

From: howlbloom@aol.com,
To: office@gsis.at,
Cc: wolfgang.hofkirchner@is4si.org,
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Electronic Symbiosis—Lessons from Bacteria

Howard Bloom
howlbloom@aol.com
Author, *The Lucifer Principle: a Scientific Expedition into the Forces of History*
The Howard Bloom Institute
Founder and co-chair, The Asian Space Technology Summit
Founder and Chair, The Space Development Steering Committee
Former Visiting Scholar, Graduate Psychology Department, New York University
Former Core Faculty Member, The Graduate Institute, Meriden, Connecticut

Some say that we should not let humanity's new electronic frontiers reshape us. But every time technology has reshaped us, it has upgraded us. To see how synergies with electronic systems like artificial intelligence can give humanity and humanism new powers, look at how bacteria have gained new abilities over the last billion years. They could have anticipated being annihilated by the new multicellular plants and animals. And they could have tried to stop the multicellulars' formation. But the multicellulars did not wipe out their single-celled forebears. Far from it. They worked out deals with single-celled bacteria. And those cooperative arrangements gave both the bacteria and the multi-cellular beasts whole new powers, whole new ways to make a living. Look, for example, at the cockroaches that first showed up on the planet 320 million years ago. For their first 69 million years, the cockroaches were limited to easily digestible food. But there was hard stuff all around them bursting with nourishment. That oh, too solid stuff was trees. And there was no way that the digestive system of cockroaches could turn bark and wood into tasty treats. Then came over 33 species of bacteria and set up shop in the cockroach's guts. Species like *Paenibacillus lactis*, *Lysinibacillus macrolides*, and *Stenotrophomonas maltophilia*.^[i] These microbial wonders could eat cellulose, the hard stuff that had previously made wood indigestible. What's more, the cellulose eaters could defecate material that was toast with butter and jam to the cockroaches, the perfect food-- sugars and short-chain fatty acids. In exchange, the microbes used cockroaches as their transport and chewing machines. The cockroaches empowered by their bacterial colonists to eat trees took off on an evolutionary path of their own. Today we call them termites. And there are 2,000 species of them. Which means that once the lowly cockroach allowed cellulose-eating bacteria and flagellates to turn its innards into a microbial dining hall, the newly empowered cockroaches found 2,000 new ways to make a living. So, no, multicellular beings did not wipe out their single-celled progenitors. They gave them a rich new home. And they gave the unicellulars breathtaking new powers. There is no guarantee that AI will empower us the way termites empowered bacteria and the way bacteria empowered termites. Especially once we begin to create AI embodied in robotic weapons, AI empowered to kill. We will have to do everything in our power to keep our AI killing programs from turning on their makers. But if all goes well, the relationship of AI and humankind will be a symbiosis. A mutual empowerment. A radical upgrade.

[i] WITH Express. 2019; 9: 111.

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Symbiotic cellulolytic bacteria from the gut of the subterranean termite *Pseudocryptotermes hypostoma* Desneux and their role in cellulose digestion

Huda RK Ali, corresponding author¹ Nada F. Hemeda, ² and Yasser F. Abdelalim ³

Howard Bloom
Howardbloom.net

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trailer for BRIC-TV's 66-minute film, The Grand Unified Theory of Howard Bloom,<https://youtu.be/rGkOkChazUQ>
Best Picture, Science Design Film Festival. Best Documentary Feature, Not Film Festival, Italy. Now available on Apple TV, Amazon, Google Play, Microsoft, Vimeo, Vudu, and Fandango.

Author of: The Lucifer Principle: A Scientific Expedition Into the Forces of History ("mesmerizing"-The Washington Post),
Global Brain: The Evolution of Mass Mind From The Big Bang to the 21st Century ("reassuring and sobering"-The New Yorker),
The Genius of the Beast: A Radical Re-Vision of Capitalism ("A tremendously enjoyable book." James Fallows, National Correspondent, The Atlantic),
The God Problem: How A Godless Cosmos Creates ("Bloom's argument will rock your world." Barbara Ehrenreich),
How I Accidentally Started the Sixties ("Wow! Whew! Wild! Wonderful!" Timothy Leary),
The Mohammed Code ("A terrifying book...the best book I've read on Islam." David Swindle, PJ Media), and
Einstein, Michael Jackson & Me: a Search for Soul in the Power Pits of Rock & Roll ("Amazing. The writing is revelatory." Freddy DeMann, manager of Michael Jackson and Madonna), Best Book of 2020, New York Weekly Times.

A Quartz Magazine Pro

Former Visiting Scholar, Graduate Psychology Department, New York University, Former Core Faculty Member, The Graduate Institute; Current Kepler Space Institute Senior Scholar.

Founder: International Paleopsychology Project. Founder, Space Development Steering Committee. Member Of Board Of Governors, National Space Society. Founding Board Member: Epic of Evolution Society. Founding Board Member, The Darwin Project.