PART I

THE FIRST HUNDRED YEARS

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Prelude: Self-Governance to 1980

Like most good magic tricks, self-governance can be done several ways. Three of the most important methods were pioneered at the end of the nineteenth century.

1.1. Industry Precedents

The use of private institutions to pursue public policy is as old as commerce. Indeed, medieval guilds already claimed to protect society's interests. Governments were quick to see that this offered new possibilities for control, most obviously when medieval French kings saw that it was easier to let the University of Paris decide which books ought to be suppressed. More than that, the university used its buying power to drive uncooperative publishers out of business. Remarkably for those days, state violence was never invoked.[1]

1.1.1. Traditional Governance Models: 1890–1980

™The rise of Big Business in the nineteenth century expanded these beginnings, showing how private power could be rooted in markets. The earliest examples almost always addressed flaws that made markets unnecessarily costly or impractical.[2]

Fixing Market Defects. In theory, the new nationwide capital markets let factory owners spread risk. At first, however, insurers had no way of knowing what, if anything, their insureds were doing to prevent fires in the first place. The insurance industry fixed this otherwise fatal flaw by drafting detailed fire codes and hiring private inspectors to see that they were followed.[3] This eventually led to the rise of a new private body (Underwriters

Laboratories, or UL) as an independent, self-supporting audit service.[4] While participation was formally optional, companies that failed to use UL regularly lost market share.[5]

UL, in turn, realized that it could deliver more value – and command higher fees – by making sure that its actions were transparent. This led to elaborate procedures modeled on traditional democratic governments, including oversight councils to review test results, explaining decisions in detailed written reports, launching internal investigations in response to criticism, and opening its facilities so that the public could watch tests being performed.[6] Modern scholars give UL credit for creating "a new, professionalized safety industry" far ahead of government, which belatedly codified UL's private standards decades afterward.[7] However, economic incentives were even more important. Crucially, UL had to balance the needs of manufacturers (who paid its fees) and fire insurers (who required UL certification in the first place).[8] This encouraged UL to be creative in meeting manufacturers' needs[9] while still refusing compromises that would alienate insurers.[10]

Most early industry schemes addressed similar market flaws. These included certification schemes that helped consumers judge the quality of goods, services,[11] and promises.[12] These standards were simple to enforce since the industry – including potential violators – found it nearly impossible to survive otherwise. That said, the regulations were tightly focused on markets and largely ignored social issues.

Shadow of Hierarchy. Other industries returned to older "shadow of hierarchy" models in which government gave private standards the force of law[13] or else threatened regulation if private industry failed to govern itself.[14] Standards entrepreneurs often exaggerated these threats for their own purposes, warning that government would intervene if industry did not[15] and dramatizing the risk of lawsuits.[16]

Supply Chain Governance. A very different solution took advantage of large firms' power over their supply chains. The most important early example was the Fashion Originator's Guild of America (FOGA),[17] whose members produced 60 percent of all quality women's wear sold in the United States.[18] In depths of the Great Depression, FOGA announced that its members would no longer sell to "unethical" retailers.[19] Since most retailers needed these goods to remain competitive,[20] at least 12,000 retailers "cooperated" in the scheme – more than half protesting that they had been coerced.[21] Soon, FOGA was running its own intellectual property system,[22] conducting random compliance audits of retailers,[23] and holding trials and appeals for violators.[24] This was too much for the U.S. Supreme Court, which struck down the arrangement on the ground that American antitrust law banned such private "tribunals for [the] determination and punishment of violations."[25]

But private standards were too useful to go away. Lawyers and judges soon found that the FOGA decision's vague rule against "tribunals" left plenty of room for standard setting. By the late 1980s, the United States had an estimated 25,000–50,000 private standards employing roughly 100,000 people.[26] This led to a lively debate on how decisions should be made. Probably the most insistent concept was "consensus," sketchily defined as "much more than a simple majority, but not necessarily unanimity."* Other rules implemented a "general rubric of 'due process'[27] and appeal rights."[28] These included rules favoring broad participation and the use of proxies for those unavoidably absent,[29] rules for appealing and overruling "no" votes[30]; open meetings and membership; notice and comment procedures[31]; and written decisions[32] and records.[33]

As Andrew Russell[34] has emphasized, most of this structure originated with standards evangelist Paul Gough Agnew in the twenties. However, standards bodies seldom if ever explained in any explicit way how their various procedures were supposed to advance democratic ideals or even fairness. Instead, they were allowed to proliferate, in Robert Dixon's phrase, like Amish "hex signs"[35] – i.e., poorly understood features that could not hurt and might possibly improve standards making.[36] Current scholars concede the point, but argue that these "pragmatic steps" are nevertheless "sensible approaches to developing democracy in an arena where the very meaning of the concept is in doubt"[37] and could evolve into new and better institutions over time.[38]

1.1.2. Traditional Theories

We end this section by reviewing how scholars have traditionally made sense of private governance. The first and most common interpretation, as we have seen, was to posit a *shadow of hierarchy* dynamic in which governments ordered private communities to self-govern and threatened

* Hamilton (1983) at p. 463. The dominant American Society for Testing and Manufacturing defined "consensus" as two-thirds of the combined negative and affirmative votes at the subcommittee level with at least 60 percent of the voting interests participating, and nine-tenths of the combined negative and affirmative votes at the committee and society levels, with at least 60 percent participation at the committee level and at least fifty votes participating at the society level. Id.

to develop its own rules if they refused. Because government willed private power into being, the resulting arrangement was as legitimate as any other official action. Even so, this left little room for private actors' wishes. Any government that cared enough to intervene in private governance almost always had strong feelings about what ought to be done. To the extent that self-governance did occur, it mostly entered through regulators' inattention.[39]

A second, more subtle model depended on *network markets*, where consumers strongly preferred that products work together, i.e., be "interoperable."[40] But in that case everyone *also* knew that only one standard could survive in the long run. This led to "tipping" dynamics in which consumers would abruptly rush to whichever standard was expected to win. At this point, firms that backed losing standards faced a harsh choice: join the dominant standard or leave the market.[41] Crucially, network markets are agnostic: in principle, many different standards are stable.* Communities often made their choice through standards bodies and private politics. The telecommunications and electrical-equipment industries have picked winners this way for over a century.[42]

Network industry models experienced an unexpected renaissance in the 1990s, when the private World Wide Web Consortium (W3C) was lionized for its "philosopher-king" model of setting Web protocols.† The basic idea was that tipping gave leaders significant though not overwhelming power to decide which standards would win. Early in the race, the king had to persuade followers that his preferred standard was worthwhile. But once tipping set in, the king could safely announce a winner, knowing that the standard could now "go ahead despite objections of a minority."[43] Thereafter, any remaining dissenters would have to drop their objections or

* This is a fundamental departure from traditional microeconomic models in which the market makes the single best choice from those available.

† Journalist Mark Fischetti provides a thoughtful account of how the philosopher-king system is supposed to work:

> [T]he few industry people who are critical of W3C claim that Berners-Lee is a king who holds an iron hand over his puppet regime. But his subjects disagree. … "The question is," Berners-Lee acknowledges "… could I by whim pervert the course of justice? No, because there would be an outcry. I have to put my ideas into the process like anyone else. … If one succeeds, fine, otherwise members will tell me it's stupid." Most often, the community embraces his ideas. … Perhaps Berners-Lee plays more of a King Arthur role, sitting at the Round Table with the best technicians who also hold the right social ideals. Fischetti (2009).

go out of business. But this was only the beginning: Given that most community members had limited information, kings who made good choices were more likely to be trusted and gain influence in the future. This influence was even stronger to the extent that some members started to follow the king's endorsements on faith. But if you were a king yourself, actually exploiting this power required very difficult judgments of just when you could declare a consensus and make it stick.

The question remains whether the philosopher-king model is efficient or democratic. Given that standards wars imply a certain amount of randomness, it seems reasonable that a king can improve outcomes on average. But that presupposes a wise and a benign ruler. There is no particular reason to expect this beyond the weak constraint that kings who consistently displease their communities will eventually lose followers.

Enforcement. So far we have concentrated on asking when firms promise to obey common rules. But most critics have a different objection: the problem, they insist, is that firms cannot be trusted to keep their promises in the first place.[44] Here the definitive analysis is due to Carl Shapiro, who explores a model in which firms that practice high standards earn a premium from consumers. But since compliance is expensive, firms that only pretend to follow the standards can earn even more profit until they are caught. Shapiro shows that enforcement is nevertheless effective in two cases. First and most obviously, consumers might watch so closely that cheating is immediately discovered and earns nothing. Second, the premium could be so large that its present discounted value exceeds the one-time profit from cheating.* Carlo Scarpa has shown that a similar analysis also applies when enforcement is delegated to third-party auditors, who have a similar temptation to earn a one-time profit by quietly defunding effort.[45]

This analysis confirms the common intuition that many self-governance schemes are vulnerable to cheating. But it is equally true that the Shapiro and Scarpa models both assume that enforcers receive no direct benefit from compliance. Conversely, cheating makes far less sense when enforcers

* Shapiro (1983). The effect is mitigated when firms that honor the standard are willing to report rivals who cheat. Gunningham and Rees (1997). The counterargument is that companies can potentially earn still higher rewards by reciprocally ignoring each others' noncompliance. Enforcement incentives are decidedly stronger for third parties that directly profit from adherence, for example where insurance companies try to suppress "bad risks." *Id*. This explains the usual rule of thumb that firms closest to the consumer – and therefore most vulnerable to backlash – should pay for audits. Roberts (2012) at p. A-233.

expect their own businesses to suffer if the standard is violated. We argue in Chapter 4 that the New Self-Governance meets this criterion.

1.2. Academic Self-Governance

Advocates of academic self-governance almost always start from the example of Asilomar, where molecular biologists asked the federal government to regulate their work.* This tends to overshadow an earlier and much more spectacular success in which physicists helped stop Nazi Germany from acquiring an atomic bomb. The example is particularly illuminating because it dates from an era when the U.S. government mostly ignored academic science so that the "Republic of Science" was left to govern itself.

1.2.1. The Atomic Bomb Conspiracy (1939–1940)

Hungarian physicist Leo Szilard realized that a nuclear chain reaction could lead to atomic bombs as early as 1933.[46] The prospect was ominous in a world where the Nazis had just taken power. Two years later, he began agitating for an agreement to limit experimental data to England, America, and a few other countries. But his colleagues resisted, objecting that Szilard's physics arguments were unworkable (which was true at the time), that scientific secrecy was abhorrent, and that censorship would impede research. Some added that Szilard, who had taken out a patent, was tainted by commercialism.[47]

The Munich Crisis and German scientists' discovery of fission made Szilard's case more pressing from 1938 onward. But when he approached colleagues at Columbia University, that year's Nobel laureate Enrico Fermi expressed strong skepticism that chain reactions would work.[48] Despite this, Szilard nevertheless wrote to another recent Nobelist, Frederic Joliot in Paris, saying that Columbia was worried that atomic bombs might be possible and Fermi was investigating. If Columbia decided to limit publication, Joliot should do the same.[49] This tentative feeler collapsed a few weeks later, when Fermi himself wrote to Joliot saying his group was trying to understand uranium fission and, he assumed, so was everyone else. This was false: we now know that only the Columbia and Paris labs were competing. The immediate

* The reverence that scientists and journalists reserve for Asilomar is surprising: if the trucking industry had demanded similar regulation, journalists would surely have accused it of trying to "capture" regulators. In any case, petitioning the government seems like a limited kind of self-governance. From this standpoint, Asilomar is mostly interesting for the community's successful efforts to suppress certain experiments until the government could act. We tell this story in Chapter 5.

implication, however, was that Fermi felt free to publish. By March 1939, the Columbia and Paris groups had both submitted manuscripts confirming that uranium fission did indeed produce neutrons.[50]

Then Hitler annexed Czechoslovakia. Szilard and physicist Edward Teller again urged Fermi to reconsider. Fermi considered secrecy repellant, but refused to pull rank: "After all," he said, "this is a democracy." If the majority was against publication he would go along. He then asked *Physical Review* to withhold publication, only to learn that Joliot had already published in *Nature*. Fermi argued that there was now no secret to keep, but Szilard pointed out that (unlike Joliot) the Columbia paper contained crucial information about the number of neutrons released. Fermi was unconvinced, but put the matter to his group's administrative head, George Pegram. Pegram delayed.[51]

Szilard next persuaded Joliot's collaborator, Victor Weisskopf, to cable Paris saying that the Columbia group would delay publication on the number of neutrons if Joliot did the same. Everyone could go on submitting papers as usual but delay printing; in the meantime manuscripts would continue to circulate among cooperating laboratories in the United States, England, France, and Denmark.* Szilard also persuaded English experimental physicist Patrick Blackett to lobby *Nature* and the Royal Society's *Proceedings* to join the scheme. Finally, Szilard, Teller, Weisskopf, and Eugene Wigner approached senior Danish physicist Niels Bohr. Like Fermi, Bohr doubted that a bomb was possible and argued that it would be hard to suppress truly important results in any case. Nevertheless, Bohr warned his home institute to check with him before publishing.[52] Szilard and his colleagues also spread the proposal to Merle Tuve (Carnegie Institution for Science), Maurice Goldhaber (University of Illinois), E. O. Lawrence (University of California, Berkeley), and the editor of *Physical Review*. This last was crucial: at the time, nearly all nuclear physics papers passed through *Physical Review*'s offices.[53]

Joliot thought that atomic bombs were a distant prospect, disliked secrecy, and thought that any experimental results would either leak or be independently discovered by German physicists in any case. But above all, he worried that others would publish if he did not.

It didn't help that Szilard and Teller were relatively obscure. Despite this, Joliot discussed the matter with colleagues. He wrote back on April 5 citing a rumor that Tuve's Carnegie group had already achieved similar results, apologetically adding that the Szilard/Teller proposal was "very

* Szilard also proposed creating a special fund to increase young scientists' salaries as compensation for lost publication opportunities. Weart (1976) at p. 29.

reasonable but comes too late." Szilard cabled back on April 7 explaining that the Carnegie rumor was false and adding that Tuve had joined the embargo. Dropping his earlier excuse, Joliot published anyhow on April 22. Columbia then followed suit. We now know that this persuaded the British and German governments to launch secret atomic energy programs.[54]

French and British scientists stopped publishing fission papers when Germany declared war that September. But when physicists asked the U.S. War Department to impose censorship, it refused, declaring that scientists would have to do the job themselves. Szilard held back his own papers and persuaded one of Fermi's graduate students to do the same.[55] The turning point came when Szilard asked Fermi to suppress a new experiment on carbon cross sections later that spring: "Fermi really lost his temper; he really thought that this was absurd." But Columbia's administrative director finally asked Fermi to keep the work secret.

Szilard also persuaded Louis Turner (Princeton) to delay a paper describing the plutonium path to nuclear energy. When physicists Philip Abelson and Edwin McMillan (UC Berkeley) published some of this same information, they drew howls of protest from scientists as far away as Britain.[56]

Now that scientists had begun suppressing papers, they needed an institution to review new work. In June, Gregory Breit (Wisconsin) persuaded his National Academy of Sciences (NAS) colleagues to organize a censorship body. NAS reluctantly agreed, making Breit chair of its uranium subcommittee. By then, France had fallen. Breit immediately wrote to journal editors asking that all papers first be submitted to his committee; sensitive papers would be restricted to a limited number of workers, with formal publication embargoed until the end of the war. The editors agreed, albeit with "raised eyebrows." Working with Fermi, Harold Urey, Wigner, and others, Breit finally established "total censorship" of American fission research.[57]

Looking back, the embargo came just in time. Lacking the American results, German scientists ended up pursuing a far more difficult, heavy-water path to plutonium. This decision goes a long way toward explaining why Nazi Germany never built a working reactor.

1.2.2. First Impressions

American academics' conspiracy to suppress atomic bomb data took place in an era when Big Science was mostly funded by individual universities and medical charities.[58] The modern federally funded system was still five years away. Despite this, the physicists' conspiracy teaches some important lessons. The first is that private self-governance is possible, even when government itself is indifferent. At the same time, success was a near thing. Misunderstandings and small accidents of timing could easily have derailed the effort, particularly given the secrecy and competition between labs. The initiative was also lucky to have had someone as skilled and passionate as Szilard for its leader.

Second, community was central. Even prominent players like Fermi refused to take unilateral action. This gave junior people like Teller and Szilard the leverage they needed to raise the issue. At the same time, self-interest ran deep. However necessary, censorship posed a direct threat to individual groups' need to publish and members' career prospects. The fact that restrictions were temporary rather than permanent reduced but did not eliminate this tension.

Finally, Szilard and Breit showed real genius by enlisting *Physical Review* and *Nature* in their conspiracy. This was only partly about having the physical ability to block publication. Unlike bench scientists, journals were semi-independent bodies that stood outside the community. This made it easier for editors to take stands even when some members objected.