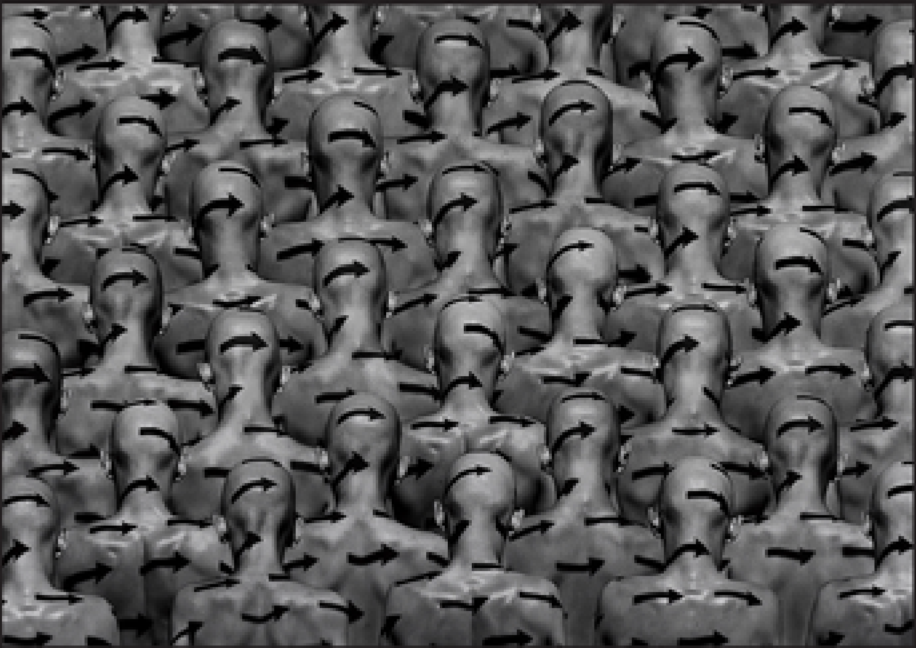
THE KNOWLEDGE WE HAVE LOST IN INFORMATION

THE HISTORY OF INFORMATION IN MODERN ECONOMICS



PHILIP MIROWSKI & EDWARD NIK-KHAH

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The History of Information in Modern Economics

Philip Mirowski

AND

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OXFORD
UNIVERSITY PRESS

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Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America.

Library of Congress Cataloging-in-Publication Data
Names: Mirowski, Philip, 1951- author. | Nik-Khah, Edward M., author.
Title: The knowledge we have lost in information: the history of information in modern economics / Philip Mirowski & Edward Nik-Khah.
Description: New York City: Oxford University Press, 2017. | Includes index.
Identifiers: LCCN 2016036012 | ISBN 9780190270056 (hardcover)
Subjects: LCSH: Neoliberalism. | Neoclassical school of economics. | Practical reason. | Economics.
Classification: LCC JC574.M567 2017 | DDC 338.501—dc23 LC record available at https://lccn.loc.gov/2016036012

1 3 5 7 9 8 6 4 2

Printed by Sheridan Books, Inc., United States of America

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ACKNOWLEDGMENTS

We were inspired to write this book after accepting an invitation extended by the Institute for New Economic Thinking to present a short course on the history of twentieth-century economics. Both of us, jointly and separately, had written on themes relevant to this topic: the confusion evident in the sundry treatments of information by economists, the neoliberalization of the economics profession, the constructivist turn in economics, and the largely misunderstood legacy of experimental economics, among others. Our intention was to summarize this previous work and draw from it lessons relevant to our post-crisis world: without understanding where orthodox economics is headed, how can the student get excited about the "new"?

Thus, we set out to explain how the economics profession ended up in its current state, seen from a doctrinal perspective. We already had bits and pieces of the story in hand, but setting out to weave them into a coherent and (we hope) compelling narrative required that we push far beyond anything we had previously written. What you hold in your hands is the result.

We presented an early draft of this book at the Hong Kong meetings of the Institute for New Economic Thinking (INET) and a revised version at INET's New York studios. We thank INET for supporting those lectures: this book benefited from the highly engaged audiences at these two events. Edward Nik-Khah is grateful to the Roanoke College Faculty Research Year program for support to complete this manuscript. Also, we thank Kyu Sang Lee for providing helpful suggestions at a critical juncture. Both of us wish to thank the Duke Center for the History of Political Economy for a resident scholar fellowship, which permitted us to work through some of these arguments at length in person.

We also want to acknowledge the encouragement of Scott Parris, now retired, one of the most important academic editors of the history of economics during his tenure at Cambridge University Press and then Oxford University Press. We will miss you, Scott.

This book makes use of passages from a handful of previously published articles. Chapter 15 draws from "A Tale of Two Auctions," *Journal of Institutional Economics* 4(1): 73–97. Chapter 16 includes excerpts from "Private Intellectuals and Public Perplexity: The Economics Profession and the Economic Crisis," which appeared in *History of Political Economy*, Vol. 45 (suppl 1): 279–311.

[1]

IT'S NOT RATIONAL

> The most merciful thing in the world, I think, is the inability of the human mind to correlate all its contents. We live on a placid island of ignorance in the midst of black seas of infinity, and it was not meant that we should voyage far. The sciences, each straining in its own direction, have hitherto harmed us little; but some day the piecing together of dissociated knowledge will open up such terrifying vistas of reality, and of our frightful position therein, that we shall either go mad from the revelation or flee from the deadly light into the peace and safety of a new dark age.
>
> H. P. Lovecraft, "The Call of Cthulhu," 1928

This book is mostly concerned with the history of economics; but we would like to suggest at the outset that it also describes a cultural rupture of far larger import. To a first approximation, it explores how economists changed what it meant within their discipline to claim to "know something," and consequently to lay claim to a special kind of expertise at the dawn of the twenty-first century. But this did not happen in a vacuum. Not to sugar-coat what might be a somewhat unpalatable assertion, what it meant to "know the truth" changed dramatically and irreversibly after World War II. In saying this, we are not engaging in the usual hand-wringing concerning postmodernism and cultural relativism that pundits have bewailed from the 1990s onwards. After all, distancing oneself from the truth claims made by historical protagonists is just something all good historians do; there is nothing that especially is distinctive or scandalous about agnosticism in the modern era. Rather, our concern in this book is with the postwar changes in the perceived validation of the truth mediated by the rise of "information" in the social sciences, and especially in economics. The truth, as conceived by modern economists, has not set anyone free. Instead, it brought about the death of the Kantian subject, and a subsequent lifeworld hollowed out the humanist concerns that many people mistakenly think are the heart and soul of a science of economics.

WHAT IS TRUTH IN ECONOMICS?

Loose talk about "truth" is bound to make most people, and many economists, skittish in the extreme. Talk about "information," by contrast, would seem far less threatening; and rest assured, most of this book will be couched in the more soothing idiom of "information" because that is how our protagonists preferred it. But we would be shirking our duty to the reader if we did not admit that just beneath the surface of our narrative lurks the suspicion that the surfeit of talk about information serves to obscure something more essential, which for purposes of this introduction we will intermittently call "knowledge," or more brutally, Truth. Given that the history which follows will present us with the most variegated conceptions of what it means to "know" something in economics, a few preliminary observations about our own philosophical position might be in order.

The postwar worry about truth in economics kicks off with a relatively famous 1940 article by Chicago economist Frank Knight entitled, appropriately, "What Is Truth in Economics?" Knight wanted to get his peers to think a bit harder about what they rather cavalierly would endorse as Truth.[1] One major concern for Knight was the suspicion that "liberalism" might suffer from debilitating internal contradictions, such as the incompatibility of the search for Truth and commitment to a freedom for anyone to think what he or she likes. Back then, Knight was fighting a losing rear-guard battle against the rising tide of logical positivists of the era; he feared a situation where "truth is merely a game in which the players are free to make any rules they please."[2] Reading his paper now, it beggars the imagination that anything nearly so philosophically self-critical could ever be published in the *Journal of Political Economy* these days. One reason for this reversal is that modern economists appear no longer capable of hard thinking about the nature of Truth; the best they can manage at Chicago, it seems, is to argue that "good economists" enjoy a high degree of consensus about economic matters when responding to questionnaires, so not to worry.

To illustrate this, we seek to briefly contrast the bygone Chicago of Frank Knight with the contemporary Chicago of Luigi Zingales and collaborators, who in 2013 published an article comparing the responses of forty-one faculty at a very few high-ranked U.S. research universities, with a sample of U.S. households conducted by the Chicago Booth Financial Trust Index project. Their headline was that there subsisted remarkable consensus among their sample of economists, but not with their sample of the lay public. Zingales and co-author Paola Sapienza reported a striking thirty-five percentage point gap, on average, between the economists' beliefs and the public. For example, about three out of four of the general public respondents said that a "Buy American" policy is good for manufacturing employment, while only 11 percent of economic experts agree. Nearly all the economists queried avowed that the North American Free Trade Agreement (NAFTA) has helped Americans prosper, but only half of respondents to the Booth survey thought so. Zingales seemed loathe to admit that the credibility of the economics profession may have suffered somewhat following the global economic crisis, still fresh in the minds of his interlocutors, and this might account for the gap.

This paper in a modern idiom is wildly popular in the economics literature these days, because it reinforces the orthodox self-image of the economist. First off, there is the extraordinary conviction that all "real economists of sound instincts" essentially agree on everything, when in fact what actually happens is that boundaries of orthodoxy are continuously being policed by a few economists located at a few top-ranked departments; it follows that their hand-picked peers are effectively self-selected for consilience; and thus appeals to consensus turn out to be effectively tautologies. Even Frank Knight knew that reliance on consensus was the lazy man's definition of Truth. But second, there lurks a barely repressed contempt for the beliefs and opinions of the general public. Once upon a time, it was permissible to presume economic agents were pretty smart, and therefore of sound mind; but no longer. This curious about-face within the modern economics profession is one of the major themes of the present volume. The mid-century Walrasian orthodoxy came clad with all sorts of "welfare theorems" that insisted markets always and everywhere gave the people what they wanted; but as the "information" revolution began to suggest that market participants didn't really know very well what they wanted, then for the first time in history, economists began to assert their competence to "design" markets, with the objective of giving people what economists believed they *should* want.

This turns out to be something of far greater import than some passing dalliance with mere abstract epistemology: as it happened, it underpins the very politics of the modern profession. One explanation for economists' recurrent tendency not to trust democracy, for instance, is that they suspect the man in the street is an epistemic shambles; in their estimation, economists therefore deserve to be respected as experts in knowledge, because their training encourages them to approach the reasoning of the layperson with a cold jaundiced eye. By contrast with economists' perception of their own situation of purported unanimity, any consensus they happen to find among the unwashed is no index of anything whatsoever.

Modern economists love this self-portrayal of their blessed status of epistemic expertise, but it is false in every respect. All you have to do is read the newspapers to realize individual economists have been persistently at each other's throats; the recent crisis merely brought this situation closer to consciousness for the public.[3] If there is widespread adherence to some doctrines among economists, that fealty tends to be more in the nature of ceremonial obeisance than carefully considered conviction.

Let us point to just one example, to prepare the ground for our history. All economists believe in the "laws of supply and demand," right? Every parrot and TV reporter blandly repeats it as gospel truth. But those who have some appreciation for the history of economic theory, and especially regarding the Sonnenschein/Mantel/Debreu theorems, which you can find in many graduate microeconomic textbooks, are also aware that those theorems essentially obviate the existence of any single valued smooth demand curve. We do not aim to provide a history of the SMD theorems in this book, because it wanders a bit far from our mandate.[4] All we want to suggest here is that neoclassical economists have been known to subscribe to contradictory propositions that demand curves both do and do not exist, simultaneously. Epistemic flexibility goes with the territory.

There is a hermeneutic attitude that will prove conducive to apprehension of our history: the precept we are suggesting is that economists nowadays possess a rather louche attitude toward truth. We do not approach this current history as an occasion for rabid "gotcha" exercises against the veridically challenged; rather, we want to ask: What sort of profession treats payments on the side and conflicts of interest as essentially harmless, as Gerry Epstein and George DeMartino have documented, and considers a code of ethics as something only other lesser mortals may need? What sort of person denies economics is an agonistic field? What kind of orthodoxy seems comfortable with characterizing the human subjects of their prognostications as "mindless"?[5] What can it imply when a recent winner of the prestigious John Bates Clark Medal writes, "in the context of a persuasion game, so long as there is one provider of information in every state of nature that would prefer for consumers to have accurate beliefs, the truth will always be revealed to a consumer to access with reports from all providers"?[6] What sort of intellectual revels in the notion that he will never suffer anything more than fleeting transient embarrassment (because the public has a notoriously short memory) for statements of dubious veracity, confident no one will ever fire him for incompetence from a central bank, nor shut down his university economics department as a cost-saving measure, nor force him to run the gauntlet of a public shaming exercise? Or, with more direct reference to the topic at hand in this volume, what can it mean for some economist comfortably ensconced at the Institute for Advanced Study in Princeton to write, "Ideas are strangely absent from modern models of political economy."[7] In other words, we aim to echo Frank Knight's original query: What is truth in modern economics?

The answer deserves something approaching the measured philosophical and self-critical consideration of a Knight, something which does not sit well in contemporary discussions of economics. While we shall not engage in much in the way of explicit philosophizing in this volume, we shall describe in subsequent chapters how cultural trends and scientific developments helped usher the economics profession from a period right after World War II—when there was great uncertainty about what, if anything, they were capable of saying with confidence about information, knowledge, and truth—into the modern situation, which has converged on a very peculiar set of epistemic doctrines. The main task of this volume is to explain how we got from there to here.

Let us oversimplify, in the interests of inviting the reader to sample our subsequent chapters. For orthodox economists today, truth is not a matter of morality, nor of individual standards of veracity, nor even coherence with some simplistic notion of the scientific method. For the orthodox economist, core doctrine dictates that truth is the output of the greatest information processor known to humankind—namely, The Market. From the efficient markets hypothesis to Nash equilibrium in game theory, to rational expectations macroeconomics to the multiple schools of market design, the twenty-first-century economist testifies over and over again that it is The Market alone that effectively winnows and validates the truth from a glut of information. The hapless agent may or may not have ambitious epistemic pretensions; so-called behavioral economics preaches that the agent is beset with biases and lapses of attention; but the wise market participant always defers to the pronouncements of the market. Paraphrasing economist and Mont Pèlerin Society[8] member Robert Barro, as long as they keep paying us, we must be right.[9] Pelf makes right, not might.

Yet it is the next step in the syllogism that has turned out to be truly novel. If markets indeed validate truth, then the cadre that gets to construct the markets gets the final say on the nature of truth. The visible hand that fashions the auction believes it can govern the world.

TALES OF RATIOCINATION

It will probably come as no surprise that we personally do not accept the economist's imprimatur of The Market as the final solution to the age-old problem of "What is Truth?" Thus do we owe the reader some brief cursory indications of the alternative stance toward truth that governs our principles of selection in this history. Contrary to academic expectations, it may be helpful to note we do not fall back on the Philosophy 101 version of "justified true belief" as the bedrock for our various narrative choices in this history of "information."[10] It strikes us that the pertinent organizing principles are not timeless monolithic criteria such as those often championed in Philosophy 101 but, rather, they involve acknowledgment that epistemology has meant different things to different groups in intellectual history.

Perhaps the type of philosophical rupture we have in mind bears a family resemblance to the notion of *parrhēsia*, the topic of Michel Foucault's last lectures.[11] He defined the term as the analysis of practices of telling the truth about oneself; what makes that intersect with our current concerns is that he also proposes that the notion of *parrhēsia* was "originally rooted in political practice and the problematization of democracy, then later diverging towards the sphere of personal ethics and the formation of the moral subject" (2011, p. 8). While Foucault certainly did not entertain any parallel equivalent modern rupture back in 1984—there is only so much prescience one can attribute to Foucault, even given his well-known foresight concerning neoliberalism—here we are intent upon stressing the inescapable connection of politics and skepticism about democracy in which the modern transformation of truth is deeply rooted. In short, whereas Foucault was mostly intent upon comparing Greek thought to the later Christian and Cynical developments concerning care of the self, we are instead fascinated with the ways a seemingly technical neutral notion like "information" has been slowly changing what it means to "know something" and by the twenty-first century has undermined liberal secular notions of democracy and Kantian notions of the ethical self. Hence, we are open to the possibility the history we proffer here shares certain Foucauvian ambitions with regard to "genealogies": to clarify how that might work, let us dally briefly with the genre of detective stories.

The metamorphosis of the detective/spy in modern literature is not often something the average economist takes time out to contemplate. [12] A little reflection would nevertheless reveal that the "classical" detective tended to be portrayed as a superintelligent (if a bit quirky) soul who would pick up on the little clues everyone else—and especially the plodding copper—would overlook. From Conan Doyle's Sherlock Holmes to John Buchan's Richard Hannay in the twentieth century, it was the burden of the superior individual to piece together the shards of history so as to arrive at the truth concerning guilt or innocence. The same went for spies, from Dashiell Hammett's Continental Op to Ian Fleming's James Bond. The reader went along for the ride, with the game being to see if you could outguess the gumshoe or spook as to whodunit before the story came to its conclusion. But the superhuman feats of ratiocination began to lose their luster by the middle of the twentieth century, to be replaced by a different sort of spy narrative.

As Rob Horning (2012) reminds us, a curiously different sort of spy popped up in literature around that time. He cites the work of Eric Ambler—*Epitaph for a Spy* (1938), *Cause for Alarm* (1938), *Journey into Fear* (1940)—as a harbinger of this trend. To quote Horning:

> All of them feature ordinary, slightly disreputable men who more or less inadvertently end up in the middle of international security conspiracies, accused of crimes they hadn't known they committed, fleeing corrupt and/or incompetent police, or working in coordination with other foreign agents whose trustworthiness remains undecidable. . . . The 1930s brought the kind of war in which every member of society was indiscriminately targeted for death from above. This would provoke a climate of militant prudence and ambient mistrust in which, say, British citizens were expected to destroy any household maps and falsify local signage to confuse expected invaders.

Ambler's novels reflect this growing anxiety over protecting information, brought on both by technological developments that made it easier to disseminate information and by the entangled complexity that dispersed relevant data across a broader populace. In *Epitaph for a Spy,* the protagonist's mere possession of a camera embroils him in an intelligence investigation and he is forced to scheme how to out a foreign agent. *Cause for Alarm* centers on a machine-company sales rep who finds himself with access to sensitive armament data. Graham, the hero of *Journey into Fear,* is targeted for assassination because his engineering work makes him know too much when war breaks out. Ambler's protagonists rarely know that they know something important; the news is generally broken to them through a violent attack or an arrest. They then learn they have become intelligence agents against their will—they have become the unwitting conduit

> of vital knowledge that can be transmitted through them without their being capable of understanding its broader importance.[13]

"Intelligence agents against their will"—what an apt turn of phrase! Instead of possessing some special transcendental capacity to discern the truth which renders them an ideal spy, the new model protagonist is a schlub who comes equipped with little more than mediocre intelligence, but is nonetheless thrust into a whirlwind of deception and secrets. The basic plot point is intended to induce vertigo: you, the protagonist, have no idea what you are doing, but no one but you are able to do this. The leading man's meager moiety of information seems insignificant, but opens a crack to view an unseen world, such that he is caught up in forces beyond his ken which render that information (and therefore his life) so critical that the protagonist must risk everything. The meaning and significance of his appointed task may not always become fully apparent to the bumbling protagonist, but shadowy players and obscure forces recruit them as unwitting conduits for history.

Michael Chabon nicely summarizes the standard plot skeleton:

> At first the problem sounds manageable. The sleuth agrees to look into it, make a call, drop in on someone. In the end, after many neighborhoods and social strata (always coextensive in a private-eye novel) have been traversed and visited, and after a vivid array of toughs, losers, and the occasional innocent has been plotted along intersecting axes of power, money, and lust, the original problem turns out to go much deeper, and much higher, than the sleuth or the reader reckoned. That original problem was only a loose thread, it turns out, and when the sleuth tugs on it the world unravels.[14]

The place and perspective of the reader are clearly different with the onset of this new genre. In most cases, the question of whodunit is not really all that important; indeed, that might be revealed at any juncture in the narrative. Anyway, there is no great thrill in outguessing a stumblebum. Some key facts might come to light in the course of events; but equally, cabals and connivance are rarely wrapped up in a tidy package at the end. The thrill for the reader seems to come in imagining being caught up in something of world-historical significance that he or she had previously never suspected: you, too, could become a "secret agent" by being in the wrong place at the right time. Suddenly, any nondescript bush-leaguer can make a difference. The mediocre cog is elevated by Providence, or maybe just the hand of history. We all avowedly profess to believe in the agency of the individual, which would imply that we judge personal choices with respect to outcomes; but the truth of the late modern detective novel is that stark and simple causal chains are denied to most of us. Insights of lasting consequence come out of left field, unheralded and unbidden.[15]

What makes Horning's thesis so striking is that he notices two things about the rupture in spy novels that turn out to be absolutely central to the history of economics we recount herein: one has to do with the technical aspects of information, and the other with politics. We quote Horning on the first point:

> The spylike pursuit of information rather than knowledge makes us function less as thinkers than processors, personal computers—and inefficient, low-powered ones at that. We are not the subjects who know things or intentionally produce knowledge; we are instead means of circulation—objects through which information passes with more or less noise in the signal. We become not only part of a network but part of a circuit. We are pawns in a larger game, "a fly caught in the

cog-wheels" as Vandassy, the narrator of *Epitaph for a Spy,* puts it.[16]

This information, this elusive something which we somehow possess while not quite understanding it, has indeed become a hallmark of the modern predicament. Rather than believing that the "truth shall set us free," we now suspect rather that the truth, if it be such, keeps us in our place. Since we agents are no longer expected to be able to comprehensively validate information, or recognize its worth, it takes on an aura of existence independent of what we think about it. With some nudging from the computer, this has been made manifest in the contemporary phenomenon of an alienated information—something that takes on a life of its own, a hypostasized entity that has its own dimensions and metrics. The best we can hope for is to sneak up on it, like a spy, and catch it in *flagrante delicto*.

And then there is the political point. Horning makes the astute observation that this inversion of the spy story did not come out of the clear blue, but tracked an important change in political theory. He perceptively cites the work of Friedrich Hayek, who *at the very same time* was describing an economic protagonist who only possessed partial and incomplete knowledge of the economy but was co-opted into the larger conspiracy of The Market to pursue ends about which he was only vaguely aware. People were not blazingly rational, said Hayek, but they possessed limited cognitive abilities. Information was being shuttled hither and yon behind the backs of traders; they only glimpsed the flash and gleam out of the corners of their eyes. Government was just another of the shadowy forces pushing the dim individual from pillar to post; the argument against the cold war enemy was that he would not acquiesce to the ineffable wisdom of The Market; and infected with hubris, he could never know that he was badly mistaken. Big organizations everywhere were lurching around in the dark; people risked becoming cogs in an inhuman machine. "Agents" in orthodox models of economics were thus being repurposed as spies in the House of Gov; someday a real revolution would eject all those misguided souls from government who believed they could control the tides of history, or so said Hayek.

Once we observe how human agency became diminished in the modern spy novel, as information becomes reified and hypostasized, it comes as a shock to realize the same thing has happened in neoliberal political theory, and then, with a lag, also in economics.[17] Economic agents were getting lost in the Big Forces that swirled all about them. Democracy was no longer considered the bulwark of progress in both instances, because the little guy might not be depended upon to do the right thing in dire circumstances. Governments were portrayed as risible attempts to control the ever-ramifying conspiracies of citizens; faceless bureaucrats never were capable of understanding the real meaning of events until it was too late. Only The Market knew for sure. And what it knew was "information."

TINKER, TAILOR, SOLDIER, ECONOMIST

The history of economic thought often finds itself nostalgic for the older spy genres, as though the culture had never moved on. If the economic agent might seem to have become a little addled, in the orthodox frame-tale the neoclassical economist never succumbs to similar disorientation. An older, and still very popular, mode of recounting the saga of economics is constructed around hagiographic tributes to inscrutable geniuses, who see their way to truths denied to others, largely by dint of their own exquisite perception and superior intelligence. They are the Sherlock Holmeses of social thought, the detectives of pecuniary life, making connections in a manner that runs rings around the plodding proponents of pre-modern economics, not to mention the other social sciences. Deductions lead cleanly from one to another, in lockstep. However popular for ceremonial public purposes (like Bank of Sweden award lectures), these narratives exude a fusty outmoded air and stifle narrative drive with complacency.

This is not the way we opt to tell the story of modern economics. Instead, we endorse the newer breed of intelligence agents as *dramatis personae,* and consequently approach the protagonists in their often clueless states, touched by forces beyond their ken, recruited to be undercover proponents of a New World of information in economics. We believe the rise of information as an organizing principle for understanding the economy and politics was first and foremost a *cultural* phenomenon, stretching from the natural sciences to economics to, yes, spy stories. Economists could no more evade the tendencies that swept them along than they could declare themselves independent of the stochastic worldview or the triumph of abstraction in the arts. But this would imply that the history of economics was not solely or even primarily the working through of logical implications of some abstract mother-structures of economic life, such as, say, the Arrow-Debreu model of general equilibrium, or the Euler equations of intertemporal optimization. As information swept through the discipline, economists could not altogether escape the cognitive challenges that they were blithely projecting onto their models of agency.

Those who seek to reinforce the older-style histories have struggled to come up with adequate categories to encompass the blooming, buzzing confusion over the profusion of exercises that call themselves the economics of information and/or knowledge. One recent example, by Samuli Leppälä (2015), seeks to divide the theoretical endeavors into those concerned with "technological knowledge" and those concerned with "market knowledge." We don't really think the distinction is historically or logically tenable, although we do have some idea of what he means in attempting this. It has certainly been the case that there has grown up a large literature concerned with something called "technological change," which of necessity occurs at a more macro level, bound up with abstract production functions and growth theory. Another separate, but massive literature tends to approach questions of knowledge and information at a more "individual" level, often traveling under such rubrics as "decision theory" or the "economics of information," and is more explicitly tied to neoclassical microeconomics. The trouble with treating them separately is that broad conceptions of the analytical character of information have tended to move in tandem through both areas during the postwar era—and that evolution is the story we tell in this volume. Nevertheless, it is certainly true that the former class of theories often become tangled up in images of what Science really is, and the putative lessons of Nature for grounding the Economy. Since one of us has covered this particular history in some previous work,[18] we shall in this volume tend to give concepts of "technological change" short shrift, in favor of questions of epistemology in microeconomics.

The reader will thus encounter herein a very different sort of history than has been conventionally on offer when it comes to contemplation of economics in retrospect. Not only will we avoid the usual reduction of economic thought to personal genius and its travail, but we shall also invert the usual strategies of writing the history of modern microeconomics. For decades now, it seems almost obligatory that, once students have learned a smattering of neoclassical price theory, they become convinced of the banality that microeconomics is really about the formal consequences of "rationality." More often than not, this leads to interminable arguments over whether people are really "rational" or not, something concerning which apparently everyone feels fully qualified and capable of having an opinion. Rather than engage in caricature, let us sample an exemplary instance, hot off the blogs:

> Neoliberalism died in 2008 with the cratering of the global economy. With support from their sponsors at the Royal Society of Arts' 'Social Brain Unit', the signal was loud and clear: Today, new advances in 'behavioural economics' and 'neuroeconomics' drawing on the 'interdisciplinary' 'pluralistic' insights of evolutionary psychology, bio-anthropology and cognitive science point the way to the future.
>
> Forget those idiotic economists who think everyone is rational! Haven't you ever seen a TED talk? Harvard psychologist Steven Pinker says we have ended violence thanks to landmark discoveries which point to our 'hardwired' irrationalities! The future* of economics and public policy lies in the discovery of these biological characteristics implanted when our ancestors were running away from a sabre-toothed tiger on the African savannah.

Neoliberalism and public choice? Forget about it. Who even needs choice when there's no rationality?[19]

This impression of the "great liberation" of neoclassical orthodoxy from *Homo economicus* is one of the stranger consequences of the triumph of "information" in modern economics. Ominously, similar sorts of sentiments govern much modern historical work on the intellectual lineage of twentieth-century microeconomics, albeit at a much higher level of sophistication. Back when we set out to research the history of information in economics, most of what we encountered were texts that sought to trace the "history of rationality" instead. Some of the best of a rather uneven bunch are *Modeling Rational Agents* (Giocoli 2003), "Producing Reason" (Heyck 2012), *How Reason Almost Lost its Mind* (Erickson et al. 2013), and *Behavioral Economics: A History* (Heukelom 2014). Each chronicle argues that the key to understanding modern histories of neoclassical microeconomics, or alternatively, "decision theory," was to distill the massive scholarly archive down to the humanist question of what was thought, in sequential eras, it meant for a person to be a rational human being. Almost invariably, the historian in question disparages mechanistic portrayals of human rationality dating from the nineteenth century, and rejoices in the superior enlightenment of the present, wherein the economics profession has finally come to appreciate that humanity is far more antipodean and paradoxical, richly emotional and multirational than previously thought. While we acknowledge that some researchers have prided themselves on pushing the boundaries of human rationality, they mostly misunderstand their own role in the larger dynamic of the intellectual history of economics. The inversion of these upbeat narratives that we put forward in this volume will entertain the proposition that *human rationality has become increasingly irrelevant to the content of microeconomics*, and that much of this trend has been rendered plausible through the instrumentality of reconceptualizing markets as information processors. In such a context, "behavioral economics" turns out to be a sideshow.

Given the massive literature on so-called rationality in the social sciences, it gives one pause to observe what a dark palimpsest the annals of rational choice has become. The modern economist, who avoids philosophy and psychology as the couch potato avoids the gym, has almost no appreciation for the rich archive of paradoxes of rationality. This has come to pass primarily by insisting upon a distinctly peculiar template as the necessary starting point of all discussion, at least from the 1950s onwards. Neoclassical economists frequently characterize their schema as comprising three components: (a) a consistent well-behaved preference ordering reflecting the mindset of some individual; (b) the axiomatic method employed to describe mental manipulations of (a) as comprising the definition of "rational choice"; and (c) reduction of all social phenomena to be attributed to the activities of individual agents applying (b) to (a). These three components may be referred to in shorthand as: "utility" functions, formal axiomatic definitions (including maximization provisions and consistency restrictions), and some species of methodological individualism.

The immediate response is to marvel at how anyone could have confused this extraordinary contraption with the lush forest of human rationality, however loosely defined. Start with component (a). The preexistence of an inviolate preference order rules out of bounds most phenomena of learning, as well as the simplest and most commonplace of human experiences—that feeling of changing one's mind. The obstacles that this doctrine pose for problems of the treatment of information turns out to be central to our historical account. People have been frequently known to make personally "inconsistent" evaluations of events both observed and unobserved; yet in rational choice theory, committing such a solecism is the only real mortal sin—one that gets you harshly punished at minimum and summarily drummed out of the realm of the rational in the final analysis. Now, let's contemplate component (b). That dogma insists the best way to enshrine rationality is by mimicking a formal axiomatic system—as if that were some sterling bulwark against human frailty and oblique hidden flaws of hubris. One would have thought Gödel's Theorem might have chilled the enthusiasm for this format, but curiously, the opposite happened instead. Every rational man within this tradition is therefore presupposed to conform to his own impregnable axiom system—something that comes pre-loaded, like Microsoft on a laptop. This cod-Bourbakism[20] ruled out many further phenomena that one might otherwise innocently call "rational": an experimental or pragmatic stance toward the world; a life where one understands prudence as behaving different ways (meaning different "rationalities") in different contexts; a self-conception predicated on the possibility that much personal knowledge is embodied, tacit, inarticulate, and heavily emotion driven. Furthermore, it strangely banishes many computational approaches to cognition: for instance, it simply elides the fact that much algorithmic inference can be shown to be noncomputable in practice; or a somewhat less daunting proposition, that it is intractable in terms of the time and resources required to carry it out. The "information revolution" in economics primarily consisted of the development of Rube Goldberg–type contraptions to nominally get around these implications. Finally, contemplate component (c): complaints about methodological individualism are so drearily commonplace in history that it would be tedious to reproduce them here. Suffice it to say that (c) simply denies the very existence of social cognition in its many manifestations as deserving of the honorific "rational."

There is nothing new about any of these observations. Veblen's famous quote summed them up more than a century ago: "The hedonistic conception of man is that of a lightning calculator of pleasures and pains, who oscillates like a homogeneous globule of desire of happiness under the impulse of stimuli that shift him about the area, but leave him intact."[21] The roster of latter-day dissenters is equally illustrious, from Herbert Simon to Amartya Sen to Gerd Gigerenzer, if none perhaps is quite up to his snuff in stylish prose or withering skepticism. It is commonplace to note just how ineffectual their dissent has been in changing modern economic practice.

Why anyone would come to mistake this virtual system of billiard balls careening across the baize as capturing the white-hot conviction of rationality in human life is a question worthy of a few years of hard work by competent intellectual historians; but that does not seem to be what we have been bequeathed. In its place sits the work of (mostly) historians of economics and a few historians of science treating these three components of rationality as if they were more or less patently obvious, while scouring over fine points of dispute concerning the formalisms involved, and in particular, an inordinate fascination for rival treatments of probability theory within that framework. We get histories of ordinal versus cardinal utility, game theory, "behavioral" peccadillos, preferences versus "capacities," social choice theory, experimental interventions, causal versus evidential decision theory, formalized management theory, and so forth, all situated within a larger framework of the inexorable rise of neoclassical economics. Historians treat components (a–c) as if they were the obvious touchstone of any further research, the alpha and omega of what it means to be "rational." Everything that comes after this is just a working out of details or a cleaning up of minor glitches. If and when this "rational choice" complex is observed taking root within political science, sociology, biology, or some precincts of psychology, it is often treated as though it had "migrated" intact from the economists' citadel. If that option is declined, then instead it is intimated that "science" and the "mathematical tools" made the figures in question revert to certain stereotypic caricatures of rationality.[22]

Beyond that, there is the even more vexing phenomenon that this abstruse definition of "rationality" is simply taken for granted as prelude for making further generalizations about the trajectory of economics after 1980, most of which suggests that the current generation of economists has providentially become the most open-minded, subtle, and psychologically sophisticated researchers in all the annals of economic thought, now that they have managed to perform the astounding conjuring trick of somehow augmenting and reconciling the previous mechanical construct of "rationality" with all manner of behavioral quirks, sociological idiosyncrasies,