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## REFERENCES FOR AN ADAPTIVE VIEW OF THE WORLD

### Introduction

This supplement offers a selection of references in support for an adaptive view of change and innovation in diverse fields of endeavor. Many items could be categorized under multiple headings.

As in the strategy domain, you will find little alignment on how innovations emerge in the references. Some beliefs about the mechanism of emergence are in stark conflict with The Emergent Approach (or vice versa) and with other references. The terminology used by authors also varies greatly. In some cases, complex adaptive systems or evolutionary terminology is not referred to at all. Some supply no mechanism for what they describe.

What unifies this bibliography is that each author touches on the behavior of adaptive systems in some way and shows in some way the need for adaptive approaches. This includes illustrating problems that occur when people and organizations fight adaptation: problems like outcome thinking, management by results, the fallacy of planning the future, and the illusion of eureka discoveries.

Comments and suggestions are welcome ([feedback@emergentapproach.com](mailto:feedback@emergentapproach.com)).

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\*\*\* Quotes are in *italics*, and commentary from the author is in brackets [ ] \*\*\*

## Places to Start

The following are (mostly) accessible for general audiences and give a good feeling for the emergence of innovations from adaptation.

**Cziko, Gary.** *Without Miracles. Universal Selection and the Second Darwinian Revolution.* Cambridge, Mass.: MIT Press, 1995.

[Presents Donald Campbell's (1916–1996) Darwinian theory of cultural evolution. Campbell's writing itself (see [Evolutionary Epistemology](#)) is quite academic.]

**Kocienda, Ken.** *Creative Selection: Inside Apple's Design Process During the Golden Age of Steve Jobs.* New York: St. Martin's Press, 2018.

[Description of the adaptive nature of innovation and puzzle solving.]

**Adrienne Maree Brown:** *Emergent Strategy: Shaping Change, Changing Worlds.* AK Press, 2017. [Applies "intentional adaptation" to societies greatest challenges. A call to action.]

**Johnson, Stephen.** *Emergence: The Connected Lives of Ants, Brains, Cities, and Software.* New York: Simon and Schuster, 2001.

[Steven Johnson's series of nearly a dozen books touching many areas of adaptation, change and innovation are written for general audiences and are accessible and engaging.]

See also,

———. *Where Good Ideas Come from: The Natural History of Innovation.* New York: Penguin, 2010.

———. *How We Got to Now: Six Innovations That Made the Modern World.* New York: Riverhead Books, 2014.

**Ridley, Matt.** *How Innovation Works: And Why It Flourishes in Freedom.* Harper, New York, 2020; and *The Evolution of Everything: How New Ideas Emerge.* HarperCollins, 2015.

**Holland, John H.** *Hidden Order: How Adaptation Builds Complexity.* Illustrated. Basic Books, 1996.

———. *Emergence: From Chaos To Order.* Illustrated. Basic Books, 1999.

**Camazine, Scott, Jean-Louis Deneubourg, Nigel R. Franks, Guy Theraulaz, and Eric Bonabeau.** *Self-Organization in Biological Systems.* New Jersey: Princeton University Press, 2001.

[Focuses on emergence/self-organization of capabilities and structures in biological systems including social insects. Their definition of self-organization is a beautiful articulation of dynamic emergence (page 8):]

*Self-organization is a process in which pattern at the global level of a system emerges solely from numerous interactions among the lower-level components of the system. Moreover, the rules specifying interactions among the system's components are executed [i.e., implemented] using only local information, without reference to the global pattern.*

**Cilliers, Paul.** *Complexity and Postmodernism: Understanding Complex Systems.* London: Routledge, 1998.

[heavy going; academic]

**Taleb, Nassim Nicholas.** *Antifragile: Things That Gain from Disorder.* New York: Random House Incorporated, 2012.

[See discussion in Chapter 2 of the Emergent Approach that *antifragile* is another term for

*adaptable*. Taleb is a leader in demonstrating the fallacies of management by prediction, planning the future, and managing by results.]

See also *Lift weights, avoid debt, drink the water*. Interview by Linda Geddes. *New Scientist*, 2012.

**Waldrop, Mitchell M.** *Complexity: The Emerging Science at the Edge of Order and Chaos*. New York: Simon and Schuster, 1992.

**Lewin, Roger.** *Complexity: Life at the Edge of Chaos*. 2<sup>nd</sup> ed. Chicago: University of Chicago Press, 1999.

[These two books on Complex Adaptive Systems, written by these journalists in the 1990s for general audiences remain relevant to this day.]

**Deming, W. Edwards.** “*Deming Speaks - Episode #3 - 1990*.” Accessed July 26, 2021.

<http://podcast.deming.org/deming-speaks-episode-3-1990>

[While not using the terms adaptation or evolution, the premise of Deming’s work was adaptationist. He railed against management by results and illustrated the damage done by focusing on measurement of high-level outcomes and silo behavior. He said you must have a theory and profound knowledge of the system. Click [here](#) for more Deming references.]

## Strategy Literature

The strategy literature connects to biology and adaptive systems in varied ways, but moreso the practice of strategy versus the foundational theory of strategy. Note also that some consulting firms have embraced the theories of adaptive evolution, for instance:

**Reeves, Martin, Simon Levin, and Daichi Ueda.** *The Biology of Corporate Survival*. Harvard Business Review 94, no. 1 (2016): 2. [Deloitte]

**Reeves, Martin, and Simon Levin.** *Think Biologically: Messy Management for a Complex World*. Boston Consultancy Group. BCG Henderson Institute (blog), July 18, 2017.

<https://www.bcg.com/publications/2017/think-biologically-messy-management-for-complex-world>.

### General Business Evolution

**Mintzberg, Henry.** *Rise and Fall of Strategic Planning*. New York: Free Press, 2013.

———. *Tracking Strategies: Toward a General Theory*. Oxford: Oxford University Press, 2007. [Mintzberg has been a leading voice in describing the adaptive nature of change and innovation, demonstrating that organizations often do not know where they were going, and do not do what they say they would do. He shows that analysis is not synthesis, and that synthesis of strategy is not a neat, straightforward, and linear process. (See also discussion of the difference between deliberate and emergent strategy in *The Emergent Approach*, p. xviii.)]

**Schoemaker, Paul.** *Profiting From Uncertainty: Strategies for Succeeding No Matter What the Future Brings*. New York: Free Press, 2012.

[**Schoemaker** is referenced in Part II. He integrates multi-future and scenario thinking into strategy work.]

**Malik, Fredmund.** *Strategy: Navigating the Complexity of the New World. Vol. 3*. Frankfurt: Campus Verlag, 2016. *Malik says, “Strategies for complexity have a very different logic and*

<https://emergentapproach.com/>

*very different points of reference compared to the Old World's traditional strategies. They leverage the logic of evolution and are thus set up to successfully deal with the unknown and the unknowable.*" p. 29

**Bhide, Amar.** *The Origin and Evolution of New Businesses.* Oxford: Oxford University Press, 2003.

[Bhidé states that it seems sensible that evolution in business must be different from biological evolution because of the presence of goals and intentionality. But he then shows how confusing a conclusion this is because his research shows that entrepreneurs are often "myopic" in their approach—quite the opposite of planning ahead. p. 66-67.]

**Quinn, James Briann.** *Strategies for Change: Logical Incrementalism.* 6th ed. R. D. Irwin, 1980. (See also *Innovation Explosion: Using Intellect and Software to Revolutionize Growth Strategies.* Illustrated. Free Press, 1997.). Quinn says, "My data shows that when well-managed major organizations make significant changes in strategy, the approaches to strategy and change frequently bear little resemblance to the rational, analytic systems so often described in the planning literature."

[See also discussion in Bhidé, p. 257.]

## Scenario Planning

As explained in chapter 10, scenario planning as a field is really an approach to strategy, with particular focus on multiple futures, and sometimes, futurism. Also, as mentioned in Chapter 13 terminology varies widely in the scenario planning literature just as it does in the general strategy literature. Table 1 (below) outlines differences in the terminology used in the scenario planning literature and *The Emergent Approach*.

**Schoemaker, Paul J. H.** "Scenario Planning: A Tool for Strategic Thinking." *Sloan Management Review* 36, no. 2 (1995): 25–40.

**Van der Heijden, Kees.** *Scenarios: The Art of Strategic Conversation.* 2nd ed. West Sussex, England: John Wiley & Sons, 2005.

**Mats Lindgren and Hans Bandhold.** *Scenario Planning: The Link between Future and Strategy (Revised and Updated).* 2nd ed. New York: Palgrave Macmillan, 2009.

**Chermack, Thomas J.** *Scenario Planning in Organizations: How to Create, Use, and Assess Scenarios.* Berrett-Koehler Publishers, 2011.

[Presents a "framework" for Performance-Based Scenario Planning; "framework" in the sense of an approach or methodology.]

**Ogilvy, James A.** *Facing the Fold: Essays on Scenario Planning.* Axminster: Triarchy Press Ltd, 2011.

**Woody Wade,** *Scenario Planning: A Field Guide to the Future.* New Jersey: John Wiley & Sons Inc, 2012.

**Koller, Tim, Aleksander Petrov, Yuri Polyakov, and Ishaan Seth.** "Are Scenarios Limiting Your Pandemic Recovery Strategy?" *McKinsey & Company (Insights)* (blog), November 2, 2020. <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/are-scenarios-limiting-your-pandemic-recovery-strategy>.

[An interesting use of a very numerical "uncertainty cube" to evaluate financial options for the most profitable way to protect against bankruptcy in the period after covid.]

See also, **Grube, Christian, Yuri Polyakov, and Roder.** "Scenario-Based Cash Planning in

a Crisis: Lessons for the next Normal.” *McKinsey & Company (Insights)* (blog), January 19, 2021. <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/scenario-based-cash-planning-in-a-crisis-lessons-for-the-next-normal>.

Table 1. Translation of Scenario Planning Terminology		
Concept	Emergent Approach terminology	Terms also used in scenario literature
The scope of scenarios	Limited to external conditions and events that you do not meaningfully influence but that can impact your results	May include the assessment of all outcomes—both those you influence (e.g., your own programs and actions) and those you do not.
The matrix for finding strategy alternatives	Strategy Alternative Matrix (SAM)	Strategy option matrices, scenario/option matrix
The components of scenarios	External conditions and events	Environmental forces, factors, driving forces, or drivers (sometimes these are internal)
Choice or decision that scenarios influence	Which framework alternative to choose (dominated by the choice of the strategy component)	Focal question or focal issue.
A very-high probability condition or event	A very-high probability condition or event	Pre-determined
A very-low probability conditions or events	A very-low probability condition or event	Wild cards
Fat-tailed distributions (Probability of occurrence times the impact of occurrence)	Low probability with potentially large impact	black swans
A value of a measurement or audit that compels action	Trigger	Signpost

Pre-designed alternatives	Contingency and pre-designed alternatives	pre-defined, -designed, or -specified, alternatives-in-waiting, on-the-self
Four-quadrant method for creating scenarios from external conditions and events	2 x 2 cross	scenario cross, scenario matrix, alternative futures matrix

## Goals and Fallacy of Management by Results

In addition to Deming ([See Places to Start](#))...

**Adams, Scott.** *How to Fail at Almost Everything and Still Win Big: Kind of the Story of My Life.* New York: Penguin, 2013. Goals are for losers and systems\* are for winners. Ordinary people focus on the outcome. Extraordinary people focus on the process. In his autobiography, Bryan Cranston (Walter White of the renowned Breaking Bad) described the lesson he learned that helped him go from an average actor to an extraordinary one. Here's what he wrote: "Early in my career, I was always hustling. Doing commercials, guest-starring, auditioning like crazy. I was making a decent living...but I felt I was stuck in junior varsity. I wondered if I had plateaued. Then, Breck Costin [his mentor] suggested I focus on process rather than outcome".

\* System = framework in *The Emergent Approach*

**Stanley, Kenneth O., and Joel Lehman.** *Why Greatness Cannot Be Planned: The Myth of the Objective.* Switzerland: Springer International Publishing, 2015.

## Innovation Literature

These are strategy approaches with particular focus on innovation.

**Pinchot III, Gifford.** "Intrapreneuring: Why You Don't Have to Leave the Corporation to Become an Entrepreneur," 1985. [Realistic "messy" view of framework design and implementation; fallacy of linear process and prediction; includes a statement that, "No one can plan something that is really new." Still important book after 35+ years].

## The Eureka! Myth

**Bocchi, Gianluca, Eloisa Cianci, Alfonso Montuori, and Raffaella Trigona.** "Eureka! The Myths of Creativity." *World Futures* 70, no. 5–6 (2014): 276–308.

**Slywotzky, Adrian.** "Steve Jobs and the Eureka Myth." *Harvard Business Review*, August 29, 2011. <https://bit.ly/3i8F1dL>.

## Evolution Literature

For a broad (and academic) survey of evolution in human endeavors, see **Nathalie Gontier's** "Guest-Editorial Introduction: Converging Evolutionary Patterns in Life and Culture" (*Evolutionary Biology* 43, no. 4 (2016): 427–45).

For references and background on biological evolution, the Wikipedia is comprehensive for the essentials. You can also start with **Ernst Mayr's** *What evolution is* (New York: Basic Books, 2001).

There are several scientific communities that address evolution in human systems: the *complex adaptive systems*, or *complexity science*, community, and the *cultural evolution* community are two. Yet they seem to have little connection.

### Complex Adaptive Systems Literature

Everything involving humans is a complex adaptive system, but there is a body of literature that describes the history and the deeper tenets of adaptive dynamics. Some were mentioned in the [Places to Start](#) section.

The Santa Fe Institute [www.santafe.edu/](http://www.santafe.edu/) was highly instrumental in the development and proposition of complex adaptive systems. Now there are many organizations focused on CAS (See [www.cas-group.net/](http://www.cas-group.net/) for more).

### "Cultural Evolution"

There is a body of literature under the *Cultural Evolution* label. This community co-opted the term *cultural evolution* even though most of these writings do not actually focus on the evolutions of innovations, that is, new cultural "species" (*cultural phenotypes* in technical terms). Instead, they focus on the spread of existing innovation by transmission. Other key differences with *The Emergent Approach* include that they (1) do not recognize forces (stressors) in the evolutionary mechanism, (2) they treat transmission as heredity, which it cannot be, and the essentially ignore what occurs in people's minds.

See Peter Compo's short video, [A Force-based Model of Cultural Evolution with Application to Business Strategy \(Compo CES Presentation\)](#), from the Cultural Evolution Society Conference held in June 2021 in Sapporo, Japan, for more discussion of these differences.

See these websites for more on this cultural evolution community:

- [www.culturalevolutionsociety.org](http://www.culturalevolutionsociety.org)
- [www.dysoc.org](http://www.dysoc.org) (Center for the Dynamics of Social Complexity; DySoC)

### Mechanism of Creativity

**Rosenbaum, David A.** *It's a Jungle in There: How Competition and Cooperation in the Brain Shape the Mind*. Oxford: Oxford University Press, 2014. [Especially, p. 13].

**Weisberg, Robert W.** *Creativity: Beyond the Myth of Genius*. W.H. Freeman, 1993. [Methods that "geniuses" use are not different from those used by ordinary people. No magic.]

**Roberts, Royston M.** *Serendipity: Accidental Discoveries in Science*. Wiley-VCH, 1989.



## The Deeper Mechanism of Human Creativity (and Evolutionary Epistemology)

These references tend to be heavy going and academic.

**Campbell, Donald T.** “Evolutionary Epistemology.” In *The Philosophy of Karl R. Popper. The Library of Living Philosophers.*, edited by P.A. Schilpp, Vol. 14–1. LaSalle, IL: Open Court, 1974. [Donald T. Campbell, was the psychologist and social scientist who led the way in seeing the adaptive nature of human creativity and learning]

**Simonton, Dean Keith.** “Creativity and Discovery as Blind Variation: Campbell’s (1960) BVS Model after the Half-Century Mark.” *Review of General Psychology* 15, no. 2 (2011): 158–74. <https://doi.org/10.1037/a0022912>.

[Simonton has himself produced a large body of articles on an evolutionary creativity model.]

**Dasgupta, Subrata.** “Contesting (Simonton’s) Blind Variation, Selective Retention Theory of Creativity.” *Creativity Research Journal* 23, no. 2 (2011): 166–82.

**Hull, David L.** *Science and Selection: Essays on Biological Evolution and the Philosophy of Science.* Cambridge, UK: Cambridge University Press, 2001.

**Gontier, Nathalie, Jean Paul Van Bendegem, and Diederik Aerts,** eds. *Evolutionary Epistemology, Language, and Culture: A Non-Adaptationist Systems Theoretical Approach.* Vol. 39. Theory and Decision Library A. Springer, 2006.

**Callebaut, Werner, and Rik Pinxten,** eds. *Evolutionary Epistemology: A Multiparadigm Program.* Vol. 190. Dordrecht: D. Reidel Publishing Company, 1987. [includes a bibliography chapter from Campbell et al.<sup>1</sup>]

## The Failure of Prediction

The following references discuss how often predictions are wrong, including expert prediction:

**Byers, William.** *The Blind Spot: Science and the Crisis of Uncertainty.* New Jersey: Princeton University Press, 2011. <https://doi.org/doi:10.1515/9781400838158>.

**Schulz, Kathryn.** *Being Wrong: Adventures in the Margin of Error.* New York: HarperCollins Publishers, 2011.

**Taleb, Nassim.** *Foiled by Randomness: The Hidden Role of Chance in Life and in the Markets.* 2<sup>nd</sup> ed. New York: Random House Incorporated, 2005.

**Osterwalder, Alexander, Yves Pigneur, Alan Smith, and Frederic Etienne.** *The Invincible Company: How to Constantly Reinvent Your Organization with Inspiration From the World’s Best Business Models.* Vol. 4. New Jersey: John Wiley & Sons Inc., 2020. [Start with p. 54, You Can’t Pick the Winner]

**Bradley, Chris, Martin Hirt, and Sven Smit.** *Strategy Beyond the Hockey Stick: People, Probabilities, and Big Moves to Beat the Odds.* New Jersey: John Wiley & Sons Inc., 2018.

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<sup>1</sup> The bibliography references are also found here: Wuketits, Franz M. *Evolutionary Epistemology and Its Implications for Humankind* (New York: SUNY Press, 1990).

“Look at how precise economic projections are—and how wrong. In the US, the government produces annually 45,000 pieces of economic information, and the private sector generates 4 million more, leading to forecasts that may run to multiple decimal points. The forecasts are reassuring. The prognosticators are smart folks. Yet, most economists didn’t predict the three most recent recessions in the US, in 1990, 2001, and 2007, and didn’t even see the recessions happening after they’d started. The initial estimate for growth in the US economy in the fourth quarter of 2008 was –3.8 percent.”

**Kuznicki, Jason.** “Cato University 2018: The Future History of Liberty.” August 4, 2018. <https://www.cato.org/multimedia/events/cato-university-2018-future-history-liberty>.

[Attempts to predict the future often fail because of over centralization.]

## Most Businesses Fail

That most business fail is evidence that businesses cannot be planned. Some will blame failure exclusively on execution, but Chapter 9 shows the fallacy of this. You can’t look at what others did without knowing those who did largely the same thing and got a different result. **Jerker Denrell**, calls this the “undersampling of failure” in “Vicarious Learning, Undersampling of Failure, and the Myths of Management” (*Organization Science* 14, no. 3 (2003): 227–43). He argues that because firms with poor performance are unlikely to survive, they are absent from the group under observation.

In biology, most variations and 98% of all the species that ever existed are extinct. Economist **Paul Ormerod**, in *Why Most Things Fail: Evolution, Extinction and Economics* (Faber and Faber, 2005) says, “Failure is the most fundamental feature of biological, social and economic systems. Just as species fail—and become extinct—so do companies, brands, and public policies. And while failure may be hard to handle, understanding the pervasive nature of failure in the world of human societies and economies is essential for those looking to succeed.”

Statistics on failures are widely available on business success and failure reports (?) from government and academic sources. For instance, **Ovide, Shira.** “Silicon Valley’s Meh Middle.” *The New York Times*, June 2, 2021.

<https://www.nytimes.com/2021/06/02/technology/silicon-valley-middle-companies.html>.

**Bhide, Amar.** *The Origin and Evolution of New Businesses*. Oxford: Oxford University Press, 2003.

**Osterwalder, Alexander, Yves Pigneur, Alan Smith, and Frederic Etienne.** *The Invincible Company: How to Constantly Reinvent Your Organization with Inspiration From the World’s Best Business Models*. Vol. 4. New Jersey: John Wiley & Sons, Inc., 2020. Start with p. 54: “You Can’t Pick the Winner: The statistics on this page stem from early-stage venture capital investments into start-ups. This data provides a very good proxy to estimate the order of magnitude regarding the success/failure ratio in established organizations. The ratio might be even more extreme if we assume that established companies are often less innovative and more risk averse than start-ups.”

**Gustafson, Katherine.** “The Percentage of Businesses That Fail and How to Boost Your Chances of Success.” Online Loan Marketplace. Lendingtree (blog), May 2, 2022.

[www.lendingtree.com/business/small/failure-rate](http://www.lendingtree.com/business/small/failure-rate)

## Data isn't as Hard as We Think It Is

**Bergstrom, Carl T., and Jevin D. West.** *Calling Bullshit: The Art of Skepticism in a Data-Driven World*. New York: Random House Trade Paperbacks, 2020.

*"Data can help us understand the world based upon hard evidence, but hard numbers are a lot softer than one might think (p. 76)."*

## Adaptation in Specific Fields of Endeavor

### Technology Evolution

The following describe the evolution of technologies and other cultural entities and supply varying explanations of how it occurs.

**Basalla, George.** *The Evolution of Technology*. Cambridge, UK: Cambridge University Press, 1988.

[A bit of a classic, shows many examples of the "descent" of technologies; but no theory, very accessible]

**Arthur, W. Brian.** *The Nature of Technology: What It Is and How It Evolves*. New York: Simon and Schuster, 2009.

[Shows the prevalence of co-option and recombination in technological evolution.]

**Wheeler, Michael, John M. Ziman, and Margaret A. Boden.** *The Evolution of Cultural Entities*. Vol. 112. Oxford: Oxford University Press, 2002.

**Ziman, John.** *Technological Innovation as an Evolutionary Process*. Cambridge, UK: Cambridge University Press, 2000.

**Vincenti, Walter G.** "The Retractable Airplane Landing Gear and the Northrop" Anomaly": Variation-Selection and the Shaping of Technology." *Technology and Culture* 35, no. 1 (1994): 1–33.

*"To the extent they have examined the issue per se, historians tend to see the rationale and introduction of the retractable gear as an essentially reasoned and ordered affair. Loftin (1985), in his detailed and technically informed book, compares the numerical drag coefficient of the Orion with that of Lockheed's earlier fixed-gear Vega and states that, generally speaking, "the spectacular reductions in drag associated with...use [of retractable gear] on an aerodynamically clean airplane were found to far outweigh the relatively small increases in weight". Though in the end correct, this statement suggests that desirability of the retractable gear was obvious and subject to straightforward engineering assessment."*

### Geopolitical

**Brands, Hal.** *What Good Is Grand Strategy? Power and Purpose in American Statecraft from Harry S. Truman to George W. Bush*. London: Cornell University Press, 2014.

[I highly recommend to at least read Chapter 1, no matter what field you are in.]

**Hoffman, Frank G.** "Grand Strategy: The Fundamental Considerations." *Orbis* 58, no. 4 (2014): 472–85.

*"The statesman who yields to war fever must realize that once the signal is given, he is no*

*longer the master of policy, but the slave of unforeseeable and uncontrollable events. Antiquated war offices, weak, incompetent, or arrogant commanders, untrustworthy allies, hostile neutrals, malignant. fortune, ugly surprises, awful miscalculations—all take their seats at the Council Board on the morrow of a declaration of war.”*

### Computation

**Axelrod, Robert, and Michael D. Cohen.** *Harnessing Complexity: Organizational Implications of a Scientific Frontier*. New York: The Free Press, 1999.

**Holland, John** (See Places to Start)

### Economists

**Arthur, W. Brian.** *Complexity and the Economy*. New York: Oxford University Press, 2014. [A leader in bringing complex adaptive systems to the study of economics.]

See also...

**Kay, John.** “Obliquity.” JohnKay, January 17, 2004.

<https://www.johnkay.com/2004/01/17/obliquity/>.———.

*Obliquity: Why Our Goals Are Best Achieved Indirectly*. Profile Books, 2010.

**Harford, Tim.** *Adapt: Why Success Always Starts with Failure*. New York: Farrar, Straus and Giroux, 2011.

**Metcalfe, J. Stanley.** *Evolutionary Economics and Creative Destruction* (The Graz Schumpeter Lectures). New York: Routledge, 1998.

**Nelson, Richard R. and Sidney G. Winter.** *An Evolutionary Theory of Economic Change*. Cambridge, Mass: Harvard University Press, 1985.

**Beinhocker, Eric D.** *The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*. Boston, Mass.: Harvard Business Press, 2006.

### Anthropology/Sociology

**Wilson, Edward O.** “Sociobiology and the Darwinian Approach to Mind and Culture.” In *Evolution from Molecules to Men*, edited by D. S. Bendall, 545–53. Cambridge, UK: Cambridge University, 1983.

**Durham, William H.** *Coevolution: Genes, Culture, and Human Diversity*. Stanford, California: Stanford University Press, 1991.

## Deming

**Deming, W. Edwards.** *Out of the Crisis*. 1st MIT Press ed. Cambridge, Mass: MIT Press, 2000.———. “The W. Edwards Deming Institute,” 2021. <https://deming.org/>.

Videos of his many seminars, including his Read Beads, are available at the DemingInstitute channel on Youtube: <https://www.youtube.com/c/DemingInstitute/videos>

Also, note to Chapter 18 on the 4-station dashboard for the many ways Deming expressed, “97% of what matters cannot be measured”:

Deming Seminar, Transformation for Management of Quality and Productivity, February 19-22, 1991, at Adam's Mark Hotel, Philadelphia [attended by the author]. He also said there, "The most important things are those that cannot be measured."

Ron McCoy, in *The Best of Deming* (Knoxville, Tennessee: SPC Press, 1994), recorded different versions at other Deming's seminars including, "The most important figures for management of any organization are unknown and unknowable;" "We should be guided by theory, not by numbers"; "3% of the problem have figures, 97% of the problems do not."

In *Out of the Crisis*, Deming wrote, "95% of all troubles in an organization are the result of the system (processes) and only 5% are the fault of people," and "Over 97% of the circumstances that affect an organization's results are immeasurable, and a disproportionate amount of management's time is spent on the 3%."

