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Robert Cook's *Nano*: A Site for Human Guinea Pigs

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Abstract:

The paper focuses on exploring Robin Cook's novel *Nano* using the theme of posthumanism. The objective would be to make an analogy between humanism and posthumanism and concentrate upon the shifting of focus or decentering from the human to the other nonhuman entities and study through different perspectives other than the human. The persistent shifting of borders to include a greater number of beings in the network or web of existence is the key matter running throughout the paper. The ever-plying transcendence towards the frontier or periphery and no concrete demarcation between the ontological boundaries is the aspect that we need to give light to and make our subject of study. How Robin Cook's novel does so, even without making use of the very term posthumanism, is to be looked upon with an amazing sense of wonder. What draws more attention is how schools of thought resemble highlighting a similitude and cutting borders. We inhabit a postmodern world today. Human experience, understanding, or interpretation is not enough. The world has moved beyond the indices of humans to the realm of machines, robots, clones, etc. Today's population is more inclusive of humans as well as "humans" with added appendages of certain sorts. The pre-existing and so-called notion of the idea of the 'human' is to be expanded and substituted with a more inclusive term.

Keywords: human, posthuman, nanotechnology, microbivores, nanorobots, Nano, molecular manufacturing, respirocytes, bio-research, guinea pigs, oxygen, analogy

Intorduction

The term human fails to define and represent us in this web of existence in contemporary times. The binary human and posthuman are not entirely opposites but rather an oscillation along a spectrum of extremes. The term posthuman comprises, not only, strictly as it is supposed to mean in terms of its etymology or literal translation, the beings that evolved in the chronological sequence after humans. Any deviation from the norms deemed to be humans are also considered as posthumans. The time frame associated with or connoted in the term posthuman

is not strict.

Adhered to. This can be more vividly explained in elaborately clarifying further. If a number line is considered and one specific integer is regarded as the human component, let's take zero as the portrayal of humans; the integers in the positive and negative axes, including the irrational numbers, can be considered posthumans. It entails a wide gamut of beings, such as humans, like those in a vegetative state or in a coma or an added appendage of any sort, ranging from an artificial limb in the aftermath to an amputation or a simple pair of spectacles or a pacemaker. This brings into picture the scene of medical humanities that offer a large scope to explore the posthuman. Thus comes Robin Cook, the master of the medical thriller genre, into the fore. A physician by profession and a novelist, Cook is known for his magnum opus, *Coma*. But his *Nano* is no less a locale to explore the posthuman theme in this network of existence.

Pia Grazdani, the protagonist of the novel, is a medical student and works for the company Nano. Pia is intrigued by the promise of the burgeoning field of medical technology. The realm of medical humanities fascinates the protagonist, and she takes up a job at the company Nano, which is concerned with bio-research. Nano, LLC, is a lavishly funded, security-conscious nanotechnology institute and is making gigantic strides in the competitive world of molecular manufacturing, including the construction of microbivores, which are tiny nanorobots with the potential to gobble up viruses and bacteria. Zachary Berman, the boss of the company Nano, plays the antagonist and is not much concerned about the ethics of using humans as guinea pigs in laboratory experiments to get ahead of the curve in the field of molecular construction. His entire concern is money-making, and in this mercenary world, he chooses nanotechnology not to be limited in terms of research and development budget. Pia is astounded to know that there is an infirmary in function at the company she works for, but she has never been to it or is barely aware of it. The corporate campus is teeming with secrets. She is warned by her immediate boss, Mariel Spallek, not to investigate the other sorts of work being undertaken at the gigantic facility but to confine herself to her own field of specialization. She is also threatened not to be too inquisitive and interrogative about the source of the apparently bottomless capital that funds the institute's research. And when she encounters a fellow employee on a corporate jogging path, suffering the effects of a seizure, she soon realizes she may have stumbled upon Nano, LLC's human guinea pigs. The tech giant seems to be on the cusp of one of the biggest medical discoveries of the twenty-first century. The dilemma, however, is the cost of such strides in the medical field.

Humanities. This advancement is either going to be a treatment option for millions of people or already sold out to the highest bidder. Thus, this progress is either going to prove to be a terrific boon to mankind or a bane detrimental to the

point that there would be no possible redemption.

Pia took considerable trouble in order to gain access to the laboratory where human guinea pigs were being experimented upon. Nonetheless, when she finally witnessed the spectacle, she stood in shock. She stood in front of a large and high glass tank full of liquid in which a man was suspended upright. The man's brain was completely exposed, and over his mouth was a tight-fitting mask, similar to a piece of scuba equipment. His open eyes gazed blankly, and the chest had been opened and a portion of the wall cut to expose the inflating and deflating lung. The viscera were completely exposed to the outside world, making the human vulnerable, and ontological boundaries of the human apparently disappeared. One of the man's legs, if he can still be designated so, and one arm, thus amounting to a total of two limbs to have been entirely removed, and on the remaining two limbs, several muscles were exposed to the earthly elements along with electrodes being inserted into certain muscle bundles. The stumps, instead of the removed limbs, were sealed with a white material. In this phase or stage of being experimented upon, how far this being can be nominated as a human is of pertinent and significant question. The man was motionless, and the sight of this pitiable picture provoked sufficient horror in its audience, a human being named Pia. The terror in a human being, here Pia, is of singular prominence as not only is there empathy for a fellow human being but also the fear that there is no sufficient distinction between the subject of experimentation and one's own being. Giorgio Agamben has brought this up in his usage of the terminology 'Homosacer' (1998), which a human being could do away with without the fear of any retribution. Homosacer was essentially a categorization on the basis of race that a person of a certain Slavish origin or of a certain ethnic division was considered less valuable than a human or, rather, did not measure up in terms of worth to be considered a man. Thus, here, Asians or, more particularly, Chinese were being used as human guinea pigs. This is of marked importance as Asian countries are teeming with population, and the worth of human life here is sufficiently less than their European or American counterparts. Asian countries are ample sites for laboratory experiments with humans as guinea pigs, for instance, in usage for surrogacy. This analysis can be compared to women being more frequent organ donors like kidneys in case of gender distinction.

The man, as the subject of experimentation whom Pia stared at, was anchored on a vertical pole that pierced his body in a cephalic-caudal axis, and also by various tubes that emanated from his body and disappeared into a number of sealed boxes on the floor. This 'half-man' or posthuman was alive and was stuck on a spike like a butterfly collector's specimen or sample. Oxygenated blood was gushing through the lines emanating from the body, oozing out in sizeable volumes. These half-dissected humans in semi-living states, artificially respired and monitored, volunteering to be human physiological experiments, were morbidly

upsetting for the protagonist and the general reader. They were living human laboratory experiments, somehow being kept alive, their circulatory systems being run through banks of testing equipment. The mere thought of humans doing this to fellow humans was a travesty of ethics and a withering of morality.

The Chinese invested in microbivores and future molecular manufacturing to augment their athletes' performance. They injected nanorobots into the bloodstream to enhance their ability and make them world-class athletes. The blue nanorobots are respirocytes that contribute to the athletes' endurance. Superefficient oxygen carriers that caused medical anomalies in the person suffused with. The functioning of the respirocytes can be depicted in detail. These respirocytes supply oxygen to the athlete's bloodstream far more effectively than the regular blood cells. A thousand times better, to be precise. They are effective to the extent that the subject's heart does not even have to be beating for adequate oxygen to be available for several hours in a patient's brain. This is the reason why the subjects who had cardiac arrest showed no neurological side effects after being heart-dead for a couple of hours. The respirocytes functioning too well triggered a hyperoxic, hypermetabolic state, resulting in a kind of heat stroke with cardiac arrest. A small dosage of these highly effective and efficient respirocytes is a great harbinger of the success of the microbivores. The nanorobots would not be detected in the doping tests. The nanorobots are inert, and diamondoid surfaced. The extremely low concentration of the respirocytes, in light of its effectiveness, makes it very rare to be seen during blood counts. This will make microbivores commercially available in the future. This is going to revolutionize the treatment of infectious diseases and create a milestone in the treatment of cancer. The nanorobots would bring forth a nontoxic, targeted cure. There would be no more need for chemotherapy or harmful radiation. These methods would be considered the equivalent of medieval medicine and therefore, outdated. And these microbivores will most probably prevent and cure Alzheimer's disease. These nanorobots will usher in a medical revolution.

The onus of maintaining or abiding by ethics is shifted to the Chinese, who can be conveniently also deemed as the 'other' by the colonial mindset. Robin Cook is an American author, and Zachary Berman, the primary antagonist, and a fellow American, very conveniently shifts the responsibility to China, stating all the human guinea pigs were volunteers. They were convicted of capital crimes in China, and every one of the subjects brought over to Nano was a condemned prisoner in China. The country, it is claimed, executes approximately three thousand people per year, which Berman does not agree with. The narrative vacillates between making Zachary Berman a complete villain and providing him with the benefit of the doubt to being deemed as the sole antagonist by asserting his stance in loud and clear terms. Berman gets to air his personal disagreement with this provision on the part of the Chinese government. It is asserted that he does not agree that certain prisoners

being condemned are accused of trivial things such as fraud or embezzlement. A few of these people would be selected and asked if they were willing to participate in the medical trial. The human aspect of Berman is vividly highlighted, and inhuman vivisection is conveniently cited as willing participation on the part of so-called volunteers. The Chinese government is accused of wanting to dominate not only economically but also wanting sporting success in order to prove by hook or by crook that their system of government is superior to the rest of the world's. Here, another binary or the 'other' comes into play. The dichotomy between communist government and capitalism is brought to the fore. Then, there is an analogy that this Chinese system of government is as bad, if not worse, as the Soviets and the East Germans in the Cold War era, bringing the American perspective to prominence. The Chinese would do anything to beat the United States of America to the gold medal. However, the fact that an American mercenary exploits Chinese desire is considerably sidelined. The blame for this entire ordeal is transferred from Zachary Berman, Mariel Spallek, or Whitney Jones to the Chinese government. In an understatement, the understanding and humanitarian aspect of the Americans is portrayed when Berman states that the Chinese government was doing all this, wanting to erase the three hundred years or so of humiliation that the country suffered under colonialism. Pia Grazdani, the protagonist of the novel, is an Albanian who mediates between the Chinese and the American points of view. The Chinese wanted to Demonstrate to the world that they could compete on a world-class level and in all endurance-based sporting endeavors. Thus, cyclists were the first among athletes to be experimented upon in the sporting scenario presented in the novel.

The subjects of experimentation in the discussion here are kept a tab upon by means of a combined tracker notifying GPS and vital signs register that sounded an alarm in case of a mishap. This makes it easy for the subjects to be kept under persistent supervision without letting the knowledge out to the general public. The lack of brain functioning was of secondary significance. The prime necessity was to ensure the heart kept working so that they could recycle the blood and figure out exactly what had gone wrong. This would help in accuracy as per exact terms and not hinge upon approximate assumptions. The humans or cyclists could be technically dead, rendering them posthuman status, but breathing and vital functions like that of the heart would be maintained mechanically. The blood of the subjects was centrifuged in micro samples, separating the usual components and the additives before reintroducing the cells and the plasma back into their artificially maintained circulation. A splenectomy was performed on a subject who was brain-dead in the course of experimentation, and a lung sample was considered for examination. A profusion of microscopic, sapphire-blue spheres blocking the capillaries, the nanorobots could be clearly seen under the high-powered

microscope. This highlights how nanotechnology is being utilized to augment human abilities with a characteristic tendency to achieve Nietzsche's Ubermensch. Man would be rendered Superman in the process of nanotechnology boosting human attributes.

Pia Grazdani, in the opening chapter after the prologue introducing a cyclist as the subject of experimentation, is reading a heavy molecular immunology textbook, preparing the reader to be engaged in a medical thriller. The narrative then introduces the next character, George Wilson, a second-year resident in radiology at the UCLA Medical Centre. The background of the conversation between the doctors revolves around medical humanities and their fellow medical student, Will McKinley. Dr. Tobias Rothman, Pia's mentor and boss, and his associate Dr. Yamamoto had been murdered. Antibiotics, as well as surgical debridements, have not been potent enough to rid Will McKinley of his infection in the course of being shot by Pia's kidnappers. Two bankers, Edmund Mathews' and Russell Lefevre's deaths, were thought to be Linked to Dr. Rothman's death. Pia later ascertains that the deaths mentioned previously were done with polonium-210 but does not exactly know how it was carried out nor who exactly had a hand behind it. The persistent osteomyelitis in Will's skull where the bullet had entered had proved to be resistant to all antibiotics. Therefore, Will's perpetuating health problems were, in large part, the cause for Pia's presence and work in Boulder, Colorado. Pia had wanted to give up her internal medicine residency and her desire to get a PhD in the aftermath of all the aforementioned happenings. She had sought to get away from New York and had then come to Boulder. Pia hoped to use nanotechnology in the form of a microbivore-based antibacterial treatment on Will McKinley. FDA approval was necessary as soon as preliminary safety studies were finished. She was genuinely and greatly passionate about working with microbivores. A lot of parents were in the process of being formalized. Pia depicted her ongoing bio-research as a sort of antisepsis. The antibiotic era of fighting bacteria was on the verge of its end. Bacteria are developing resistance faster than new antibiotics can be found. Thus, medical nanotechnology would come to the rescue and prove to be the new hope. It will provide rapid cures, particularly for sepsis, more specifically osteomyelitis. These microscopic nanorobots, termed, aptly enough, microbivores, are much smaller in magnitude than the red blood cells, and they consume bacteria and other microorganisms when introduced into the bloodstream of a living animal. They will be capable of being programmed or coded to seek out, eat, and digest infectious proteins like prions or the tau proteins associated with the cause of Alzheimer's disease, against which antibiotics are ineffective and tend to fail in order to create visible results. Nanomedicine has also contributed to its effective usage in sunscreen. But the future of medical nanotechnology is much brighter. It was going to usher in a change, bringing about a revolution. It is going to completely change

medicine, probably as much as regenerative stem cell technology, if not more. The nanorobots are ovoid, with their axis measuring up to about three micrometers in length, which is impressive as it is six times smaller than the width of a human hair. The most significant aspect of these microbivores is their comparatively smaller size. When George likens this to science fiction, Pia is sticking to it as the reality on which she is working. Pia had initially thought of joining a nanotechnology company in L.A. but had found out afterward that their program or research was still in the design stage. However, she had also applied for a research position, then was contacted by a head-hunter who had sought her out for the company in Boulder called Nano. This company had far outpaced its competitors in molecular molecular manufacturing, which It combines building nano-sized devices, especially arm by atom and molecule by molecule. This is the key to making these nanorobots. The head-hunter had informed Pia that Nano had already built some microbivore prototypes and had begun testing them in vivo. She terrifically appreciated those incredible, scanning electron microscopic images of these nanorobots.

The other character who is markedly obsessed with nanotechnology is Zachary Berman, the primary antagonist. His concern lies with the possible usage of nanotechnology in the paint business. His brother Jonathan had died in agony from bone cancer, and his father had followed suit in quick succession, having developed rapid-onset dementia. However, Zachary had been addicted to challenge and creativity from his childhood and found domestic life a humdrum affair. Though his brother died from aggressive cancer and his father died from a broken heart, his enthusiasm lay in establishing a foothold over the competition in the paint business in northern New Jersey. He came across an article that was particularly concerned with a section about research into the use of carbon nanotubes in paint that could block cell phone signals in a concert hall. Hello was convinced that this was fertile ground that was virtually unexplored and definitely underexploited. His zeal to learn about nanotechnology was that of a starving man having stumbled into a grocery store. When his mother was diagnosed with Alzheimer's some months later, Zachary was suddenly consumed by the promise of nanotechnology in the medical realm. He desired to find a cure for cancer as a fitting tribute to his last brother. It apparently seemed to Zachary Gar, with nanotechnology, that the sky was the limit. Berman had become a hypochondriac after his brother's sudden illness and demise and his parents' dementia. His acumen as a businessman and Pia's passion had led them to cross paths as he regularly took advantage of the fact that Nano employed a number of doctors. What consumed Zachary was the fear that the same Alzheimer's dementia he had witnessed in both his parents while they gradually relentlessly descended into absolute helplessness. He hoped to reassure himself by getting tested for the apolipoprotein E4 gene associated with an increased risk of the disease. On

the contrary, to his horror, the test had the opposite impact. He had to know from the test that he was homozygous for the gene, a factor that amplified his risk, as did the fact that both his parents had it. For Zach, his interest in medical nanotechnology became a personal obsession.

A scene presenting a prairie dog's death is delivered. Pia's concern for animals is brought to the fore. In the physiology lab during the first year of medical school, Pia refused to take any part in elaborate experiments using dogs because the animals were euthanized at the end. Her concern is further highlighted when it is made known to the readers that even stray cats around the med school dorm never failed to garner her attention in one form or the other. Pia's perception is that Nano is gradually pacing towards the use of these microbivores on mammals, starting with mice being the first subject of injection of these nanorobots. This brings us to the crux and climax of the novel, where not any mere animal but humans themselves are the subjects of experimentation. Thus, the disgusting and unethical aspect of medical humanities calls forth our attention.

Nano is a hub of activity with fierce and contentious competition, with a number of busy patent attorneys engaged in its legal department and the whole area exuding the appearance of a military base more than a commercial establishment. The people were also apparently dressed in military-style uniforms. In the claimed infirmary of Nano, the laboratory with humans as guinea pigs has a thin line demarcating the people or humans working upon those human subjects as guinea pigs. In comatose patients, where the body is in a vegetative state, the brain-dead person lies with vital body functions being artificially maintained through the ventilator. The human subjects experimented upon lay hung like butterfly specimens in a research laboratory. These nanorobots in the future could help maintain all vital functions in not only brain-dead persons but also simultaneously heart-dead for a couple of hours. The superefficient respirocytes could keep the human body functioning for a couple of hours without the brain or heart functioning for a short while, thus blurring the lines between death and life. The human and posthuman distinction is also difficult to surmise in brief terms. The human without heart and brain functioning and with respirocytes injected into the bloodstream hinges on the borderline before humans and posthumans. The degree or extent to which these entities or beings can be cited as humans and the contradictory nonhuman or superhuman or posthuman attributes found co-existing in a human ontological body are not clearly demarcated. Robin Cook uses the term 'half-man' as a substitute for the human guinea pigs. They represent the initial stages of development of the posthuman prototype and aid in the progress of nanotechnology in bio-research. Later, Zachary Berman claims that they are convicted of several sorts of crimes in their home country and a very

The meager number had been sacrificed in the process of advancing

nanomedicine. Berman deems them to be 'volunteers,' which is incomprehensible on the part of Pia as well as the wider audience that any person would willingly undergo that intense amount of pain and severe suffering.

'Nano,' the company is impressive as a landscaped complex consisting of multiple modern buildings, some as high as five stories tall, that stretched off into dense clumps of huge evergreen trees. The sprawling extension comprises or houses all the general biology laboratories. The whole area was surrounded by a towering chain-link fence topped with razor-encrusted concertina wire. The structure, in its entirety, exuded the appearance more of a military base than a commercial establishment. Here, it is of utter significance to mention that Nano can be seen as a representation of the posthuman world but interspersed with humans as security and also as beings working upon human guinea pigs. The secluded nature can be studied in terms of demarcation between the human and posthuman world, but the boundaries are neither very marked nor very concrete in terms of where they are outlined or defined. The human and posthuman identity is not very clear. Documents like driver's licenses and hospital IDs, being a necessity on the part of humans to create the requisite acceptance into the posthuman world, manifest how identity is a fluid concept. A human being is essentially recognized through documents consisting of mechanical or digital codes, and these legal papers or charters can be studied as incarnations av, atars, or extended versions of a human. This can be made clearer by an analogy of our human identity with our social media accounts on various social media platforms ranging from email, LinkedIn, Telegram, Facebook, and WhatsApp to whatnot. Each of our social media avatars is an extended posthuman version of our human identity. The physical body is not present in each of these multiple forums but still is an inherent recognition of us, a distinguishable representation of us. We are accountable for the posts on our social media and can be held responsible and suffer retribution for any deviating, unacceptable things on any of these. More significantly, while gaining physical access to 'Nano', during their entry, Pia and George had to swipe their passes, another legal tender, and then, more pressingly of concern, they peered through the iris scanner. Even human organs have been digitalized and coded. To limit human beings from access on the basis of their profession is one thing. Since George was a radiology resident at UCLA and not some kind of industrial spy, he would preferably gain access to Nano as an outsider. But to individually eliminating human beings from Nani's world after digitalizing their anatomy is a completely different sort of isolation and separation. To top it all, each employee of Nano is isolated and alienated from the other ongoing works carried out at this company and required to confine themselves to their area of specialization, remaining aloof from all the other processes being carried out in its vicinity simultaneously.

Pia could draw parallels between concentration camp victims of the Nazis

and the human guinea pigs as their forearms were tattooed with a series of numbers. The inhuman and unethical aspect is repeatedly presented before the reader. She cited that Nano had other medical diagnostic products on the market, like sensors and DNA arrays for in vitro testing and sequencing, along with other nonmedical, commercial usage, but her primary interest lies in these nanorobot microbivores. The crux of her bio-research includes working on the biocompatibility of the microbivores. She precisely points out that the subjects of her experimentation are a type of roundworm, and then they move on to mammals specifically with no immune response. So, she is aghast to discover that human beings were the subjects of experimentation in Nano. The embodiment as a source to create a demarcation between humans and posthumans becomes blurred. Comatose patients on life support systems and human guinea pigs on the brink of ushering in nanomedicine are extended human beings or 'half-man' as termed by Robin Cook. These modified human versions are in the process of achieving the superhuman. These respirocytes would alter human functioning for the better, and the structural change would be too microscopic to bring any change in morphology. The human ontological boundary is intact with the superhuman or posthuman embedded in it. This characteristic posthuman trait is the signifier of the future resident on this planet, perhaps overcoming planetary frontiers in the course of time.

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