THE STORY PLANT

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OBSERVER

On Sale January 10, 2023

FROM RENOWNED SCIENTIST ROBERT LANZA AND AWARD-WINNING AUTHOR NANCY KRESS COMES A MIND-EXPANDING THRILLER THAT SHATTERS OUR PERCEPTION OF REALITY

"A STARTLING, FASCINATING NOVEL."

—Kim Stanley Robinson, New York Times bestselling author

"REAL SCIENCE AND LIMITLESS IMAGINATION COMBINE IN A THRILLING STORY YOU WON'T SOON FORGET."

—Robin Cook, New York Times bestselling author

OBSERVER IS THE BEST OF SCIENCE AND FICTION—AN INTELLECTUAL ADVENTURE WITH REAL HEART."

—Daryl Gregory, award-winning author of *Spoonbenders*

Called "one of the most brilliant minds of our times" and listed among *Time* magazine's most influential people, Robert Lanza's work has spanned many fields, from biology to theoretical physics. Best known for his pioneering research in the vanguard of stem-cell science and for cloning the first human embryo, Lanza is also the father of biocentrism, a theory where the observer is the basis of the universe.

In **OBSERVER**, written with Nebula and Hugo Award-winning author Nancy Kress, Lanza's groundbreaking scientific work is the basis of a bold and thought-provoking novel that confronts mysteries in the space between biology and consciousness, between the self and what we assume is external reality

Young neurosurgeon Caroline Soames-Watkins's star has been on the rise. But when she accuses a superior of sexual misconduct, a Twitterstorm upends her career. With few professional options, and an impoverished sister with a profoundly disabled child to support, she is willing to consider a strange and unexpected proposal from her great-uncle, Nobel Prize-winning scientist Samuel Watkins, a man she barely knows.

Sam Watkins changed the world and made a fortune patenting an over-the-counter cure for the common cold. He has since invested untold sums of money to build a medical facility in the Caribbean. But he is very sick and in urgent need of a surgeon to perform a unique procedure developed at his island compound behind a wall of secrecy. The procedure isn't for the cancer surely killing him. It is to offer life of an altogether different kind. Helped in his mission by eminent physicist George Weigert, his longtime friend from Oxford, and charismatic tech entrepreneur Julian Dey, Sam has gone far beyond curing the body to develop a technology that could solve the riddle of mortality.

Though wary of the project's secret aims, Caroline signs on for the chance to secure a future for her sister and herself. What she encounters is something much more profound. It will put her on the precipice of a humanity-altering discovery. It will lead her to a level of interpersonal connection that she never thought possible. And it will plunge her into unimaginable danger on a mind expanding journey to the very edges of science.

OBSERVER will thrill you, inspire you, and lead you to think about life itself in startling new ways.

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ABOUT ROBERT LANZA

“His mentors described him as a ‘genius,’ a ‘renegade’ thinker, even likening him to Einstein.” – *U.S. News and World Report*

Robert Lanza is an American scientist and author whose research spans the range of natural science, from biology to theoretical physics. He was part of the team that cloned the world’s first human embryo and the first endangered species. His work has been crucial to our understanding of nuclear transfer and stem cell biology.

He is credited with several hundred publications and inventions, and more than 30 scientific books, including the definitive references in the field of stem cells and regenerative medicine.

Lanza and his work have been featured in many scientific journals and media outlets including a cover story in U.S. News where he was called “the living embodiment of the character played by Matt Damon in the movie *Good Will Hunting*.”

In 2007, he published an article for The American Scholar titled “A New Theory of the Universe” in which he argued that biology should be placed above other sciences in an attempt to solve one of nature’s biggest puzzles: the theory of everything. This new theory became known as biocentrism, which he has written about in three recent books:
Biocentrism (2009), *Beyond Biocentrism* (2016), and *The Grand Biocentric* Design (2020).

Dr. Lanza received his BA and MD degrees from the University of Pennsylvania, where he was both a University Scholar and Benjamin Franklin Scholar. He was also a Fulbright Scholar. He has worked with renowned Harvard psychologist B.F. Skinner, immunologist Jonas Salk, heart transplant pioneer Christiaan Barnard, and Nobel laureates Gerald Edelman and Rodney Porter.

ABOUT NANCY KRESS

“One of the best science fiction writers working today.” – Kim Stanley Robinson

Nancy Kress is the author of twenty-seven novels, three books on writing, four short story collections, and over a hundred works of short fiction. Her fiction has won six Nebulas (for “Out of All Them Bright Stars,” “Beggars in Spain,” “The Flowers of Aulit Prison,” “Fountain of Age,” “After the Fall, Before the Fall, and During the Fall,”and “Yesterday’s Kin”), two Hugos (for “Beggars in Spain” and “The Erdmann Nexus”), a Sturgeon (for “The Flowers of Aulit Prison”), and a John W. Campbell Memorial Award (for PROBABILITY SPACE).

She writes often about developments in science, particularly genetic engineering. Her work has been translated into over a dozen languages (including Klingon). She teaches writing and was the “Fiction” columnist for Writer’s Digest magazine for sixteen years. Kress also teaches, including a semester as guest lecturer at the University of Leipzig, an instructor at writing workshop in Beijing, and a yearly science fiction “boot camp” for aspiring professionals in Taos, NM.

She and her husband, author Jack Skillingstead, live in Seattle.

Q&A WITH ROBERT LANZA

Q: You're a scientist who's written or co-written many books on topics like stem cell biology, regenerative medicine, cloning, tissue engineering. Why did you decide to write a novel?

A: My medical career was really a side endeavor.

I've spent most of my life—from my earliest boyhood until now—developing biocentrism, a new scientific theory where the observer is the basis of reality. It's a reexamination of everything we think we know about time, space, consciousness, and the nature of the universe.

For thousands of years we've looked to the sky and gods for answers. We landed on the moon and even flung a piece of metal outside the solar system. But despite the development of superconducting-supercolliders that contain enough niobium-titanium wire to circle the earth 16 times, we have no more of an understanding of why we exist than the first thinkers of civilized consciousness. Why are we here? Where did it all come from—the laws of nature, the stars, and the universe? Humans have been asking these questions forever, but contemporary science hasn't succeeded in providing many answers. The answer lies deeper. It involves our very selves.

Although I've written peer-reviewed scientific papers and nonfiction books on the topic, I wanted to introduce the ideas to a broader audience in a fun, entertaining way---and through storytelling bring to life the science behind the astounding fact that time, space, and reality itself, all ultimately depend upon us, the observer.

Q: As a medical doctor who spent his career developing therapies and tools to cure disease, what inspired your interest in the nature of reality?

A: My interest in the nature of reality long preceded my medical career. My home life was less than the Norman Rockwell ideal. As a child, my parents didn't allow me to hang around the house unless to eat or sleep. I was basically on my own, and for play I took excursions, walking for miles deep into the forests of eastern Massachusetts, observing nature like Emerson and Thoreau did (two other transcendentalists who grew up just a few miles from me).

There I followed streams and animal tracks. I visited places that teemed with as much life as any city -- snakes, raccoons, turtles and birds all caught my attention. My understanding of nature began on those journeys. I rolled logs looking for salamanders and climbed trees to investigate bird nests and holes in trees. As I pondered the larger existential questions about the nature of life, I

began to intuit that there was something wrong with the static, objective reality I was being taught in school.

The animals I observed had their own perceptions of the world, their own realities. Although it wasn't the world of us human beings—of parking lots and malls—it was just as real to them.

Once I found an old tree with knots and dead limbs. There was a giant hole in its trunk, and I couldn't resist becoming another Jack to this beanstalk. I reached inside the hole to investigate. A great beating and flying feathers startled me as I felt claws and a beak sink into my fingers. As I withdrew my hand, a small screech owl with tufted ears, stared back at me. Here was another living creature, living in its own world yet a world it somehow shared with me. I let the little fellow go, but I went home a slightly changed young boy.

Indeed, my first science project—"Animals"—included souvenirs from these various excursions: insects, feathers, and bird eggs. It won me second place behind my best friend's project on "Rocks." Even in fifth grade I was convinced that life—not material and rocks—was the cornerstone of existence. It was a complete reversal of the natural scheme of things taught in our schoolbooks—that is, atoms and physics at the base of the world, followed by chemistry, and then biology and life.

This fascination with the nature of life infused my entire career, leading me to the very frontiers of biology and medicine. Later, as a scientist, I began to put my thoughts on paper. In fact, I wrote a book proposal on the idea in my early 20's. One prominent agent told me I was trying to "slaughter the sacred cow." Another agent told me that it was the kind of book you write at the end of your career, not the beginning. His advice was to "go build your career" and that I should write the book after I became successful. It turned out to be prophetic advice.

Q: You wrote about biocentrism in 2007 in an 8,000-word essay for the *American Scholar*, the venerable magazine known for publishing the work of the world's greatest thinkers, and received both praise and criticism. Since then you've co-written three nonfiction books on the topic, which have sold hundreds of thousands of copies. Yet the theory is still considered "out there." Do you think that's a failure of imagination or comprehension on the part of those who are dismissive?

A: Immanuel Kant received a similar reaction after publication of his *Critique of Pure Reason*. No less a figure than Herbert Spencer, finding, at the onset, that Kant considered space and time to be forms of sense-perception rather than objective things, decided that Kant was a stupid man, and threw his book away. "It is either vexation at a threatened reform," Kant said "or real narrow-mindedness."

People are generally open to ideas as long as they fall under the existing orthodoxy. Even as radical and mind twisting as Einstein's theories of relativity may seem, they still fall within the existing scientific paradigm–people still cross the street and go about their business without having to change their worldview, i.e. there is still a real pre-formed world out there.

The great anthropologist, Loren Eiseley, nailed the problem: "The student of scientific history soon learns that a given way of looking at things, a kind of unconscious conformity which exists even in a free society, may prevent a new contribution from being followed up, or its implications from being fully grasped. The work of Gregor Mendel, founder of modern genetics, suffered such a fate. Darwin's forerunners endured similar neglect...Like other members of the human race, scientists are capable of prejudice…I say this not to defame the profession of learning, but to urge the extension of education in scientific history. The study leads both to a better understanding of the process of discovery and to that kind of humbling and contrite wisdom which comes from a long knowledge of human folly in a field supposedly devoid of it. The man who learns how difficult it is to step outside the intellectual climate of his or any age has taken the first step on the road to emancipation, to world citizenship of a high order."

When I was taking advanced physics as a student at PENN, I spoke with the professor who taught the course about my theory. He said that he grew up when Einstein was God and that no amount of scientific evidence could make him change his mind about the nature of space and time. This is consistent with what the great Nobel physicist Max Planck once said: "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it." Or as Jubal says in *Stranger in a Strange Land* by Robert Heinlein, "All of us are prisoners of our early indoctrinations, for it is hard, very nearly impossible, to shake off one's earliest training."

Although I published parts of biocentrism in peer-reviewed physics journals, including the same journal Einstein published his theories of relativity, a paradigm change necessarily involves controversy and broader societal involvement.

That being said, a great number of people already enthusiastically embrace biocentrism, saying for example that "it changed my life" or "it's the best book I ever read." The great Nobel laureate E. Donnall Thomas said, "Any short statement does not do justice to such a scholarly work. The work is a scholarly consideration of science and philosophy that brings biology into the central role in unifying the whole… Most importantly, it makes you think." In his book "The Unobservable Universe," physicist Scott M. Tyson wrote that "The views that Dr. Lanza presented in this book changed my thinking in ways from which there could never be retreat. Before I had actually finished reading the book, it was

abundantly obvious to me that Dr. Lanza's writings provided me with the pieces of perspective that I had been desperately seeking. Everything I had learned and everything I thought I knew just exploded in my mind and, as possibilities first erupted and then settled down, a completely new understanding emerged. The information I had accumulated in my mind hadn't changed, but the way I viewed it did –in a really big way."

Q: How do you prove the critics wrong and where will you take biocentrism from here?

A: Biocentrism can be falsified using a range of different experiments—for instance, scaled-up superposition. Even the entanglement of living things might soon be scientifically testable. Indeed, bacteria have already been entangled, and a team of researchers led by Juan Ignacio Cirac, a pioneer of quantum information theory, recently proposed a methodology that "opens up the possibility of testing the quantum nature of living organisms by creating quantum superposition states in very much the same spirit as the original Schrodinger's cat "gedanken" paradigm. This is a starting point to experimentally address fundamental questions, such as the role of life and consciousness in quantum mechanics."

The observer-linked variations described in my new *JCAP* paper are also testable (see the new research I published in the *Journal of Cosmology and Astroparticle Physics* [*JCAP,* May 18, 2021] with theoretical physicist Dmitriy Podolskiy and Andrei Barvinsky, one of the world's leading theorists in quantum gravity and quantum cosmology). They can be checked by performing both real and numerical experiments on various quantum-mechanical systems. In fact, the results have already been checked numerically using the MIT computer cluster and will be checked experimentally in the near future.

Another empirical prediction based on our *JCAP* paper is that the statistical properties of observer networks determine both the value of gravitational constant and the effective cosmological constant in the model. To confirm this, you can measure running of effective cosmological constant with spacetime scale and see if it correlates with growth of the biomass on Earth (as a measure of number of observers). This is an extremely cool prediction, especially considering the dark-matter coincidence is a major scientific puzzle. Interestingly, the dark energy-dominated era began about 4 billion years ago, exactly when life (observers) emerged.

Another important biocentric prediction was also just confirmed by Proietti and his colleagues in Edinburgh. They performed a quantum experiment showing there is no such thing as objective reality (*Science Advances*, September 20, 2019). "If one holds fast to the assumptions of locality and free choice," wrote the authors, "this result implies that quantum theory should be interpreted in an observer-dependent way."

Future experiments along these lines are likely to test additional tenets of biocentrism. But biocentrism's adherents are unlikely to be surprised by the results. As Nobel laureate Eugene Wigner said, "The very study of the external world [leads] to the conclusion that the content of consciousness is an ultimate reality." Of course, there is already a long list of other experiments that strongly support biocentrism. Consider, for instance, the famous double-slit experiment. When scientists watch a particle pass through two slits in a barrier, the particle behaves like a bullet and goes through one slit or the other. But if you don't watch, it can go through both holes at the same time. So how can a particle "out there" change its behavior depending on whether you watch it or not? The answer is simple – reality is a process that involves our consciousness. Or consider Heisenberg's uncertainty principle. If there's really a world out there with particles just bouncing around, then we should be able to measure all of their properties. But you can't. The same for entangled particles. How can a pair of particles possibly be instantaneously connected on opposite side of the galaxy? Answer: Because they're not just "out there" – space and time are simply tools of our mind.

In fact, an amazing experiment published in the prestigious journal *Science* showed that scientists could retroactively change events that had already happened in the past. As light passed a fork in the experimental apparatus, it had to decide whether to behave like particles or waves. Later on (well after they had already passed the fork), a scientist could turn a switch on or off. What the scientist did at that moment retroactively determined what the particle actually did at the fork in the past. Of course, we live in the same world.

Q: How can biocentrism change the world and life itself?

A: First and foremost, biocentrism means that the fundamental ground state of the universe is not empty space, nor dumb, randomly colliding particles. Instead, that view would be replaced with the knowledge that the basis of the universe is conscious life. Which itself, though not spelled out in so many words, is infused with exquisite underlying intelligence. It would also mean that the supposed yawning endless emptiness of the cosmos is not real. I'm guessing people will happily accept this development, too. Who among us is attached to nothingness?

So: the Lonely Hearts Club aspect of the cosmos vanishes. And the big bang, that classical-science "explanation" for the genesis of everything, reverts to a hollow, meaningless oddity, a non-clarification—maybe not such a surprise, since the notion of everything arising mysteriously from "nothing" never seemed like a thesis any teacher would award with a passing grade.

Next, "mind" or "consciousness" becomes the essence or matrix of the cosmos, which, again, means that life is central to everything. Talk about "beginnings" loses all urgency, since time never existed outside of consciousness to begin with.

Speaking of which, if consciousness is everywhere and never discontinuous, then there's no death to experience. Sure, that dead dog in the road isn't going to get back up again and put his muddy paws on your pants. But in terms of awareness, you have never not experienced consciousness and its myriad sense impressions, nor will this parade ever cease. You can count on this. So, biocentrism has handed you the "no death" card—it's unlikely you'll ever want to trade it in again for something else. If you're bummed out by the fact that your experiences may not always be witnessed through your present eyes in your present body, well, you get what you pay for.

As a further bonus, once you've truly understood that all experiences occur strictly in the mind, so that the blue skies and pretty flowers you see are not physically apart from you "out there," the ensuing sense of oneness often produces a profound peace and serenity. Whether "peace of mind" is something you've personally coveted or not, many attest that it is a worthy goal.

Finally, of course, there is the alluring dance of future possibilities. With time and space firmly recognized as being "internal" properties of your own perceptions, biocentric technological developments may well allow travel through time, in ways that would be impossible if those dimensions were true external barriers.

And, on a far more fundamental level, biocentrism tells us that the mind's algorithms define our universe. Thus, it might be possible to add another algorithm, one that governs the interactions of, say, the units (universes) in the multiverse, where our universe is just one of the bubble universes, each of the others containing a slightly different history from ours. For instance, you might be able to step into a room where your dead cat is still alive, or where 9/11 never happened. Or it might be possible to change the mind's algorithms so that instead of time being linear, it is three-dimensional, like space. Consciousness could then move through the multiverse. Future technology might enable us to develop the tools to control such journeys. If so, you would be able to walk through time just like you walk through space. And after creeping along for billions of years, life would finally escape from its corporeal cage.

But above and beyond all this, acceptance of biocentrism would give us not only a worldview that unites us all more intimately than could be achieved by any government program, but a scientific model that—incorporating the centuries of hard-won breakthroughs—at last makes sense.

Q&A WITH NANCY KRESS

Q: You've written over thirty books, four collections of short stories, and over one hundred stories and novellas. Most of your work is in the science fiction category and much is centered on genetic engineering. Your stories often center on the moral problems of science and technology. What was the catalyst that sparked your interest in exploring this topic?

A: All good fiction centers on moral or ethical problems, but (usually) only science fiction deals with ethical issues raised by technology. This is important because both technology and the science that fuels them are growing exponentially. Genetic engineering, in particular, changes so fast that by the time a scientific journal vets and publishes an article, other scientists have already moved past those findings. And genetic engineering is everywhere: If you live in the United States, yesterday you probably ate something with genemod crops in it, or took medicine manufactured with the aid of genemod bacteria, or had contact with some other quietly-occurring aspect of the genetic revolution. This is the future, and the future is now. There will be many decisions to be made about this revolution: who controls it, who benefits, who objects to it and why. Important questions, and also fertile ground for the conflicts that drive fiction.

Q: Is *Observer* the first novel you've co-written? Why did you choose to collaborate and how did the process work? Also, what was it like to work with a scientist whose work features prominently in the book?

A: This is my first collaboration, yes, and it was an interesting and fruitful way to work. The scientific ideas in the book are Robert Lanza's; the characters and sentences are mine; the plot is the result of give-and-take between us. However, that is not as clear a division as it sounds: I shaped how his extensive scientific knowledge is presented, and he contributed many valuable ideas about how the story should unfold.

Q: The characters in many of your books are scientists, some working to advance humankind and prevent catastrophes, others looking to profit from their creations and knowledge, and some with more malevolent intentions. In Observer there are all three. Does this reflect our current reality?

A: There are no scientists with malevolent intentions in Observer. The characters with malevolent intentions are people translating science into technology, which is—and always has been—true of any science. The day that humanity discovered fire, the crime of arson became a possibility. And so on through the ages. And it is not, of course, mutually exclusive to both work to advance humankind through science and to profit personally from your work; scientists, too, have to pay the mortgage and feed their kids.

Q: How do you see the boundaries between science fiction and reality?

A: Science fiction has occasionally predicted real-life developments: communication satellites (Arthur C. Clark), remote hand-like manipulators (Robert Heinlein), organ transplants (Larry Niven), etc. But SF is not a predictive literature; often we get it wrong. Rather, good science fiction is a rehearsal of one possible way that reality might go, and thus can serve as a signpost ("Look what we might be able to do!"), a cautionary tale ("If this goes on…real problems!"), or an exploration of questions that affect the choices and decisions which lie ahead ("Consider this, please, in planning, that.")

Q: To what extent do you think science fiction can affect or improve the developments in science and technology in human life? Is it right to say that science fiction can change what human life looks like in the future?

A: I think, alas, that few books have the power to change the future. There are exceptions (Uncle Tom's Cabin, Silent Spring), but usually novels can only serve in the ways I mentioned in your previous question, and only, of course, for the people who actually read them. That does not, however, keep us authors from trying!

SCIENCE FICTION BOOK CLUB
Interview with Nancy Kress

February 2020

Nancy Kress is the author of thirty-three books, including twenty-six novels, four collections of short stories, and three books on writing. Her work has won six Nebulas, two Hugos, a Sturgeon, and the John W. Campbell Memorial Award, and has been translated into two dozen languages, including Klingon. In addition to writing, Kress often teaches at various venues around the country and abroad, including a visiting lectureship at the University of Leipzig, a 2017 writing class in Beijing, and the annual intensive workshop Taos Toolbox, which she teaches every summer with Walter Jon Williams.

Tony DeSimone: "Nano Comes to Clifford Falls" is one of my favorite short stories. Do you think the advent of 3D printing could lead to that story becoming a reality?

Nancy Kress: The 3-D printers in my story are super-machines, capable of creating anything. Although I think that large, versatile 3-D printers are certainly going to change manufacturing, by themselves they will not create the sort of universal unemployment that my story explores. You would still need to have raw materials mined or grown, transport to get those materials to the printers, and an economic reason to put traditional companies out of business. Competition will accomplish part of that, but not all of it. Like much SF, my story exaggerates the situation in order to spotlight it, especially its effects of my characters. That's what, in my opinion, good SF does: not so much invent tech as examine what its effect on society could be.

Let me add, however, that most of the effects in my story can, will, or already do exist if you use a broader definition of subversive tech: automation. 3-D printing is a part of this larger picture. We have already seen huge numbers of manufacturing jobs disappear in this country. The usual scapegoat is globalization: "Those jobs went overseas." Some, of course, did. But many studies say that as many as 80% of those jobs were lost not to globalization but to automation. This can only increase as technology advances in self-driving trucks, AI that can handle routine clerical tasks, and a host of other computer and/or robotic tasks (one tiny example: food-delivery robots from Starship Technologies, essentially "coolers on wheels," now deliver some items like pizza in D.C.) What are all those displaced workers going to do for money, for meaningful time-filling occupation, for life structure? Some can adjust; some will not. That's what I wanted to explore in "Nano Comes To Clifford Falls."

Mike Saltzman: Like you, I find that I require a lot more sleep than most people I know. I can sleep 10 hours a night and still be tired. Did you ever find a way to alleviate that problem in your own life?

Nancy Kress: No, but with advancing age, the problem has shifted. Now I can't get enough sleep, waking far too early no matter what time I go to bed. Ironies abound.

Joshua Carrasco/Jeff Minor: Who are some of you favorite current authors?

Nancy Kress: Although not exactly current, my favorite SF author of all time is still Ursula K. LeGuin. I reread THE DISPOSSESSED every few years: for its characters, its passionate belief, its prose. Of those alive now, I enjoy N.K. Jemison (even though I don't usually read fantasy, tending more toward science fiction), Daryl Gregory, Jack Skillingstead, Karen Joy Fowler. In mainstream, I have long been a fan of Anne Tyler (now, alas, retiring). I am about to read the controversial AMERICAN DIRT. However, I find that the older I get, the more non-fiction I read. Some of that is research, but a lot is curiosity about the world outside my head—more curiosity than I had when young. I don't know why.

Peri Dwyer Worrell: I just read "After the Fall" (etc). Why do you think you return to the plot element of exceptional children in your work?

Nancy Kress: Children interest me. Fresh out of college, I taught the fourth grade for four years. A young mind is certainly no tabula rasa—we arrive with a full set of genetic traits, and our families and neighborhoods shape kids to an enormous degree. That's part of why children interest me: To what extent can we have a hand in creating a society with humane beliefs and practices, and to what extent are we stuck with inborn proclivities toward hierarchy, violence, and gender differences? Complex questions—more complex than the shouting and outrage that even asking the questions often leads to. Children are the natural laboratories for studying those issues, as well as the eventual (I hope) solutions to them. Besides, young children are engaging. And exceptional children make good protagonists because, by definition, they are not like everyone else and that inevitably leads to conflict, the engine of all stories.

Molly Greenspring: Are there ways to write about the future from a more removed perspective or are all writers a product of their time?

Nancy Kress: All writers are products of their time, yes. But we can struggle—and sometimes it is a struggle—to transcend what we experience all around us and imagine a different way of life. Why was Euripides, of all the great Greek dramatists, the one to see that slavery was morally wrong? We don't know. For SF writers, a new perspective can come from extrapolating a current trend ("If this goes on…."), from imagining a way of life suited to a completely different environment (How would we live differently if some among us could control earthquakes? See N.K. Jemison), or from setting a story so far in the future that there exist entirely different rationales for living meaningfully (I tried to do this in "My Mother Dancing.")

Molly Greenspring: How much research is done for your books about subjects like genetic engineering, divisions in society and transhumanism?

Nancy Kress: A lot. A very lot. I am not trained as a scientist, and when I write the kind of hard SF that exists, for example, in "Yesterday's Kin" or STINGER, I research the science first, and thoroughly. I read journals and books, I research online, I plague scientists and doctors I know with questions. Such research often shapes or even suggests plot points. When I wrote "Beggars in Spain" in 1991, both my scientific research and the science in my story were minimal, and not particularly supported. Since then, I have more, and more accurate, science. This presents its own challenges; the science should be interesting, credible, and clear, but it should not slow down the story or distract from it.

John Grayshaw: Do you have advice for other writers that aren't scientifically trained how to do scientific research and get the science right?

Nancy Kress: First, find some development or piece of tech that interests you (I subscribe to SCIENCE NEWS, which every two weeks provides brief introductions to what's happening in a variety of fields.) Once you've got something, go to trusted sites on the web to learn more. Then find books and journal articles, as recent as you can, and read them. I do this, incidentally, for other aspects of my stories besides science. For my character Army Ranger Leo Brodie in IF TOMORROW COMES, I read three memoirs by Rangers who served in Iraq, studied the Ranger Handbook, researched sniper rifles and Stryker tanks online, and finally hired an ex-Ranger to read the manuscript and correct whatever I had wrong or outdated. Which he did. My closest friend is a doctor, and she reads and vets everything medical in my stories (Bless you, Maura!)

Eva Sable: So much to read, so little time ... If I wanted to get a sense of you as a writer, which of your works would you recommend?

Nancy Kress: For short stories, THE BEST OF NANCY KRESS, which conveniently brings together a bunch of my short work. For novellas the ones that have won awards: "Fountain of Age," "The Erdmann Nexus," "Beggars in Spain," "After the Fall, Before the Fall, During the Fall," 'Yesterday's Kin." For novels, probably the novel version of BEGGARS IN SPAIN. But taken all together, that's a lot of verbiage. I've been at this a long time ☺.

Jan van den Berg: I used to subscribe to Asimov's Science Fiction Magazine (1980s and 1990s) and read quite a few short stories by you. Does the short story format suit you better than novels (or the other way around) or do you like both formats?

Nancy Kress: Novellas are my favorite length (17,500 – 40,000 words). They are long enough to create an alternate world, but short enough that one plot line can barrel on through, without the need for subplots that a novel has. I also really like short fiction. Probably soon I will stop writing novels entirely and concentrate on the shorter lengths, which I enjoy more and think I'm better at.

Gary Denton: I loved that you explored a moral, political, and philosophical question in The Beggars in Spain series. "In the most objective terms you can manage, what do we owe the grasping and nonproductive needy?" What was the process of creating this series like? Were there incidents or inspiration that made you decide this would be your next work?

Nancy Kress: I think you are paraphrasing! I didn't say "What do we owe the grasping and non-productive needy," I said "What do the haves owe the have-nots?" Many people are have-nots despite working one, two, even three low-paying jobs to support their families. What got me started on exploring this question was two very different books. I read (again) LeGuin's THE DISPOSSESSED, in which the answer to the question is "Everything." In a society in which no one owns anything, not even personal pronouns (they say "the handkerchief I use"

rather than “my handkerchief”), all is shared. The other book was ATLAS SHRUGGED, to which the answer is “Nothing. Let them fend for themselves.” I wasn’t satisfied with either

answer, lacking both LeGuin’s faith in property as the root of (nearly) all evil, and Rand’s coldness and inconsistency (too long to go into here.) So I wrote the book as a way of figuring out what I did think the haves owe the have-nots, and why. The other two books of the trilogy were written because the story did not seem done.

Gary Denton: In another interview, you said that genetically engineering people who don't need sleep gestated as a story you tried different versions of for 13 years before you send off "Beggars in Spain" as a novella where you combined it with economics and morality. Do you feel most good science fiction stories need two or more ideas to explore?

Nancy Kress: Yes. In fact, most good fiction except very short stories combine an idea about the outer world with a change in the protagonist’s inner world. This is especially true of science fiction and fantasy, which is in the business of inventing outer worlds different from our own.

Gary Denton: Your latest book 'Terran Tomorrow' had a similar genesis as 'Beggars in Spain' - a Nebula Award-winning novella that became a trilogy of novels. Is that the nature of the publishing industry, they want to turn great shorter stories into trilogies, or did you plan it that way?

Nancy Kress: I did not plan it. My entire career has been pretty much unplanned, writing whatever moved me at the time instead of doing what the publishing industry finds most lucrative: building a “brand,” writing long series so that there is an automatic readership of people who liked the first one, sticking to one subgenre (fantasy, horror, hard SF, space opera, etc.) If I had done it the way I was “supposed to,” I probably would have made more money. But this way has satisfied me. The novellas became novels and then trilogies because I felt I wanted to say more about the characters or the situation.

John Grayshaw: Who are some of the Science Fiction writers you are friends with. Do you have any interesting stories about any of those relationships?

Nancy Kress: For the last eleven years, I have lived in Seattle, which has a thriving SF community that includes Greg Bear, Ted Chiang, Eileen Gunn, Nicola Griffith, and, until her recent death, Vonda McIntyre. In addition, 35 years of con-going have introduced me to a lot more writers who became friends. Yes, I know stories about all these people, but I’m not going to tell any because I’d like to keep their friendship ☺

John Grayshaw: I read that Bruce Sterling, at a workshop gave you some advice that ended up shaping “Beggars in Spain. Are you also friends?

Nancy Kress: Yes, although now that Bruce lives in Europe, I don’t see much of him. I admire his work a great deal, however.

John Grayshaw: Do you like to go to Science Fiction Conventions. Do you have any interesting stories about them?

Nancy Kress: I don't go to as many conventions as I used to, but I still enjoy them. Not only do I get to sit on panels and do readings, but I get to see friends scattered all over the country. And a lot of business gets done at cons, as well, since editors and agents are there. I am

enormously pleased to be Guest of Honor at the 2021 World Science Fiction Convention in Washington, D.C.

John Grayshaw: How did you get involved in teaching writing? What are some of the things you enjoy about it?

Nancy Kress: I have always been a teacher: primary school (teaching fourth grade), high school (did not go well), college (State University of New York). After I started publishing, the transition to teaching SF writing was a natural. I've done Clarion and Clarion West multiple times, and now each summer Walter Jon Williams and I teach Taos Toolbox, a two-week intensive workshop in New Mexico. Our guest lecturer is George R.R. Martin. I like teaching writing for several reasons: to help along new talent, for the camaraderie, and to help sharpen my own writing. Teaching craft to others forces a writer to think about their own. In addition, I've been fortunate enough to teach writing in Beijing and in Leipzig, both fascinating cities.

John Grayshaw: A career such as yours has had many turning points, can you talk about some of these more pivotal moments?

Nancy Kress: Every writing career (including George Martin's, as he explains to my Taos students every year) has at least one low point, where a writer thinks: Okay, that's it, my career is over, what are the chances of becoming a plumber? I reached that point after two books of mine in a row did not sell well and my publisher was going to demote me from hardcovers to only mass-market paperback. But the next books I wrote happened to be space opera, a popular genre (the PROBABILITY series), and an editor who believed in me said, "Wait…I think we can sell this."
And they did.

On the writing side rather than the business side, you already alluded to Bruce Sterling's critique of a story of mine at a professional writing group we both attended in the early 1990's. His critique was harsh and, as I realized after licking my wounds for a few weeks, accurate. He said that the society in my story made no sense, was just stuck together "from 1950s and 1960s SF tropes" because I hadn't considered the economic underpinnings of any society. He was right; I hadn't. So I started to think about money and power, and the next thing I wrote won both the Nebula and Hugo, "Beggars in Spain." That was a turning point for me, for sure.

John Grayshaw: What are some of your hobbies other than writing?

Nancy Kress: I play chess. Badly but with gusto.

John Grayshaw: Do you have a writing routine or habits that you stick with?

Nancy Kress: Yes. I am very much a morning person, and so I write first thing (well, after my first coffee and a few online chess moves). I never write in the afternoon, although I can research, edit, or read and critique student manuscripts then. In the evening I can barely

remember my own name. Fortunately, there are a lot of non-writing occupations where that is not required.

John Grayshaw: What are you working on right now?
Nancy Kress: A novel, in collaboration with a scientist. More than that I won't say, since I find that talking about work in progress tends to lessen my desire to actually write it. Talking is so much easier.

John Grayshaw: What are your goals for the future?

Nancy Kress: To write more short fiction, my first love. And to read more of the young up-and-coming writers. Ours is an exciting genre, and I'd like to learn more about where it's going now.