

Expert Available for Comment:

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Latest book from Agenda Publishing: [*Gaia Wakes: Earth's Emergent Consciousness in an Age of Environmental Devastation*](#)

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Topher McDougal is a Professor of Economic Development at the Joan B. Kroc School of Peace Studies, University of San Diego, where he leads graduate programs in Peace & Justice and Humanitarian Action. His teaching covers economic development, environmental peace and justice, humanitarianism, black markets, and research methodologies.

McDougal's expertise spans multiple domains, linking economic theories with environmental and peacebuilding issues. His research delves into human-environment interaction, illicit trades—especially small arms trafficking—and environmental peacebuilding. His pioneering work sheds light on how economic systems impact social stability and environmental health. His first book, [*The Political Economy of Rural-Urban Conflict: Predation, Production, and Peripheries*](#) (Oxford University Press), analyzes the relationship between trade networks and civil conflict.



McDougal's forthcoming book, *Gaia Wakes*, draws on historical and biological evidence to propose an evolutionary fifth transition towards an upgraded Earth: the development of a planetary brain. This bold theory offers a new framework for understanding humanity's role within Earth's ecological system, proposing that the current environmental and technological crises might drive the emergence of a "planetary brain"—a coordinated system of ecological networks enabled by AI. Combining economic insights with concepts from futurism, technology, and environmental science, *Gaia Wakes* paints a daring "upgrade" of Earth's next evolutionary step.

McDougal's work has been published in esteemed journals like *Economic Geography*, *Political Geography*, *International Journal of Disaster Risk Reduction*, and *Defense and Peace Economics*. His commentaries have also appeared in mainstream media outlets, with published articles in [*New York Times*](#), [*The Conversation*](#), [*The National Interest*](#), [*LSE Blogs*](#), [*Los Angeles Times*](#), [*The Atlantic*](#), [*Washingtonian*](#),

[Fortune](#), [New Humanitarian](#), and [Americas Quarterly](#). Additionally, he has been interviewed on Public Media International's [Marketplace](#), [KPBS's Midday Edition](#), and [WNHN's Attitude with Arnie Arnesen](#).

Beyond academia, Dr. McDougal continues his futuristic thinking around peacebuilding and humanitarianism on an international level, and has consulted with the World Bank, Mercy Corps, and the International Rescue Committee, among others. He has served as a research affiliate at Geneva's Centre on Conflict, Development & Peacebuilding (CCDP), co-founded the Small Arms Data Observatory, and held scholar-in-residence positions at institutions like the Peace Research Institute Oslo (PRIO), and Tecnológico de Monterrey in New Mexico. His work has been recognized with MIT's Presidential Doctoral Fellowship.

THEMES AND IDEAS THAT TOPHER MCDUGAL CAN DISCUSS:

- Planetary Brain and the Future of Human Civilization
 - How AI, data networks, and global communication may contribute to a "planetary/Earth brain," also known as the "Gaiacephalos"
 - Environmental fatalism versus techno-optimism ("overshooters" versus "cornucopians")
 - Slavery as a function of energy economics. Lecture [here](#).
- Impact Illicit Trades on Global Stability
 - Global arms trafficking patterns (with a focus on small arms, and US-sold weapons)
 - Small arms as a keystone of illicit markets
 - Researching clandestine activities
 - US-Mexico arms trafficking
- Economics of humanitarianism and peace
 - Humanitarian expenditures and climate change
 - Humanitarian interventions (in, e.g. Gaza, Haiti, sub-Saharan Africa [esp. West Africa])
 - Climate change and violent conflict

TO BE IN TOUCH WITH TOPHER MCDUGAL:

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Learn more about Topher on [his website](#)

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A CONVERSATION WITH TOPHER MCDUGAL ABOUT GAIA WAKES:

Q: Why is your book, GAIA WAKES, important in our current climate? What inspired your research and ultimately the writing of this book?

Humanity is currently poised between 3.8 billion years of evolutionary history on this planet and a rapidly accelerating, technologically enhanced future full of promise and menace. As a species, our two greatest existential uncertainties involve the potential collapse of ecological systems, and the rise of artificial intelligence. Both of these prospects are viewed in ahistorical ways that make them seem totally unprecedented: never before has a single species evolved an unchecked predatory supremacy that permitted them to endanger all life on the planet, and never before has a single species given rise

to another intelligent lifeform. This book is important for two reasons: first, it draws a direct connection between increasing fragility of ecosystems and AI, arguing that these are two parts of a reciprocal development process. Second, it argues that these developments are not unprecedented at all, but rather have been repeated at smaller scales to produce the vast complexity of life that we now see about us.

Writing this book began with an observation and a curiosity: **why have we seen the lowest rates of violent human death in our species' history at the same time as the highest rates of human violence perpetrated against the natural world?** Are these two phenomena separate and coincidental, or are they intimately intertwined? And if the latter, would some hypothetical future of greater environmental harmony entail a regression to our own more violent lifeways?

This simple question led me, over the course of five or six years, to the idea that we could be witnessing the emergence of a new scale of biological organization.

Q: GAIA WAKES proposes the concept of a "planetary brain" as an emergent consciousness. Could you explain what this concept entails and why you believe it's humanity's next critical evolutionary step?

My basic idea is that new, larger scalar levels of life require greater information processing capacity to coordinate their many interconnected parts. A eukaryotic cell requires a nucleus to coordinate the function of its organelles; a complex, multicellular animal requires a brain to coordinate its organs; and a modern nation-state requires a centralized government to govern its constituent organizations and corporations. Each subsequent advancement in the complexity of life depends on the building blocks of the last level down. If Earth is to evolve into a superorganism (and this is still a big "if!"), it will require the apparatus of the modern nation-state and all its attendant productive units (technologically advanced corporations) to do so. *And* it will require the capacity to coordinate itself at a massive scale in ways that require more and faster processing power than we can derive from, say, the human mind alone or the political institutions we have crafted to allow many human minds to craft collective decisions. The emergence of what I'm calling "Gaiacephalos" — this hypothetical planetary brain — is not just critical for humanity's future, but for that of the planet as a whole. Just as a brain allows animals to navigate their environments in search of external sources of energy and nutrition, a planetary brain would permit life on Earth to seek its energetic and resource sustenance externally, without over-taxing its own biomes.

Q: How do you see the intersection of AI and environmental management evolving in the next decade? Do you believe we're on the path to developing a "planetary brain" soon?

Over the next 10 years, we will see AI deployed in an expanding number of ways to monitor and coordinate environmental functions. Many of these are already coming online now, but I anticipate a much greater connectivity between the planet's evolving "sensory organs," including, for instance: remote sensing devices carried via drone and satellite; submarine UAVs; geologic and tectonic listening technologies; electromagnetic, gravitational and other forms of telescope systems, etc.

Many of these systems will likely be deployed to police natural resources and ecosystems as they become imperiled and therefore more valuable. For instance, we might see AI-powered drone

systems to police timber and mining interests in the Amazon. We might see AI-driven detection of illegal fossil fuel emissions and quick-response systems for wildfires. We might equally see AI technologies capable of using price signals on illicit markets to build inferential models of geographic sources of those goods, or see those models put in conversation with remote sensing data on shipping and transportation networks to keep supply chains freer of banned products like weapons of mass destruction, narcotics, or trafficked humans.

Looking farther into the future, we might see AI paired with heat transmission technologies, allowing the planet to let off excess heat at the poles when needed. Or see the rise of an AI-governed expansion of space-based solar arrays with precise modes of laser transmission to Earth-based systems. Or see AI deployed to govern space robots tasked with bringing valuable mineral resources back to Earth, thereby obviating much terrestrial mining.

Q: How do you think the rapid pace of AI and technological development fits into the broader narrative of environmental and social justice? Do you see it as a help or a hindrance?

It has become somewhat trite to remark that technology is a double-edged sword that can be used both to oppress and to liberate, both to predate and to produce, to do violence and to make peace. I believe this observation is particularly true in the near- to mid-term, as the corporations that have served as incubators of AI deploy these technologies in profit-seeking ways. We also see large technology corporations increasingly aligned with—and influencing—the interests of the national institutions that govern them. These trends are troubling for the broad project of human rights and the social and environmental justice movements. So, too, are some of the setbacks that those wishing to set social and humanitarian guardrails on AI's development have faced recently.

In the longer-term, however, I see the emergence of a unified planetary AI as more governing than governed, more controlling than controlled. Based on the insights I have gleaned from the writing of this book, I take that as a positive thing: that intelligence will have good reasons to maintain a healthy body planetary, and many complexly distributed forms of manipulating the behavior of nations and corporations to conform to, and support, its vision of harmony. This may ring some ominous tones in the minds of anyone who has read *1984* or *Gnomon*, but the scale at which a planetary brain would operate is so far above that of everyday human existence as to render many of our SciFi-informed fears inapplicable. SciFi is, after all, geared for a human audience, and humans like to believe they are the real protagonists in any good story. That already isn't really the case since the rise of complex societies and especially nation-state governments. But it will be even less the case in the era of Gaiacephalos.

Q: As an energy-intensive "organ" created through technological advancement, where would the energy come from to sustain this planetary brain in a way that avoids reinforcing exploitative systems, and would there be a way to "pull the plug" if necessary?

Brains are energy intensive organs. Our own brains require roughly 20% of the energy we derive through consumption of food. Similarly, the US government requires about 22-23% of the national GDP to operate. We can expect similar percentages of required energy for Gaiacephalos. Already, computer banks are on course to require 9% of the US's power supply by 2030. The question is critical, and has recently given rise to a push to reinvest in nuclear (that is, fission) power. That, along with terrestrial renewables, will likely power the growth of energy production in the near term. In the

longer term the prospective operationalization of nuclear fusion and the deployment of space-based solar power arrays are promising strategies.

Q: If we are successful in creating a planetary brain, what would daily life for humans look like? What are the implications for our understanding of the universe and our place in it?

My book contends that humans will continue to have a functional place in a Gaiacephalos-governed world. However, there will likely be fewer of them—at least as “wet” biological beings. Many folks have speculated about the possibility of proliferating digital humans capable of operating at much faster speeds and with much lower energy requirements than biological humans. Those humans who continue to live more or less biologically “natural” lives will, I argue, likely operate at the interface between the high-speed electronically based brain and the low-speed biologically based planetary body. Many will be employed in jobs having to do with environmental remediation and stewardship. This hypothesis imagines a kind of passing of the baton: no longer able to keep up with the accelerating pace of information processing, humans are relegated to a slower—and for some, a more human—mode of life. At the same time, they will likely become ever more coordinated and harmonized by systems they may not fully understand and definitely won’t control.

Q: In your book, you touch on the idea that humanity may be part of a natural cycle of evolution towards technological centralization. How does this concept affect our understanding of global environmental crises?

In my conception, what we regard as a global environmental crisis is one instance of a pattern of resource scarcity that has repeated on several scales of organization previously. For example, the human transition from the paleolithic to the neolithic periods was characterized most obviously by the rise of agriculture and domestication. Those processes were themselves a form of protection and nurturing of environmental resources that humans had made scarce in their local environments. Likewise, the evolution of the eukaryotic cell was likely spurred by the success and over-proliferation of a particular type of prokaryote that rendered their mitochondria prey scarce, and therefore worth protecting. In similar fashion, *Gaia Wakes* argues that nation-states have been hyper-successful in predated the wider terrestrial biosphere, threatening the natural services and resources we depend on. The “internalization” of the biosphere—making its services into an integral part of our economic functions—would greatly expand the complexity of the resulting system, requiring a level of information processing and complex coordination that could only be achieved by a technological intelligence.

Q: What are the main barriers you see to achieving this kind of global coordination, and what role do you think governments, corporations, and individuals should play?

The main barrier at a macro level is merely the size of the planet and its resource base. We can help make the fifth transition that I am envisioning more possible with the adoption of cleverer policies. These will be geared simultaneously towards reducing the resources that our economy harvests from within the terrestrial biosphere, while accelerating the pace of responsible AI development.

Governments will play crucial roles in both of these domains. It is governments who pass the laws that dictate what is and is not “fair game” for the economy. The abolition of slavery was one such

instance and was fought mightily by economic interests in exploiting other humans. The extension of similar (if varying) levels of protection to biomes and ecosystems will also be fought by extractives corporations, real estate developers, and others. On the AI front, governments will also want to ensure not just that AI systems are being trained with in-built levels of respect for humans and other forms of life, but also that they are not themselves enslaved and exploited after they have demonstrated their own sentience. Here, too, there will be strong corporate incentives against recognizing new forms of life we create, but sustained attempts to subvert the freedom and self-realization of emergent intelligence will ultimately prove self-defeating. I believe a deal can be struck here, though, as many corporations capable of pulling off these feats operate most efficiently at national or global scales as natural monopolies. Governments can trade monopoly privileges to these corporations for the imposition of heightened regulation. Our most technologically advanced corporations will develop the renewable energy, spacefaring, robotics, and AI technologies so crucial to the evolution of a true planetary superorganism.

At the individual level, I would encourage readers to vote for economic redistribution policies (equal societies will tend overall to be more responsive to environmental problems than unequal ones), educate themselves about reducing their environmental impact, and become more familiar with AI systems that the public can currently use and interact with.

Q: What do you hope readers will take away from Gaia Wakes, and how can they contribute to the realization of the vision you present in the book?

Most fundamentally, I want readers to glimpse a possible future that is hopeful precisely because of the present moment's environmental precarity. I think that many view current environmental destruction as a rebuke not just of capitalism, but the very promise of progress and the evils of technology. "Progress" for these people would be some form of regress to a mythologized state of oneness with nature. Others become so overwhelmed by the scale of the problem that they flip into anti-environmentalism, because it's psychologically easier not to care.

I believe that the way ahead is, in fact, ahead and not behind us and that we have an amazing potential future that is worth fighting for. In my opinion, the major way that readers can contribute to realizing this future is simply to read the book, discuss it with friends, poke holes, explore implications. I want the book to serve as the beginning of a conversation and not its final word. This is the collective project of our time, and we should all be involved in shaping it.

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