

The ultimate think tank: The rise of the Santa Fe Institute libertarian*

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Abstract

Why do corporations and wealthy philanthropists fund the human sciences? Examining the history of the Santa Fe Institute (SFI), a private research institute founded in the early 1980s, this article shows that funders can find as much value in the social worlds of the sciences they sponsor as in their ideas. SFI became increasingly dependent on funding from corporations and libertarian business leaders in the 1990s and 2000s. At the same time, its intellectual work came to focus on the underlying principles of adaptation, innovation, and decentralized coordination supposedly at work in ‘complex systems’ from biological ecosystems to markets and firms. This research cast the ideas of the libertarian economist Friedrich Hayek into a new scientific idiom. SFI also became a space where figures in business, media, academia, and politics could come to learn to see the world in a particular way—to acquire the subjectivity of what I call ‘the Santa Fe Institute libertarian’. At SFI, visitors did not simply learn the principles of neo-Hayekian complex system science. They came to see themselves as agents of social evolution, providing the spark that the free-market system needed to produce new technologies and new solutions to social problems without top-down political direction. For the Institute’s corporate and libertarian financiers, SFI was not just a space where intellectuals described the world in favored ideological terms, but a space where elite actors became committed to the project of making a new political-economic order.

Keywords

complexity science, libertarianism, neoliberalism, science funding, social entrepreneurship

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In 2006, Jesse Walker, an editor at the libertarian web magazine *Reason*, identified a new political identity forming in his social milieu. ‘Call them’, he wrote, ‘Santa Fe Institute libertarians’. These were people, in Walker’s view, ‘who reflexively vote Democratic (when they vote at all) but are easily 80% libertarian in their own attitudes’. Despite their loose cultural affinity with Democratic Party liberalism, the fundamental values of the Santa Fe Institute libertarians were the same as those of Walker and his *Reason* colleagues: ‘spontaneous order, entrepreneurship (many of them are entrepreneurs themselves), decentralization, free expression, and peace’. Walker hoped that the Santa Fe Institute libertarians, with their liberal do-gooder energy, could help the libertarian movement make inroads into a mainstream audience that saw libertarianism as the sole province of Scrooge-like billionaires. ‘It’s a big tent’, he insisted (Walker, 2006).

That libertarians would seek to broaden their political appeal is unremarkable. What is more surprising is that this strategy, and the new political identity it aimed to cultivate, should be associated with an organization that presents itself as a ‘research institute’ focused on the science of ‘complex adaptive systems’, not a political advocacy organization. Founded in the early 1980s by researchers at Los Alamos National Laboratory, the Santa Fe Institute (SFI) boasts a roster of prestigious scientific affiliates headlined by Nobel-prize-winning physicist Murray Gell-Mann. Often called a think tank by observers—the ‘ultimate think tank’, in Oprah Winfrey’s words—SFI has shied away from the label, casting itself instead as a truly academic institution, complete with ‘professors’ and postdocs, that just happens to operate independently of any university.¹

And yet the Santa Fe Institute libertarians abound. SFI derives most of its funding from donations from corporations, individual philanthropists in industry and finance, and foundation grants—in particular from the John Templeton Foundation, an organization dedicated to promoting free-market politics and religious values. The Institute for Humane Studies (IHS), a libertarian group funded by Charles Koch and his late brother David, has regularly provided financial support to students attending SFI’s annual ‘Summer School’ program. One former director of the foundation that publishes *Reason*, Gerry Ohrstrom, has served for years as an SFI trustee.² Over the last three decades, the influence of SFI’s financial backers has steadily marginalized the research program in the physical sciences envisioned by its Los Alamos founders. SFI’s research programs now take ‘complex’, non-linear physical systems as just one example of the capacity for spontaneous, adaptive, unpredictable, and unplannable self-organization also at work in countless biological, environmental, and social systems. Such social systems include, as the libertarian economist and philosopher Friedrich Hayek maintained in the mid 20th century, capitalist markets. Indeed, longtime SFI economist Brian Arthur once remarked that SFI was at work ‘rediscovering Austrian economics’ as developed by Hayek and his mentor Ludwig von Mises (Tucker, 1996).

In this article I develop an explanation for the disconnect between the intense enthusiasm of corporate and libertarian financiers for SFI and the comparative political-economic timidity of many of its official research publications. The key political accomplishment of corporate and libertarian financing for the human sciences at SFI has not been the creation of a well-codified and easily weaponizable ideology—an *ism*—but rather the creation of a new social world populated by a new political subject: the SFI *libertarian*, in Walker’s terms, rather than SFI *libertarianism*. Drawing on newly

available archival material as well as interviews and published and digital sources, I show that donors have prized SFI above all as the nucleus of a social network—as an institution for training, socializing, and connecting individuals to act in a particular social world with a particular worldview. More important than SFI's production of scientific papers has been its production of 'thought leaders' through seminars, fellowships, conferences, educational programming, and alumni networking.³ It has never been necessary for these thought leaders—the various corporate executives, entrepreneurs, public intellectuals, consultants, and so on who find their way to Santa Fe—to grasp all the nuances of complex systems science, or even to commit themselves to an orthodox libertarian ideology. What has mattered is that they come to inhabit a particular conceptual worldview, that they learn to understand society as a system that is always spontaneously evolving and adapting, with solutions to social problems constantly emerging and gaining traction thanks to the innovative activity of individuals like themselves.

For participants, SFI has offered a passport to an elite world where business leaders, philanthropists, and media personalities congregate at gatherings like the World Economic Forum and promote each other's work (Drezner, 2017; McGoey, 2015). To the enthusiasm of its funders, SFI has helped populate this elite world with actors who look to themselves and their own problem-solving capacity, rather than to governments or mass social movements, to 'promote the well-being of humankind and of life on earth'. Through the social world of SFI, corporations have hoped to develop executives, employees and investing partners who view businesses as the mechanism through which the complex economic system solves pressing problems. And libertarians have hoped to produce 'social entrepreneurs' who embody the libertarian promise that new solutions to social problems will emerge spontaneously on the market without central direction. If SFI is a site of 'scientific entrepreneurship', as its former president Geoffrey West maintained in 2007, its product has been *people* as much as it has been ideas.⁴

On the one hand, the history of the Santa Fe Institute is an important chapter in the recent history of the political economy of intellectual life. SFI is one site where powerful actors in business, media, academia, and philanthropy have become participants in the construction of what two of its advocates call, in utter seriousness, 'philanthrocapitalism'. Elites who might have been engaged in projects of state-building or university-based intellectual production in the mid 20th century are increasingly engaged in 'independent-sector' projects that blur the lines between for-profit business, philanthropy, and what Daniel Drezner calls the 'ideas industry'. The history of SFI illustrates and helps to explain this phenomenon (Aschoff, 2015; Bishop and Green, 2010; Drezner, 2017). In particular, it shows that this transformation was not a spontaneous process or a product of a shifting zeitgeist but was deliberately encouraged by a right-wing funding infrastructure. Just as late 20th-century conservative funders such as the Olin Foundation opened up space in the legal profession for a novel conception of lawyers' vocation—purifying legal structures in accordance with free-market standards of economic efficiency—the right-wing funders who loom large at para-academic institutions such as SFI helped promulgate new understandings of what it means to be a scientist or an intellectual (Teles, 2008). As many mainstream universities now seek to encourage their faculty and graduate students to become more 'entrepreneurial' and pour resources into their own interdisciplinary research centers (often with help from corporate and libertarian financiers, such

as the Koch network), it is more important than ever to understand the history of the avant-garde para-academic institutions, like SFI, that serve as a model for this wave of university restructuring.

The history of SFI also contributes to our understanding of the relationship between science funding and ideology on a theoretical level. The historiography of science funding, particularly in the natural sciences, often views funders as interested principally in the ideas of scientists, whether for practical or for ideological reasons, even if their funding has important downstream consequences for the social organization of the sciences (McGarity and Wagner, 2012; Mirowski, 2011; Rieppel, Deringer, and Lean, 2018). In the case of SFI, however, funders prized the social world as much as the ideas, a theme that historians of institutions in the human sciences have recently emphasized (Cohen-Cole, 2013; Medvetz, 2012; Parmar, 2012; Rohde, 2013). The task has been to construct an elite network capable of encompassing entrepreneurs, political advocates, and nerdy scientists meditating on the deep principles of the universe in the New Mexico desert all at once. SFI's ideas have bound the Institute to this emerging network as much as the money. But it is above all by forming a node in this network—by producing Santa Fe libertarians—that the Institute repays its funders. 'Making up people' is not just a function of the vernacularizing of human-scientific concepts, but an integral component of the material and institutional life of human-scientific practice (Hacking, 2006).

Emerging syntheses

SFI was not established as a site for 'scientific entrepreneurship'. Rather, its founders, embedded in the world of government-funded high-energy physics, conceived the Institute as a place for highly credentialed academic scientists to collaborate on fundamental questions in the natural sciences that were likely to require multiple forms of disciplinary expertise to answer. SFI founding president George A. Cowan and many of his early collaborators were affiliated with the nearby Los Alamos National Laboratory, an important island in the archipelago of Cold War military-academic institutions. The on-the-ground research culture of these institutions emphasized 'pure' scientific inquiry and 'creative', freewheeling collaboration, despite the fact that the whole system ultimately depended on the continuing judgment of the federal government that lavish science budgets and comparatively limited micromanagement were in the geostrategic interest of the United States. In the 1980s, this tension was reaching boiling point. Federal science budgets entered a new era of austerity under the Carter and Reagan administrations, and the national laboratories were expected to use commercial patenting to make up their funding gaps. As the end of Cold War began to seem imminent, scientists expected this trend to intensify, and saw the need to strategize for the demise of the world of scientific research the conflict had sustained (Mirowski, 2011; Oreskes, 2014, 2021; Turner, 2006).

In 1983, Cowan and his Los Alamos circle formulated their own escape plan: they would create a new private institute that could keep the research culture of Cold War science alive in the brave new world they saw on the horizon. Cowan soon recruited Caltech professor and Nobel laureate Murray Gell-Mann and University of Illinois professor David Pines, both physicists, to help lead the effort from outside. Serving on the

White House Science Council in the early years of the Reagan administration, Cowan saw to his dismay that ‘scientific factors mattered considerably less to the White House staff than political considerations’. At the new Santa Fe Institute, however, the science would come first. Cowan’s touchstone for his vision of SFI was the Manhattan Project, in which he participated as a young scientist. Cowan remembered the Manhattan Project as an environment of collaborative inquiry between brilliant scientists into fundamental physical questions, despite its military purpose. The physicist-turned-journalist Mitchell Waldrop, who wrote a popular book-length profile of SFI in its early years, was even more grandiose: SFI could be a ‘New Athens’, a forum for rarified intellectual endeavor insulated from the worldly pressures that bogged down the mainstream academy in careerism and hyper-specialization (Pines, 2014; Waldrop, 1992: 72).⁵

Arguably the core ritual of the research culture of Cold War was the interdisciplinary meeting, where an institution would host eminent guests for a period of intensive discussion about promising directions for new research projects (Cohen-Cole, 2013). SFI began with two such interdisciplinary meetings in the fall of 1984, where the central topic of conversation was how the Institute ought to be structured to best cultivate future interdisciplinary meetings. Guests presented their ideas about various ‘Emerging Syntheses in Science’ that Institute research might explore, but they did not imagine the defining trait of the Institute to be a particular subject matter—much less ‘complexity’ or ‘complex adaptive systems’—but a mode of intellectual activity. For Cowan and his friends in the Cold War science establishment, the priority was ‘putting the right people together’ and letting them pursue their interests in an open-ended fashion.⁶ The content of the investigations mattered much less than having ‘a group of scholars who have true interdisciplinary interests coming together and speaking’, as Fermilab founding director Robert Wilson argued. ‘Whether the kind of work that they’re doing is interdisciplinary or not is not what’s important’ (Pines, 2014: 85). Norman Ramsey, the former director of the Universities Research Association, observed that several presenters had expressed excitement about the study of complex systems, but he insisted that the study of such systems at the Institute would just be ‘the illustrative example of what you would do in a cross-disciplinary activity’ (ibid.: 23).

The Institute’s founders believed that if the new Institute was governed by scientists themselves, the ‘activity’ of rigorous interdisciplinary collaboration would take precedence over the imperative to produce work that was immediately applicable to social or political concerns. Though many of the founders hoped that the new Institute’s work would have a positive social impact, they imagined this impact to flow inexorably if vaguely from the quality of the science performed. ‘It will be useful to humanity’, Norman Ramsey contended, ‘but research is clearly what we can do best’ (Pines, 2014: 85). In this spirit, cofounder Murray Gell-Mann explicitly rejected the ‘think tank’ as a model. At best, Gell-Mann speculated, think tank-style activities could transpire in a co-located but institutionally separate organization (ibid.: 18). In an early document disseminated to interested parties describing the aims of the Institute, the founders emphasized the difference between their proposed domains of inquiry and analysis of policy problems and predictive work, which were deemed ‘sufficiently different from that of the subjects we have discussed’ to merit a separate organization for their study,

one that was to be funded completely separately from the scientific institute as well.⁷ To the extent that Santa Fe work would improve human welfare, it would be by promoting ‘general awareness and sophistication concerning science’, not by inveighing in detail on social or political questions.⁸

With this lofty vision set down, the leaders of the newly minted SFI got to work, and by the end of 1985 they found themselves with a serious fundraising deficit. George Cowan, despite his appreciable personal wealth, didn’t like talking about money all that much. In response to a question at one of the 1984 conferences about the ‘scale’ of the new Institute, Cowan expressed his annoyance at being asked about ‘something as crass as \$50 million versus \$100 million’, and changed the subject to ‘what themes and what subsets of major themes in science’ the Institute ought to explore first (Pines, 2014: 79). Cowan maintained that because of widespread sentiment that ‘the time is ripe’ for the Institute’s research, the Institute’s future ‘fund-raising campaign’ would have little trouble obtaining ‘adequate resources’ (ibid.: 207). In reality, in 1984 and 1985 the Institute’s funding requests were denied twice by the Mellon Foundation and once by the Josiah Macy Jr. Foundation (a major early patron of cybernetics), and they had yet to receive NSF funding.⁹

As president, Cowan’s first response to these funding difficulties was to reach out to the well-connected acquaintances he had met in the New Mexico business world and in the Reagan White House. Cowan’s friend Art Spiegel, heir to a catalog fortune, became treasurer. His influence, and that of the network of businessmen to which he was connected, was felt in short order. In January 1986, a friend advised Spiegel that ‘if the Institute is to survive, they better start adding some business leaders as important as their scientists’. That same day, Spiegel wrote to Cowan that he thought ‘it would be good to diversify our Board and add more businessmen’.¹⁰ Spiegel talked to oil tycoon Robert O. Anderson about SFI while they were staying at a friend’s ranch in the winter of 1985–6, and Anderson would become chairman of the SFI board by 1988.¹¹

At the same time, SFI leadership also began to think about how to make its activities more palatable to corporate and foundation funding sources. As the businessman and philanthropist George Stranahan wrote to Cowan in May 1986, ‘The board needs to take a marketing approach to developing its programs. As much as they *want* to ask “what problems would it be fun to work on” they *need* to ask “what programs will attract funds.”’¹² To answer the latter question, in late June 1986 a group from SFI led by David Pines gave a presentation to several major foundation executives in the Carnegie Corporation boardroom. Pines sent a memo to Cowan the next day summarizing the advice they received. He emphasized the importance of media attention as a means of recruiting potential donors and noted that the executives had strongly discouraged them from separating out policy-relevant research into an institutionally autonomous think tank.¹³ Other aspects of institutional structure also came to seem significant to the task of marketing SFI. Stranahan made this point in his letter: ‘The Institute needs to develop some corporate ties. A nice way to kill two birds here is to add corporate figures to the board.’¹⁴ SFI did Stranahan one better. The ‘Plan for Governance’ written in July 1986 featured a separate Board of Trustees, that would include business leaders and be responsible for general governance issues and fundraising, and Board of Advisors, that would focus on the nitty-gritty of specific scientific programs. This bicameral structure had been proposed and

explicitly rejected at one of the 1984 founding conferences as a threat to the principle that scientists themselves would govern the Institute (Pines, 2014: 76).¹⁵

As SFI went about establishing corporate ties and marketing its usefulness to potential donors, it increasingly emphasized the concept of ‘complex adaptive systems’ as the core subject of its research. Though absent from the ‘Emerging Syntheses’ conferences, enthusiasm had grown at SFI about the study of those complex systems whose collective behavior somehow mutated to increase fitness in response to external stimuli. In the summer of 1986, the subject earned an entry in SFI’s workshop series, whose past installments had included subjects like superstring theory and evolutionary game theory. As the year progressed, however, SFI increasingly presented complex adaptive systems as its calling card. A document titled ‘Next Steps in Fundraising’ written shortly after the Carnegie Corporation meeting centered around a vision for a ‘Complex Adaptive Systems Research Network’.¹⁶ Hoping to use this new focus to garner foundation attention and funds, SFI leadership worked to develop an easily articulable and comprehensible definition of complex adaptive systems. Pines and Cowan even offered a ‘case of French champagne’ to the summer workshop participant who could come up with the best such definition—and promised to inform Russell Sage Foundation president Eric Wanner of the winning entry.¹⁷

The biggest push towards the consolidation of the complex adaptive systems concept as SFI’s intellectual focus came not from foundations but from corporations, or more precisely one specific corporation. At a Russell Sage Foundation board meeting in the summer of 1986, SFI board vice-chairman Robert McCormick Adams introduced the Institute’s work to the new Citicorp CEO, John Reed. By September 1986, Reed had become enthusiastic enough about SFI that he was willing to officially commit his ‘moral, intellectual, and financial support for’ an SFI workshop analyzing ‘the global economy’ as an evolutionary complex adaptive system.¹⁸ Philip Anderson, an SFI-friendly physicist with an interest in economics, agreed to lead the conference along with Stanford economist Kenneth Arrow.¹⁹ Reed was unable to attend the actual meeting, in September 1987, but Citicorp vice president Eugenia Singer was present as his representative. Whatever he heard from Singer was enough to convince him to commit a million dollars to the Institute to endow the first SFI resident professorship, to be filled by Stanford economist W. Brian Arthur (Waldrop, 1992: 143).

SFI leadership was eager to tout the economics conference, and Reed’s ensuing support, as a proof of concept for what SFI was trying to accomplish. While the Institute was once reticent about the policy applications of its work, a late-1987 vision statement document asserted that ‘practical applications of new techniques for understanding complex systems seem almost infinite’, citing the embryonic Citi-supported economics program as paradigmatic in this regard.²⁰ The experience of working with Reed, and perhaps the tantalizing thought of the vast Citibank coffers that the Institute had barely begun to tap, led Institute leadership to focus their new fundraising efforts primarily on business—and business-conservative—funding sources. By the end of 1987, SFI had received new unrestricted grants from the H. J. Heinz Company Foundation and the Richard Lounsbery Foundation, a conservative foundation that would later fund the George C. Marshall Institute, a prominent sponsor of climate change denial.²¹ Entrepreneur Stewart Brand was added to the board at the end of 1988 because, as

Cowan wrote, 'He has contacts with a number of corporation executives who may provide us with support after being exposed to his enthusiasm for our programs.'²²

The Santa Fe researchers who benefited the most from the growing influx of support from corporations and conservative philanthropists were the ones who were most committed to the 'complex adaptive systems' concept, and its application across disciplinary lines. By the end of the 1980s, arguably the best-known SFI affiliate was Stuart Kauffman, a philosopher-turned-theoretical biologist. Kauffman was more willing than anyone else at SFI to press the claim that all complex adaptive systems were essentially isomorphic to one another—that, as he once remarked, 'It's all the same thing, the same goddamn thing.' To explain what unified complex adaptive systems, Kauffman invoked the concept of 'spontaneous order' developed by the libertarian philosophers Friedrich Hayek and Michael Polanyi in the mid 20th century. In Kauffman's formulation, spontaneous order occurred when the action of 'agents'—from biomolecules to stock-brokers—following simple 'local rules' nonetheless produced complex patterns of 'global order'. The favorite example of spontaneous order among Kauffman and his SFI colleagues was the 'Game of Life' computer simulation devised by the British mathematician John Conway in 1970. In the Game of Life, 'cells' on a two-dimensional grid would either become colored or blank as the simulation progressed according to a set of rules that referred exclusively to the colored or blank status of adjacent cells. Users discovered that despite the fact that the rules of the simulation did not refer to the overall pattern of the grid, certain orderly, recognizable visual patterns or animations frequently cropped up as the simulation ran with different initial conditions. SFI researchers imagined that everything from consciousness to financial markets might be understood as an extremely sophisticated type of Game of Life. For support for his work at SFI, Kauffman leveraged recently established Institute connections with the Monsanto Company and longtime New Mexico Republican Senator Pete V. Domenici (Helmreich, 2000; Waldrop, 1992).²³

Nonetheless, by the end of the 1980s, frustration was mounting at the perceived discrepancy between the internal sense of the significance of the work being done at SFI and the external attention they had received from media and funders, which was still felt to be inadequate. The economics program had the best track record of attracting corporate interest, reflecting the discipline's burgeoning prestige in the worlds of business and politics during the Reagan era (Backhouse, 2005; Solovey, 2020: 253–66). SFI's leaders felt that a funding squeeze would accelerate the Institute's turn to economics and the social sciences. Not everyone was happy about this prospect. In a remarkably candid interview in a 1988 edition of SFI's *Bulletin*, George Cowan said that he thought the economics program was 'possibly overly ambitious'. He blamed 'the world out there which responds to the notion of new ideas about economics more quickly than to any of the other notions we're kicking around'. Because 'there are people who are prepared to support this new effort', Cowan argued, 'the Institute has moved more rapidly in that direction than caution might have indicated'.²⁴

Cowan announced his decision to resign the presidency in 1990.²⁵ That year, six new members, all businesspeople, were added to the Board of Trustees, including future chair Jim Pelkey, consultant Jacqueline Cotsen (who like John Reed had experience at Citi and in the tobacco industry), and Santa Fe-based transportation executive Ray Sena

(‘articulate, self-confident, adds ethnic representation’, noted the memo nominating him).²⁶ It was also at this time that SFI formally dropped plans to one day create tenured professorships; a visiting faculty, augmented by additional workshop visitors, was codified as the Institute’s *modus operandi*.²⁷ The intellectual content of the workshops bent ever more towards the abstract and ‘transdisciplinary’. At the Science Steering Committee meeting that year, a proposal for a workshop on climate modeling was rejected as too ‘broad’, while a workshop on ‘scaling behavior’, including Kauffman’s ideas on the unifying principles of complex adaptive systems, was approved. The minutes noted the recent receipt of \$100,000 from controversial banker Robert Maxwell for the study of ‘integrative aspects of complex adaptive systems’.²⁸ Maxwell’s daughter Christina was added to the board two months later.

The sense that SFI was entering a new era acquired institutional shape when Murray Gell-Mann was unsuccessful in his bid to replace Cowan as SFI president. The board instead selected Ed Knapp, who had gotten involved with the Institute in its early years at the end of his time as a Reagan-appointed National Science Foundation director (Solovey, 2020: 246). Knapp officially became president at the annual board meeting in March 1991. David Pines would later reflect that ‘we never formally abandoned [the founding] vision until after Ed Knapp became President’.²⁹ Knapp institutionalized SFI’s growing focus on corporate fundraising—which, because of his own Republican convictions and Reagan-world connections, as well as the disproportionately conservative leanings of American business leaders, also entailed a rightwards political shift in SFI’s funding base. He established a new leadership position, ‘Administrative Vice President’, to deal full-time with financial matters, and ‘lured’ Bruce Abell, a ‘speechwriter and general lightning rod in the White House Science Office’ during the Reagan administration, to Santa Fe to fill it. And in mid 1992, he announced the establishment of a ‘Business Network for Complex Systems Research’, a new ‘corporate membership program’ that would raise funds and ‘establish links’ between ideas circulating at SFI and in industry.³⁰

A central part of Knapp’s fundraising strategy was to place ever more emphasis on the study of the general principles of complex adaptive systems—the sort of thing that Stuart Kauffman was focusing on. Knapp wrote to Stewart Brand in 1991 to inform him of a planned 1992 workshop on the ‘underlying scientific principles that have been emerging over five years of work at SFI on complex systems’, an event that he hoped would ‘have an important impact on how we and others perceive SFI’.³¹ In his presidential message in the fall/winter edition of that year’s *SFI Bulletin*, Knapp publicly gave his imprimatur to the ‘complexity’ conception of SFI’s research focus. He noted proudly that SFI was now ‘recognized as representing the leading edge in a major new direction in science, the synthesis of complex system behavior from individual interactions between system components—called the science of complexity’.³²

Eight years after SFI’s founding conferences, the Institute was no longer defined by a method—conversation between disciplinary experts—but a subject matter: ‘complexity’. While the Institute’s founders once worried that too narrow a subject matter focus would constrict its scientists’ autonomy, SFI now valued the complexity concept as a tool to promise funders that its researchers were uncovering fundamental principles at work not only in atomic nuclei and crystal lattices but in markets and firms.

A New Economy

The 'Business Network' label was well chosen. Over the course of the 1990s, SFI became an important part of a true business network, providing an organizational infrastructure for business leaders, business lobbyists, and business admirers in media and academia to meet one another, launch projects, and develop a shared vocabulary. In the language of the time, the overall purpose of this business network was to make a 'New Economy'. Celebrated by Bill Clinton and Newt Gingrich alike, the New Economy was imagined as an economic order built around the high-tech sector, from industrial automation to personal computers and dot-com startups. New Economy boosters promised that high-tech embodied a propulsive dynamic energy that could counteract the doldrums brought on by the manufacturing crisis of the 1970s and the recurrent financial crises of the 1980s. In practice, the construction of the New Economy was characterized by deregulation of the telecommunications industry, the 'restructuring' and downsizing of corporations to provide the 'flexibility' to capitalize on new technological innovations, and the expansion of venture capital financing for technology startups (Stiglitz, 2003).

The 1990s are often remembered as a period of ideological complacency—of indulgent fantasies of the end of history. In fact, the decade was characterized by a strong degree of coordinated action by elite actors in business and government to enact the transformations required for the construction of the New Economy. SFI helped facilitate such coordination both pragmatically and intellectually. What mattered most was not what was done *at* SFI, but what was done *with* SFI—with the connections people made with one another through the Institute, and the ideas they acquired for explaining and justifying their actions. It was with justification that the 1998 SFI annual report could brag about 'extensive coverage in the general media and within companies and corporations' of the 'New Economy', noting that SFI work 'has gone far in having this descriptor accepted within academic, business, and government environments'.³³

Before the formal establishment of the SFI Business Network, the Institute's reach into the worlds of venture capital and the high-tech industry started to expand in late 1990, when Esther Dyson joined the board. Dyson, the daughter of physicist Freeman Dyson and a prominent businesswoman and investor, was added to the board on the recommendation of Silicon Valley executive Jim Pelkey and her friend Stewart Brand.³⁴ Dyson quickly became a favorite of SFI leadership. Knapp wrote with exuberance to Brand in 1991, describing how Dyson had raised thousands for SFI by requesting donations in lieu of gifts at her recent birthday party.³⁵ At the beginning of 1992, Pelkey noted to Brand that 'we've had considerable success during the past several months in attracting a group of young entrepreneurs and venture capitalists', and that 'a large part of the credit for that must go to Trustee Esther Dyson, who joined the Board in 1990, and has opened several doors for SFI already'.³⁶ In addition to her connections in the business world, Dyson also facilitated a burgeoning relationship between SFI and political libertarianism. Knapp twice visited the libertarian Electronic Freedom Foundation, where Dyson was a board member, and solicited them for a donation between \$50,000 and 100,000.³⁷

Dyson brought together her connections to the tech industry and her connections to the libertarian movement in her advocacy for telecom deregulation. In 1994, Dyson and fellow SFI board member George A. Keyworth II co-authored a 'Magna Carta for the

Knowledge Age' with the popular libertarian writer George Gilder and the futurologist Alvin Toffler, a close Newt Gingrich collaborator. 'If there is to be an "industrial policy for the knowledge age"', the group argued, 'it should focus on removing barriers to competition and massively deregulating the fast-growing telecommunications and computing industries'. In developing their argument, Dyson and her co-authors drew on the conceptual framework developed at SFI. Society, understood as an evolutionary system, had reached what Toffler had previously termed a 'Third Wave' of development, one in which spontaneous order rather than deliberate planning ensured dynamism and growth. 'The complexity of Third Wave society is too great for any centrally planned bureaucracy to manage', they wrote. Characteristic of this complexity was the seemingly overnight rise of new technology giants. These giants might appear to be monopolistic within their industries, but that was to be expected when they were ushering entirely new industries into existence. If 'static competition' was receding, it was only to be replaced with 'dynamic competition', which as part of its proper functioning creates 'creates winners and losers on a massive scale'. The Magna Carta's core ideas were soon codified into law with overwhelming bipartisan support in the deregulatory Telecommunications Act of 1996 (Dyson *et al.*, 1994; Turner, 2006: 227–8).

The idea of dynamic competition emerged in large part from the work of W. Brian Arthur, the first Citibank Professor of Economics at SFI and the in-house figure most closely associated with the New Economy. Arthur's central concept was that of 'increasing returns'. Arthur argued that it was 'natural' that the first firm to capitalize on a new technology would enjoy advantages that would bolster its market position. With new technologies, he asserted, 'the more they are adopted, the more experience is gained with them, and the more they are improved'. By the time the second entrant to the market was up and running, the original firm was getting ready to introduce a new and improved version of the product (Arthur, 1989: 116). Dynamic competition, between firms introducing new technologies rather than firms competing for share of an existing market, would naturally produce apparent monopolies in the new industries that took off, though they were always at risk of being made obsolete by another new firm introducing a qualitative technological leap. As Newt Gingrich's *To Renew America* co-author William Tucker summarized in a 1996 profile of SFI, 'Improvement leads to improvement, which interlock in an ever more interdependent network of improvements' (Tucker, 1996).

Arthur himself was reluctant to explicitly critique antitrust policy on the basis of the 'natural' laws of technological development he had uncovered. Just because the formation of monopolies was natural did not mean it was good from a public policy perspective, especially if it obstructed the equally natural supersession of today's tech giants by tomorrow's. William Tucker thought Arthur's reluctance to follow his arguments all the way to their pro-monopolistic conclusions was regrettable. He blamed the influence of the left-leaning Kenneth Arrow and Murray Gell-Mann among the first generation of SFI researchers. Nonetheless, corporate enthusiasm for the work of Arthur and other SFI economists remained steady. Ian Ross, president of AT&T Bell Labs, wrote to Brian Arthur in 1990 to express his excitement that Arthur's work could help explain why 'it is important for the Nation to recognize that there are certain industries that cannot be treated according to the principles of traditional economics'—that is to say, why telecommunications should be exempt from the anti-monopolistic conclusions of conventional

economic theory. With an eye towards future collaboration, Ross said that he ‘would very much appreciate any suggestions or any support that you and your colleagues could provide in furthering these ideas in the national interest’.³⁸ Later in the decade, an SFI annual report bragged that ‘corporations from the investment and financial sector recognize that SFI, in challenging the conventional rational, decreasing-returns, equilibrium view of economics, is advocating alternatives that offer the promise of understanding the new high-technology world’.³⁹

The reality was that from the perspective of the Business Network, there was no reason for SFI researchers like Arthur to directly enter the political fray themselves—that was what people like Tucker and Dyson were for. The most popular expositions of SFI ideas and their implications for public policy and business in the 1990s did not come from permanent SFI faculty members but from members of the constellation of donors, visitors, advisors, and admirers who came to orbit the Institute with increasing density. The consultant Michael Rothschild helped popularize Arthur’s work in his best-seller *Bionomics: The Inevitability of Capitalism* (Rothschild, 1990), a book that in turn ‘floated around’ SFI. Rothschild pressed the SFI equation of capitalist markets and biological organisms and other natural systems to its logical political conclusion: capitalism was literally a part of nature and any attempt to interfere with its natural functioning was doomed to failure. Socialism, Rothschild wrote, ‘tries to fix what is “wrong” with the spontaneous, self-organizing phenomenon called capitalism. But, of course, a natural process cannot be “fixed”’ (Goodrich, 1991: 61, Helmreich, 2001: 502).

If policymakers could sit back and let the market run its course, business leaders did not enjoy the same luxury. In fact, in the complexity science story, markets only self-organized because of the ceaseless efforts of individual firms to adapt themselves to their environment, like organisms in an ecosystem. That meant that SFI and its apostles could at once prescribe laissez-faire in the economy as a whole and advise business leaders on how to ‘revolutionize’ their own firms. The best way to revolutionize a firm, it turned out, was to make it more like a complex adaptive system. In 1999, the basic principles of the SFI approach to corporate restructuring appeared in a volume titled *The Biology of Business: Decoding the Natural Laws of Enterprise*, edited by entrepreneur and SFI Business Network member John Clippinger and with a foreword from Esther Dyson. The volume argued that complexity science elucidated the wisdom of the quintessential New Economy organizational reforms endorsed by consultancies such as McKinsey, also an SFI Business Network member. The structure of old corporations was too unwieldy, bureaucratic, and inward-looking to permit rapid adaptation and innovation in a dynamic, constantly evolving marketplace. Firms should eliminate layers of middle-management that pursued the hopeless dream of ‘command-and-control’ in favor of new positions such as ‘chief knowledge officer’, with the autonomy to ‘create new sources of variation that can alter the organization’s evolutionary path’ (Clippinger, 1999: 136). Decentralization, outsourcing, and internal competition between teams could introduce ‘market-like mechanisms’, a more ‘self-organizing approach’ to management (ibid.: xxiii). It was also vital that managers use digital technologies to collect as much data as possible on customer preferences and employee performance. By defining performance criteria, collecting data, and constructing proper incentive systems, managers could use ‘feedback loops’ rather than annoying hands-on

intervention to get the most out of their organizations. ‘Managers do not operate the network; they influence the feedback that causes the network to self-organize’, as one contributor summarized (*ibid.*: 129).

SFI hoped that its own network would be self-organizing—that its organizational infrastructure could seamlessly integrate its in-house scientists with its funders, allies, and evangelists in the worlds of business, politics, consulting, and journalism. The reaction of the external scientific community to SFI’s direction in the 1990s is a reminder that the success of this strategy was not guaranteed. In the middle of the decade, the Institute received a wave of criticism from outsiders about the direction of its research activity, both publicly and privately. The journalist John Hogan excoriated the Institute in a 1995 *Scientific American* piece titled ‘From Complexity to Perplexity’, arguing that SFI efforts to develop a unifying theory of complexity had removed researchers so far from the realm of the empirically testable that their activity could barely be considered science at all (Hogan, 1995). The same year, in a critical article in the *New York Review of Books*, the eminent evolutionary biologist John Maynard Smith emphasized that SFI’s complexity science approach to evolution was by no means standard in evolutionary biology. ‘Devotees’ of complexity, he wrote, were practicing ‘fact-free science’ (Smith, 1995).

SFI was never totally reliant on corporate or individual philanthropy; SFI researchers succeeded in obtaining grant support from mainstream funding institutions for various projects throughout the late 1980s and early 1990s. But there was some evidence that patience was wearing thin. In 1996, two philanthropic program reviews, one sponsored by the MacArthur Foundation and the other by the NSF, expressed concern that the Institute had come perilously close to leaving the world of mainstream science behind. The MacArthur reviewers, for instance, encouraged the Institute to take steps to rectify ‘a common perception that most of the “products” of SFI are published in non-competitive, “house” venues’. Some of the NSF reviewers were less polite. ‘It seems that SFI wants to follow the “high road” and leave the hard work to traditional research universities’, one wrote. Another expressed their view that SFI’s complex systems modeling of financial markets ‘is probably of more interest to Wall Street than to economic policy or science in general’. The NSF report painted a picture of an institute whose insulation from the broader academy had produced ‘insufficient openness to participation and decision-making’ from scientists, with ‘women and minority groups’ in particular starkly underrepresented. The Institute’s founding values of scientific autonomy and disciplinary rigor clearly still held sway in the larger scientific establishment.⁴⁰

What were the benefits of SFI affiliation that might lead an academic researcher to disregard their colleagues’ raised eyebrows? Pecuniary incentives obviously played a role. Following significant NSF budget cuts in the late 1970s and 1980s, many academics outside SFI also turned to corporate philanthropy for support in the 1990s. As one SFI researcher remarked in an interview, there was a perception that corporate and other non-traditional funding sources were willing ‘to fund things that no one else will’. SFI provided the infrastructure to connect researchers who felt marginalized from established scientific funding channels with funders whose coffers had swelled as the NSF’s shrunk (Mirowski, 2011).⁴¹ Some researchers also aspired to use SFI’s

connections not simply to make ends' meet but to profit from the New Economy themselves. In 1997, faced with the imminent loss of government support for his work on 'artificial life', SFI stalwart Chris Langton chose to seek funding from the private sector rather than change course. He founded a startup called the Swarm Corporation, named after his best-known piece of artificial life software. Shortly afterwards, *BusinessWeek* called Swarm the 'best thing to emerge from the Santa Fe Institute'. Stuart Kauffman, after ten years in residency at SFI, founded a startup to support his work as well, called BiosGroup, though unlike Langton he stayed on as an external professor (Helmreich, 2001: 487–8). Langton and Kauffman were following the lead of SFI physicist and market modeler Doyne Farmer, who had founded a financial betting startup of his own a few years earlier called the Prediction Company. He remarked that his goal was to 'make so much money that he would never have to write a grant proposal again' (Waldrop, 1992: 358).

Besides the money, SFI also offered researchers membership in an exciting, high-powered, and even glamorous social world. As its Cold War founders had envisioned, the social life of the Institute had crystallized around the interdisciplinary meeting—but by the end of the 1990s nature of the meeting as a social event had changed dramatically (Helmreich, 2000). Rather than an opportunity for scientists to escape into an *Arrowsmith*-esque world of pure inquiry, meetings at SFI became a way for scientists to leave the supposedly cloistered environs of the academy and make contact with the world of commerce and celebrity. At the close of the decade, SFI's annual report boasted that a dynamic of 'dialogue' had replaced the 'teacher/student' dynamic that characterized SFI's first encounters with business.⁴² Visiting SFI for a weekend, a month, or a summer, scholars had the opportunity to converse not just with other scholars but with jet-setting business leaders and even famous artists such as Cormac McCarthy, a prominent presence at SFI beginning in the late 1990s. One researcher who became involved with SFI in the 1990s remembered it as a place to 'hang out' and make interesting friends. At SFI he felt like he was part of a 'network of minds'.⁴³ Another remarked that his wife 'loves Santa Fe'. They made a vacation out of their visit and were always 'quite eager to return to Santa Fe year after year'.⁴⁴

In short, being at SFI was fun. Stewart Brand helped design and fundraise for a stunning new campus in the foothills of the Sangre de Cristo mountains that opened in 1994. Researchers dined with business leaders at world-class restaurants and perused the city's world-class art galleries. The SFI environment helped visiting researchers feel like they were at once experiencing the commanding heights of the New Economy, the Georgia-O'Keefe bohemianism of a Southwestern art colony, and the frisson of pioneering both literal and intellectual frontiers. Displayed in the SFI stairwell, and reprinted on the cover of one annual report, was an old photograph of Albert Einstein in full headdress with members of the Hopi Nation, taken during one of his Manhattan Project-era visits to Los Alamos. A researcher taking one step out of the established academic community to join the SFI network could feel that they were stepping into a world where genius coexisted with the authenticity of the exotic. SFI's intellectual quest for the 'natural' principles of markets and businesses would transpire in a setting where researchers could enjoy a more 'natural' mode of living and working—long the promise of the American West (Deloria, 2004; Helmreich, 2000: 31–2).⁴⁵

Strong reciprocity

The burst of the dot-com bubble in 2000 and the eruption of the Enron scandal the following year put a damper on the optimism of the New Economy discourse, not just at SFI but throughout the philanthropic world and American political culture more broadly. The idea of sitting back and letting the tech-finance nexus organically evolve the economy to prosperity lost some of its luster. Even George W. Bush called for a ‘compassionate conservatism’. The American political and business elite seemed to discover suddenly that people needed to be taken care of after all, and it was no longer obvious that personal computers and the Internet would suffice to do the job (Olasky, 2000; Stiglitz, 2003). As New Economy exuberance waned, it became clear that it was time for a new era at SFI. It was no longer enough to explain that markets would inevitably generate technological innovation, or even to provide ambitious business leaders with strategies for joining the vanguard. It would be necessary to elaborate a vision for how complexity theory could help address ‘social problems’—a vision for rectifying injustice and inequality that remained exciting to the Institute’s corporate and libertarian financial backers.

This vision was SFI’s contribution to the developing world of philanthrocapitalism. SFI researchers set about reorienting their theories of social and economic evolution to focus on social problem-solving. Introducing a new emphasis on evolutionary psychology, SFI researchers elaborated a portrait of human nature as intrinsically cooperative and spontaneously oriented toward problem-solving. As these cooperative problem-solvers interacted and worked together, they would tend, obviously, to cooperate to solve problems. Philanthropy, not just technological innovation, was an emergent product of complex social systems, including markets. Enduring problems were a sign of some blockage obstructing the free play of these cooperative instincts. Identify and remove the blockage, and solutions would emerge spontaneously. SFI leaders took these ideas to power players in business, philanthropy, and media at new institutional settings for the promotion of ‘social entrepreneurship’ such as the World Economic Forum. These new enlistees in the SFI network then drew on SFI ideas in more direct messaging promoting ‘social entrepreneurship’ as an alternative to government-led social problem-solving. The result was an influx, by the 2010s, of a new wave of corporate and libertarian financial support for SFI.

Beginning in the year 2000, SFI rehailed its economics program under the leadership of a new director, Samuel Bowles. Bowles and his longtime collaborator Herbert Gintis, who officially joined the SFI faculty soon after Bowles, began their careers at Harvard in the 1960s as outspoken Marxists. They were denied tenure and left for the University of Massachusetts at Amherst in the early 1970s as part of an influx of radical economists. At Amherst they published *Schooling in Capitalist America* (Bowles and Gintis, 1976), a widely read Marxist study of the American education system. Despite *Schooling*’s long afterlife on sociology syllabi, Bowles and Gintis abandoned its Marxism soon after its publication. Eventually they also gave up on its socialism. According to Gintis, the key catalyst was the rising profile of Amnesty International in the late 1970s and early 1980s (the organization won the Nobel Peace Prize in 1977). ‘If you mention human rights to a Marxist, they laugh at you, like the tooth fairy’, Gintis

remarked. But the work of Amnesty and other human rights advocacy organizations convinced him and Bowles that moral suasion rather than class struggle was the most promising avenue of social change. The Amnesty model also suggested that the leadership of nongovernmental, philanthropic organizations, rather than traditional political movements, could spark the moral transformations that were the source of social progress (Clark, 2000; Moyn 2010). As Bowles and Gintis were turning their intellectual attention from class structure to moral norms, they began to attend conferences at SFI in the 1990s, initially at the recommendation of their old Harvard mentor Kenneth Arrow.⁴⁶

The decision to put Bowles in charge of the economics program, therefore, was not as politically shocking as it might have seemed to an outsider. Nonetheless, it did ‘represent a new direction’ for the program, as the 2000 SFI annual report put it.⁴⁷ Bowles and Gintis had never published on ‘complexity’ or technological innovation, the program’s calling cards. The keyword that unified their research with SFI’s existing concerns was ‘evolution’. SFI researchers had long understood biological evolution as a model for complex adaptive systems. In the 1990s, SFI had sponsored conferences in the field known as ‘sociobiology’ or, increasingly, ‘evolutionary psychology’—the study of the evolutionary origins of human behavior. SFI visitors such as Robert Axtell produced models depicting cooperative activity as an example of the ‘order’ that could emerge spontaneously from complexity: even without a rule to act cooperatively, agents could still evolve the behavior spontaneously (Epstein and Axtell, 1996). At SFI in the 2000s, Bowles and Gintis strove to make the evolutionary psychology of cooperation the pivot point for the ‘unification’ of economics with other human-scientific disciplines. Reflecting this ambition, SFI eventually rebranded its economics program as ‘Behavioral Sciences’. With this move, one of the quintessential categories of Cold War human science received a jolt of new life for the neoliberal era: Once connoting a desire to place the study of human activity on a supposedly more scientific, laboratory-friendly basis, now the term primarily reflected the impulse to replace talk of macro-level social structures with analysis of the interaction of individual agents (Pooley, 2016; Solovey, 2013).⁴⁸

Starting from evolutionary psychology rather than complexity theory, Bowles and Gintis developed an image of society as a problem-solving organism that ultimately converged with the stance of earlier SFI work on complex adaptive systems. As elaborated at greatest length in their book *A Cooperative Species* (2011), Bowles and Gintis argued that human behavior was characterized by what they called ‘strong reciprocity’, an instinct for people to cooperate even when it ran against their individual self-interest from a short-term, ‘rational’ perspective. Drawing on lab experiments by the economist Ernst Fehr and anthropological fieldwork by Robert Boyd, Bowles and Gintis claimed that individuals were consistently willing to sacrifice their own immediate utility in order to promote cooperative norms such as fairness. Experimental subjects would agree split their payout from an experimenter with another participant even if they were assured there would never be a future experiment for the fellow participant to return the favor (Fehr, Fischbacher, and Gächter, 2002). A strong inbuilt drive to prioritize fairness over personal benefit would have promoted overall reproductive fitness in groups in which it emerged in human evolutionary history, Bowles and Gintis concluded. The payoff was that it was not necessary to deliberately ‘promote’ cooperation.

Cooperation was natural. Left alone, cooperative instincts would work to solve social problems spontaneously. ‘Where the invisible hand fails, the handshake may succeed’, they argued—the handshake, *not* the state or the militant labor union (Bowles and Gintis, 2011: 200). In fact, the heavy hand of the state or union could actually obstruct natural cooperative instincts and promote destructive norms of materialism and self-protection. As the title of a subsequent Bowles book put it, ‘good incentives are no substitute for good citizens’ (Bowles, 2016).

From these premises, much of the ‘applied’ work that Bowles led at SFI in the 2000s sought to validate concern about various social problems while urging restraint about taking an overzealous public policy response. The results of a long-gestating SFI study on intergenerational inequality appeared in 2005 in a volume edited by Bowles and Gintis with Melissa Osborne Groves called *Unequal Chances*. In this volume, Bowles and Gintis repudiated the emphasis of *Schooling in Capitalist America* on socialized class markers as the driver of persistent inequality, arguing that genetics, ‘personality’, and ‘luck’ also played an important role alongside race and wealth inheritance. In *Schooling*, Bowles and Gintis had recommended socialist economic reforms to address the problem of ‘unequal chances’. But now, having come to consider that prescription the weakest part of *Schooling*’s argument, they were left painting a ‘scientific portrait’ with muted policy implications.⁴⁹ The following year, Bowles edited a book on cycles of poverty with Steven Durlauf and Karla Hoff, concluding that the problem was too complex to ‘permit the identification of any single specific policy recommendation to counter potential poverty traps’. The editors emphasized that ‘one should not underestimate the difficulties in designing efficacious policies’, and the expansion of charter schools was the only policy intervention to receive explicit support in the book (Bowles, Durlauf, and Hoff, 2006: 11). As always, external admirers were willing to draw out the implications of SFI theory even more sharply. In 2008, Justin Danhof of the conservative National Center for Public Policy Research drew on Bowles’ critiques of incentive-based policymaking in an argument against carbon pricing (Danhof, 2008).

The question was not what the best policy solution to a social problem might be, but who would act as that problem’s Amnesty International, providing the leadership to reopen the channels through which humanity’s natural cooperative energies wanted to flow. Attitude change was everything. For example, SFI helped incubate the work of Harvard social psychologist and SFI faculty member Mahzarin Banaji and her collaborator Anthony Greenwald on ‘implicit bias’. Implicit bias, Banaji and Greenwald claimed, ‘plays a greater role than does explicit bias in explaining the discrimination that contributes to Black disadvantage’ (Banaji and Greenwald, 2013: 209). Contemporary racial inequality, they argued, was not primarily a product of a fundamentally racist social structure or of conscious white supremacy but was an emergent product of countless discriminatory actions undertaken by individuals who held no overt prejudices but had absorbed unconscious though detectable biased attitudes that shaped their automatic behavior. In the familiar SFI refrain, Banaji and Greenwald remarked that ‘strategies available to avoid unintended discrimination resulting from hidden biases’ are not ‘easily described’ (ibid.: 166). Nonetheless, there is one strategy that has since caught on: consulting. Implicit bias consultants, including Banaji and Greenwald’s Project Implicit, could—for a fee—work with organizations in the business, government, and nonprofit sectors to explain the evidence

for implicit bias and provide exercises for confronting and modifying unconscious attitudes. If most people, as natural cooperators, really did not want to be racist, they just needed the kind of practical tips and tricks a consultant could provide to modify their behavior. Then just as spontaneously as racial inequality emerged in the first place, it could un-emerge (Zelevansky, 2019).

In the 2000s, a new term gained traction to describe nongovernmental social problem-solvers, from Amnesty International to implicit bias consultants: ‘social entrepreneurs’. The label was especially fitting at SFI, given that the figure of the social entrepreneur in many ways occupied the position in SFI research in the new millennium that the technology entrepreneur had enjoyed in the 1990s. ‘Ours is the age of doing good by doing well’, Herbert Gintis announced in 2009, in a blurb for a book called *Be the Solution: How Entrepreneurs and Conscious Capitalists Can Solve All the World’s Problems* (Strong, 2009). In a sense, SFI came to conceptualize itself as a social entrepreneur whose mission was the promotion of social entrepreneurship. Participants in a 2002 conference for philanthropists, for instance, learned that they ought to focus on identifying ‘doers’—entrepreneurial figures already at work developing solutions to social problems—and provide them with money ‘as directly and efficiently as possible’.⁵⁰

SFI came to frequently employ its dizzying array of meetings, conferences, seminars, workshops, symposia, and online learning modules to encourage would-be ‘doers’. Aspiring entrepreneurs could attend SFI-sponsored events from New Mexico to Austin, Texas and Google’s Mountain View campus to learn more about the ‘Santa Fe Institute perspective’ on innovation, and to hear about the underlying scientific rationale for the social significance of their career ambitions. At the 2016 SFI Annual Symposium, participants from the business world learned that ideal ‘corporate athlete’ for the 21st century was defined by ‘a long-term commitment to making a difference in a domain’.⁵¹ SFI Trustee John Chisolm put it most succinctly in the title of his book *Unleash Your Inner Company* (Chisolm, 2015). The natural expression of the cooperative, problem-solving instincts flowing through every individual was a money-making firm.

Just as was the case during its era of New Economy boosterism, the point of SFI’s advocacy on behalf of social entrepreneurship was not just to provide an ideological excuse for public policy inaction but to contribute to the creation of a new political-economic order. SFI’s primary audience remained existing business elites, not external political skeptics. Since 2000, SFI leaders and trustees have provided encouragement to entrepreneurs to direct their attention to social problem-solving at venues such as the World Economic Forum, which has played a crucial role in convincing global economic elites to view philanthropy and business as inextricable.⁵² SFI-sponsored conferences and publications on ‘social investing’ have provided practical guidance to investors interested in providing social entrepreneurs with reliable access to capital (Collins, 2016). And SFI researchers have encouraged policymakers to conceptualize the promotion of ‘social innovation’ as their core purpose—not direct problem-solving but the incubation of a problem-solving class. Since the early 2000s, the influential journalist and urban planning theorist Richard Florida has helped popularize SFI research that depicts cities as uniquely favorable environments for innovation—the natural home of what Florida calls the ‘creative class’. Florida’s enormously influential writing and advocacy reshaped 21st-century urban policy across the United States, as municipal leaders devoted

considerable resources to programs of ‘urban renewal’ aimed at attracting young, wealthy, creative problem-solvers to their core neighborhoods (Florida, 2010; Long 2010). From Davos to Austin, Texas, SFI’s 21st-century business network has helped create the infrastructure for the systematic conversion of social problems into business opportunities for entrepreneurs in both the for-profit and nonprofit sectors.

In turn, SFI’s embrace of social entrepreneurship has attracted financial support for the Institute from many of the wealthiest backers of the philanthrocapitalist agenda. In 2008, eBay cofounder Pierre Omidyar joined the SFI board and committed 7.5 million dollars to financing the Institute’s postdoctoral program, now known as the Omidyar Fellowship. Omidyar was one of the earliest champions of social entrepreneurship and what he calls ‘impact investing’. ‘We believe market forces can be a potent driver for positive social change’, Omidyar’s website explains. ‘That’s why we invest in both for-profit businesses and nonprofit organizations, whose complementary roles can advance entire sectors.’⁵³ SFI’s most important funder today, the John Templeton Foundation, has also been pre-occupied with the promotion of ‘moral capitalism’. The Templeton Foundation’s annual Freedom Prize once had a special category for ‘social entrepreneurship’, to honor recipients ‘engaged in innovative and successful projects that strengthen society’. While ‘the 21st century opened with unparalleled stories of greed and corporate corruption’, a blurb for the award in 2004 explained, the work of social entrepreneurs was a reminder of ‘the role of ethics in free markets: intangible assets like goodwill and trust produce real-dollar value; companies that serve social needs can be profitable’. At SFI, Templeton funding underwrites the Institute’s most abstract work on human cultural evolution—in search of ‘universal patterns in the emergence of complex societies’, like the work of Bowles and Gintis on strong reciprocity. The quest for universal patterns was precisely the dimension of SFI research that drew the ire of NSF reviewers in the 1990s, but it is what excites the Templeton Foundation the most.⁵⁴

SFI remains, as I have argued throughout this paper, not just a site for the production of ideas—however favorable to its backers’ political interests—but a site for the production of people. Since the late 1980s, the Institute has acted as an important node in a network of elite actors in business, politics, and media working to construct a new leadership class—the stewards of the New Economy and today’s philanthrocapitalism; the creative class, the social entrepreneurs, the Santa Fe Institute libertarians. Wealthy philanthropists have partnered with SFI because they have wanted to see this leadership class built, and because they themselves have aspired to its membership. In 2019, for instance, it was revealed that the billionaire sex trafficker Jeffrey Epstein donated approximately \$275,000 to SFI over the course of his life, including a \$25,000 donation two years after his first sex offense conviction in 2008 (Last, 2019). Epstein relentlessly used his philanthropy to gain access to elite social circles, and in particular sought out scientists whose friendship could burnish his reputation as a Renaissance man of ‘curiosity’ and ‘energy’—to help him ‘come to be accepted by the Establishment’, as a 2003 Vanity Fair profile observed. Epstein’s donations, then, are evidence that he saw SFI as one possible ticket to establishment acceptance. SFI cofounder Murray Gell-Mann was a regular attendee of Epstein dinner parties (Ward, 2003).⁵⁵

It is a reminder that science funding is not only an intellectual but a social fact. The ideas that emerge out of partnerships between institutions like SFI and their wealthy

backers knit together a social world—a big tent, as Jesse Walker put it for *Reason*. Like the concept of complexity itself, the defining trait of the social world of SFI is its flexibility, its ability to provide unity while preserving difference. SFI could encompass theoretical physicists and organizational sociologists; entertaining dinner-party guests and high-priced consultants; hard-core tech industry cheerleaders and liberal social entrepreneurs. By assembling these intellectual, social, and political differences within the same institutional container, the SFI network acquired a sense of depth and robustness that more homogenous and overtly activist think tanks could never aspire to possess. But the bounds of acceptable difference only extended so far. As SFI's libertarian financiers hoped, the Institute as a social fact demonstrated the possibility of arriving at a posture of acquiescence to corporate power from a variety of ideological starting points. At the same time that the Institute's gravitational field held participants' ideas in orbit around its trademark renovation of Friedrich Hayek and spontaneous order, it held participants themselves in orbit around centers of social power, from Santa Fe to Davos and DC. If funders have pursued their ideological objectives in other contexts by insisting upon disciplined messaging and lockstep coordination, the history of SFI demonstrates that it can be useful instead to produce a solar system: diffuse, in motion, heterogeneous—and yet circumscribed by an outer limit that few ever transgress once inside.

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1. For Winfrey, see her interview with SFI trustee Cormac McCarthy ('Where Does Cormac McCarthy Eat Lunch?', 2008).
2. Information on IHS scholarships for the SFI program was available at <https://theihs.org/seminars-conferences/santa-fe-institute> circa 2018, though the page now seems to be deleted. See also Ohrstrom's SFI profile ('Gerry Ohrstrom', n.d.), his profile in the January/February 2012 SFI Update, and his interview for the *DonorsTrust* blog ('Why Gerry Gives', 2020).
3. For 'thought leaders' see e.g. 'JSMF-SFI Postdocs in Complexity Conference' (n.d.).
4. See 'About' (n.d.); Geoffrey West, 'Turning Risk into Return to Transform Science', 2007 Santa Fe Institute Annual Report, Santa Fe Institute Archives (hereafter 'SFIA'), unfiled, Box 'SFI Annual

- Reports 2002-2009 (2004 & 2005 missing)', p. 5. The SFI archives are located on-site at the Institute's campus in Santa Fe and accessible to scholars subject to Institute approval.
5. 'George Cowan's Interview' (2012); 'History' (n.d.).
 6. 'George Cowan's Interview' (2012).
 7. 'The Aims of the Rio Grande Institute', draft dated 28 June 1984, SFIA, Box 'SFI Concepts, Mission Statements 1984-1989', Folder 'Aims of the Institute March-Nov. 1984'.
 8. 'The Santa Fe Institute: A Response to a Major Change in Modern Science', 10 July 1985, SFIA, unfiled, Box 'SFI Concepts, Mission Statements 1984-1989'.
 9. Letter from J. Kellum Smith to George Cowan, 27 July 1984, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence 1984'; letter from James G. Hirsch to George Cowan, 10 January 1985, and letter from John E. Sawyer to Robert McCormick Adams, 18 November 1985, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence 1985', SFIA.
 10. Memo from GWD to AHS [Spiegel], 28 January 1986, and memo from Spiegel to Cowan, 28 January 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence, 1986'.
 11. Memo from Arthur Spiegel to George Cowan, Mike Claffey, Ed Knapp, and Ron Zee, 24 April 1987, SFIA, Box 'Board Correspondence 1987-1988 and David Pines Correspondence 1987', Folder 'Board Correspondence 1/87-6/87'.
 12. Letter from George Stranahan to the Santa Fe Institute, 31 May 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence, 1986' (emphasis in original).
 13. Memo from David Pines, 'Summary of Advice Received During 6/25/86 Carnegie Corp Meeting', 26 June 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence, 1986'.
 14. Letter from George Stranahan to the Santa Fe Institute, 31 May 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence, 1986'.
 15. Philip Anderson and David Pines, 'Notes on a Plan for Governance of the Santa Fe Institute', draft dated 18 July 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence, 1986'.
 16. 'Next Steps in Fundraising', 28 June 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence, 1986'.
 17. Letter from David Pines to participants in SFI Workshop in Complex Adaptive Systems, 29 September 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'Board Correspondence, 1986'; letter from Pines to Wanner, 3 November 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'David Pines Correspondence, 1986'.
 18. Letter from David Pines to James Modrall III, 19 September 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'David Pines Correspondence, 1986'.
 19. Letter from David Pines to Kenneth Arrow, 1 November 1986, SFIA, Box 'Board Correspondence 1984-1986 and David Pines Correspondence 1986', Folder 'David Pines Correspondence, 1986'.
 20. 'The Santa Fe Institute' undated 1987, SFIA, unfiled, Box 'SFI Concepts, Mission Statements 1984-1989'.

21. '1987 Sources of Support' (1987); Richard Lounsbery Foundation Report, 2009–13.
22. Memo from George Cowan to SFI Board Executive Committee, 11 November 1988, SFIA, Box 'George Cowan Correspondence 1988', Folder 'George Cowan Correspondence Incoming July-Dec 1988'.
23. Letter from Stuart Kauffman to Murray Gell-Mann, David Pines, and George Cowan, 9 March 1988, and letter from Pete V. Domenici to George Cowan, 17 March 1988, SFIA, Box 'George Cowan Correspondence 1988', Folder 'George Cowan Correspondence Incoming Jan-June 1988'.
24. *Bulletin of the Santa Fe Institute*, Summer/Fall 1988, in Stanford University Library, Stewart Brand Papers (hereafter 'SBP'), Box 74, Folder 1.
25. Robert McCormick Adams and George Cowan to SFI Nominating Committee, 27 February 1990, SFIA, Box 'Board Correspondence 1989-1990 and External Faculty 1988-1989', Folder 'Board Correspondence 1990'.
26. *Bulletin of the Santa Fe Institute* 5(2), Summer/Fall 1990, pp. 6–7; memo from Cowan to Nominating Committee, 1989, SFIA, Box 'Board Correspondence 1989-1990 and External Faculty 1988-1989', Folder 'Board Correspondence 1990', Folder 3, Box 74, SBP.
27. 'Steering Committee Meeting Minutes', 11 January 1990, SFIA, Box 'Board Correspondence 1989-1990 and External Faculty 1988-1989', Folder 'Board Correspondence 1990'.
28. *Ibid.*
29. For Gell-Mann's interest in the presidency, see memo from Robert McCormick Adams and George Cowan to SFI Nominating Committee, 27 February 1990, SFIA, Box 'Board Correspondence 1989-1990 and External Faculty 1988-1989', Folder 'Board Correspondence 1990'; for information on Knapp and the Pines quote, see 'History' (n.d.).
30. Ed Knapp, 'President's Message', *Bulletin of the Santa Fe Institute*, Fall/Winter 1992, SFIA.
31. Memo from Bruce Abell to Stewart Brand, 19 February 1992, SBP, Box 74, Folder 4; see also letter from Abell to George Cowan, 29 September 1988, SFIA, Box 'George Cowan Correspondence 1988', Folder 'George Cowan Correspondence Incoming July-Dec 1988'.
32. Knapp, 'President's Message'.
33. 1998 Santa Fe Institute Annual Research Report, SFIA, unfiled, Box 'SFI Annual Reports 1998-2001', pp. 4, 18–19.
34. Letter from James Pelkey to Stewart Brand, 28 August 1990, SBP, Box 74, Folder 3.
35. Letter from Ed Knapp to Stewart Brand, 19 December 1991, SBP, Box 74, Folder 4.
36. Letter from Jim Pelkey to Stewart Brand, 30 January 1992, SBP, Box 74, Folder 4.
37. Letter from Ed Knapp to Mitchell Kapor, 30 July 1992, SBP, Box 74, Folder 4.
38. Letter from Ian Ross to W. Brian Arthur, 9 March 1990, SIFA, Box 'Board Correspondence 1989-1990 and External Faculty 1988-1989', Folder 'Board Correspondence 1990'.
39. 1993 Annual Report on Scientific Programs, SIFA, Box 'SFI Annual Reports 1993-1997 (1996 missing)', Folder '1993', p. 8.
40. Paul Lingenfelter, 'Review of the Santa Fe Institute Summary Report', 30 May 1996, unfiled, p. 3; letter from Rolf Sinclair to Ellen Goldberg, 8 April 1996, not paginated consistently; both in SIFA, Box 'Notes; Correspondence; Reports [Unsorted] 1990s', Folder 'SFI—With Us'.
41. Herbert Gintis, interview with the author, 10 March 2017.
42. Suzanne Dull, 'Business Network Annual Report', 3 November 2000, available at: <http://tuvalu.santafe.edu/files/gems/busnetanmtg2000>.
43. Gintis, interview.
44. Daniel Dennett, interview with the author, 1 March 2017.

45. On the campus renovation, see SBP, Box 74, Folder 1; for the Einstein picture, see SFI Annual Report, 1987.
46. Bowles and Gintis (2001); Gintis, interview.
47. 2000 Santa Fe Institute Annual Scientific Report, SIFA, unfiled, Box 'SFI Annual Reports 1998-2001', p. 1.
48. Gintis, interview.
49. Summary in *Santa Fe Institute Bulletin*, Spring 2005, pp. 6–7; Gintis, interview. <https://sfi-edu.s3.amazonaws.com/sfiedu/production/uploads/publication/2016/10/31/spring2005v20n1.pdf>
50. See Elgin (2002).
51. See de L. Thompson (2016).
52. SFI faculty members such as Samuel Bowles and Geoffrey West have served as 'agenda contributors' and speakers at WEF; SFI trustee and influential 'social entrepreneurship' advocate John Hagel III is a member of WEF leadership.
53. <https://omidyar.com/our-partners/>; 'SFI Receives \$7.5 Million Challenge Grant' (2008).
54. 'Templeton Freedom Awards' (n.d.); 2011 Santa Fe Institute Annual Report, SIFA, unfiled, Box 'SFI Annual Reports 2010-2014', p. 3.
55. Epstein's partner, Ghislaine Maxwell, is the daughter of erstwhile SFI funder Robert Maxwell.

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