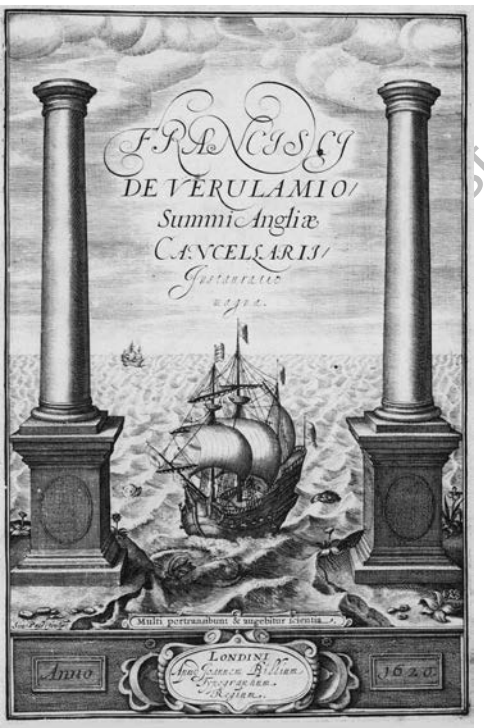
PART V

CODA



Frontispiece of Francis Bacon's *Instauratio Magna*, 1620

Sir Francis Bacon (1561– 1626) was a key figure in the Scientific Revolution, a movement that challenged the authority of ancient sources of knowledge. The engraving on the title page of Bacon's 1620 book (above) provided "one of the most vivid iconographical statements of new optimism about the possibilities and the extent of scientific knowledge," writes Steven Shapin, a Harvard historian of science.[1]

But did the scientific method go too far—beyond overthrowing ancient authority to suppressing Bruner's narrative-mode reasoning? And does the hegemony of the logico-scientific mode, particularly in the analysis of human behavior, restrict our view of the possibilities and problems for Aristotelian *eudaimonia* (happiness, flourishing)?

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The Case for Widening

Concluding his introduction to a 1971 edition of Knight's book, Stigler wrote that he found it

> intensely interesting for a reason somewhat removed from the theory of profit: It explains as no other work does the crucial importance of uncertainty, and its inevitable consequence, ignorance, in transforming an economic system from a beehive into a conscious social process with error, conflict, innovation, and endless spans and varieties of change. The full yield of this vision has hardly begun to be reaped by modern economics.[1]

Edmund Phelps's 2006 Nobel Prize Lecture suggested that the full yield remained remote. The "distinctive character of the modern economy," observed Phelps, involves "uncertainty, ambiguity [and] diversity of beliefs." Entrepreneurs "have to act on their 'animal spirits,'" often launching their innovations first and discovering the benefits and costs afterward.[2] Knight, Phelps wrote elsewhere, understood that "uncertainty is a hallmark of the modern economy."[3] But instead of treating the modern economy as it really is ("an evolving, unruly, open-ended system"), the "established body of economic theory" implied a "deterministic future."[4]

Another nearly twenty years have passed, yet the deterministic research that won Stigler and Phelps their Economics Nobels remains dominant. Chaos theorists hold out hopes they will provide a unified theory of complex, unruly systems, but "the full yield" of their vision has also "hardly begun to be reaped." And whatever success a mathematical chaos theory might have with the distributional and statistical uncertainties of natural systems or anonymous financial markets, I am skeptical about imminent breakthroughs in resolving the uncertainties of one-off, contextual choices. Similarly, notwithstanding its anticipated marvels, I find it difficult to imagine how artificial intelligence will tame even banal uncertainties that frustrate actual human intelligence. Nor, in a dynamic, ever-changing world, can we rely on convention or precedent to predict the consequences of our choices.

Should we surrender? In *Excessive Ambitions*, Jon Elster (chapter 12) argues that "large bodies of social science are permeated by explanatory hubris. Economists and political scientists, in particular, rely on deductive models and

statistical tools that are vastly less robust and reliable than their practitioners claim."[5] In "Excessive Ambitions (II)," Elster similarly attacks "overreaching" prescriptions aimed at creating institutions that will "produce good decisions, select good decision-makers, or create good decision-making bodies."[6] Instead, Elster proposes a modest, harm-minimizing approach: "insulate decision-makers as much as possible from the influences of self-interest, passion (emotion or intoxication), prejudice and cognitive bias. Once that has been done, one should let the chips fall where they may."[7]

But chips do not just "fall where they may." Choices, no less than chance, matter. And why hold uncertain choices about one-offs hostage to the logico-scientific standards of verifiability that Elster demands? What is so wrong with Bruner's plausible narrative-mode reasoning? Recognizing the impossibility of provable certitudes, why discard the legitimacy and solidarity—Albert Hirschman's "voice"—of debating the best imaginable choice? And cannot academics—economists no less than historians—contribute to such discourse?

The applications discussed in Parts 3 and 4 suggested the possibilities for what we can learn about uncertain entrepreneurial interactions. The discussion was abductive and reasoned in the narrative mode. Its sensibility, in William James's (chapter 9) typology, was more bottom-up empiricist than top-down rationalist. Although based on some general premises and conjectures (Part 1) and supported by some classic theoretical ideas (Part 2), my inferences did not claim universality or timelessness: they pertain to current arrangements for organizing enterprise in the United States and possibly other technologically progressive, largely decentralized economies and societies. I relied on qualitative observations that others could interpret differently. For all that, I daresay that my approach offered a perspective on questions (especially about the role of routines and discourse) that mainstream economics does not usually examine.

Compared to the possibilities, however, I restricted the scope of my applications. Because I wanted to make a credible case for going beyond the standard logico-scientific approach to uncertainty, I stuck to issues of commercial entrepreneurship that I have researched for much of my academic career. Yet the possibilities and benefits of applying a broadened approach are virtually limitless. I have already hinted at these broader possibilities through several medical and legal examples (such as drug and criminal trials) in Part 1 of this book.

At the same time, I am reluctant to suggest a standardized template. While the general conjectures I outlined in chapter 3 have potential applicability beyond commercial enterprise, they are not universal. I don't believe meaningful universal rules for managing real-world uncertainties are even possible. Therefore, in the rest of this coda, I again sketch out specific puzzles that a broadened approach could help examine. And while these puzzles go beyond my comfort

zone, I do not stray too far from what I have covered here and in my earlier work. I won't propose voyages through entirely unfamiliar waters. Similarly, while I am more explicit here about the public policy implications, I will not offer concrete prescriptions.

Specifically, in increasing order of distance from the ideas discussed earlier—and public policy importance—the following three sections raise questions about

- Deviations from normal patterns of entrepreneurial specialization.
- How new technologies and discourse about uncertain topics interact.
- Delegating authority about uncertain policy choices to specialists.

In discussing these questions, I revisit ideas covered in earlier chapters, making this coda a look back as well as a look forward.

1. Deviations from Normal Patterns

The entrepreneurial specialization map (Figure 4.1) framed the applications in Part 3. Organizational evaluation and planning routines, we saw, help place different organizations along a diagonal channel from the top left (high uncertainty + low investment and complexity) to the lower right (low uncertainty + high investment and complexity) corners of the map.

The map and its underlying routines help explain the normally symbiotic division of entrepreneurial labor in a modern economy. To start with, at least, the relationship between small startups and large mature businesses is harmonious. New and fledgling businesses target small, low-cost, highly uncertain opportunities, while giant enterprises place calculated bets on large, complex initiatives. The former often serve a Darwinian purpose in selecting the "fittest" new products and technologies that the latter can scale up.

Upstart businesses may also offer complementary goods and services whose revenue potential is too small or speculative to interest established companies. In the early 1980s, as IBM made its PCs a mainstream must-have, swarms of startups enhanced the value of and sales of PCs by providing installation and maintenance services, hardware add-ons, and educational videos and books. Entrepreneurial app and game developers now use and enhance the value of phones and tablets made by Apple and Samsung, the cloud services of Microsoft and Amazon, and the 4G and 5G networks of telecom oligopolists.

The specialization diagonal also describes a common trajectory of new businesses, products, and technologies. They often evolve along the diagonal, toward more scale and complexity and less uncertainty. Their pace can be fast or slow, however, and some new products and technologies (e.g., cloud computing,

5G networks, or anti-obesity drugs) require huge investments for their initial market introductions.

Gold rushes ("irrational exuberance") can suspend organizational demands for evidence and thus normal uncertainty limits. These suspensions can occur in "hot" sectors such as biotech in the late 1980s, the internet in the late 1990s, and recently, artificial intelligence. Manias can also be widely distributed. Years of unconventional monetary policies in the 2010s made investors "increasingly aggressive," VC and "old Cambridge" (chapter 8) economist Janeway wrote in January 2022. Bubbles formed in crypto assets and meme stocks. "Nontraditional capital," such as mutual funds, hedge funds, and sovereign wealth funds, flooded into venture-backed businesses at extreme valuations. The "extraordinary increase in the supply of capital . . . eliminated any perceived need for critically assessing business models and business plans."[8]

Manias can provide opportunities for astute—or lucky—entrepreneurs to get in and out before the music stops. During the internet bubble, entrepreneurs and investors made great fortunes in businesses, such as Marc Andreasson's Netscape, which later evaporated. And just as wars can spur significant medical advances (such as the development of penicillin in World War II), occasionally "explosions of investor exuberance have funded the deployment of innovative technologies at sufficient scale to transform the market economy, as was the case with railroads, electrification, and the internet."[9]

But, continues Janeway, they may not: "Whether a bubble is productive depends on what it leaves behind." The Dutch tulip mania of the 1630s, London's South Sea Bubble of 1720, and recent manias in non-fungible tokens and meme stocks left no identifiably productive legacies. Conversely, just as transformational medical advances do not require battlefield catalysts, technological revolutions do not require manic investments. Moreover, "All bubbles burst, so even investors in the vehicles of a productive episode inevitably will fall into one of two categories: the quick or the dead."[10]

Whether investors who deploy their personal funds choose to dance while the music plays may be a private choice. For entrepreneurs, "Taking virtually free capital from investors who have no interest in (or capacity for) firm governance is irresistible," Janeway writes.[11] But what about mutual funds, which normally invest in public companies whose routines are designed for the lower-right corner of the specialization map? Historically, US rules such as the Investment Company Act of 1940 have discouraged fiduciaries from operating outside this domain. But these rules have, in recent years, been diluted. Should they have been? Can we count on the directors of investment companies to restrict fund managers to domains where they have the necessary expertise?[12] Or does investment in multibillion-dollar private unicorns no longer require governance expertise or effort?

Normal specialization raises the opposite policy concerns: underinvestment by financiers in unproven entrepreneurs and by corporate executives in breakthrough projects. Does the "procedural rationality" (per Simon, chapter 9) of evaluation routines and their uncertainty ceilings produce socially undesirable results? And can these be corrected by government subsidies?

Schemes to subsidize startups emerge from supposed "market failures" in early-stage financing. Financing constraints likely do discourage some aspiring entrepreneurs. Self-financing undoubtedly increases the personal downside for many business founders. But the hazards of investing all their savings and incurring possibly imprudent levels of personal debt did not stop my *Inc.* list interviewees from starting their businesses (chapter 14). Moreover, individuals discouraged by financing constraints might also be less capable of coping with the uncertainties.[13] Financing constraints may not even force founders who target niche markets to start on a suboptimal scale, while bootstrapping encourages them to undertake quick, cheap, trial-and-error development.

And suppose some theoretical "market failure" in private financing does exist. Practically speaking, how could public subsidies fill the "financing gap"? What process or criteria could a public agency use to solve the uncertainty problems that discourage the private financing of low-evidence initiatives?

Similarly, at the other end of the specialization spectrum. The routines of public companies reflect their comparative advantage in undertaking large, complex projects and their fiduciary responsibility to stockholders. They strongly discourage investments in futuristic technologies and unfathomable customer wants. The hype notwithstanding, even the visionary Steve Jobs respected technical and commercial limits. Pathbreaking advances that require significant initial investments, such as CAR-T and mRNA development, must unavoidably economize and improvise to carry on, often on a smaller scale than their promoters would prefer. Some undoubtedly shut down. Typically, evaluation routines make the upper-right-hand space of Figure 22.1 a dead zone.

Is this empty space a zone of market failure? Schumpeter's analysis suggests it could be. According to Schumpeter, economically significant innovations are "large" and "spontaneous" rather than "small" and "adaptive." They so displace the "equilibrium point" that "the new one cannot be reached from the old one by infinitesimal steps. Add successively as many mail coaches as you please, you will never get a railway thereby."[14] Dramatic imagery, but how realistic? To take Schumpeter's own example, steam engines that powered railways emerged from water pumps in coal mines and gradually made their way into public transportation.

Economic historian Nate Rosenberg's careful research documents the "continuities" of innovation.[15] Unfortunately, Rosenberg's guarded language cannot compete with Schumpeter's rhetoric, and the "slow and often invisible

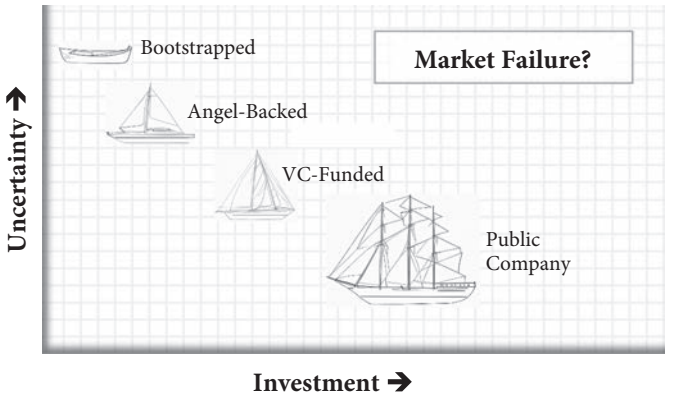

Figure 22.1 Dead Zone

accretion of individually small improvements in innovations" are often ignored because of "a preoccupation with what is technologically spectacular," as Rosenberg puts it.[16] The 2023 drama of Large Language Models captivates the public, while the earlier painstaking progress in artificial intelligence, going back to Simon and Newell's work in the 1950s, did not. Yet Charles Darwin's "endless forms most beautiful and most wonderful"[17] evolved from simple beginnings through small mutations. Similarly, the sum of modest advances routinely produces technological revolutions.

Could diverting resources from commonplace, incremental enterprise to select, radical initiatives nonetheless serve the common interest? Perhaps large, uncertain initiatives, like national security, the control of infectious disease, and basic scientific research, are legitimate public goods. But who would select such initiatives and how? Big Science funding inevitably reflects the consensus of scientific communities—and a bias against renegade ideas. Public funding agencies, like large stockholder-owned businesses, cannot rely on hunches to place big bets– their legitimacy requires structured, defensible reviews (as I argue in section 3 of this coda). They can more easily seed small, speculative projects as the US Department of Defense did in the late 1960s to get the internet started. And even that project was funded after several years of private and public evaluation of alternatives.

So is the uncertainty-investment tradeoff an avoidable pathology or a practical, desirable necessity? Let the reader decide.[18]

2. Technologies of Discourse

As mentioned, expectations of daily sunrises, according to the Scottish Enlightenment philosopher David Hume, are based on animal instinct, not

reason. Hume's skepticism included questioning the claim that our insights about cause-and-effect relationships derive from reason. He proposed instead a "naturalist conception" based on "the instinctive associative mechanism of the 'imagination.'"[19] Differently put, an unavoidably uncertain world requires the instinct of imagination.

As an ardent supporter of the scientific sensibilities emerging in his time and a staunch (in the classical tradition) empiricist, Hume also valued evidence and observation. But, evidence collaborates with and does not replace imagination. For example, expecting to like the seventh *Harry Potter* book "because" we enjoyed the first six combines empirical data (our responses to the earlier books) with imaginative extrapolation. We could plausibly expect the opposite: we could imagine that the seventh will disappoint because all long streaks must inevitably end.

Take this further. Voluntary exchange and collaboration, beyond the obligations of kinship and custom, require giving and accepting reasons that combine imagination and evidence. Promoters of entrepreneurial schemes, drawing on their observation and experience, imagine why buyers will pay for their products and investors will back their ideas. To close the deal, promoters must communicate their imagined reasons and evidence in a way that will resonate with the imaginations and experiences of potential buyers and investors and overcome their doubts about value and feasibility. So, too, outside business entrepreneurship. The claims of reformers and reactionaries, racists and antiracists, pro- and antivaxxers, prosecutors and defense lawyers, and even scientists and medical researchers originate in their imaginations and experiences.

Misaligned Imaginations

Research that conflicts with the imaginations and experiences of target audiences face rejection. Robin Warren and Barry Marshall won the 2005 Nobel Prize in Medicine for showing how H-Pylori bacterial infections cause stomach and duodenal ulcers. But when they presented their initial findings in October 1982, the response was "mixed." The "standard teaching" was that "nothing grows in the stomach."[20] Marshall recalls that "most of my work was rejected for publication, and even accepted papers were significantly delayed. I was met with constant criticism that my conclusions were premature and not well supported. When the work was presented, my results were disputed and disbelieved, not on the basis of science, but because they simply could not be true. I was told that the bacteria were either contaminants or harmless commensals."[21]

Language and art—primal markers of human societies—are well suited for discourse that can help reduce doubts and disagreements (chapter 19). Evocative words and images enable us to align imaginations and interpretations of evidence while our capacities for imaginative discourse have advanced relentlessly throughout human history. The knock-on effects have profoundly shaped and reshaped the human condition in every sphere.

Enriched vocabularies have extended the possibilities that people can invite each other to imagine. And canonical stories and "conventionalized narrative" have converted "individual experience into collective coin which can be circulated," writes Bruner. "Being able to read another's mind need depend no longer on sharing some narrow ecological or interpersonal niche but, rather, on a common fund of myth, folktale, 'common sense.'"[22]

Technological advances in the physical devices of discourse have been momentous. Written communication, which broke our reliance on in-person speech, started on clay and stone tablets. A procession of new technologies for recording, reproducing, and transmitting the written word followed. These included papyrus scrolls, animal skins, paper, quill pens, typewriters, cylinder seals, woodblock printing, movable type, the Gutenberg printing press, rotary presses, and postal and telegraph networks. Visual and audio communication advances included the development of paint brushes, pigments added to beeswax and suspended in oil or water-soluble media, acid etching of metal plates, offset printing, photography, telephones, gramophones, radio, movies, television, tape recorders, and videocassettes. In recent decades, communications services and devices have been leading products of the digital revolution. Apple's Mac established a foothold through desktop publishing, and the iPhone has made Apple the world's most valuable commercial enterprise.

Besides creating new markets for companies like Apple, advances have supported the initiatives of the users of the new technologies. Upstarts and established organizations have both benefitted along the lines discussed in chapter 18 (on the aims of uncertainty-reducing discourse). Upstarts use affordable yet high-quality sound equipment, digital cameras (including traditional single-lens cameras, mobile phone cameras, camcorders, bodycams, and drone cameras), and editing software (such as Photoshop) to produce professional-class content. They distribute the content widely through platforms and social media, bypassing traditional intermediaries like newspapers, radio, and television.

Crowdsourcing platforms such as Kickstarter and Indigogo allow entrepreneurs to look beyond their own families, contacts, and local communities to fund the development of new products and projects that would not interest professional investors and which they cannot bootstrap. Similarly, the top "influencers" on YouTube and TikTok have attained followings that rival

those of Hollywood stars, which they monetize through brand sponsorship, selling ads and merchandise, and viewer fees. In 2023, twenty-five-year-old James Stephen Donaldson (professionally, "MrBeast") had over 200 million YouTube followers[23] and an estimated net worth of $500 million.[24] On TikTok, the twenty-four-year-old Charli Grace D'Amelio, who posts her dance videos, had over 150 million followers.[25]

New communication technologies have supported insurgent political initiatives. Change.org, founded in 2007 in San Francisco, gives campaigners tools to promote petitions and collect signatures. It claims over five hundred million registered users.[26] Famously, two outsiders—Barack Obama (a first-term senator from Illinois) and Donald Trump (who had never held public office)—used online campaigns and social media to mobilize grassroots support and funds to win election to the US presidency.

Large, established organizations have also used technological advances in their uncertainty-reducing discourse. Consumer goods giants were the backbone of twentieth-century radio and TV advertising. The term "soap opera" originates in melodramas sponsored by large soap producers. Large corporations now use search engine and social media ads and sponsor influencers on YouTube and TikTok. Similarly, companies selling products whose features cannot be clearly explained in writing rely on online videos. I frequently look to YouTube to unravel the mysteries of my allegedly user-friendly iPad.*

New technologies have become integral to routines that organizations use to evaluate and plan uncertain ventures. Designers use computerized 3-D models to secure the feedback and approval of bosses and new product committees. Spreadsheets have become an indispensable tool for analyzing financial prospects. Mocking their made-up assumptions and details misses the point of discourse about imagined futures: Spreadsheet models provide valuable conversation pieces for discussing what could be made to happen and how. Project management software, data repositories, wikis, and videoconferencing help control the alignment uncertainties of complex initiatives.

Coordinating Complex Initiatives

Much is made of how large projects fail. More surprising is the smooth execution of many complex initiatives. Netflix has transitioned from mailing DVDs to streaming videos and has become a producer of movies. Amazon

* YouTube user instruction is another example of new technology–enabled symbiosis. Upstart producers of widely watched how-to videos earn advertising revenues that they share with Alphabet (Google), the YouTube operator. Large companies like Apple whose products are supported by the videos also benefit.

has swiftly shifted from "hub-and-spoke" fulfillment to regionalized facilities to slash shipping times. By mid-year 2023, Amazon delivered 1.8 billion packages the same or the next day to its US customers, about a fourfold increase since 2019.

The migration of computing infrastructure to the "cloud" has been comprehensive and quick. In 2020, more than 60 percent of US businesses moved their workloads to the cloud, and as of 2023, 94 percent were using cloud services.[27] Cloud computing, in turn, helped businesses adapt swiftly to the disruptions of Covid lockdowns.[28] In the public sector, the US Postal Service has implemented "end-to-end logistics tracking." It offers customers tracking services as accurate as those provided by private companies like FedEx and UPS.[29] Public agencies, like private companies, responded to the challenges of the Covid-19 pandemic rapidly. Under legislation passed in March 2020, the US government made 476 million emergency payments to qualifying individuals.[30] Apparently, public or private bureaucracies can—at least occasionally—use project management techniques and technologies to perform impressive feats of coordination.

But no rose is without its thorns. Advances in communication technologies can also increase mutual doubts and mistrust. Below, I review three doubt-and-disagreement increasing pathways: the overproduction, weakened quality control, and divisiveness of discourse.

Knight anticipated the overproduction problem in a 1949 comment (on an article by Hayek) that he wrote for the *University of Chicago Law Review*. Knight complained about the "pathetic failure to recognize the limits of intercommunication" in the "stampede" to rush "more and more billions of words onto more and more tons of paper through the printing press (now supplemented by getting them 'on the air'). We are approaching a limiting condition in which everyone writes or talks, while no one reads or listens—since no one can do both at once. . . . And while one person can communicate to a large number, and with modem facilities, to the whole world, no skill or device will enable one to receive communication *from* more than one at a time."[31]

The "modern facilities" that Knight wrote of in 1949 now seem primitive in their overproduction of communication.

Overproduction produces different harms in the workplace and public life. In the workplace, employees confront a torrent of emails and instant messages. Many are irrelevant or trivial, but recipients cannot identify the important ones

without reading them. Ironically, tech companies that enable the messaging flood also now offer software to automate prioritization and filtering. But the software has done little to reduce the problems of information overload. Low costs have also degraded person-to-person communication. The expense and effort of writing or typing out a letter, putting it in a stamped envelope, and then into a mailbox signaled (as in the Spence model mentioned in chapter 7) its potential value and seriousness. So did making a long-distance phone call. Now we expect emails from unknown senders and calls from unknown callers to be worthless junk.

Oversupply creates different difficulties for public discourse.

Technology has broken the power of traditional media oligopolies. Cable networks and now online internet streaming destroyed the stranglehold of three TV networks in the United States and state broadcasters in other countries. Low costs also made news reporting a round-the-clock affair. The intense competition for audience attention has created strong incentives to exaggerate or fabricate.

Moreover, technology has democratized the competition for attention. Anyone with a mobile phone or an internet connection can now report news or opine cheaply and widely. On the positive side, citizen-journalists can publicize grave ills. Amateur video recordings have exposed police brutality. But technology has also made doctoring images easy. And as audiences get bored, the pressure to sensationalize or fabricate intensifies.

Second, new technologies and platforms have weakened mechanisms to police the quality of discourse.[32] The internet initially produced great hopes for decentralized quality control. When eBay, the pioneering e-auctioneer, first published customer reviews, scholars praised and documented the benefits of independent evaluations of sellers.[33] But soon, sellers began paying reviewers to post glowing evaluations of their products, and entrepreneurs started "click farms" to mass-produce fake ratings and rankings.[34] E-commerce sites resisted: Amazon began ranking reviewers and identifying "verified purchasers." But that encouraged sellers to offer high-rated reviewers free goods or pay for "verified" purchases.[35]

Things are similar in the public sphere. Traditional media producers reflected what their readers wanted. Supermarket tabloids published improbable stories of extraterrestrials and celebrity scandals. In contrast, publications like the *New Yorker* and *Inc.* magazine catered to serious subscribers, ranging from literary lefties to conservative small-business owners. In my experience, both magazines checked the accuracy of their articles with great diligence, although what they covered (and how) naturally reflected the interest of their readers.

Google and Facebook wrecked the advertising model that supported careful reporting—and fact-checking. More competition for fewer readers and advertisers tempted traditionally staid news outlets toward tabloid sensationalism and fantasy. What the outlets now call "fact-checking" has become a partisan effort to discredit the views they oppose. Meanwhile, Section 230 of the Communications Decency Act (CDA) protects online platforms like Google and Facebook from lawsuits over falsehoods posted by their users, while sensationalist postings increase their ad revenues.[36]

Organizations like Snopes claim to objectively evaluate news and rumors. But Snopes itself relies on web-based advertising. It faces the same pressures to sensationalize and exaggerate as the targets of its investigations—refuting demonstrable falsehoods may not attract the commercially necessary web traffic. And Snopes, say its conservative critics, makes up the claims it supposedly refutes, and then tailors the results to suit the preferences of a leftist audience. Who then to trust? While independent policing of the news has prima facie appeal, it fails to answer the question posed in Juvenal's *Satires*: *Quis custodiet ipsos custodes?* "Who will guard the guards themselves?"

A third technologically magnified threat is divisive discourse. Twentieth-century technologies spawned media oligopolies (like TV networks and newsmagazines) that created and disseminated products for mass consumption. Here, the problem for discourse was excessive blandness and societal groupthink. Twenty-first-century advances have promoted the opposite kind of excesses. The new info- oligopolists provide platforms for content they do not themselves create. Unlike the media oligopolies they destroyed, they are protected by Section 230 rules, as mentioned. Yet platforms benefit from shrill, unpaid- for content that does not attempt to change minds and disdains any broad middle. It targets preexisting prejudices and reinforces dogmatic beliefs.

Optimistically, the advantages of the new communication technologies exceed the drawbacks for private discourse. We have and will somehow continue to cope with information overload and dubious reviews on e-commerce platforms. Prospects in the public sphere seem more troubling, however. Technology has made it easy to mobilize mobs against agnostics, not just rival dogmatists, making dysfunctional spillovers from stories (chapter 21) more potent and toxic.*

* To borrow from William Butler Yeats's "The Second Coming": "The best lack all conviction, while the worst / are full of passionate intensity." Silence is the pragmatic choice for the best who refuse sectarian protection from mobs of the worst.

But even with public discourse, it's worth asking: Are conditions really worse than in the good old days? Horrible falsehoods that justified witch hunts and pogroms did not need social media for dissemination. Sensationalism and warmongering marked the "yellow press" circulation wars in the 1890s. And even if technology has made public discourse more hateful and divisive, are drastic restraints on free expression a suitable remedy? Might not a measured reform of privacy and antitrust rules—and eliminating the exceptional liability protections for platform oligopolists—be sufficient?[37]

3. Balancing Justification and Authority

Agency and authority have lurked in the background for most of this book. Agency, our belief in willful choices when we can't know what will happen, stands in contrast to predetermination and fate. It creates rational anxieties (doubts, uncertainties) about our choices. If everything was predestined, why worry? At the same time, because excitement accompanies anxiety, agency makes life an adventure worth living.

Agency also encourages us to value voluntary agreement over authority. Human interdependencies, no less than nature, limit our choices. Inevitably, what we might want to do is constrained by the preferences of our fellows. In agreeing to align our choices, we exercise agency more than if some authority dictates alignment. Likewise, there is more agency in agreements about specific issues than in the Hobbesian fiction of a blanket contract with an all-powerful Leviathan.

Yet deference to authority endures. As ever, might often seems right. Force and intimidation, not debate or sweet reason, secure authority among children in schoolyards as they did in prehistoric tribes. Athenian democracy, which excluded women and slaves, was "most honoured in the breach."[38] In 416 BCE, Athenians attacked the neutral island of Melos during their war with Sparta. "The strong do what they can, and the weak suffer what they must,"[39] the invaders told the Melians. After the Melinians surrendered, Athenians executed Melinian men and enslaved the women and children. Moreover, democracy in Athens, such as it was, did not endure.

As of 2020, less than half of the world's population lived in some sort of democracy, and fewer than a tenth in fully democratic states.[40] Full democracies, too, have expanded the executive branch's powers and made legislative oversight and deliberation an empty performance. The powers of the security apparatus in democracies can also be draconian.

In the workplace, socialist workers' paradises never empowered workers. Most capitalist businesses are explicitly hierarchical. Just as pharaohs commanded the

construction of pyramids, Steve Jobs could order the development of the iPhone without consulting Apple's shareholders or many rank-and-file employees. Legal firms that were once governed by the consensus of their partners now vest considerable authority in small executive committees, and career administrators control once self-governing university faculties.

Although authority limits agency, it does have benefits in coping with uncertainty. Reaching consensus through reasoned discussion can pose insurmountable difficulties. Put aside simple conflicts of preference or interest: Neither logic nor evidence can eliminate ignorance about future wants or the means for securing them. Yet "imaginative instincts" about wants and means often diverge, creating disagreements that cannot be easily resolved through honest discourse. Moreover, interminable discussion can harm everyone. Therefore, empowering an authority, at least as a fallback if discourse fails or takes too long, can serve the common good. And hybrid arrangements, with authority serving as a referee or fallback, guided by the prior give-and-take of divergent views, can outperform relying entirely on authority or justificatory discourse.

As with communications technologies, combining authority and discourse poses more severe problems in the public sphere. In the private sphere, competition for customers, talent, and funding stimulates efforts to improve decision-making. Businesses keep changes in routines and structures they believe have worked in their organizations, copy or adapt what they see working in other organizations, and try to eliminate dysfunctional practices. Overcentralized organizations run by imperious bosses or organizations paralyzed by endless internal debate survive only if they have monopolistic power. Generally, the backstop of centralized authority balances justificatory discourse about uncertain matters.

In the public sphere, the functions and roles of public agencies often protect them from competitive pressures. Politicians responsible for the oversight and control of the agencies can face electoral contests, but even in full democracies, uncontested elections to "safe" seats and offices are hardly unknown. And for those politicians who face tough elections, fundraising and campaigning leave little time for the duties of their office. In either case, the practical capacity of politicians to supervise public agencies is limited. Additionally, public organizations face severe institutional constraints on organizational experiments and learning from other's experiences.

Imbalances of authority and justification can produce two kinds of public dysfunctions. Arrangements requiring excessive justification and few options for authoritative override can paralyze, producing what Philip Howard, founder of the Common Good coalition, calls the Rule of Nobody.[41] At the other end, we have Robert Moses's ruthless destruction of vibrant New York City

neighborhoods to make way for soulless public housing projects, illegal wiretaps by J. Edgar Hoover's Federal Bureau of Investigations, and the CIA's Bay of Pigs fiasco in Cuba.

In keeping with my focus on technological advances, however, I restrict my attention to controlling the authority of experts over technically uncertain matters. The problem arises because technological progress—and experts who do not explicitly coerce through violence—threatens the legitimacy of the institutions that progress requires.

There can be little doubt that technological advances create irrepressible demands for new rules and regulations. To cite uncontroversial examples: The development of automobile transport required driving rules and vehicle inspections. Air travel required a system to control traffic and certify the airworthiness of aircraft. Radio, television, mobile networks, and Wi-Fi required regulating airwaves' use to prevent signal interference. New petrochemical, pharmaceutical, textile, nano-material, and fracking technologies created new forms of air and water pollution that governments had to discourage and control. The discovery of antibiotics required rules to prevent bacteria from acquiring drug resistance, and advances in genetic engineering cry out for rules to stop the creation of deadly new viruses.

Technology cannot however resolve uncertainties about the design of good rules, as Elster's "Excessive Ambitions" essay suggests. Yet the need for new rules inevitably increases the authority of experts who implement the rules. What they say often goes: their expertise makes the experts a law unto themselves, without any serious demands to justify choices that are, at their core, highly uncertain and hit-or-miss.

Up to a point, the independence of empowered experts serves the public interest. The typical layperson or professional politician lacks the knowledge and expertise to regulate technological advances—and even imperfect rules designed by fallible experts are often better than "letting the chips fall where they may." Ceding authority to experts, however, also has drawbacks. Conformist, uncritical thinking on issues for which there can be no demonstrably correct answer is one problem. Experts who have internalized a scientific discipline's Kuhnian paradigm (chapter 5) will not question its premises or inferences. If, as often happens, all the responsible experts are committed to the same paradigm, they will not debate fundamental issues.[42]

Paradigmatic conditioning poses a further problem. As mentioned, scientists value general propositions on topics aligned with their disciplinary paradigm. Their research designs seek to remove contextual influences and exclude variables outside their paradigmatic framework. Contextual, one-off vagaries, crucial in practical recipes, are just random noise in scientific theories.[43]

But intellectual commitments to scientifically desirable abstractions can increase the risks of expert control. Until the 2008 financial crisis, for example, the US Federal Reserve's econometric model did not include a financial sector. Such exclusion and abstractions are acceptable, even desirable, in scientific economic research, which values precise equilibrium models. And academic approval matters to Fed economists who try to publish their research in economics journals. However, excluding important institutional variables in central banking and other regulatory arenas poses systemic risks.[44]

Scientific groupthink may, on balance, be a necessary evil. The more significant societal problem with expert rule now likely pertains to expert control of highly uncertain ends. The expert has no advantage over the public or politicians in choosing goals. As Elster's essay suggests, the social sciences provide no criteria for the goodness of policy outcomes. Natural sciences, engineering, or medicine don't either. Long-term ends are even more problematic. Stanford polymath (and previously, Simon's Carnegie collaborator) James March points out that we cannot discover long-term goals through analysis.[45]

Consider goals for public health. Immortality being out of the question, could the goal be life expectancy? But what about life expectancy and quality-of-life tradeoffs? Likewise, what about variations in death rates across time, ages, incomes, and demographics? Are low variations across these dimensions a suitable goal, and if so, which dimensions should public health authorities prioritize? Without choices about such priorities, justifiable choices of means (e.g., lockdowns during pandemics) are impossible. Yet no scientific or technical knowledge can guide the choices.

In principle, politicians are supposed to specify the ends for which experts are expected to develop appropriate means. In practice, politicians often obfuscate or avoid the question, leaving experts to choose both ends and means, as happened in the Covid-19 pandemic. Sometimes, even if politicians specify ends, experts may ignore or reinterpret their marching orders. One way or the other, experts often exercise de facto control.

Now, the very notion of choosing public policy goals implies favoring one interest, be it financial or psychic, real or perceived, over another. Pandemic lockdowns pitted the preferences and beliefs of the wealthy and old against those of the young and less well-to-do. So determining goals, inevitably without any scientific or logical basis, puts experts in the business of allocating favors, turning them from public servants into overlords or, more kindly, philosopher kings. Additionally, experts' goal choices reflect their personal financial, psychological, social, ideological, or whatever interest. Those people whose interests are sacrificed by experts are naturally aggrieved. Worse, experts rarely publicly discuss or justify goals, upsetting those who suffer no harm or may even benefit. The game is rigged, many come to believe.

Independence Beyond the Law?

Inflation targeting by the US Federal Reserve (the Fed) exemplifies the problem of expert control over ends.[46] The Fed's influence and reliance on economic expertise have grown substantially since it was formed in 1913. Hostility to centralized government, dating back to the nation's independence, had prevented the formation of a proper central bank in the United States until Congress passed the Federal Reserve Act of 1913 after several financial panics. Moreover, because of continuing fears of excessive centralization, Congress created a Federal Reserve System of twelve more or less independent regional Reserve Banks.

In the 1930s, after the decentralized system had failed to prevent widespread bank failures in the Great Depression, power shifted to the Federal Reserve Board based in Washington, DC, and its twelve-member Federal Open Market Committee (FOMC).[47]

Starting in the 1960s, economic experts began playing an increasingly significant role at the Fed. Macroeconomics and its academic promoters, many Keynesians, were gaining prestige. The academics claimed the Fed should actively steer the economy and not just prevent financial crises but that the Fed's decision-makers lacked the necessary economic expertise.[48]

Congress formalized the Fed's macroeconomic responsibilities when it passed the 1978 Full Employment Act. The act gave the Fed a "dual mandate" of full employment with price stability. Then, in 2012, the Fed officially declared a 2 percent inflation target.[49]

The Fed now enjoys exceptional independence and autonomy. Unlike other federal agencies that require legislative budgetary appropriations, the Fed is entirely self-funding. By a simple majority of its twelve-member FOMC, the Fed can—and does—conjure up trillions of new base money. No congressional or presidential approval is necessary. Economic expertise is deeply entrenched. The Fed Board employs more than four hundred PhD economists,[50] and its chair is now expected to have a similar pedigree. President Donald Trump's 2018 appointment of a lawyer, Jerome Powell, as chair raised eyebrows.[51]

So, what is the problem? As mentioned earlier, commitments to paradigmatic economics pose the risk of disciplinary groupthink. But that is mainly an issue of means—what about the Fed's 2 percent inflation target?

Paul Volcker, the late, legendary 1980s inflation-fighting Fed chair, was an outspoken opponent of the target. Two percent inflation, which might not seem like much, Volcker wrote in 2018, doubles prices in a generation. Volcker also noted that no economic theory or evidence supported the claim

that a little inflation greases the economic wheels or reduces the risks of depressions.[52]

As troubling is the disregard for the 1978 legislation that the Fed invokes to support its target. The legislation mandated stable *prices*, not stable *inflation*. These are not the same thing. Prices rising at 2 percent each year—and thus doubling in a generation—isn't the price stability that Congress has mandated. Moreover, the 1978 law established specified precise numerical targets—3 percent for unemployment and zero for inflation; a source for the data (the Bureau of Labor Statistics); and a target date of 1988 (thus allowing for a ten-year transitional period).[53]

Besides flouting the letter and spirit of the law, the Fed's 2 percent target implicitly infringes on the legislature's Constitutional prerogative to levy taxes. Inflation—of any magnitude—is a tax. Moreover, inflation is an iniquitous levy, falling more heavily on the less well-to-do. High-income earners—including distinguished macroeconomists who argue for even higher inflation targets—do not feel the pinch as much. If they invest astutely, they can even benefit from inflation.

The Fed has also invoked the bogeyman of inflation falling below its 2 percent target to justify aggressive, unconventional monetary policies. Openly, and by design, the policies benefitted wealthy stock- and bondholders[54]—including members of the FOMC. Some were reprimanded or even forced to resign for violating Fed rules intended to control insider trading.[55] Activist policies also make the Fed a potent force in financial markets, boosting the policymakers' egos and post-Fed speaking and consulting opportunities.[56]

Fed officials may feel that their technical expertise entitles them to disregard the zero-inflation target set by the 1978 law. They may also convince themselves that their personal financial prospects and the approval of their social and professional circles do not influence their disregard. But sizable portions of the public are not thus convinced. Activists from both sides—Tea Partiers and Occupy Wall Streeters—have made the Fed targets of street protests.

Dissatisfaction with experts who don't explain—yet complain about political interference—isn't self-correcting. Disgruntled voters cannot dismiss experts. But they can turn to demagogues who are even less public-minded and more authoritarian. Increasingly, voters have done just this, jeopardizing the institutions that produced much dynamism, prosperity, and liberty.

Economists and other scholars can help control or reverse the discontent of which they are also often targets. Practical progress usually requires new

theoretical ideas. The Federalist Papers—articles and essays that Alexander Hamilton, James Madison, and John Jay wrote and pseudonymously published between October 1787 and April 1788—had a clear, practical purpose: to promote the ratification of the Constitution of the United States. They have guided lawmakers and politicians in the United States, Latin America, and Europe ever since.[57]

Not coincidentally, these papers are also considered a landmark of political theory and political science. The authors themselves saw their work as combining the practice and theory of government.[58] A pure handbook or manual, like one for repairing muskets or horse carriages, would not have had lasting, widespread appeal. Instead, the Federalist Papers contained general theories based on broad assumptions about human societies and nature.

But even the farsighted Federalist Papers, written by authors living in a predominantly agricultural, technologically backward society, could not foresee the problems of expert power and impaired discourse that twentieth- and twenty-first-century innovations would produce. So, while we should marvel at the durability of many of their insights—about governing the un-angelic in a large republic,[59] for instance—new or updated theories incorporating the effects and uncertainties of widespread commercial and technological enterprise that pervade the modern world could have great practical value.

Economists and other scholars have much to contribute—if they can transcend their paradigmatic dogmas. Effective solutions to human problems, as exemplified by the Federalist Papers, combine, per William James, abstract, rationalist monism and down-to-earth, baroque empiricism (chapter 9). Their logic likewise reflects both logico-scientific deduction and narrative mode ("thinking in cases") reasoning (chapter 18).

Progress requires both scientific and humanistic understanding. Explanations that rejected willful intent were instrumental in understanding the natural world. Hippocratic medicine, Newtonian physics, and Darwinian biology rejected animism and divine interventions and designs. Naturalistic understanding has supported great practical advances. But practical advances, by humans and for humans, are not predestined, accidental, or deduced from scientific laws. Advances and obstacles spring from human feelings, from hopes, ambitions, love for adventure, fears, frustrations, jealousies, and disagreements. The outliers are as crucial as the averages.

The ambitious social scientist strives for simplicity, generality, and timelessness. Yet, like effective action, consequential theories and explanations of uncertain choices cannot ignore complexity, context, and impermanence. "For every complex problem there is an answer that is clear, simple, and wrong," H. L. Mencken wrote. The hedgehog, who knows just one big thing, cannot design

the governance of unruly enterprise without the fox's knowledge of many little things.

Contemporary scholars would do well to heed Knight's conclusion to his 1949 comment:

> So, the final word should be, "beware of absolutes." Here again the honest thinker must advert to our religious tradition, with its tendency to erect an antithesis between right and might, or between the right and the expedient, with its absurd and monstrous maxim of "do right though the heavens fall." On the other hand, Talleyrand is said to have said that the only good principle is to have none. But like most bright or poetic sayings this also is "inaccurate." The right principle is to respect all the principles, but to take care to use good judgment as to which one to follow in any particular juncture—or, still more precisely, how far to follow any one and how far its opposite principle. There is always a principle, and a good principle, to be followed in any course of action, and used to justify that particular action. The ultimate besetting sin of the "intellectuals" is oversimplification—because it is that of those who elect them to interpret and formulate their own thinking.[60]

For economists, respecting a broader range of principles—and using judgment to decide which ones to use when—carries risks. Restricting the scope of acceptable problems and solutions legitimizes assessments of scholarly contributions. Per Kuhn, it also raises the collective productivity of economists and their scientific standing. Recall Stanford economist David Kreps's observation that a strong, cohesive paradigm has secured for his disciplinary colleagues exceptional prestige and incomes. Yet, might not a broader, weaker paradigm better serve the common good?