

Evolution May Be Purposeful And It's Freaking Scientists Out

Richard Dawkins' *Selfish Gene* faces a formidable challenge as a biophysicist makes a case for an evolution driven by purpose, intention and a collective intelligence.

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scientists are worried

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“Where are all the genetic cures?” asks Denis Noble, a frustrated biophysicist, Royal Society fellow and pioneer of the field of systems biology. “They don’t exist. Where will they be? They won’t exist.” Since mapping the human genome in 2003, research priorities and funding shifted significantly towards genetics. The investment improved disease detection and management but failed to deliver on its promise of cures for our most common deadly diseases like heart disease, type 2 diabetes, Alzheimer’s and most cancers. Compounding the issue, a [large-scale, 2023 study](#) concluded that genetic risk scores perform poorly at predicting who’s going to develop common diseases. For Noble, the billions invested annually in genetic research represents less of a strategy and more of a scientific confusion—that we are our genes.

The scientific story of who we are is a reductionist, gene-centric model that forfeits natural phenomena like *purpose* due to its association with intelligent design and a transcendent, intelligent designer. Noble is neutral on religious matters. Yet he sees compelling evidence

that purpose may be fundamental to life. He's determined to debunk the current scientific paradigm and replace the elevated importance of genes with something much more controversial. His efforts have enraged many of his peers but gained support from the next generation of origins-of-life researchers working to topple the reign of gene-centrism. If successful, the shift could not only transform how we classify, study and treat disease, but what it means to be alive.

Emergent Heart Beats

One of the earliest biomedical computer programmers, Noble created the first model for a working human heart in 1960 on a vacuum tube computer. The project led to his discovery that heartbeats are emergent properties—new phenomena—arising from feedback loops, transforming our understanding of heart function and underpin treatments for heart conditions that we use today. His research on the heart's pacemaker demonstrates a prioritization of the organism as a whole over its genes alone. "Several genes could individually be knocked out but the process

continues,” says Noble. These genes are responsible for heart rhythm, yet other mechanisms can take over to get the job done.

In the 1960s, Noble served as the dissertation examiner for the then-unknown Richard Dawkins. Dawkins—a prominent figure in the New Atheism movement—would go on to author the 1976 classic *The Selfish Gene* that popularized the gene-centric theory of evolution. Gene-centrism says evolution acts on genes, not individual organisms. We are merely vessels for our genes that are driving evolution by Darwinian natural selection. Noble's analysis suggests that evolution acts on the organism as a whole, with the organism harnessing randomness and variation to create and heal itself—on purpose. In this re-evaluation, Noble believes that purpose, creativity, and innovation are fundamental to evolution. He argues that we experience these processes as drives, but they are not purely subjective. They also progress non-consciously in other parts of our body. These natural processes harness randomness and unpredictability—stochasticity—to

survive, make decisions, and thrive.

“Stochasticity is the center of creativity in organisms,” says Noble.

Evolution on Purpose

Noble’s formal training is in cellular electrophysiology, the study of the differences in electrical charges inside and outside of a cell membrane. He suspects that crevices of ancient rocks served as cradles for emergent self-sustaining systems. Eventually, membranes evolved from lipid-coated bubbles, replacing the fissures in rocks as containers for these emergent systems. This gave rise to the first living entity—a single-celled organism.

According to Noble, the constraints of a cell’s membrane and the restriction of freedom of molecules inside a cell, made purpose both possible and necessary.

This development required a sort of intention or cognition within emergent networks of molecules to create and sustain biological functions.

Reinterpreting Existing Evidence

Noble sees evidence of purposive and intentional evolution in our immune response to viruses. Detection of the

invader triggers a flurry of rapid mutations in the genes of B cells, creating a legion of gene variants. These variants are antibodies, the most effective of which are deployed to combat the virus. In a defensive assault, the immune system self-modifies its own DNA. “It changes the genome. Not supposed to be possible,” says Noble. “Happens all the time.”

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The conventional view is that this is still random natural selection—cranked up to warp speed inside the body during the lifetime of an individual organism. Noble agrees, but adds the observation that the organism's immune system initiates and orchestrates the ramped up process, harnessing natural selection to fight off the invader. For Noble, this routine

procedure offers clear evidence of the organism actively participating in its own evolution—it's *doing* natural selection. This is an alternative theory of evolution where cognition is fundamental. In this theory, the smallest unit of life—cells—have some version of intelligence and intent that allows them to detect and respond to their environment. Noble clocks the immune response as a goal-directed pattern of behavior at the cellular level that scales to every level of organization within a living system. He believes we're working ourselves into a sweat to exclude something so essential to evolution and to life as purpose and intention.

The Future of Evolution

Noble is part of The Third Way, a movement in evolutionary biology that views natural selection as part of a holistic, organism-centered process. He co-authored *Evolution "on Purpose,"* published by MIT Press in 2023, which argues that organisms evolve with intention.

Recent research calls into question whether genetic mutations are even

entirely random. A 2022 study in *Nature* shows a [mutation bias](#) supporting the organism as a whole. Noble doesn't understand why studies like these aren't making bigger waves. "Do you, you people working in gene-centric biology, do you realize what has already been published?" asks an incredulous Noble.

This is one of his central criticisms of Richard Dawkins, whom Noble dubs the primary exponent of gene-centrism. Dawkins is one of the world's foremost science communicators. Noble considers Dawkins an exceptional writer who simply hasn't kept up with the science. When asked for comment, Dawkins responded, "I have a whole chapter dealing with Denis Noble in my next book, *The Genetic Book of the Dead*. It will be available in September."

Where Evolution Went Wrong

Noble attributes our legacy of missteps to rigid assumptions put in place over a century ago to stand in for a lack of evidence. Darwin's namesake theory of evolution by natural selection was first published in 1859. This slow process alters instructions to build an organism

only through genetic mechanisms like random mutations and recombination that get passed down to offspring.

Near the end of his life, Darwin was corresponding with physiologist George Romanes, exploring additional mechanisms of inheritance and the role of physiology. Despite Darwin's broadening views, his theory was scaled back posthumously. Following Darwin's death in 1882, biologist and 'Neo-Darwinist' August Weismann promulgated the idea of a one-way barrier cordoning off reproductive cells from the rest of the body. This barrier required that reproductive cells were the sole vehicles for inheritance. Neo-Darwinists would go on to revive a theory of genes and genetic recombination. Mendelian genetics with Darwin's natural selection were synthesized. The reproductive cells became the housing for genes which ascended to the centerpiece for evolution.

In 1894 at age 46, Romanes died of a cerebral hemorrhage. And so died the lone voice advocating for Darwin's ultimate views—views of evolution which

emphasized more complexity and physiology. Noble suspects if Romanes had survived, we may have avoided a gene-centric paradigm paralysis. Instead, Noble feels “our genetic hope is more about faith than facts.”

Mortality And A New Biology

Noble is urgently reviving and expanding on Darwin and Romanes. Last month, a special edition of *The Journal of Physiology*, co-edited by Noble and Michael Joyner of the Mayo Clinic, featured 21 articles challenging current evolutionary theory and advocating for the inclusion of phenomena like agency and cognition.

These articles corroborate the general theme that *Genes Are Not The Blueprint For Life*, the title of Noble's review in the journal *Nature*, heralding science writer Philip Ball's primer *How Life Works: A User's Guide to The New Biology*. Ball, a former editor of *Nature*, admonishes the life sciences for ignoring obvious natural properties of living systems like agency and purpose because of “quasi-mystical” associations with intelligent design. In the book, Ball illustrates the resistance to

letting go of the “tidy tale” of gene-centrism and the idea that genes control health more than “a bit’ and ‘somewhat’.” Like Noble, Ball is advocating for a new biology.

Noble’s urgency is more than academic. “This is critical to the future of health care,” says Noble, who feels the public is paying the ultimate price for gene-centrism. “I face the same problem as many other people face,” says Noble. “Families having to deal with serious illness, with social care that costs more than you can ever afford. I've been through all of that. I know what it does to families.” He considers it a foregone conclusion that aging populations will strain health systems to the point of rupture if we continue with gene-centrism.

The Critics

Noble’s critics worry that entertaining religion-adjacent views subverts established science and the entire scientific project. But Noble’s research doesn’t challenge the scientific method. It challenges a scientific epoch marked by a purely mechanistic view of nature

that coincided with the Industrial Revolution and age of mechanization. Noble appreciates concerns raised by skeptics, yet refuses to exclude natural phenomena from scientific inquiry.

Noble's critics also accuse him of exaggerating the importance of physiology, while Noble insists physiology has been unjustly sidelined since Darwin. "Physiology now has to come to the rescue of evolutionary biology," says Noble.

Another objection is that Noble is contesting a theory of evolution that has since been revised to address new evidence. For Noble, this is exactly his point. New evidence doesn't merely refine the theory, it undermines it.

Biology's existential crisis reached a flashpoint in 2016, when Noble and a group of scientists and philosophers organized a conference on New Trends in Evolutionary Biology with the Royal Society of London. Royal Society members petitioned—unsuccessfully—to kill it. The protest letter (Royal Society member Richard Dawkins' signature was noticeably absent) read "...we wish to

express our concern that this meeting will severely damage the reputation of the Society among the worldwide community of evolutionary biologists (it has already attracted adverse comments among colleagues in the USA).”

They never name their U.S. colleagues, although American biologist and prominent anti-creationist, Jerry [Coyne](#) uses words like "stupid," "rotten" and “blundering tyro” in his public condemnation of Noble. Canadian biologist Laurence A. Moran [echoes](#) Coyne’s outrage adding, “It's difficult not to be very angry at people like Denis Noble.” Moran writes that if science was working properly, Noble would “fade into the woodwork of the Senior Common Room at some college in Oxford.” It’s true Noble didn’t raise serious objections to evolutionary theory until after he retired as Chair of Cardiovascular Physiology at the University of Oxford in 2004. He says “coming out” would have invariably damaged the reputation and careers of the research team in his lab.

The Next Generation

“We need to shame them. I'm sorry, but we do,” says bioengineer and origins-of-life scientist Joana Xavier about Noble’s caustic critics. Xavier, a next-generation evolutionary theorist, resents “bullying” from prominent scientists that shuts down young biologists and stymies scientific progress. She and her peers have new tools and fresh perspectives, yet Xavier says their academic careers are jeopardized by demeaning attacks.

Xavier’s research made headlines for her discovery of emergent, cooperative networks of molecules that mutually catalyze each other's formation in ancient bacteria. These systems were first theorized by complexity scientist, Stuart Kauffman, as a candidate for the origins-of-life story that challenges gene-centrism. Xavier studied under Noble and Kauffman before launching the Origin of Life Early-Career Network (OoLEN) with over 200 young, interdisciplinary researchers from around the world. This group co-authored an inaugural scientific paper *The Future of Origin of Life Research: Bridging Decades-Old Divisions*.

Xavier has identified another form of intention at the cellular level of emergent systems: *cooperation*. She doesn't understand why it's acceptable to think of evolution as competitive but evidence of cooperation is considered taboo. "I think to solve life's origins, we'll need to look much more at cooperation. And emergence really brings cooperation into the scene, whether you want it or not," says Xavier, who also sees creativity as fundamental to life. "It's so obvious, you either accept that it is true that life is creative or you don't."

Xavier says her field is at an inflection point with gene-centrism holding back progress in health and medicine. "I think we're completely stuck," says Xavier. She's actively pushing in a new direction even if she has to leave academia for the private sector to do it. "The gene-centric paradigm," says Xavier, "That has to go. It's urgent."

These days, Noble is surrounded by young researchers eager to reopen the case of evolution. "I have young people helping me with all of this because, believe me, I can't do all of this on my

own,” says Noble. Creativity, purpose and organism-centered evolution are still only postulates that need rigorous testing. Noble is eager to explore both his theory and others. With theories of who we are, how we heal, and how we came to exist, Noble stresses “we should have more than one horse in the race.”

Watch the interviews with Noble and others that informed this article here: