



Excerpted from

## Dignity, Technology, and Global Order New Approaches to Complex Challenges

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# Lessons from Innovative Organizations

Given the structural inadequacies of the organizations discussed above, we cannot rely on these traditional entities to address certain critical, complex, long-term strategic questions. As we look to create new structures more amenable to this, there are a number of historical organizations that were successful at achieving breakthrough innovations in other areas that can provide valuable lessons about effective organizational incentives and structures. Bell Labs, the Advanced Research Projects Agency (ARPA), Xerox Palo Alto Research Center (Xerox PARC), and the RAND Corporation<sup>28</sup> all offer verdant ground for lessons learned about stimulating innovation in the face of complex, long-term challenges.

Each of these organizations was created to address an unmet need and grew to foster truly innovative thinking. Bell Labs was founded in 1925 by Western Electric and AT&T to focus on basic and applied research that would inform the future of the telecommunications industry. Jonathan Gertner, author of *The Idea Factory*, stated the case succinctly: “For a long stretch of the twentieth century, Bell Labs was the most innovative scientific organization in the world.”<sup>29</sup> One of the things that set Bell Labs’ approach apart was that they didn’t focus on simply thinking up good ideas; they recognized that an important part of connecting innovation with the market was to start by looking for good problems.<sup>30</sup>

ARPA was created in 1957 by President Eisenhower, originally to centralize all space-related research so that it would report to the secretary of defense. Bureaucratic turf battles with NASA and branches of the military resulted in ARPA temporarily becoming a fringe agency that was only able to pursue “beyond-the-cutting-edge” projects that the service branches could do

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28 The RAND Corporation is still a powerhouse in policy research, but the focus here is on its early days, thus its inclusion in the “historical” case studies.

29 Jonathan Gertner, *The Idea Factory* (London: Penguin Books, 2012), 1-2.

30 Gertner, 33.

without.<sup>31</sup> Jack Ruina, the first head of ARPA, hired one of the true geniuses of the twentieth century, J.C.R. Licklider (“Lick”), to turn the agency into “a force for technological excellence.”<sup>32</sup> Lick was told to “assault the technological frontiers everywhere you can.”<sup>33</sup> The end-result, among others, was the interactive computer and networked systems we depend on today, as well as the seeding of innovative excellence across the country.

Xerox PARC’s origins go back to Xerox’s strategically questionable purchase of Scientific Data Systems (SDS) in 1969. The initial mission of the new acquisition was to expand Xerox’s rule over “the office of the future.”<sup>34</sup> Jacob Goldman, the newly arrived chief scientist who did not approve of the deal, decided to turn SDS instead into a world-class research unit. He and George Pake built one of the finest teams ever assembled to assault the frontiers of technology. Perhaps their greatest strategic insight was not to anticipate the future and help Xerox navigate it, but to articulate a vision for the future and then work to create that future on behalf of Xerox.

Finally, the RAND Corporation was born from Project RAND, a post-World War II effort to retain the connections between scientific and technological talent mobilized during the war with the military. Initially housed via contract at the Douglas Aircraft Corporation, RAND was spun off into an independent nonprofit corporation in 1948, with initial funding secured via an interest-free loan and loan guarantee from the Ford Foundation. RAND’s mission was to improve public policy by helping the government, military, and other clients get unbiased, evidence-based information about complex problems facing the nation, and ultimately, in their words, to make the world better.<sup>35</sup>

While these organizations had their differences in focus and structure, five important common success factors emerge from our analysis. Each of these organizations:

1. Aligned their mission with a big vision that touches on deep questions about humanity

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31 M. Mitchell Waldrop, *The Dream Machine* (San Francisco: Stripe Press, 2018), 199.

32 Waldrop, *Dream Machine*, 199.

33 Waldrop, *Dream Machine*, 200.

34 Michael A. Hiltzik, *Dealers of Lightning* (New York: Harper Collins Publishers, 2000), 29.

35 *Ideas in Action: 60 Years of Rand*, DVD, directed by David Mallet (Santa Monica: RAND, 2005).

2. Focused on a long time horizon
3. Created a community of top talent
4. Allowed time, space, and autonomy for exploration and problem finding
5. Secured patient, long-term funding

## Aligning With a Big Vision

Bell Labs, ARPA, and Xerox PARC all began with a big vision that would, as computer scientist Alan Kay said, act “like a magnetic field from the future that aligns all the little iron particle artists to point to “North” without having to see it.”<sup>36</sup> The vision captured people’s imagination and allowed them to explore aspects of it that they found personally interesting and worth pursuing.

A number of researchers who played key roles in ARPA’s organizational development were inspired by their time at the MIT Research Laboratory for Electronics (formerly the Rad Lab), which, according to electrical engineer and future MIT president Jerry Wiesner, took as its charter “the universal role of communication processes in man’s universe.... Our interests ranged from man-made communications and computing systems to the sciences of man, to inquiries into the structure and development of his unique nervous system, the phenomena of his inner life, and finally his behavior and relation to other men.”<sup>37</sup>

Leadership at Bell Labs determined that goals should have an “indistinctness,” but serve a clear larger vision: “anything remotely connected to human communications.”<sup>38</sup> Within that vision, engineers and scientists could pursue any problems they wished. According to Gertner, “the techniques forged at Bell Labs—that knack for apprehending a vexing problem, gathering ideas that might lead to a solution, and then pushing toward the development of a product that could be deployed on a massive scale—are still worth consid-

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36 Alan Kay, “The Power of the Context,” transcript of speech delivered upon being awarded—with Bob Taylor, Butler Lampson and Chuck Thacker—the Charles Stark Draper Prize of the National Academy of Engineering February 24, 2004, last accessed 9/2/21 at <https://www.debugmind.com/files/alan-kay-context.pdf>.

37 Waldrop, *Dream Machine*, 91.

38 Gertner, *Idea Factory*, 32.

ering today, where we confront a host of challenges (information overloads, infectious disease, and climate change, among others) that seem very nearly intractable.”<sup>39</sup>

RAND’s overarching vision is perhaps less dramatic; it is focused more on their belief that rigorous, evidence-based analysis can and should inform policymaking. But for them, that umbrella still provides cover for a wide array of innovative approaches to problems. The RAND Corporation is well-known for their expression “the answer is a question,” stressing the need to get to the fundamental, underlying issues that need resolution.<sup>40</sup>

This problem-centered approach is an important corollary to aligning with a big vision. Innovation should be in service to a human problem, not simply innovation for innovation’s sake. Gertner observed that at Bell Labs “... there were plenty of good ideas out there, almost too many. Mainly they were looking for good problems.”<sup>41</sup> Even though Bell Labs, Xerox PARC, and ARPA were focused on technology, they retained a strong connection to the human element of their innovations.

Aligning with a big vision also helps keep focus on the horizon, avoiding the distractions and frameworks of the present. Excessive attachment to current paradigms is a dangerous element of human nature. John Pierce of Bell Labs believed that, “Humans all suffered from a terrible habit of shoving new ideas into old paradigms. ‘Everyone faces the future with their eyes firmly on the past’...”<sup>42</sup>

## Long Time Horizon

One of the themes that comes up repeatedly, especially in the cases of Bell Labs, ARPA, and Xerox PARC, is the need for long time horizons. Arthur Waldrop credits much of the success at ARPA to the leadership, who not only understood the overarching vision, but “perhaps most important, they continued to foster ARPA’s extraordinary un-federal-government-like management style—one that might be summarized as allowing ‘the freedom

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39 Gertner, 4.

40 *60 Years of Rand*, DVD.

41 Gertner, 33.

42 Gertner, 200.

to make mistakes.”<sup>43</sup> In his analysis of Licklider’s success at ARPA, Waldrop notes “Perhaps most important of all, however, Lick had the patience to take the long view. He couldn’t get it all done in one year, or two years, or a lifetime. But by creating a community of fellow believers, he guaranteed that his vision would live on after him.”<sup>44</sup>

At ARPA, Bob Taylor encouraged people to get ten years ahead of the curve. Waldrop paraphrased Taylor’s approach as “Don’t just invent the future; go *live* in it.”<sup>45</sup> This was similar to the approach at Xerox PARC, where Alan Kay was frustrated by Xerox’s attitude of scanning the future for trends and then defending against them. Kay’s response to this was “Look, the best way to predict the future is to *invent* it!”<sup>46</sup> At Xerox PARC, Jack Goldman’s assistant George White emphasized the importance of getting far ahead: “Otherwise, by the time the ripening and maturing process from your research comes through events will have overtaken you.”<sup>47</sup> As a telling counter-example, Bell Labs started to decline and ultimately fail when they were forced to focus less on fundamental research and more on commercial return and shorter time horizons.<sup>48</sup>

## People and Community

The third important factor, while working in the pursuit of a grand vision over a long time horizon, is to create an interdisciplinary community of smart, creative people. All of the organizations we analyzed had this in common: they recruited and attracted the best and brightest. A number of the other factors we describe contribute to their ability to do so, but the fact remains that the key asset is the people, not the ideas or products.

At ARPA, Jack Ruina told managers to find the best and brightest. Waldrop paraphrases Ruina as telling them to “Go out to the university labs, the national labs, the private sector, anywhere. Look for people with ideas that push the envelope. Give them development money. Be generous. Take risks.

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43 Waldrop, 318.

44 Waldrop, 252.

45 Waldrop, 339.

46 Hiltzik, *Dealers of Lightning*, 122.

47 Hiltzik, 124.

48 Gertner, 346.

Cut through the red tape. Do whatever you have to do. But do it.<sup>49</sup> Beyond attracting smart individuals, the key was to form them into a community. Licklider didn't care much for people's accomplishments and laurels; he focused on just getting very bright people.<sup>50</sup> For Lick, the point was to have fun. There was no tolerance for laziness or unclear thinking, but Lick didn't tell them what to do.<sup>51</sup> It was an atmosphere of ideas and excitement. Brainstorming in a group over "beer and pretzels" was better than sitting alone and writing a chapter.<sup>52</sup> The community and atmosphere were warm and interactive. This was key not only at ARPA, but also at Bell Labs. Bell Labs set out to create "an organization of intelligent men," recognizing that an interdisciplinary group was better than the lone scientist or small team.<sup>53</sup>

The interdisciplinary aspect of the community is also a critical insight. A critical mass of exceptionally bright people is important, but it was equally important that they have people of a similar caliber from other backgrounds in order to foster creativity and new insights. At Bell Labs, Kelly believed that "the most valuable ideas arose when the large group of physicists bumped against other departments and disciplines..."<sup>54</sup> Xerox PARC had an open-door policy which led to lots of cross-pollination with Stanford researchers, professors, and students.

RAND also succeeded in building a strong sense of community. They attribute part of this to their policy of open office doors and freeform atmosphere, recognizing that many of the best ideas, interactions, and cross-pollination of ideas happened while having lunch in the courtyard and other non-traditional environments. They claim they didn't need to tell people how long to work; people worked because they wanted to work on those sticky questions. They had a sense of mission. People don't just work there, "they belong there."<sup>55</sup> They were able to attract some of the best and brightest because they offered funding and intellectual freedom. They fostered an exciting

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49 Waldrop, 200.

50 Waldrop, 115.

51 Waldrop, 119.

52 Waldrop, 120.

53 Gertner, 32-33.

54 Gertner, 345.

55 *60 Years of Rand.*

and collegial atmosphere where their people could work on important and difficult questions.<sup>56</sup>

One of the most important insights about creating a research community, was that it is not just about the policies and atmosphere, but about the central disciplinary focus that serves as its formative glue. Waldrop quotes James Morris of Carnegie Mellon as saying, “Remember, in the aftermath of *Sputnik*, the glamour field was physics, not computing. Lots of very smart people made a career decision to go into a field that didn’t exist yet, simply because ARPA was pouring money into it.” Licklider himself explicitly recognized that by creating a community and providing ample funding, *the community emerged into a field*.<sup>57</sup> As we look to new areas worthy of deep, interdisciplinary investigation, this is a critical factor to keep in mind.

## **Time, Space, and Autonomy for Exploration and Problem Finding**

As they attracted the best and brightest, all of these organizations provided their talent with the time and space to explore whatever ideas the researchers thought worth pursuing, even if it led them down long alleys and dead ends. At Bell Labs, researchers were given what researcher Morry Tanenbaum called “circumscribed freedom.”<sup>58</sup> At Western Electric, the Bell Labs predecessor, they strove to create “a free environment for the ‘operation of genius’.. genius was not predictable. You had to give it room to assert itself.”<sup>59</sup> At Bell Labs, Pierce “was given free rein to pursue any ideas he might have.”<sup>60</sup> Often this meant paying people to articulate and understand problems. The most entrenched and complicated problems are often not what they appear on the surface; they require intellectual noodling and exploration. Lick himself recognized that the majority of his time was spent not on what most outside observers would consider his main accomplishments, but on getting into the position to think, exploring hypotheses, learning new things necessitated by a problem, and other activities required to “get into a position” to do the “real

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56 *60 Years of Rand*.

57 Author emphasis. Waldrop, 252-253.

58 Gertner, 352.

59 Gertner, 27.

60 Gertner, 194.

work.”<sup>61</sup> At Bell Labs the line between the art and science of discovery was not always clear, leading researchers to prefer thinking of their work not as lab work, but rather as work at “an institute of creative technology.”<sup>62</sup>

A major aspect of providing this space for the “operation of genius” was the removal of distractions. The researchers’ job was to work on the primary issues at hand, not be drawn away by administrative burdens. For university researchers and professors who made the jump to these organizations, this meant not having to deal with the burdens of tenure, teaching, grading papers, dealing with university bureaucracy, and, most importantly, raising funds.

### Patient, Long-Term Funding

The final and indispensable success factor across all of these organizations was the availability of ample, long-term funding. Without large amounts of money, none of these organizations would have existed. A huge proportion of researchers’ time is spent seeking, applying for, and shaping research around funding. This not only takes them away from their primary task but also forces them to only pursue those mainstream topics which are most likely to get funding. This is akin to the old adage about the man looking for his lost key under a streetlamp. When asked by a bystander where he lost it, he replied that he lost it down the street, but that the light is better here.

Fernando Corbato, as quoted by Waldrop, captures this dynamic at ARPA well:

“this was at a time when the National Science Foundation was handing out money with eye droppers—and then only after excruciating peer review. Compared to that, Lick had a *lot* of money. Furthermore, he was giving out umbrella grants, which allowed us to fund the whole program. So there was this tremendous pump priming, which freed us from having to think small. The contrast was so dramatic that most places gravitated to ARPA. So that opening allowed a huge amount of research to get done.”<sup>63</sup>

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61 Waldrop, 155.

62 Gertner, 3.

63 Waldrop, 445.



Without this funding to support Lick's vision, Waldrop points out that there "would have been no ARPA community, no Arpanet, no TCP/IP, and no Internet. There would have been no Project MAC-style experiments in time-sharing, and no computer-utilities boom to inflame the imagination of hobbyists with wild speculations about 'home information centers.' There would have been no life-giving river of cash flowing into DEC from the PDP-10 time-sharing machines it sold to the ARPA community. There would have been no windows-icons-mouse interface a la Doug Engelbart. And there would have been no creative explosion at Xerox PARC."<sup>64</sup>

Discussing the importance of funding at Bell Labs, Gertner stresses, "An institute of creative technology required a stable stream of dollars. 'Never underestimate the importance of money,' the physicist Phil Anderson says—and it was true."<sup>65</sup> It was this steady funding that allowed them to look ten or twenty years down the road. It allowed Xerox PARC to pay a premium pay scale so they wouldn't be outbid by universities and other organizations.

Exploring the lessons of Xerox PARC's successes (and failures), Hiltzik notes that one of the reasons we don't have a new Xerox PARC today is that the environment for corporations has changed. "No company, no matter how wealthy, dares devote even a fraction of its wealth to search for knowledge that may not produce a return to the bottom line. The utopian ideal of a corporate laboratory whose scientists are free to roam through Ideaspace draws only ridicule today."<sup>66</sup>

## Concluding Thoughts

In 1997, at the age of eighty-six, John Pierce started to explore what lessons could be learned from Bell Labs. He thought the primary factors of success could be reduced to four factors:

- A technically competent management all the way to the top.
- Researchers that didn't have to raise funds.

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64 Waldrop, 445.

65 Gertner, 154.

66 Hiltzik, 397.

- Research on a topic or system could be and was supported for years.
- Research could be terminated without damning the researcher.<sup>67</sup>

Jacob Goldman's philosophy at Xerox PARC, as described in *The Dream Machine*, also included many of these factors:

"It wasn't enough to just hire a bunch of supersmart individuals. You had to build a community, a culture, an environment of innovation. You had to give your people the kind of challenge that would light a fire in their eyes, that would generate an atmosphere of nonstop intellectual excitement, that would let them feel in their gut that *this* is where the action is. You had to provide them with lavish resources—everything they needed to do the job, without stinting. And through it all, most important, you had to keep the bottom-line guys at bay so *your* guys could have the freedom to explore and make mistakes. Somehow you had to make the higher-ups accept that none of this would necessarily result in products the following year, or maybe even in five years. But in ten years you might just change the world."<sup>68</sup>

These organizations are obviously not the only ones with important lessons for organizational innovation. These were selected partly due to their legendary status as incubators of groundbreaking research and applied knowledge, partly to the fact that, with the exception of RAND, all are from outside the policy realm, and also because they were able to institutionalize these practices, as opposed to conducting one-off research projects. There were also notable post-war attempts to address complex policy challenges through ad hoc working groups. Two notable and relevant examples are the aforementioned Ford Foundation Gaither Commission Report and the Rockefeller Brothers Fund (RBF) Special Studies Project (SSP). While the Gaither Commission focused on defining a vision specifically for the Ford Foundation, RBF's Special Studies Project aimed at providing a strategic assessment and vision for the entire nation.

There are parallels between the time in which the SSP was formed and today. 1956 was a time of geopolitical uncertainty, with Laurance Rockefeller, writing on behalf of the RBF trustees, stating that "The age in which we live

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67 Gertner, 351. Quoting a letter from John Pierce.

68 Waldrop, 323.

is one of deep and widespread ferment. We have been witnessing a revolution in politics, social order, science, economics, diplomacy, and weapons.<sup>69</sup> The report claims that the United States was “in a critical situation requiring the urgent attention of thoughtful citizens.”<sup>70</sup> The project formed a high-level working group composed of former government officials and esteemed corporate, academic, and civil society leaders and then further organized subpanels involving 108 individuals. The final report was nearly 500 pages, including six primary reports.

While the overall report provided an extraordinary, detailed strategic overview of the challenges facing America, in terms of providing innovative, out-of-the-box thinking, the report was less successful. Professor John Andrew III, writing in the *Presidential Studies Quarterly*, noted that in initial “ideal world” submissions from experts, “The distinguished authors, ironically, could discuss programs but seemed to have difficulty conceptualizing policies and envisioning a future much different from the past or present. The new agenda seemed to be chiefly an effort to make small adjustments in existing policies.”<sup>71</sup> Andrew continues, “most of the panelists operated within very narrow intellectual boundaries. Few questioned fundamentals. They pursued reform, not structural change. They professed to seek a wider vision, but most often fell short.”<sup>72</sup> While the project was clearly successful at convening recognized leaders and experts, it was less successful at coming up with truly innovative solutions to the actual policy challenges.

Both the SSP and Gaither Commission were established for a discrete purpose, and then disbanded after the reports were issued. These provide helpful examples of the importance of gathering a leading group of high-level citizens that provide convening power and have direct connections to policy-makers, but also may demonstrate negative lessons about the ability to make substantive progress on the challenges themselves. The absence of a long time horizon and pressure to provide near-term results and recommendations are likely major contributors to these shortcomings.

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69 *Prospect for America: The Rockefeller Panel Reports* (New York: Doubleday, 1961), xv.

70 *Prospect for America*, xv.

71 Andrew, John, III, "Cracks in the Consensus: The Rockefeller Brothers Fund Special Studies Project and Eisenhower's America," *Presidential Studies Quarterly*, Summer 1998, Vol. 28, No. 3, 536.

72 Andrew, 537.

## Recent Attempts at Organizational Innovation

In addition to the organizations above, there are lessons to be learned from organizations that have more recently adopted alternative approaches, including the Janelia Research Campus, the Santa Fe Institute, the MacArthur Foundation's Research Networks, Stanford's Center for Advanced Study in the Behavioral Sciences, and the Tobin Project. Following is a brief description of each, and then we will return to them later in discussions of new organizational models.

In terms of intentional organizational design, Janelia (originally the Janelia Farm Research Campus, or "Janelia Farm" for short) may be the most outstanding recent example of how applying innovative organizational best practices to complex problems can stimulate the creation of new knowledge and tools.

Originally conceived in 1999, Janelia was established by the Howard Hughes Medical Institute (HHMI) in 2006 in a concerted effort to break through academic impediments in the pursuit of biomedical breakthroughs necessary for pushing the frontiers of knowledge. To this end, HHMI funded the construction of a \$500 million purpose-built campus for the Janelia Farm Research Campus on 281 acres in Ashburn, Virginia and committed to covering the annual operating budget, freeing researchers to focus on research. It is worth noting that even as construction began, people still didn't know exactly what the specific research focus would be. Instead, the emphasis was first on building a collaborative scientific culture, attracting top talent, and creating a financially and intellectually independent institution. The priority was more on the "how" than the "what."<sup>73</sup>

Gerald Rubin, one of Janelia's founders and its first director, took lessons from some of the organizational sources of past innovation, including Bell Labs and the Cambridge-based Medical Research Council Laboratory of Molecular Biology. He carefully and deliberately structured Janelia in accordance with the some of the best practices of these and similar organizations: attracting the best and brightest, forming them into small, collaborative teams of multidisciplinary groups, providing ample long-term funding, allowing long research time horizons, granting research freedom and permission to

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73 Howard Hughes Medical Institute. "Janelia Farm Research Campus: Report on Program Development," November 2003, 36.

flirt with failure, and encouraging exploration of the unknown. Researchers at Janelia have no grants to seek, no papers to grade, no classes to teach, no committees on which to serve. The simple, powerful idea behind Janelia is to remove the barriers to long-term problem solving, “liberating smart people to do meaningful work.”<sup>74</sup>

Janelia sees itself not as a rebuke to other research organizations, such as universities or private companies, but as a complementary, alternative model to serve different needs and ends—both human and research. And while Janelia works on fundamental research and long time horizons, it also aims to strike a balance between long-term research freedom and application of the newly acquired knowledge and building of tools.

The Santa Fe Institute (SFI) is another cross-disciplinary research center that was established in an effort to break out of stove-piped, linear thinking. The original impetus was to push back against the division of researchers into what founder George Cowan called “specialized camps that more or less ignored one another”<sup>75</sup> and what C.P. Snow referred to as the two cultures.<sup>76</sup> They also recognized that universities had limitations, and “were ill-equipped to nurture emerging new fields.”<sup>77</sup> Cowan’s idea was to “attack problems that cut across many fields, problems like human behavior and cognition.”<sup>78</sup> It took a number of years to go from concept to reality, but Cowan and his colleagues eventually got things moving by hosting a series of workshops, inviting a cross-disciplinary group of researchers together to discuss topics of interest and the concept of a new institution. One of the reasons this approach was so successful was that Cowan was able to bring together a core group of highly esteemed scientists, including a large number of Nobel laureates.

Currently, SFI’s focus is on complex systems science. It is both an institution and a network. SFI calls itself a “visiting institution,” hosting meetings, workshops, conferences, and resident researchers and post-docs. They host around 25 resident researchers and have a network of around 120 external

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74 Author interview with Gerald Rubin, April 4, 2021.

75 This section draws heavily on two articles on the history of the Santa Fe Institute posted on the SFI website: <https://www.santafe.edu/about/history>.

76 C.P. Snow, *The Two Cultures and the Scientific Revolution* (New York: Cambridge University Press), 1959.

77 “History,” Santa Fe Institute.

78 “History.”

professors and scientists. Those whom SFI refer to as “fractal faculty” spend up to three months per year in residence. SFI espouses all of the same principles that were present in the organizations discussed above. They start with finding exceptionally bright people and invite them to join. These researchers are firewalled off from fundraising. Rather than telling researchers what to study, they “cultivate a great community and let the researchers propose what they should study.”<sup>79</sup> They offer a mix of space for contemplative research and for group workshops where, in the words of SFI vice-president for applied complexity William Tracy, “high burst” intellectual work can happen.<sup>80</sup>

One of the most important insights that SFI recognized is that to attract talent they needed to align the work of the organization with that of the researchers. In practical terms, this means that the innovative work that either happens at SFI or is inspired by SFI workshops leads to publications in top journals. Publications are the incentives of the home institutions, the “currency of the realm,” both for junior researchers who are in early stages of their career, and for more seasoned tenured faculty. The professional connections made at SFI also have direct, positive impacts on the researchers’ “day jobs.” SFI also has been able to create a strong sense of community and distinctive culture. For a sense of the organizational culture, it is worth reading SFI’s operating principles on their website, written by author and trustee Cormac McCarthy.<sup>81</sup>

Stanford University hosts the Center for Advanced Study in the Behavioral Sciences (CASBS), an organization that grew directly out of the Ford Foundation Gaither Commission Report’s “Program Area Five: Individual Behavior and Human Relations.” The goal of this program area was to apply new methods of scientific knowledge to questions of human welfare by examining “the principles which govern human behavior in political, economic, and other group activities, and in the individuals’ personal life.”<sup>82</sup> The Committee declared that “the first essential step in the further understanding of human behavior is to institute a long-range plan for the increase in basic knowledge.”<sup>83</sup> In 1952, the Ford Foundation trustees approved the creation

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79 Author interview with William Tracy, March 3, 2022.

80 Ibid.

81 “Operating Principles,” *Santa Fe Institute*, updated 2017, <https://www.santafe.edu/about/operating-principles>.

82 Gaither et al., *Study for the Ford Foundation on Policy and Programs*, 91.

83 Gaither et al., 97.

of such a center, the Center for Advanced Study in the Behavioral Sciences, which was officially established at Stanford University in 1954. It was first structured as a way for senior scholars to train younger ones, with the hopes of enlarging the social science talent base. But the forced seminar style, where senior fellows lectured to junior fellows, was found inconducive to substantive intellectual exchange, and the Center moved to a more informal model.<sup>84</sup> The CASBS website currently describes their organization as follows: “A leading incubator of human-centered knowledge, CASBS facilitates collaborations across academia, policy, industry, civil society, and government to collectively design a better future.”<sup>85</sup> CASBS’s activities range from two-week training programs, year-long fellowships and projects, to multi-year programs.

The MacArthur Foundation’s Research Networks take a different approach. Rather than build a permanent organization, MacArthur funds ten-year project networks composed of interdisciplinary experts. MacArthur describes the networks as follows:

They are designed to identify a big problem and bring together researchers, practitioners, and policymakers from multiple disciplines to work collaboratively over an extended period of time, typically six to as many as ten years. Ambitious and innovative—but not prescriptive—research networks liberate their members to pursue work that has the potential to change prevailing paradigms.

We do not know from the beginning what the results of a research network will be; however, our experience suggests that providing the space and resources for motivated, dynamic thinkers to come together to solve complex challenges can be often fruitful.<sup>86</sup>

The use of networks, as opposed to the creation of a permanent organization, reflects what Valerie Chang, MacArthur’s managing director of programs, described as a mechanism that can jostle researchers out of their day-to-day routines and get them to interact with a diverse group of people on

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84 “The early years and mission,” *Center for the Advanced Study in the Behavioral Sciences at Stanford University*, updated 2013, <https://web.archive.org/web/20140811010850/http://www.casbs.org/early-years-and-mission>

85 “About CASBS,” *Center for the Advanced Study in the Behavioral Sciences at Stanford University*, <https://casbs.stanford.edu/about/about-us>.

86 “About Our Research Networks,” *MacArthur Foundation*, updated April 2017, <https://www.macfound.org/networks/>.

topics of importance.<sup>87</sup> Originally more research-focused, these networks now increasingly emphasize policy relevance and impact. A significant amount of funding and effort goes into the planning for each network, getting a sense of how researchers work and honing the key questions, such as what paradigm shift is desired and what might be the shared network vision. Many of the principles and rationale for this network approach are described in a monograph by former MacArthur staff member and network participant Robert Rose, *Finding Answers To Big Questions: Overcoming Disciplinary Boundaries Through Research Networks*.<sup>88</sup>

The Tobin Project is another network-style organization that aims to bring scholarly expertise to current policy challenges. Founded in 2005 by David Moss, the Tobin Project is “motivated by the belief that rigorous scholarship on major, real-world problems can make a profound difference.”<sup>89</sup> The project origins were conversations between David Moss and Nobel laureate James Tobin, where they recognized that there was a need to apply expertise from the academy to social and political problems. At the same time, being academics themselves, they recognized the limitations of university incentives to engage on these applied and prescriptive policy endeavors. The Tobin Project was founded to provide a forum and entrepreneurial spark for such work.

Their methodology is based on workshops and conferences, resulting in publications. They continue to refine a model for bringing scholarly expertise to policy challenges, which they describe as follows:

- Define strategic research questions with the greatest potential to benefit society.
- Engage leading scholars across disciplines and institutions, and build communities of scholars around core research questions.
- Incubate and produce new research through scholarly collaboration and with policymaker input.
- Disseminate compelling ideas through academia, public discourse, and policy formation.

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87 Interview with Valerie Chang, April 20, 2021.

88 Robert M. Rose, *Finding Answers To Big Questions: Overcoming Disciplinary Boundaries Through Research Networks: A Guide to Conceiving, Organizing, Implementing, and Monitoring Interdisciplinary Research Networks*, <https://www.macfound.org/media/files/rosenetworkmonograph.pdf>.

89 “About,” *The Tobin Project*, <http://tobinproject.org/about>.



- Innovate continually on the Tobin model of strategic research development.<sup>90</sup>

They currently focus on four pillars of research: government and markets, economic inequality, institutions of democracy, and national security.

According to founder David Moss,<sup>91</sup> while convening smart people is critical, success also requires discipline to drive conversations in the direction of new, novel topics. Otherwise, experts tend to expound on more conventional matters. Without guidance, policy discussions can also easily veer into unproductive political discussions. It is also important to ask the “right questions” at the outset, otherwise gravitational pull can lead in directions that aren’t necessarily as interesting. Moss also recognized that finding the right people to frame and ask the questions is important; these people are not always subject matter experts, but they have the ability to see the big picture. Moss also echoed the observation made by the other organizations that it is important to separate people from the administrative and bureaucratic activities they dislike. Deep work happens when bureaucratic interference is removed.

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90 “Tobin Project Model,” *The Tobin Project*, <http://tobinproject.org/tobin-project-model>.

91 The following observations are from an interview with David Moss conducted by Jude Blanchette on June 10, 2021.

