

The Optimization Trap: Why Too Much Efficiency Makes Us Fragile

with Olivier Hamant | Episode 230

Show Notes and Links to Learn More

The TGS team puts together these brief references and show notes for the learning and convenience of our listeners. However, most of the points made in episodes hold more nuance than one link can address, and we encourage you to dig deeper into any of these topics and come to your own informed conclusions.

00:00 – [Olivier Hamant \(Works & Books\)](#), [INRAE Research Director](#), [ENS de Lyon](#), [Laboratoire de Reproduction et Développement des Plantes](#),

Olivier's featured works:

- [Olivier's 3-part presentation series "From performance to robustness"](#)
- Oliver's 60 page Manifesto: [Antidote to the cult of performance. Robustness from nature](#)
- [Olivier's book translated in English](#)
- An article on incoherence: [Is incoherence required for sustainability?](#)
- An article on suboptimality: [How humans may co-exist with Earth? The case for suboptimal systems](#)
- Short scientific tribunes:
 - [Learning from Nature](#)
 - [Debunking the idea of biological optimisation: quantitative biology to the rescue](#)
 - [Plant scientists can't ignore Jevons paradox anymore](#)
 - [Plants show us the light](#)
 - [Impact factor: Playing a number on you](#)

03:06 – [Nate's How to Think About the Future Frankly Series](#) (recent work on robustness)

03:30 – [Efficiency, Specialization, Systemic robustness vs. performance](#)

04:33 – [The Great Simplification](#), [Over-optimization](#)

04:53 – [Performance = efficacy plus efficiency](#), [Robustness and viability in biological systems](#)

06:01 – Society obsessed with performance: [Key performance indicators](#), [Made possible by fossil fuels](#)

06:42 – Qualities that create robustness: [Symbiosis](#), [Diversity](#), [Redundancy](#)

07:19 – [Charles Perrow](#), [Normal Accidents](#), [System accidents](#)

08:09 – [Ecological niche](#), [Parasitism](#), [Reductive evolution](#)

08:50 – [Stress test \(Biological stress\)](#)

09:40 – [Brittle systems](#)

09:58 – [*Homo sapiens over ~300,000 years](#), [Cooperative hunting](#), [Neolithic Revolution](#), [Agricultural Revolution](#), [Sedentism](#), [Renaissance plantations](#), [Colonialism](#), [Mechanization of agriculture](#)

The Great Simplification

- 11:15 – [Charles Darwin, *On the Origin of Species*, Adaptability rather than adaptedness](#)
- 12:36 – [Multi-level selection, E.O. Wilson, David Sloan Wilson \(*The Great Simplification* Ep 56\)](#)
- 13:11 – [Sharks as robust generalists, Orchid-pollinator coevolution, Ecological specialization](#)
- 13:33 – [Planetary boundaries, Global heating, 2026 European heat waves, *The Bottlenecks of the 21st Century*](#)
- 14:20 – [Monoculture & fragility, Forest pathogens](#)
- 15:32 – [Car dependency](#)
- 16:25 – [Software monoculture and cyberattack risk](#)
- 17:03 – [Spandrel](#)
- 17:41 – [Post-World War II robustness \(1945-1948\): Social Security, Universal Declaration of Human Rights, IUCN](#)
- 18:09 – [Energy surplus](#)
- 18:44 – [The Carbon Pulse, Possible future shapes of the Carbon Pulse, Future growth scenarios](#)
- 18:53 – [Risk homeostasis, Two-factor authentication and reduced vigilance](#)
- 19:40 – [*World population of 8.2 billion](#)
- 21:09 – Three turning points: [Neolithic, Renaissance, Industrial Revolution](#)
- 22:10 – [Nutrient-poor oceans, Marine species interaction networks, *Determinants of community structure in the global plankton interactome*](#)
- 22:36 – [Wide-boundary perspective \(Frankly on such\)](#)
- 22:50 – [Lions rest 16 to 20 hours a day](#)
- 23:25 – [Burnout, Ecosystem collapse, Sexual selection, Status, Relative fitness](#)
- 24:10 – [Negative externalities](#)
- 24:21 – [Improvisation, Sight-reading a score, Free jazz](#)
- 26:00 – [Agroecology](#)
- 26:15 – [Legume nitrogen fixation instead of fertilizer, Crop diversity to reduce pesticides, Soil organic matter instead of irrigation](#)
- 26:48 – [Anthony Barnosky, *Animal biomass up sevenfold in recent centuries, Haber-Bosch process, Corn and soybeans as livestock feed](#)
- 28:00 – [Fertile Crescent, Spread of the Neolithic crop package, Agroforestry](#)
- 28:38 – [Farm labour requirements without fossil inputs \(more info\)](#)
- 29:21 – [Right to repair, Growth of organic farmland in Europe](#)
- 30:40 – [Power vs. Energy, *The Great Simplification* Ep highlighting such](#)
- 32:44 – [Lithium mining, Mineral requirements for clean energy transitions, Saving the machine instead of life, Nature-based solutions \(*The Great Simplification* Ep highlighting such\)](#)
- 33:28 – [Declining net energy, Energy return on investment, Air conditioning masking heat waves](#)
- 34:40 – [Jean-Marc Jancovici on efficiency, sobriété, and poverty, Sufficiency](#)
- 35:34 – [Rebound effect, Low-cost airlines, Ultra-fast fashion](#)
- 36:22 – [Jevons paradox \(New IMF Paper: *The Generalized Jevons Paradox and the Future of Energy*\), Backfire effect, the Economic Superorganism \(Frankly #97\)](#)

The Great Simplification

- 36:52 – [Norman Borlaug](#), [Land sparing vs. land sharing](#), [Palm oil deforestation](#), [Soy-driven deforestation](#)
- 38:38 – [Kogi people of Colombia](#)
- 40:25 – [Evolutionary mismatch](#), [Sharing economy](#), [Functionality economy](#)
- 41:27 – E.O. Wilson [referenced quote](#): [The Superorganism](#)
- 43:45 – [Commons vs. Patents](#)
- 44:10 – [Calls for the commons in France](#)
- 44:47 – [Stalinism](#), [Extractivism](#), Income inequality in [the USSR](#) and the [U.S.](#) 1950s–1970s, [1970s oil shocks](#)
- 45:52 – [Robustness as a third way between growth and degrowth](#), [Degrowth](#)
- 46:40 – [Ecological overshoot](#), [Ecosystem services](#)
- 47:19 – [Sea level rise](#), [Amphibious architecture](#)
- 48:24 – [Risk society](#)
- 49:25 – [Flexible design in buildings](#), [Design for disassembly](#)
- 50:53 – [Repair Café](#), [COVID-era reallocation of streets and public space](#)
- 51:55 – Four determinants of robustness:
- [Redundancy](#)
 - [Heterogeneity](#)
 - [Link to the living \(biophilia\)](#)
 - [Deep link to the local territory](#)
- 53:39 – [Nate's series How to Think About the Future: \(Part 2\)](#), [Decision-making under deep uncertainty](#)
- 54:45 – [Active minority](#), [Serge Moscovici](#) on minority influence
- 55:28 – [Silent majority](#), [Sun Tzu](#), [The Art of War](#), [Go \(board game\)](#)
- 55:51 – [Flocks of birds guided from the periphery](#), [Collective animal behaviour](#), [Nonviolent resistance](#)
- 56:16 – [Polycrisis](#)
- 57:26 – [*Human brain size has decreased since the Neolithic](#), [Luke Kemp](#), [Lootable agricultural surplus](#), [Goliath's Curse](#) (*The Great Simplification* appearances: [#194](#), [#153](#))
- 58:16 – [Reduction of the human jaw](#)
- 59:05 – [Dental caries and the shift to agriculture](#), [Dietary diversity of hunter-gatherers](#)
- 59:55 – [Baseload power](#)
- 1:00:33 – [Néo-Loco solar bakery](#), [Solar oven](#)
- 1:01:12 – [Sourdough fermentation](#)
- 1:02:04 – [Bread prices and the invasion of Ukraine](#)
- 1:02:27 – [Sustainability as a frame](#)
- 1:03:08 – [Homo sapiens as wise ape](#), [Intelligence as adaptability](#)
- 1:03:44 – [AI in service of performance and extraction](#), [Energy and water footprint of AI](#), [AI as a machine to de-learn](#), [Cognitive offloading](#)
- 1:04:22 – [Deskilling](#)
- 1:04:50 – [Serendipity](#)
- 1:05:48 – [Homogenization of thought by AI](#)
- 1:06:44 – [The human predicament](#)

The Great Simplification

1:07:19 – Three principles from living systems:

- [Circularity](#)
- [Cooperation](#)
- [Robustness](#)

1:07:45 – [Nuclear waste as non-circular](#), [Circular bioeconomy](#)

1:08:18 – [Cooperation after disaster \(*A Paradise Built in Hell*\)](#)

1:09:10 – [Ultrasociality](#)

1:09:46 – [Entreprise à impact](#), [Impact as a military term](#)

1:10:33 – [Impact investing](#), [Trustpilot](#), [Trust emerging from uncertainty](#)

1:15:14 – [Robustness learning communities in France, Belgium, and Quebec](#)

1:15:36 – [Robustness in French local government](#), [Centre des Jeunes Dirigeants](#) and [their response](#)

1:16:16 – [Antidote to the cult of performance](#) (in English)

1:17:04 – [Robustness vs. resilience](#), [Nassim Nicholas Taleb](#), [Antifragile](#)

1:18:05 – [Viability theory](#), [Japan's post-Fukushima resilience policy](#)

1:19:06 – [Early specialization and burnout in young athletes](#)

1:19:32 – [Polymaths](#) and [generalists](#), [Range](#)

1:20:28 – [Outdoor and nature-based learning](#)

1:21:14 – [Permaculture](#), [Soil carbon sequestration](#)

1:22:12 – [2027 French presidential election](#)

1:22:35 – ["The Opposite"](#)

1:23:02 – [Joy](#)