more heroic, a golden achievement to celebrate. But this... it's almost barbaric. Why didn't you stop?"

"We were so close. We thought it worth the cost," the old man replied, his voice raspy, filled with remorse.

"How did you survive? Was your first Copy never deactivated?" James asked.

"Oh, it was. But it was revived later, when a new company took over the research. By then, the connections and mechanical bodies had much improved."

"What happened to the first Copy, the one of Mr Eccles? Was he revived as well?"

"Yes, at about the same time, I believe. We were in contact for a time."

"What happened to him?"

"He recovered, in a way. With the new equipment, it was possible to communicate with him, even to obtain from him a recollection of those terrible few minutes. But Garth Eccles 1 had developed a fascination with oblivion and immortality. He wanted to die and he wanted to live and could not choose one or the other. He had himself Copied soon after this was commercially possible, then the first Copy tore apart its own nexus. This happened again, and again." James shuddered. "Is there still a Copy around?"

"I don't know, Mr Van Der Berg," the old man said, shaking his head,

"Eccles may have realised this cycle of Copying and suicide was pointless and ended everything for good. But I really can't say."

James was back in his suite in the nexus center, his mind, his nexus, reeling. He felt dizzy, even though, physically, that was now impossible. He wondered if a Copy of Garth Eccles was still extant. If so, and if he had continued with the cycle of Copying and suicide, it would be Garth Eccles 1.1.1.1... the first Copy of the first Copy of the first Copy.... James dialed Greenberg once more, but it was disconnected. After a moment the call put through to the switchboard of Greenberg's nexus center.

"I'm looking for 123.8.10.10.450.8," James said. He could almost feel his heart racing.

"Sorry, Sir. Can't get through. Looks like there was some kind of accident. Can I put you on the callback list?" the Copy at the switchboard said after a few moments.

"Yes, please," James answered and disconnected the call.