THE BIRTH OF "STEM":

CRISIS, CONVERGENCE, AND THE CONFLATION OF EQUITY

WITH HUMAN CAPITAL

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ABSTRACT

Scholars argue that U.S. education policies are not only shaped by a multitude of interests; notions of crisis tend to catalyze them. The *No Child Left Behind Act of 2001* was no exception in this regard, yet at the same time, it marked the beginning of a reform era that would greatly alter assessment, teaching, learning, and curricula in the public schools. This study details the genesis of 'STEM,' as it emerged through a convergence of interests and crises, and among a series of social dynamics that would guide schooling in the U.S. for the next fifteen years. The specific social dynamics explored include economic fluctuations, venture philanthropy, immigration and national security concerns, and rapid advancements in technology and scientific research between 1990 and 2005.

I make the case that the twenty-first century's first education 'crisis,' the rise of venture philanthropy, and the culminating reform movement were born out of a convergence of interests *and* crises related to 1) battles over immigration and 2) the technological transitions and economic conditions that surrounded the rollover into the year 2000. Amid these changes, concerns about the management and the production of human capital became prioritized for industry, government, and academia, particularly as it related to fields in science, technology, mathematics, and engineering. These pre-existing concerns were then given legitimation and a sense of urgency after the attacks on September 11, 2001, thus necessitating the strengthening of an existing government-industry-academic partnership that could produce more human capital in the U.S. The expressed crises and interests of the federal government, Shirley Jackson

(academia), and Eli Broad and Bill Gates (industry) are examined in order to understand the partnership's driving interests and its inordinate focus on public schools.

Through document and critical policy analysis, this narrative provides a social history, detailing how the complexities of the information age became a powerful shaping force that brought forth the birth of 'STEM' and the disproportionate discursive and curricular emphasis on science, technology, engineering, and mathematics in education. This emphasis, I conclude, has not come without consequence to concerns over equity and quality in teaching and learning.

DEDICATION

These pages are dedicated to the only three people with enough dedication and confidence in me that they would join me on this lengthy journey. To Kelly, Mom, and the brightest beacon in our three lives, Clara. I cannot thank you enough for your patience and love, especially as we have labored together through this particularly strenuous feat.

"… we're 90% metaphor
with a leanness of meaning…
I am a poem
heeding hyper-distillation…"

– Ani DiFranco[1]

[1] Ani DiFranco, "Self Evident," in *So Much Shouting, So Much Laughter,* Righteous Babe Records, 2002, compact disc.

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CONTENTS

CHAPTER 1: INTRODUCTION

A Vignette on Confinement in Schools and a Desire for Movement

As an undergraduate, I remember numerous discussions in my social foundations and methods courses about what Florida's high-stakes testing mandates and the developing *No Child Left Behind Act* (NCLB) would mean for us as future educators. We spoke about how we could keep our classrooms from being overrun by the threats of testing as long as we could maintain some focus on communal- and child-centered learning. Many of us were convinced that the test was 'only a test' and that we could be great teachers without having to cater our instruction to it. But we had no way of knowing at the time how coercive administrative mandates would become within a few years or how the policies would reshape the form and content of public schooling.

I started teaching in the fall of 2002 just as NCLB was beginning to roll out into the schools. My first year as a third grade teacher was a whirlwind of eleven- and twelve-hour days; much of my time was spent fighting off the typical rookie illnesses and trying to make some sense of the intense curricular, technological, and bureaucratic overload. After gaining some sense of the ropes, I was then asked to be our school's technology teacher. In many ways this new position was the same but different, and by my fourth year in the field, I had developed an arduous, love-hate relationship with my job. That is, I adored the people I worked with. I was perpetually invigorated by the process of working together toward common goals, whether it was fundraising for school projects, pooling resources for students in need, or figuring out how Brittany and I might transition Leo from his electric wheelchair into the thick of the swamp so he and his peers could experience the mud walk field trip together. Even though I loved so much

about my work and these shared struggles in particular, I hated most of what we were *required* to do: test prep, drill and kill, scripted lessons, paperwork for the sake of 'documentation,' professional development (that almost always de-professionalized us), and of course, 'continuing education' (as if we were not always learning from our students and peers anyway). Put simply, we could have done so much *more* if only we could be released from teaching through the motions.

It took me a while to find my way to graduate school, but it was there where I finally had the time and support to analyze the dynamics of my love-hate relationship with teaching and schooling. It was there also where the problems kept growing for me. In my first academic presentation, for instance, I theorized about something I called *aesthetic suppression*. I described this as the closeted work, the self-imposed silences, and the restrained experimentation that prevents the creative experiences of the teacher and students from developing in the classroom setting. I associated this suppression with a fear of the dehumanizing consequences that proceed from an authority's perceived failure to meet its amorphously defined expectations. That paper came out of an experience I had with my third graders. We were learning about Egypt, and one of the students had said, "It would be so cool if we could actually go to Egypt and see the mummies!" I responded that a trip to Egypt might not yield the effect she had hoped for because many of the mummies reside in European museums. The children were shocked, and immediately started rattling off the most beautiful questions:

> "Why are they in *European* museums?"
> "Shouldn't the Europeans get to *own* the mummies since they *paid* to excavate them?"
> "Yeah, but don't the mummies *really* belong to the Egyptians since they came from their *land*?"

Their questions were vivid sparks that could have led us into the most productive

inquiries about culture, ethics, and power. Amazed and exhilarated at what was happening in our classroom at that moment, I remember well what ran through my head: *We should drop everything and run with their energy and enthusiasm!* Their questions swirled around the room and filled the space between each of us. And then it happened: *...But we can't. We don't have time*, I conceded.

Something I could not see had tugged at me ever so slightly. Yet there was no obvious or visible threat at that moment, and no one was standing outside our classroom door. In fact, our portable stood at the back of the schoolyard, so we were usually well insulated from oversight anyway. Despite all of this, I still made the decision to shut down that cluster of promising inquiries. I could not make sense of *why* I felt coerced, but my willingness to suppress that aesthetic experience with my students remains one of my many pedagogical regrets.

Drawing from my experiences with aesthetic suppression and my desire to better understand and articulate what I felt to be so terribly confining to the craft of teaching and learning, I wrote my master's thesis on a conceptualization of *moral oppression*. I focused on what I perceived to be the most crushing problems for the public school teacher: the structural issues of classism, racism, and sexism and the problems inherent to corporatic, technocratic, and bureaucratic mentalities. These components comprised the six mechanisms of restraint that I examined through the conceptual framework of intersectionality[1] and an expansion of Marilyn Frye's metaphor of the birdcage.[2] The result was a philosophical and metaphorical study of

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[1] Patricia Hill Collins, *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment* (New York: Routledge, 2000).

[2] Marilyn Frye, *The Politics of Reality: Essays in Feminist Theory* (Berkeley: Crossing Press, 1983).

power and agency as I had experienced, intuited, and interpreted it in myself and in those around me.

I present these autobiographical thoughts about teaching and my path toward academic inquiry as a way to show that the study I lay out in these pages, like most intense inquiries I am sure, has been long in the making. With every inquiry and with every year that I am immersed in the messiness of education, my perspective about the problems in the field grows bigger – from the personal feelings of aesthetic suppression, to the classroom and school-based experiences of having one's situated expertise constrained, to the structural and political mechanisms that bolster the bars on the institutional cage. It should be obvious that my relationship with school, learning, and teaching remains a conflicted and poignant one. It should be obvious also that my work seems to come back regularly to my problem with unnecessary confinement (via manipulation or coercion), my desire for at least some bit of movement and exploration, and my ceaseless attempt to learn to see the invisible yet very tangible obstacles that I and those around me run up against far too frequently.

I suspect it might be because of my conflicted relationship with school and this resurging problem of confinement that I am drawn toward the connection John Dewey makes between inquiry and his conception of freedom:

> Genuine freedom, in short, is intellectual; it rests in the trained power of thought, in ability to "turn things over," to look at matters deliberately, to judge whether the amount and kind of evidence requisite for decision is at hand, and if not, to tell where and how to seek such evidence.[3]

To be clear, it is not that I think a mind can ever truly 'be free,' for we – as individuals who are part of communities, institutions, and societies – are always bound in some capacity by our own

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[3] John Dewey, *How We Think* (1910; repr., Washington, D.C.: Dover, 1997), 67.

memory, history, habit, ideology, and language. This reflection on my inquiries, however, does suggest to me that I am likely to continue struggling to understand those modes of confinement that are most insidious and unseen, especially where they restrict knowledge and personal and communal growth. And in this respect, it seems as though discourse is my next logical inquiry.

Moral and Intellectual Growth by Way of Dewey's Method of Inquiry

I believe ethical research continually grapples with trying to understand, locate, and interrogate power in the taken-for-granted spaces of practice, discourse, and ideology, especially when it seems to manipulate and harm large numbers of people. For me, this means that good research works toward justice, meaning that it should contribute toward a more humane shared existence that can be redefined and struggled toward collaboratively. According to Dewey,[4] our moral aims and moral actions are realized through the dilemmas that confound us, but the 'right' courses of action are not discovered through mindless meandering or reliance upon a set of universal ethical principles. Instead, he argues, *intelligent inquiry* is the moral response to dilemma: "The practical meaning of the situation – that is to say the action needed to satisfy it – is not self-evident. It has to be searched for…Hence, inquiry is exacted..."[5] Because of my interest in meliorative action and my understanding of Dewey, I see all meaningful research as a form of inquiry, regardless of the methods employed. It is problem-oriented and, I believe, it rises out of the experience, feelings, and needs of the individual or community posing the question.

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[4] John Dewey, *Reconstruction in Philosophy* (New York: Henry Holt and Company, 1920).

[5] Ibid., 164.

In *How We Think*, Dewey explains that all inquiry begins with the experience of a felt difficulty or "problem." He defines the problem as the moment that "perplexes and challenges the mind so that it makes belief at all uncertain;" it involves "sudden change."[6] The feeling associated with the difficulty can become the catalyst that leads the individual into inquiry. The second phase a person typically goes through is the process of locating and defining the problem: she or he makes "necessary observations…to bring to light just what is the trouble, or to make clear the specific character of the problem."[7] Once the problem is defined, the third phase revolves around suggesting a possibility or idea. Dewey calls this "the very heart of inference," or what some might see as devising a hypothesis.[8] He says, "Given a difficulty, the next step is suggestion of some way out," and the source of these suggestions are found in "past experience and prior knowledge."[9] Phase four begins when the inquirer develops that possibility or idea through reasoning. She or he must "hunt for additional evidence…that will develop the suggestion" and then go through the process of weighing its possible implications.[10] As the inquiry proceeds, new data and suggestions inevitably surface. Thus, the fifth phase is constituted by further experimentation and observations. Finally, once the inquirer feels as though she or he has sufficiently tested and explored the questions and data at hand, the inquiry concludes with the sixth phase: the acceptance or rejection of the original belief or disbelief.

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[6] Dewey, *How We Think*, 9.

[7] Ibid., 74.

[8] Ibid., 75.

[9] Ibid., 12.

[10] Ibid., 13.

With these phases of inquiry in mind, I nestle the following study into the overarching framework of a Deweyan inquiry. However, even though these phases are presented sequentially here, it is important to keep in mind that they rarely, if ever, occur in a linear order. Rather, these steps tend to cycle back on one another, numerous times over, in the questioning and testing process as the inquirer moves toward some form of conclusion about their belief or course of action. Following Dewey's vein of thought, Robert Sherman and Rodman Webb state that philosophical inquiry is the process through which we arrive at resolution and, ultimately, growth. "[Inquiry] is a mediator between a disrupted and a reconstructed life. Its function is to develop 'possibilities' for the conduct of life...[as it] mediates between a given experience and one's intent or aim."[11] A most fascinating component of inquiry is that it possesses a certain continuity about it, in that one inquiry always yields extraneous and future inquiries.[12] But first, Dewey said, one must become aware of a deeply felt problem.

Sputnik in the Twenty-First Century?

> "To a layman a flash of lightening comes close to being an isolated instantaneous occurrence. A scientific account of it is a narration of a prolonged history of which the flash is one incident…"[13]

Given my experiences as a classroom teacher and my puzzlement over aesthetic suppression, it could certainly be said that there were several incipient problems in waiting when

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[11] Robert R. Sherman and Rodman B. Webb, "Qualitative Research in Education: A Focus," in *Qualitative Research in Education: Focus and Methods*, ed. Robert R. Sherman and Rodman B. Webb (Abington, Oxon: RoutledgeFalmer, 2001), 13.

[12] Dewey, *How We Think*, 134; John Dewey, *Logic: The Theory of Inquiry* (New York: Henry Holt and Company, 1920), 140.

[13] Dewey, *Logic*, 222.

I heard President Obama deliver the State of the Union Address on January 25, 2011. He addressed the political polarity at the time by speaking of the necessities of both debate and difference to democratic engagement. His thoughts on difference were accompanied by a tone of cooperation as he moved on to "common hopes and a common creed," the need to "work together," and a sense of "shared responsibility." As the monologue progressed, though, the need for cooperation and the idea of democracy were quickly fused with the competition-laden notions of neoliberalism and the free-market.[14] That is, the president then turned toward innovation, expansion, and the industries of science and technology as though he was seeking validation for a faith in this way of life. Finally, he turned to history: "Half a century ago, when the Soviets beat us into space with the launch of a satellite called Sputnik, we had no idea how we'd beat them to the moon..." He told of how the nation excelled in the Space Race by "investing in better research and education" and of how that strategy "unleashed a wave of innovation that created new industries and millions of new jobs." The president declared that this generation had finally arrived at its "Sputnik moment." He suggested the nation "invest in biomedical research, information technology, and especially clean energy technology" as a way to "strengthen our security, protect our planet, and create countless new jobs for our people." His rhetoric led one to believe that joblessness, outsourcing, and the rising Asian market were the 'enemies' the nation was expected to defeat in this new race: "…if we want innovation to produce jobs in America and not oversees – then we also have to win the race to educate our kids." He announced, "That's why instead of just pouring money into a system that's not

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[14] Michael W. Apple, "Creating Difference: Neo-liberalism, Neo-Conservatism and the Politics of Educational Reform," *Educational Policy* 18 (January and March 2004): 12.

working, we launched a competition called Race to the Top."[15] Within a matter of minutes, the president's speech had spanned the nation's job market and economy, it traversed China and India, and finally smacked down on the soils of the U.S.'s educational institutions.

At the time that I heard this address, I had just finished taking a graduate course on the history of schooling in the U.S. The course had some emphasis on Cold War education policy, and because of this, my ideas and longstanding frustrations with schooling suddenly started congealing around the discourse in the speech the moment I heard it. That is, my understanding of education reform in the 1950s quickly became the metaphor that helped me begin to interpret and, more importantly, *question* the 2011 discourse. *In what ways were the two eras similar, and how were they different?* As Dewey explained, the second step in making sense of one's perplexity is to begin "a search for relevant data."[16] Thus, I turned to history.

Parallels Between *Sputnik I* and *Sputnik II*

Sputnik I: 1945-1958

The 1940s and 1950s was a tumultuous time for the ego of the U.S. The country was grappling with its fears about the spread of communism across the post-World War II landscape of Europe and Asia. On top of these fears of communism, there was also the nuclear threat. That is, after causing massive devastation to Hiroshima and Nagasaki in 1945, the U.S. had the monopoly on nuclear weaponry. This monopoly, and any sense of security that some might have

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[15] Barack Obama, "Remarks by the President in State of the Union" (speech, Washington, DC, January 25, 2011), White House, Office of the Press Secretary, https://www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address.

[16] Dewey, *Logic*, 232.

felt, was short-lived; it only took four years for the Soviet Union to successfully explode its first atomic bomb. If this was not enough to stir up the anxieties of the day, "Less than a week later the communists took control of mainland China."[17] In the span of a few days, the two fears at the forefront of the country's psyche had actualized.

The discourse that emerged to counteract these fears came in the form of a paternalistic fever to 'defend democracy.' Given the dynamics of the Red Scare, it is obvious that the notion of protecting democracy would not stress freedom of speech or diversity in thought and ways of being. What emerged instead was a nationalistic movement to protect the political system and preserve the dominant economic system. As the fears spread, the perception developed that weakness had to be battled on all fronts. *After all*, some assumed, *how could the country properly defend itself if its 'stock' was 'weak?'* Thus, the discourse consumed not only the realms of politics, economics, and national security; it seeped into the schools as well, as it always seems to do.

In 1949, President Truman gave a speech titled, "Education, Our First Line of Defense: Learning Alone Can Combat the Tenets of Communism."[18] This speech represented a somewhat contradictory move for a discourse rife with paternalism. In other words, where paternalism might typically seek to shelter or confine for the sake of protection, this statement instead placed the nation's children, caretakers, and teachers firmly on the frontlines. A powerful correlation

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[17] John L. Rudolph, *Scientists in the Classroom: The Cold War Reconstruction of American Science Education* (New York, 2002), 14.

[18] Deborah Owens, *The Origins of the Common Core: How the Free Market Became Public Education Policy* (New York: Palgrave MacMillan, 2015), 43. For the transcript see Harry S. Truman, "51. Address at Rollins College, Winter Park, Florida," (speech, Winter Park, Florida, March 8, 1949), Harry S. Truman Library and Museum, https://trumanlibrary.org/publicpapers/viewpapers.php?pid=1067.

was drawn: "weakness in the classroom meant weakness in the dangerous postwar world."[19] Because of this fear, JoAnne Brown argues, "educators in the public schools found themselves under attack for alleged weaknesses in pedagogy and curriculum that were blamed for many perceived weaknesses in national character." Progressive pedagogues and life adjustment curricula[20] were lambasted for being anti-intellectual and vulnerable, if not sympathetic, to communism.[21]

In the midst of such arguments about anti-intellectualism, common misunderstandings about the nature of science and disciplinary work also emerged, which led to increased fear and conflations about the differences *between* science and technology. According to John Rudolph's analysis, many people believed that the scientific understanding of atomic energy was some sort of secret – almost like a code – that needed to be protected from thieves and international spies, lest the country's atomic advantage would give way. Scientists tried to explain, however, that because of the nature of science, "When one is so fortunate as to know where to look and what results to expect, then discovery is certain." From this perspective, national security policies could never effectively safeguard scientific findings. But as one scientist put it, "In science…you cannot *keep a secret*. The best and most you can hope to do is to *keep ahead*."[22] The real race, then, was toward the *technological* developments that could be created as a result of the scientific findings. In this respect, science was subordinated to technology, and given the

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[19] JoAnne Brown, "A is for Atom, B is for Bomb: Civil Defense in American Public Education," *The Journal of American History* 75 (June 1988): 70.

[20] Rudolph, *Scientists in the Classroom*, 17.

[21] Brown, "A is for Atom," 73.

[22] Rudolph, *Scientists in the Classroom*, 45.

country's "emerging spirit of laissez-faire individualism," such a climate "placed a newfound premium on intelligence, if only of the technical sort."[23]

Misunderstandings aside, the public had also become quite distrustful of the scientific community during the Cold War. Of course, it can be hard to blame those who had witnessed not only technological developments in nuclear weaponry, but the horrific results of the bombings of Japan and the intermittent threats of nuclear fallout from U.S. testing sites. The people's suspicion of the technologies, however, posed a major threat to "the scientific community" because it had "depended on popular support – or at least very large acquiescence – in order to maintain federal funding of large-scale scientific research."[24] In light of this, some elite scientists of this era attempted to gain unfettered control over funding and academic freedom in their field by insulating it from the fickleness of the public's fears and input. The solution to this problem was originally conceptualized in 1945 by Vannevar Bush, a leader of the Manhattan Project, and his vision was realized five years later in the creation of the National Science Foundation (NSF).

In 1950, the NSF became the newly devised group that was tasked with providing "independent funding and coordinating…for scientific research."[25] More importantly for the purposes of this study, this particular "federal agency…provided the key institutional base for the science education reform movement." Throughout Bush's advocacy for publicly funded scientific research, he impressed upon Congress that one of the benefits of science was "its capacity to produce impressive technological applications."[26] Such technologies, it would seem,

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[23] Ibid., 31.

[24] Ibid., 41.

[25] Ibid.

[26] Ibid., 118.

benefitted national security as much as they did the consumer markets. Most importantly, though, the techniques and the metaphors that scientist reformers used helped to place them in a unique position where they were able to define not only the problems in education and their solutions; they were able to suggest the *means* by which to solve the problems.[27]

Needless to say, it was a broad network of people who rallied together during the debates and frenzy of the late 1940s and 1950s. In order to capture the span of actors involved in creating the resulting education reforms, historians have described this network as a partnership between government agencies, academics, and professional educators.[28] In other words, while there might have been *some* pivotal actors from each of these areas, the arguments and resulting direction were created and sustained by innumerable webs of people and their interactions with one another. This coordination was facilitated, no doubt, by federalism: the mode of governmental organization "where the national government pursues national aims but has faith in the distinctive capacities of the states." And as Patrick Roberts explains, President Eisenhower, who served for the majority of the 1950s, "was one of the last presidents to endorse the spirit of cooperative federalism."[29]

As a result of the discourse and the political coordination, the two greatest fears of the decade – communism and atomic bombardment – became manifest in two curricular shifts. First,

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[27] Ibid., 197.

[28] The educators who were mainly involved in the National Defense Education Act of 1958 were from the National Education Association and the U.S. Office of Education. See Wayne J. Urban, *More Than Science and Sputnik: The National Defense Education Act of 1958* (Tuscaloosa, 2010), 106-135. However, the scientists, who have been characterized as academic 'elites,' came from the National Science Foundation. See Rudolph, *Scientists in the Classroom*, 2.

[29] Patrick S. Roberts, "The Lesson of Civil Defense Federalism for the Homeland Security Era," *The Journal of Policy History* 26, no. 3 (2014): 356.

there was the civil defense curriculum, which came along at the very beginning of the 1950s. This curriculum, which was anti-communist in nature, involved training and infrastructural reorganization for the purpose of emergency preparedness. The school curriculum is most commonly known for the infamous air-raid drills that taught school children to 'duck and cover,' but the ideas inherent to it were well integrated throughout many aspects of schooling. For instance, public and private schools across the U.S. also implemented child identification protocols, where children were issued dog tags to wear so as "to aid civil defense workers in identifying lost and dead children in the event of an atomic attack."[30] The paranoia of nuclear attack permeated the architecture of school campuses as well. Many believed that school buildings should function as bomb shelters and spaces for emergency evacuation, so buildings constructed during this era included less windows and more protective devices such as "bomb curtains."[31] Given the changes that citizens witnessed in their schools – especially parents – there can be little doubt that the civil defense curriculum itself contributed to the public's escalating fears and suspicions of science and its ensuing technological developments.

The second curricular shift came in the mid-1950s with the introduction of the pre-college science education curriculum that was written and led by scientists. It was assumed that no group was better equipped to "bring education into the scientific age"[32] than the experts of the physical sciences who had been involved in Cold War research and development. Furthermore, since the Space Race had increased the demand for scientists in general, it was assumed that these scientists should be the ones to oversee the production of emerging scientists as well. The

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[30] Brown, "A is for Atom," 81.

[31] Ibid., 88.

[32] Rudolph, *Scientists in the Classroom*, 84.

development of this curriculum, according to Rudolph's study, was orchestrated by Jerold Zacharias, a physicist involved in both the MIT Radiation Lab and the Manhattan Project. Zacharias started developing the physics-based high school curriculum in 1956 after he attained the interest and funding from his colleagues at the NSF. With this backing, he took leadership of a group called the Physical Science Study Committee, which developed a series of teaching materials and methods, a detailed scope and sequence, experiments and procedures, assessments, and the black and white instructional filmstrips that many readers might recognize.

The aim of this curriculum, according to Zacharias, was to provide the resources that would get "the least talented football coach [to] get his physics class under way without a fumble."[33] His assumptions about the professional and academic capabilities of teachers mirrored the many curricula reformers who came both before and after him.[34] However, the work of the Physical Science Study Committee only gained in legitimacy once the Soviet Union launched Sputnik in October of 1957. With the public's fears ignited, the NSF decided to get behind curriculum development in biology and chemistry too,[35] and then, less than a year after Sputnik's launch, Eisenhower signed the *National Defense Education Act of 1958* (NDEA).

This particular piece of legislation is often credited with being the initial bridge toward federal intervention into localized schooling, but there are two equally important shifts that occurred because of NDEA. First, the legislation provided substantial funding for education.

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[33] Zacharias as quoted in Rudolph, *Scientists in the Classroom*, 96.

[34] The concept of the 'teacher proof' curriculum was present in the ideas of John Franklin Bobbitt in the early 1900s. See Herbert M. Kliebard, *The Struggle for the American Curriculum: 1893-1958*, (New York: Routlege, 2004). It is present also in the scripted curricula and educational software programs being used in the schools today.

[35] Rudolph, *Scientists in the Classroom*, 100.

Among the specified earmarks were provisions for the advancement of science and world language curricula in schools, and funding for research and development on effective uses of school-based media technologies. Second, NDEA also provided a massive funding boost for the NSF, "that nearly tripled its budget for fiscal year 1959."[36] These two components of the legislation meant that through NDEA, scientists secured the implementation of a curriculum that favored their view of the world as well as the funding to propagate it.[37]

The discourse of the Cold War era was shot through with paternalistic and very limited notions of 'democracy.' Due to fears of communism, anything that was remotely collective in nature was shunned. 'Democracy' assumed a hyper-individualistic meaning; whatever contradicted this definition was suspect, if not attacked. If one thing is to be gleaned from the complicated era surrounding the launch of Sputnik (which I refer to as *Sputnik I* for sake of clarity) it is that this period was filled with a myriad of fears and a variety of 'crises' that worked with and against one another simultaneously. These struggles were ushered into the curriculum and the lives of children by a paternalistic contradiction that aimed at national and personal protection by throwing the youth and their schools into the fight.

The civil defense program, for instance, was a realization and reinforcement in the logic that assumed education could protect the 'vulnerable mind' from the ideology of communism and the physical body from the effects of nuclear attack. This move not only censored open inquiry and dialogue about ways of thinking and being; it stands to reason that the curriculum itself further inflamed the prevalent fears and skepticism about science and its ensuing

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[36] Ibid., 109.

[37] This conclusion about reform in general is replicated in Kliebard's analysis as well. See Kliebard, *The Struggle for Curriculum*, xix.

technological developments. The logic of the pre-college science curriculum, on the other hand, was designed upon the belief that teachers and schools could produce the next generation of scientific human capital if the scientists oversaw production. This came with the added benefit that, from the perspective of the science experts at least, a scientifically trained citizenry stood a better chance of staving off the fearful 'over-reactions' that were aimed at the scientists, their funding, and the emerging technological developments.

Thus, by the time NDEA was signed into law, the problems, their solutions, and the means for solving them had already been a decade in the making through a web of government agencies, academics, scientists, and professional educators. Sputnik was merely the serendipitous event that could be seen by the public, and thereby ignite the sense of crisis that justified the need for broad federal action on the part of the public.[38]

Sputnik II: 1999-2011

Because of the works of historians of Cold War reform, it was possible for me to detect five parallels between the 1950s education-related circumstances that surrounded *Sputnik I* and those that surrounded what I call *Sputnik II*: the era that led up to the re-launching of the metaphor in President Obama's speech. The most prominent parallel is that the United States continues to be rife with national security concerns; feelings of crisis abound in the post-September 11th landscape just as they did at the height of the Cold War. In 2011, however, the fears of the U.S. were being further agitated by the aftermath of the historic economic downturn and the perceived threat of rapid growth in the Asian markets. Where the crisis of *Sputnik I* might have catalyzed public support for science and education through NDEA, President

[38] Ibid., 84.

Obama's 2011 speech left me with the impression that *Sputnik II* was being used to invoke a sense of crisis with the hope that it would incite a similar response (i.e. the valorization of science and the use of schools toward this aim).

A second parallel between the two periods was the narrowed use of the term 'democracy.' With *Sputnik I*, 'democracy' tended to symbolize the exact opposite of communism (as if the two existed on a spectrum), and therefore did not provide any sense of openness to thinking about or imagining varied ways of living. In contrast, President Obama did open his speech by expressing the value and good that can come from varied perspectives and "contentious" debates about beliefs, but his notion of democracy was fused with neoliberalism. Michael Apple defines the characteristics of neoliberalism as:

> ...the dramatic expansion of that eloquent fiction, free market; the drastic reduction of government responsibility for social needs; the reinforcement of intensely competitive structures...the lowering of people's expectations for economic security; the "disciplining" of culture and the body; and the popularization of what is clearly a form of social-Darwinist thinking...[39]

Thus, whether it was the discourse of *Sputnik I* or *Sputnik II,* the term democracy was not used to address the political system and the social habits that lead toward a better quality of life for all; rather it was a somewhat veiled means for swearing allegiance to the economic system.

This emphasis on economics is heavily intertwined with the much larger third parallel between these two eras: the belief that 'science will save us.' For example, much of the public had grown wary of science and the technological developments surrounding *Sputnik I,* a result that was largely related to the horrific consequences of nuclear weaponry. The key to quelling

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[39] Apple, "Creating Difference," 15.

such fears, for the scientific elite at least, was an epistemological one: *more scientific thinking*.[40] The fears of nuclear weaponry, however, simultaneously fed the secondary fear of being outpaced by the Soviet Union. So for those who shared the concern about national security – individuals most likely from industry and the federal government – the solution was an obvious one: *more scientific output* in regard to technological production and human capital alike. Of course, if the logic supported the notion that the country needed to think more scientifically and to produce more scientific output, then surely it also needed to seek counsel from *more science experts*.

The assertion that 'science will save us' was rampant with *Sputnik II* as well, but it had evolved somewhat. The concerns for safety remained ever-present due to fears of terrorism, but the country's national security concerns had taken root in an economic component that was not necessarily eminent with *Sputnik I*. Again, because of the financial collapse in 2008 and the industrial growth in China and India, the perceived threat surrounding *Sputnik II* was blatantly economic instead of nuclear. Because of this threat, the president proposed that the country "invest in biomedical research, information technology, and especially clean energy technology" as a means to "strengthen our security, protect our planet, and create countless new jobs."[41] This means that the primary discursive prescription was the same – *more scientific output* – and

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[40] The tendency of scientists and engineers to assume "that the publics' views can be changed and that the way to do so is to increase 'scientific literacy' with more information" is, unfortunately, a recurring discourse that delegitimizes localized knowledges, the innumerable ethical frameworks, and the multitude of ways to view and understand science. Brian Wynn is credited with first calling this belief about and approach to communicating with the public about science the "deficit model." Canek Phillips and Kacey Beddoes, "Really Changing the Conversation: The Deficit Model and Public Understanding of Engineering," (paper, American Society for Engineering Education, Atlanta, GA, June 23-26, 2013).

[41] White House, Office of the Press Secretary, "Remarks by the President in State of the Union."

therefore required more government-funded scientific research, more technological production, and more human capital.

As with *Sputnik I*, these professed needs also required the input of *more science experts*. Recall, however, that some scientists in the 1950s argued that science and technology were two very different things: science was about research and discovery, and technology was the output derived *from* science. Considering this argument and the fact that the crisis of *Sputnik II* was deemed to be primarily economic and output-related (not nuclear), the scientists took a backseat to a group of experts with a set of intersecting characteristics that became valorized at the onset of the information age. These were individuals who had 1) mastered the booming economy of 1990s, and 2) understood well the innovations taking place in the information technology sector. This intersection, I explain, is where the venture capitalists emerged as the *economic and technological experts* believed to be most qualified for prescribing and overseeing the solutions to *Sputnik II*.

The call for *more scientific output*, especially when it comes to human capital, always has political and epistemological implications for education. For both eras in this study, these demands resulted in a push for *more scientific thinking*, and this leads to the final parallel between *Sputnik I* and *Sputnik II*: failing schools. President Obama embraced this discursive notion when he claimed that the public education system was "not working."[42] Like the use of the Sputnik metaphor itself, this claim was not new; educational historians have depicted time and again that reform is often aimed at fixing the supposedly broken institution.[43] Unfortunately,

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[42] Ibid.

[43] David B. Tyack and Larry Cuban, *Tinkering Toward Utopia: A Century of Public School Reform* (Cambridge: Harvard University Press, 1995); Carl F. Kaestle, *Pillars of the Republic: Common Schools and Society, 1780-1860* (New York: Hill & Wang, 1983); Joel

this component of the discourse indicated to me that the harmful education reforms I had experienced since I started teaching in 2002 were unlikely to abate in the near future.

Furthermore, while the Sputnik metaphor was being used to sound a rallying cry to the public, it signified a glaring concern for public schools and their teachers and students because references to the Cold War and the Space Race alluded to "the beginning of a long decline in the public image and influence of professional educators…"[44] The era to which the president referred was also symbolic of heightened fear and paranoia; increasing federal control; another shift in educational reform; and a flood of resources that would travel through the schools, the colleges, and into the military industrial complex.[45] While this metaphor might have felt inspirational to those interested in scientific research, technological development, and profit, it felt detrimental to those of us who remain committed to the intellectual, emotional, and social growth of human beings.

Spring, *The American School, 1642-2000* (New York: McGraw-Hill, 2005); David B. Tyack, *The One Best System: A History of American Urban Education* (Cambridge: Harvard University Press, 1974); John L. Rury, "Democracy's High School? Social Change and American Secondary Education in the Post-Conant Era," American Educational Research Journal 39 (Summer 2002): 323; David F. Labaree, *Someone Has to Fail: The Zero-sum Game of Public Schooling* (Cambridge: Harvard University Press, 2010).

[44] Urban, *More Than Science and Sputnik*, 156.

[45] Gerald L. Gutek, *American Education 1945-2000: A History and Commentary* (Prospect Heights: Waveland Press, 2000), 44-51, 91-115; Rudolph, *Scientists in the Classroom*; Urban, *More Than Science and Sputnik,* p. 75-76, 136-171; Brown, "A is for Atom," 68-90; Homer A. Neal, Tobin L. Smith, and Jennifer B. McCormick, *U.S. Science Policy in the Twenty-First Century* (Ann Arbor: University of Michigan Press, 2008), 3-16.

Statement of the Problem: A Convergence of Crises and Interests

When the work of many education historians is considered, it is apparent that schooling in the United States was founded on crisis. This social institution, which has long been feminized and labored over by women in the U.S.,[46] is perpetually subjected to the cruel and often contradictory whims of paternalism. In moments of upheaval and uncertainty, the patriarchy has tended to latch onto and attempt to control the spaces and people it believes it can. More often than not, this has included schools, children, and women (since women entered the profession, at least). Thus, from the *Old Deluder Satan Law of 1647* to the *Every Student Succeeds Act of 2016*, those in power have consistently attempted to use school policies to ward off *their* perceived problems of the day, whether it be heresy and 'moral degradation,' cultural and racial 'degeneracy,' threats of communism, lags in human capital production, or international challenges to the nation's economic and political domination. The trend of crisis is so pervasive, in fact, that studies in the genesis of education policy might be more suitably described as simply *a study of crises among the elite*. And unfortunately, when there is a crisis in education, few experts or policymakers presume that educators, students, and their communities can provide valuable insights into the system's problems and its potential solutions.

With the approach of the twenty-first century, however, such crises seemed to occur with accelerating frequency. As philosopher Lynda Stone argued in 2004, "A crisis exists in American education…The 'inception' of this current crisis is generally dated from the early eighties – and the report known as *A Nation at Risk.*"[47] This period of crisis is now more than

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[46] Nancy Hoffman, *Woman's "True" Profession: Voices from the History of Teaching* (Cambridge: Harvard Education Press, 2003).

[47] Lynda Stone, "Crisis of the Educated Subject: Insight from Kristeva for American Education," *Studies in Philosophy and Education* 23 (2004): 103.

three decades old. As a result of the persistent discourse of failing schools, many education scholars have become skeptical of the legitimacy of the crisis rhetoric associated with contemporary education reform movements.[48] I agree that we should always maintain a healthy awareness for the propensity of some to manufacture a crisis.[49] But crises also spread rapidly, with obscurity, and thereby complicate the ability to see their origins and understand the real problems at hand. Because of this, David Labaree reminds us that "…if major social reform is the offspring of social crisis…then the first step in trying to understand the nature of the…movement is to figure out the nature of the crisis that provoked it."[50]

In terms of the crisis surrounding *Sputnik I*, there are two insights from Cold War education historians that have been particularly illuminating. The first is that the pre-Sputnik reforms and the passage of NDEA were facilitated by a partnership between government agencies, academics and scientists, and professional educators.[51] As a result, the education policies and curriculum were infused with a complicated variety of fears and problems. Given

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[48] David C. Berliner and Bruce J. Biddle, *The Manufactured Crisis: Myths, Fraud, and the Attack on America's Public Schools* (White Plains: Longman, 1997); Deron Boyles, *American Education and Corporations: The Free Market Goes to School* (New York: Falmer Press, 2000); Ira Shor, *Culture Wars: School and Society in the Conservative Restoration* (Chicago: The University of Chicago Press, 1992); Peter Sacks, *Standardized Minds: The High Price of America's Testing Culture and What We Can do to Change It* (New York: Da Capo Press, 1999); Erwin V. Johanningmeier, "A Nation at Risk and Sputnik: Compared and Reconsidered," *American Educational History Journal* 37 (2010): 347-365; Diane Ravitch, *Reign of Error: The Hoax of the Privatization Movement and the Danger to America's Public Schools*, (New York: Basic Books, 2013); Diane Ravitch, *The Death and Life of the Great American School System: How Testing and Choice Are Undermining Education*, (New York: Basic Books, 2010).

[49] Berliner and Biddle, *The Manufactured Crisis*.

[50] Labaree, *Someone Has to Fail*, 83.

[51] Urban, *More Than Science and Sputnik*; Rudolph, *Scientists in the Classroom*.

these factors, it is probable that President Obama tapped into an existing conceptual framework and that the notion of crisis was shared by an array of people in policy circles. It is important, therefore, to first discern who was involved in the government-industry-academic partnership that preceded the 2011 speech, and one way to do this is by determining who else was using the Sputnik metaphor around that time.

A second invaluable insight provided by historians is the fact that the groundwork for NDEA was laid long before the launch of Sputnik catalyzed an already anxious U.S. public. This insight is further bolstered, of course, by my philosophical stance on Deweyan inquiry and the belief that modes of action emerge from a deeply-felt problem or, in this case, a sense of crisis. My philosophical position and historical understanding, thus, suggest that the notion of crisis had already been felt, defined, and prepared to be ameliorated long before President Obama brought it to the people in 2011. The problem, said simply, is that like the launch in 1957, the Sputnik moment of 2011 was also not the real crisis. Crisis discourse – whether today or in the 1950s – always has a backstory; it has social and educational ramifications that sit quietly beneath the president's rhetoric as it is spoken.

The landscape of education reform changed significantly with the arrival of the twenty-first century.[52] During this time there was a major convergence – of crises *and* interests – that grew into an uncharacteristically bi-partisan movement[53] that was facilitated by the emergence of

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[52] Unlike earlier reform movements in U.S. history, Diane Ravitch argues that this particular one was "… determined to cut costs and maximize competition among schools and among teachers." An overarching aim was "… to eliminate the geographically based system of public education," which has been in place in the U.S. for over a century, "… and replace it with a competitive market-based system of school choice." Ravitch, *Reign of Error*, 19.

[53] Ibid., p. 22-28. McGuinn argues that this bi-partisan convergence was developed under the Bush Administration between 2001-2005 and coupled accountability, federal funding, and more federal control. Patrick J. McGuinn, *No Child Left Behind and the Transformation of*

venture philanthropy. This convergence yielded massive policy networks[54] that are problematic because of the substantial threat they pose to democratic contribution and decision-making. This has resulted in centralized mandates, along with technocratic methods and banal assessments that increasingly devalue the practical knowledge and situated experience of the students, teachers, and communities served by public schools. Thus, while I agree with Labaree's overarching point about crisis in social reforms, something that has added both power and obscurity to this movement is the fact that it was not elicited by *one* crisis, but from a *convergence* of crises. In addition to these problems, and given the crises and interests of those involved in steering this reform movement, there has emerged a curricular trend that values and aims to produce very specific forms of knowledge at the grave expense of others. As with *Sputnik I*, the crisis discourse of *Sputnik II* has since congealed into a curricular shift that is now simply referred to as STEM (science, technology, engineering, and math). Or, when the arts and reading are put unquestioningly in the service *of* science, some call it STREAM. Few are willing to acknowledge

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Federal Education Policy, 1965-2005, (Lawrence: The University Press of Kansas, 2006). Labaree describes this convergence as two simultaneously occurring reforms: the standards movement and the choice movement. Labaree, *Someone Has to Fail.* Along the same lines as Labaree, Reckhow sees it as a convergence among those with interests in markets and accountability who have become "impatient with public bureaucracies and have focused their efforts on creating … private and nonprofit alternative for developing and running schools." Reckhow, *Follow the Money: How Foundation Dollars Change Public School Politics*, (Oxford: Oxford University Press, 2013), 2. These scholars all describe this same convergence, but in slightly different ways. Gimpel and Edwards, however, explain how some aspect of this right-left coalition developed out of the efforts of lobbyist and immigration attorney, Rick Swartz. James G. Gimpel and James R. Edwards, Jr. *The Congressional Politics of Immigration Reform* (Boston, 1999)

[54] Mark Wolfmeyer, *Math Education for America?: Policy Networks, Big Business, and Pedagogy*, (New York: Routledge, 2014).

that this really amounts to something that might better be called EBSS: everything but social studies.[55]

In academia and the blogosphere, there is a plethora of critical research and commentary on the ramifications and ideologies of this reform movement. The problem in terms of scholarship, however, is that the backstory of this convergence has yet to be told. To better understand, and not only be critical of contemporary reforms, this narrative is vital. After all, the reforms of today are always connected in some capacity to those of the past, and meliorative action first requires that inquiry make those connections.

Having clarified the problem at hand, Dewey says the next move is to suggest some way out of the felt difficulty. In this respect, the historical and discursive parallels between *Sputnik I* and *Sputnik II* – ideas and beliefs about crisis, democracy, failing schools, and whether science will save us – provide a framework through which to examine the dynamics that would come to shape U.S. education reform throughout the first decade and a half of the twenty-first century.[56] The answer, I believe, is to conduct a historical analysis by way of this metaphor. That is, just as Labaree reminds us that there is much analysis to be done when someone claims a crisis, Lakoff

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[55] See Jessica A Heybach and Eric C. Sheffield, "Creating Citizens in a Capitalistic Democracy: A Struggle for the Soul of American Citizenship Education," in *Citizenship Education Around the World: Local Contexts and Global Possibilities,* eds. John E. Petrovic and Aaron M. Kuntz (New York: Routledge, 2014). The authors note that in a political climate, rife with the conflation of neoconservative and neoliberal rationalities, anything resembling civics education is appropriated in the service of maintaining domination over the global economy. In this respect, social studies remain merely superficial and economic, not transformative and emancipatory.

[56] According to Reisigl and Wodak, these individual components are interdiscursive, meaning that they "are linked to each other in various ways." *Sputnik I* and *Sputnik II,* however, are intertextual, meaning that they "are linked to other texts" (i.e. discourses), "both in the past and in the present." Martin Reisigl and Ruth Wodak, "The Discourse-Historical Approach (DHA)," in *Methods of Critical Discourse Analysis*, eds. Ruth Wodak and Michael Meyer (Thousand Oaks: SAGE Publications, 2009), 90.

and Johnson also note that a specific metaphor – in this case, Sputnik – can serve as a framework for understanding ideology and human action:

> A metaphor may thus be a guide for future action. Such actions will, of course, fit the metaphor. This will, in turn, reinforce the power of the metaphor to make experience coherent. In this sense metaphors can be self-fulfilling prophecies.[57]

These historical and metaphorical insights bring me to the questions I explore in this study: *Whose crisis is this really? What were the crises of those involved in the re-launching of the Sputnik metaphor, and how did they and their interests converge around public education?*

After chasing the use of the Sputnik metaphor throughout a decade of public statements and governmental reports, I believe that the origin of the *Sputnik II* framework likely came from the scientist and academic, Shirley Ann Jackson. My winding journey through the rabbit holes of the Internet suggest further that the dominant crises stemmed not only from her concerns; they also came from the federal government and the venture philanthropists Bill Gates and Eli Broad.

These four entities comprise the focus of this analysis and function as part of what Maarten Hajer calls a *discourse coalition*: "a group of actors who share a social construct," such as the Sputnik metaphor. The coalition "[tries] to impose their views of reality on others, sometimes through debate and persuasion, but also through manipulation and the exercise of power." The point that may be most pertinent to this study, however, is that the social construct adopted by the coalition is one that emerges "in the context of a historical" background, and therefore implies "knowledge of how similar phenomena were dealt with in the past."[58] Even

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[57] George Lakoff and Mark Johnson, *Metaphors We Live By*, (Chicago: The University of Chicago Press, 1980/2003), 156.

[58] Maarten A. Hajer, "Discourse Coalitions and the Institutionalization of Practice: The Case of Acid Rain in Britain," in *The Argumentative Turn in Policy Analysis,* ed. Frank Fischer and John Forester (Durham: Duke University Press, 1993), 46.

though I focus on Jackson, Gates, Broad, and the federal government specifically, it is important to note that the government-industry-academic partnership stretched well beyond this discourse coalition. To be clear, it was a massive web of actors.[59]

However, I choose these particular entities for this study because the *Sputnik II* discourse is given voice by them, but also because a specified focus makes the narration much more manageable. That is, they each represent differing, and at times overlapping, segments of the broader government-industry-academic partnership. The federal government comprises the first leg of the partnership, while Gates and Broad represent the industry component. Jackson, on the other hand, is more complex because of her experience in all three segments. Thus, she functions as part of the governmental segment in Chapter 2, but then represents the academic leg once she becomes the president of Rensselaer Polytechnic Institute and a leader in the organization known as BEST. By narrowing the focus to these specific members of the discourse coalition, one can attempt to pull some coherence out of an otherwise chaotic era, and in doing so, it is possible to examine the *Sputnik II* discourse alongside some of the ideas and actions that contributed to it. In this capacity, the narrative structure resembles a French braid, so to speak. That is, I begin by weaving a few primary threads together, and then I backtrack when needed so I can bring more breadth and new lines into a broader, overarching story.

Jackson warrants a significant place in this analysis because an understanding of the corporate reform movement can be made much clearer by her work and insights. Not only did the construct of *Sputnik II* appear to originate with her, but she has also gone unmentioned by critical education scholars. Furthermore, where many scholars have written in a general sense about the convergence of interests in recent U.S. education policy, few have written specifically

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[59] Wolfmeyer, *Math Education for America?*.

about *interest convergence* in the capacity described by Derrick Bell. This is the unfortunate political tendency where, "The interest of blacks in achieving racial equality will be accommodated only when it converges with the interests of whites."[60] Jackson's storyline makes Bell's argument evident in the elite circles that encompassed national education policy at the beginning of the new century. As an African American woman with an accomplished career – one that spans the corporate realm, the field of science, the federal government, and higher education – Jackson has consistently seen the country's diversity as "an American strength that must be exploited."[61] She has claimed that women and people of color have long been an untapped resource for the scientific, engineering, and technological sectors. I interpret this to mean that she aims at 'equality by way of human capital.' While the ethical foundation of her position is debatable, my narrative suggests that, consistent with Bell's description, it is the human capital component of Jackson's aim that the industry and venture philanthropists seemed most willing to embrace.

The involvement of Broad and Gates in this discourse coalition may not be surprising to many readers because of their continued involvement in U.S. education policy. Many writers have rightfully turned a critical eye toward the heavy-handed and undemocratic interventions of corporations and venture philanthropists in their critiques of neoliberal education reform efforts. Corporate philanthropy, although it has long been a part of education reform movements and

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[60] Derrick A. Bell Jr., "Brown v. Board of Education and the Interest Convergence Dilemma," *Harvard Law Review* 93 (1979): 523.

[61] Council on Competitiveness, *Innovate America: National Innovation Initiative Summit and Report* (2005), 21, http://www.innovationtaskforce.org/docs/NII%20Innovate%20America.pdf.

schooling,[62] played an integral part in shaping the school policies that have trailed the signing of NCLB.[63] The recent development of *venture philanthropy*[64] has also been particularly problematic, and there is certainly substantial literature that critiques the large family foundations[65] and their part in what Diane Ravitch calls the "corporate reform movement."[66] Scholars have also focused on the effects of venture philanthropy in the "neoliberalization of the

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[62] James D. Anderson, *The Education of Blacks in the South, 1860-1935* (Chapel Hill: The University of North Carolina Press, 1988); Peter Dobkin Hall, "Business, Philanthropy, and Education in the United States," *Theory into Practice* 33, no. 4 (Autumn, 1994): 211-217; John H. Hamer, "Money and the Moral Order in Late Nineteenth and Early Twentieth-Century American Capitalism," *Anthropological Quarterly* 71 (July, 1998): 138-149.

[63] Boyles, *American Education and Corporations*; Randy Hewitt, "Priming the Pump: "Educating" for Market Democracy" in *Schools or Markets?: Commercialism, Privatization, and School-Business Partnerships*, ed. Deron R. Boyles (Mahwah: Routledge, 2009), 47-58; Alex Molnar, *School Commercialism: From Democratic Ideal to Market Commodity*, (New York: Routledge, 2005).

[64] Peter Frumkin, "Inside Venture Philanthropy," *Society*, 40 (2003): 7-15. Frumkin describes the concept of venture philanthropy, but the undemocratic description in this sentence is not his perspective.

[65] Ravitch, for instance, details the connections between the wealthiest venture philanthropists – a group she calls "The Billionaire Boys' Club" (Bill and Melinda Gates Foundation, Walton Family Foundation, The Eli and Edythe Broad Foundation, Robertson Foundation, and Michael & Susan Dell Foundation). See Ravitch, *The Death and Life*, 195. See also Ravitch, *Reign of Error;* Mark Dowie, *American Foundations: An Investigative History* (Cambridge: MIT Press, 2002); Kenneth Saltman, "The Rise of Venture Philanthropy and the Ongoing Neoliberal Assault on Public Education: The Case of the Eli and Edythe Broad Foundation," *Workplace,* 16 (2009): 53-72. Megan E. Tompkins-Stange, *Policy Patrons: Philanthropy, Education Reform, and the Politics of Influence,* (Cambridge: Harvard Education Press, 2016); Reckhow, *Follow the Money*; Michael Klonsky and Susan Klonsky, *Small Schools: Public Reform Meets the Ownership Society*, (New York: Routledge, 2008); Philip Kovacs, ed., *The Gates Foundation and the Future of U.S. "Public" Schools*, (New York: Routledge, 2011).

[66] Salient components of corporate reform include a strong emphasis on high-stakes testing and its use in the management of schools, students, and teachers; the eradication of due process and pensions for teachers; the elimination of democratically elected school boards; and the deprofessionalization of educators. See Ravitch, *Reign of Error*, 19.

global economy," and how it shapes local[67] and global[68] schooling policies. In one way or another then, scholarly attention has been devoted to the interventions of venture philanthropists; their influences on education policy; their support for charter schools, privatized management of schools, and other education-related companies; and the profits they sought from their ventures. However, scholars have failed to produce a historical account describing *how* the venture philanthropists came onto the scene in the U.S. For example, Diane Ravitch simply describes it in the following way: "Each of the venture philanthropies began with different emphases, but over time they converged in support of reform strategies that mirrored their own experience..."[69] She also mentions the substantial boost in philanthropic school funding that occurred after 1998,[70] but a historical account of what occurred during this timeframe has yet to be told. Thus, I provide a case study that explains how these dynamics came together in the U.S. specifically. Yet, at the same time, it must be noted that this narrative is only one small component in a much larger global education reform movement.

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[67] Pauline Lipman, *The New Political Economy of Urban Education*, (New York: Routledge, 2011), 103.

[68] Daniel Tröhler, "Change Management in the Governance of Schooling: The Rise of Experts, Planners, and Statistics in the Early OECD," *Teachers College Record*, 116 (2014): 1-26; Riyad A. Shahajahan, "Coloniality and a Global Testing Regime in Higher Education: Unpacking the OECD's AHELO Initiative," *Journal of Education Policy* 28 (2013): 676-694; Heinz-Dieter Meyer, "The OECD as Pivot of the Emerging Global Educational Accountability Regime: How Accountable are the Accountants," *Teachers College Record* 116 (2014): 1-20; Heinz-Dieter Meyer et al., "Accountability: Antecedents, Power, and Processes," *Teachers College Record* 116 (2014): 1-12.

[69] Ravitch, *The Death and Life,* 200.

[70] Ibid, 195-222.

Argument

Conducting analyses of the convergence of interests surrounding schooling policies is a tried and true historiographical method in education studies. Thus, in the course of this study I will make the case that the country's first education 'crisis' of twenty-first century, the rise of venture philanthropy, and the recent corporate reform movement were born out of 1) battles over immigration and 2) the technological transitions and economic conditions that surrounded the arrival of the year 2000 (Y2K). These pre-existing concerns were then given legitimation following the attacks on September 11, 2001. I utilize the historical accounts of *Sputnik I* as a framework to explore *Sputnik II*. As a result, I construct a historical narrative explaining the convergence of interests among the discourse coalition as well as the convergence of crises for the individual legs of the government-industry-academic partnership. By weaving these together, I am able to explain how these interests crystalized around and then empowered education reform in the U.S. at the onset of the twenty-first century.

With *Sputnik I,* the demand for *more scientific output* and *more scientific thinking* combined with fears of nuclear weaponry and brought about the pre-college science curriculum for the scientific age. With *Sputnik II*, I argue, these same demands mixed with a new set of fears that were related to the new technological landscape, terrorism, and the historic economic recession. These circumstances not only opened up space for a major convergence of interests that were realized in the formation of the government-industry-academic partnership; they provided the venture philanthropists with the opportunity to give momentum to their own suggestions. While a disproportionate emphasis on science, technology, engineering, and mathematics is certainly not new in the U.S., I argue further that these dynamics did yield the

curriculum for the information age as well as the discursive device[71] that is now commonly and uncritically referred to as STEM. The solution for public education during *Sputnik I* might have come from *more scientific experts*, but the massive capital accumulation and public valorization of the 'successful billionaire' in the 1990s helped ensure that the venture philanthropists were poised to be the *economic and technological experts*[72] in the era of *Sputnik II*.

The data for this analysis have been collected through a snowball method and fall into three categories. First, the written and spoken words of Jackson, Gates, and Broad have been scoured for their own thoughts regarding crisis, Sputnik, and their personal justifications for being interested in schooling and policy. These data are taken from speeches, interviews, personal blog posts, authored papers, organizational reports, and press releases published by these individuals and the organizations with which they have been affiliated. The second data set comes from governmental and industry reports that are either cited or authored by these individuals and their organizations. Throughout the narrative, I strive to use these actors' words as much as possible. The third data set comprises articles from news outlets. I use these to help flesh out some of the more contextual details about the chronology of the discourse coalition's work and actions during this period.

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[71] Such devices – like metaphors, fallacies, tropes, etc. – comprise the multitude of components that are utilized to forward discursive strategies. Reisigl and Wodak, "The Discourse-Historical Approach (DHA)," 95. The acronym that was originally coined by NSF during the 1990s was SMET. However, that started evolving into the more preferred term, STEM, after 2001. Madeline Patton, *ATE@20: Two Decades of Advancing Technology Education* (Madison: Internet Scout Research Group, 2013), https://atecentral.net/local/misc/ATE_at_20.pdf; Mark Sanders, "STEM, STEM Education, STEMmania," *The Technology Teacher*, (January, 2009).

[72] The fact that philanthropists were seen as experts in the economic capacity is not necessarily surprising in light of Dowie's insights: "… because most of America's original philanthropists were capitalists or heirs of capitalists, the culture of capitalism has quite naturally permeated the philanthropic imagination." Dowie, *American Foundations*, xxxvii.

A vast majority of the data for this study is web-based and has been copied and stored into an alternative digital format to safeguard against potential data loss. The reports, activities, statements, and news events, as well as my analytical insights, have been logged into a series of overlapping timelines. I draw from this larger data set in order to construct a historical narrative that focuses on the convergence of crises for the discourse coalition, as well as some of the complexity that brought Jackson, Gates, Broad, and the federal government to focus so heavily on U.S. education reform in the beginning of the twenty-first century. My analysis begins with Jackson's appointment to the Nuclear Regulatory Commission in 1995 and ends in 2005. By this point, Jackson was actively broadcasting the notion of the 'quiet crisis,' and all legs of the government-industry-academic partnership had finally incurred a financial interest in propagating a 'native-born' STEM workforce. To demonstrate the validity of my thesis about the convergence of crises and interests and the ability to decode them through metaphor and historical narrative, I first isolate the individual crises of the discourse coalition and how they coalesced at different points in time, resulting in the government-industry-academic partnership. Next, I explain how their proposed solutions aimed toward the creation of a STEM workforce, thereby setting up the impending curricular shift toward STEM. Finally, I provide evidence for how Jackson, Gates, Broad, and the federal government justified their need to advocate for the creation of a national STEM workforce and what each member of the discourse coalition stood to gain in doing so.

Organization

The following chapter orients the reader to the members of the discourse coalition. It begins with Jackson's appointment to the Nuclear Regulatory Commission where, during her five-year tenure in the federal government, she was tasked with overseeing the Y2K preparations

of the nation's nuclear infrastructure. It was toward the end of this period that she began to express her sense for a looming crisis: the dwindling production of scientific and technical talent in the U.S. I bring Gates and Broad into the narrative by turning toward the economic and legislative circumstances that led to market inflation (and its inevitable implosion) through the technology, telecoms, and housing industries. Through these changing dynamics, I explain how these particular venture philanthropists accumulated their wealth and how their family foundations each started taking an interest in K-12 public education. The narrative returns to Jackson just before she leaves her government position to return to academia as president of Rensselaer Polytechnic Institute: the nation's oldest scientific, technological, and engineering research university. It is during this time that she starts to envision the solidification of a government-industry-academic partnership like the one developed during the Cold War.

Chapter 3 opens with the culmination of federal and philanthropic interests that occurred during the height of the technology boom. Given the massive wealth accumulation from that era, conceptions about philanthropy, venture capitalism, and the tech industry's ability to shape the future were in a state of flux. The Clintons hosted the White House Conference on Philanthropy in October of 1999, and the president invited people from the intersection of these three realms to consider the problem of public education. At the same time, the Y2K rollover project not only elicited concerns within the federal government about its own managerial efficiency; the transition also facilitated the formation of the government-industry partnership. After explaining this union, I turn toward the sense of crisis that catalyzed the technology industry's influence in Washington, D.C.: immigration policy and H-1B visas. I consider how the fight for ever-expanding access to international labor resulted in a tech lobby coalition and a new industry-

academic partnership. With the formation of these two alliances, it is possible to see how arguments for immigrants' human rights got sacrificed to the corporate frenzy for human capital.

Just as substantial changes were occurring in information technology, major upheavals were also being brought about in science. In Chapter 4, I describe how the rapidly changing dynamics of the biomedical and biotech fields started to influence the investment directions of Gates and Broad as well as the federal government's concerns about national security. The growing awareness of the vulnerabilities caused by scientific and technological advancements culminated in the most thorough national security evaluation conducted since the one preceding *The National Security Act of 1947* and NDEA. Like other federal agencies in 2000, the Hart-Rudman Commission also mimicked frustrations about managerial inefficiencies. But in addition to demonstrating the spread of this belief throughout the government, the commission adopted the tech industry's rhetoric about a workforce shortage. Through this, the federal government concludes that it has a crisis in human capital and deems education a national imperative, especially in the subjects of science, math, engineering, and technology.

Though the Hart-Rudman Commission associated human capital concerns with education, it was certainly not the only governmental group to take interest in this topic when the twenty-first century was approaching. To be clear, human capital has long existed as an undercurrent in education policy, but it has had a varying amplitude. Therefore, Chapter 5 examines the growing interest in human capital as it developed within the NSF and as it continued to intensify throughout the surge toward neoliberal policies and the Clinton administration's results-based, business-inspired governmental reforms. Through an analysis of the NSF's biennial reports, called *Women, Minorities, and Persons with Disabilities in Science and Engineering*, it is possible to detect changes in language and the expanding scope of interest

as it transitioned from a primary focus on industry, to institutions in K-12 and higher education. This demonstrates how an initial interest in inclusion and equity became consumed, yet again, in the drive for more human capital.

Each leg of the government-industry-academic partnership had expressed interest in the volume and vitality of a science, technology, engineering, and mathematics workforce prior to the inauguration of President Bush. Industry had rooted its crisis in H-1B visas and access to international labor. The federal government had associated its crisis with an aging workforce and its inability to attract native-born labor to the public sector. While the NSF – a quasi-academic, quasi-governmental organization – had certainly expressed its interest in diversifying the fields of science and engineering, the academic component of the partnership had yet to experience a crisis all its own. I argue in Chapter 6 that this changed, along with everything else, in 2001. Not only was the term STEM born, but Jackson became a leader in an organization tasked specifically with building public-private partnerships that could help produce a larger, more diverse STEM workforce in the U.S. In the aftermath and horror of September 11th, NCLB was signed into law. However, because of shifts in immigration trends and policy, academia would slowly start to feel the crisis of a financial squeeze resulting from the declining enrollments of international students. With this development, the convergence of crises and interests was complete. The study concludes with the argument that the government-industry-academic partnership solidified because the cultivation of a native STEM workforce would not only solve the problem of each segment; it would provide financial benefits as well.

CHAPTER 2: PRE-Y2K ERA DEREGULATION AND ACCUMULATION

Jackson & the Federal Government

Shirley Ann Jackson was working as a theoretical physicist and professor at Rutgers University in 1995 when President Bill Clinton nominated her to head the U.S. Nuclear Regulatory Commission (NRC). Her accomplishments were impressive. Four years at the university had been preceded by a decade and a half of research and consulting work at AT&T Bell Laboratories.[1] She also had a decade of experience working with state-level task forces like the New Jersey Commission on Science and Technology.[2] By July of 1995, the first African-American woman to graduate from MIT with a PhD was confirmed as "both the first woman and the first African-American" to chair the five-member, federal commission.[3] Jackson's new position at the NRC put her in charge of "licensing and regulating nuclear facilities and materials" as they related to the "protection of public health and safety; protecting the environment; protecting and safeguarding materials and nuclear facilities in the interest of

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[1] Rensselaer Polytechnic Institute, "Profile of Shirley Ann Jackson, Ph.D.," *President of Rensselaer Polytechnic Institute* (website), accessed March 24, 2013. http://www.rpi.edu/president/profile.html.

[2] National Science Foundation, "Shirley Ann Jackson, Leader in Higher Education and Government, to Receive the Vannevar Bush Award," press release, March 22, 2007, http://www.nsf.gov/news/news_summ.jsp?cntn_id=108494.

[3] U.S. Nuclear Regulatory Commission, "Honorable Dr. Shirley Ann Jackson, Chairman," *About NRC* (website), last modified July 29, 2014, http://www.nrc.gov/about-nrc/organization/commission/former-commissioners/jackson-chairman.html; Rensselaer Polytechnic Institute, "Profile of Shirley Ann Jackson."

national security; and assuring conformity with antitrust laws."[4] Jackson brought to the NRC her strong background in and preference for science and technology, her experience with policymaking, and her extensive familiarity with the corporate climate.

The power structure within the NRC had functioned on a "Commission model" since 1980, which meant that its management and policies were "based on a group of informed individuals making collaborative decisions."[5] This democratic process was altered under Jackson's lead when she chose to reorganize the commission into a "businesslike" management structure. As her profile boasted, "She conceptualized and introduced risk-informed, performance-based regulation to the NRC (utilizing probabilistic risk assessment on a consistent basis), which has been infused throughout its regulatory programs."[6] Her management tactics won accolades from those who lauded her "science-based" approach to policy and management.[7] But neither the businesslike practices of the commission nor Jackson's perspective regarding her own authority were well received by her colleagues and peers.[8] These assessments would be

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[4] Ibid.

[5] U.S. Congress, House of Representatives, Committee on Oversight and Government Reform, *A Crisis of Leadership: How the Actions of Chairman Gregory Jaczko Are Damaging the Nuclear Regulatory Commission*, 112th Cong., (December 13, 2011), 48, http://oversight.house.gov/wp-content/uploads/2012/02/12-13-11-NRC-Report-Final-1.pdf. Debate about the efficiency of management in the NRC ensued after the handling of the nuclear disaster at Three Mile Island. The Reorganization Plan in 1980 "strengthened the role of the Chairman as the principle executive officer," but as of 2011, only two Chairs had ever taken a centralized approach to managing the commission (p. 8).

[6] Rensselaer Polytechnic Institute, "Profile of Shirley Ann Jackson."

[7] National Science Foundation, "Shirley Ann Jackson, Leader."

[8] Martin Virgilio, Jackson's Chief of Staff between 1996 and 1997, recalled her belief "that the Chairman ought to be responsible for presenting policy to the commission, that the Chairman ought to be responsible for ensuring that the staff is following the commission's policy. It caused a lot of…friction between [Jackson] and the other Commissioners at the time."

echoed in her future work. Moreover, as will be discussed intermittently throughout the following chapters, other federal departments were embracing this evolving managerial approach as well.

Accumulation via Legislative Shifts and Deregulation

Jackson's tenure at the NRC coincidentally paralleled substantial economic changes in the U.S. financial market and shifts in mortgage lending practices. The U.S. stock market had been experiencing gradual increases since before 1990, but the second half of that decade brought an explosion of growth in both the national and international markets.[9] This economic expansion is typically associated with the innovation and developments that rose out of the industries of informational technology (IT), telecommunication, and biotech,[10] but it was simultaneously fuelled by the increasing number of foreign investors who placed their faith and money in the U.S. market while international banks and economies fluctuated. As analysts have explained, these mutually-reinforcing phenomena led the stock market to "[grow] even faster, doubling between 1990 and 1995, and then tripling between 1995 and the peak in 2000."[11] This period of growth has come to be known more commonly as the 'dot-com' or 'tech bubble.'

See U.S. Congress, House of Representatives, Committee on Oversight and Government Reform, *A Crisis of Leadership*, 14-15.

[9] Aart Kraay and Jaume Ventura, "The Dot-Com Bubble, the Bush Deficits, and the U.S. Current Account," in *G7 Current Account Imbalances: Sustainability and Adjustment*, ed. Richard H. Clarida (Chicago: University of Chicago Press, 2007), 460.

[10] Michael S. Teitelbaum, *Falling Behind?: Boom, Bust, and the Global Race for Scientific Talent* (Princeton: Princeton University Press, 2014), 57.

[11] Kraay and Ventura, "The Dot-Com Bubble," 461-462.

As technological start-ups and investors were inflating the tech bubble in the mid-1990s, the U.S. Congress passed two important legislative pieces that would influence the wealth accumulation of emerging venture philanthropists as well as the impending series of market collapses that would soon ravage the economy. The first legislative shift involved a series of modifications to the *Community Reinvestment Act* (CRA), which was originally signed in 1977. At its inception, the law was designed to provide low- and moderate-income communities with access to fair banking and mortgage lending by addressing the discriminatory practices of redlining and capital exportation.[12] Over time, the government sought to hold banks accountable by creating a publically accessible system of "examination assessments" that rated how well lenders followed the provisions of the law.[13] The Clinton administration started pushing for stricter adherence to the act in 1993, but lenders countered that "an overemphasis on paperwork and documentation" stalled the implementation while at the same time hindering the ability to know "how much actual credit was being extended" to the targeted communities.[14] The president's initial response was that the industry should "replace paperwork and uncertainty with performance and objectivity,"[15] thereby assuming that data and quantification would automatically result in quality.

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[12] Raymond H. Brescia, "The Community Reinvestment Act: Guilty, But Not As Charged," *St. John's Law Review* 88, no. 1 (2014): 8.

[13] This system was devised under the 1989 modifications of the *Community Reinvestment Act*. In it, lenders were ranked in much the same way teachers are today under current school reforms: "outstanding, satisfactory, needs to improve, and substantial noncompliance." David P. Ely and Kenneth J. Robinson, "Is the Community Reinvestment Act in Need of Further Reform? Evidence from Equity Markets During the 1995 Reform Process," *Journal of Financial Services Research* 23, no. 1 (2003): 61.

[14] Ibid.

[15] Ibid., 62.

After two years of negotiations with banks and regulatory agencies, the Clinton administration finally unveiled a series of reforms that placed value on "performance rather than process" and claimed to seek consistency among regulatory assessments.[16] The problem, however, was that the CRA assessments were only ever required for the traditional depository banks: those localized branches that are commonly found within communities. Because of this, the "stand-alone mortgage lenders"[17] – many of which also happened to be owned by large corporate banks – were able to avoid the oversights of the federal government. Congress approved the modifications to the law in May of 1995, thereby creating the loophole wherein compliance regulations might have increased for smaller banks, but it was reduced for many of the larger mortgage lenders.[18]

The second legislative shift was signed into law less than a year later, on February 8th, and is known as the *Telecommunications Act of 1996*.[19] It was considered a landmark signing in that the ceremony was streamed over a high-speed fiber optic network, and it was the first U.S.

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[16] Ibid., 60.

[17] Brescia, "The Community Reinvestment Act," 2.

[18] Ibid., 8.

[19] In November of 1997, the Pelavin Research Institute provided a report to the Department of Education with suggestions for how districts could fund the massive technological overhaul envisioned by President Clinton and this policy. The authors believed that with technology, schools could decrease "personnel-related costs," "accept higher student-teacher ratios," "blur the distinction between classes," and "significantly adapt instructional experience to the individual student." 54 One of its more concerning suggestions, however, was that this: "A school district may want to abandon equity-based notion that investment should take place in all its schools at the same time. Instead, it would select come schools or grade levels for early development and help them lead the way for others…" Pelavin Research Institute, *Investing in School Technology: Strategies to Meet the Funding Challenge* (Washington, D.C.: 1997), 50-54, https://www2.ed.gov/PDFDocs/tech4b.pdf.

law to be enacted by an electronic signature.[20] The goal of the legislation was quite clear: "To promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[21] Similar to the housing act, the telecom act also rested upon the free market assumption that a more competitive market would yield lower prices and better quality products to customers.[22] In its attempt to realize this aim, the government required local telecom companies to relinquish control over their markets and "lease elements of their networks to [their] retail rivals."[23] In effect, this law "dis-mantled [the] decades-old barriers separating the cable, broadcasting, and telephone industries" that were designed to prevent the re-creation of massive communications monopolies like Bell and AT&T.[24] It is important to note the detrimental affects each law yielded for the local banks, utilities, and their communities, and how they contrasted against the hefty infrastructural and financial gains that each bill provided to large corporations.

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[20] Guy Lamolinara, "Wired for the Future: President Clinton Signs Telecom Act at LC," *The Library of Congress Information Bulletin* 55, no. 3, February 19, 1996, https://www.loc.gov/loc/lcib/9603/telecom.html.

[21] *Telecommunications Act of 1996*, Public Law 104-104, *U.S. Statutes at Large* 110 (1996): 56.

[22] Ibid., 120.

[23] George S. Ford and Lawrence J. Spiwak, "20th Anniversary of the Telecommunications Act of 1996: Lessons Learned from the U.S. Unbundling Experience," *Federal Communications Law Journal* 68, no. 95 (2016): 107.

[24] David J. Atkin, Tuen-Yu Lau, & Carolyn A. Lin, "Still on Hold?: A Retrospective Analysis of Competitive Implications of the Telecommunications Act of 1996, on its 10th Year Anniversary," *Telecommunications Policy* 30 (2006): 92.

Another very small component of the *Telecommunications Act*, which was lauded by the president, was the goal "to connect all our classrooms and libraries to the Information Superhighway by the year 2000." At the time, this law was hailed to be as groundbreaking as the Interstate Highway Act of 1957 because of its potential to impact communication and hence human connection.[25] The law signified an intentional push to get the expansion of Internet access well underway. But with the deregulation of telecommunications, the federal government simultaneously fed a frenzy that allowed the telephone, media, and internet technology companies to begin fighting to consume one another's market share.[26] This chaos, in turn, came to be known popularly as the telecoms bubble.[27]

Within a year of the approved modifications to CRA, banks across the nation (including the government-sponsored enterprises, Fannie Mae and Freddie Mac) began altering their lending practices to satisfy the new criteria laid out by the federal government. The effects were quite volatile. In the frenzy, many companies weakened the traditional lending standards on income requirements, monthly payments, down payments, and mortgage fees.[28] At the same time, because some mortgage lenders were freed from federal oversight, predatory lenders were

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[25] Lamolinara, "Wired for the Future." The article claims that the initiative on the "Information Superhighway" was first started by Al Gore in 1993, which is amusing because Gore's father was heavily influential in the creation of the 1957 legislation.

[26] Atkin, Lau, & Lin, "Still on Hold?," 83.

[27] "The Great Telecoms Crash: Behind the Jitters in Stockmarkets Lies the Biggest and Fastest Rise and Fall in Business History," *The Economist*, July 18, 2002, http://www.economist.com/node/1234886.

[28] Intense competition was incited among both borrowers and lenders as growing numbers of people entered the housing market. Competition among lenders increased because they attempted to capture larger shares of the market. Jeff Holt, "A Summary of the Primary Causes of the Housing Bubble and the Resulting Credit Crisis: A Non-Technical Paper," *The Journal of Business Inquiry* 8, no. 1 (2009): 124.

able to begin preying upon the very communities the CRA was designed to protect.[29] Additionally, this whole process was fueled further by the accompanying technological advancements[30] of the time. That is, as the accessibility to and utilization of personal computers and the Internet became more prevalent, "[home] buyers were no longer limited to borrowing locally but could search the Internet for the mortgage provider who would offer the most favorable terms."[31] Thus, lenders sought more in terms of borrowers, while borrowers sought less in terms of rates. The result was that market competition not only lowered standards; business rewarded those who had the lowest standards.[32] Worse yet, it placed those with the least to gain – the working and middle classes – in positions where they would very probably lose the most.

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[29] Brescia, "The Community Reinvestment Act," 38.

[30] While I focus on tech and housing here, massive growth occurred in telecom as well. See Ford and Spiwak, "20th Anniversary of the Telecommunications Act"

[31] Holt, "A Summary of the Primary Causes," 124.

[32] If one thinks of the internet as a developing 'thoroughfare' in the shifting infrastructure, then its development influenced commerce in the 1990s and early 2000s much the same way the creation of canals and turnpikes influenced the economy in the 1820s: it was an open conduit that allowed movement in commerce. The infrastructure changes in the 1820s led to a "boom in trade and also a sharp increase in competition… [When] goods and information were suddenly able to cross great distances at low cost, this brought a severe challenge to America's economic, social, political, and religious life." In the midst of such rapid change, "…reformers came to the conclusion that the primary institutional way to resolve this crisis was…[the] public schools." Labaree, *Someone Has to Fail*, 52-54. These technological changes, which drastically shape the way society functions, end up catalyzing what is known as "sociotechnical revolutions." Philip Piety, *Assessing the Educational Data Movement* (New York: Teachers College Press, 2013), 4.

While mortgage lending and the housing market had been increasing gradually since 1995, these changes caused the market to accelerate dramatically in 1998.[33] This meant that the housing and telecoms bubbles began swelling on the tail end of the tech bubble. It also demonstrated the power of consumers, consumer-based technologies, and unregulated corporate feeding frenzies to create unpredictable and rapid fluctuations in financial markets.

Emergence of Y2K-related Fears

As the world prepared to enter the new millennium, fears surrounding the impacts of the year 2000 (Y2K) upon the nation's critical infrastructures began to fester, particularly within the federal government.[34] The digital transition from the 1900s to the 2000s posed potential hazards for an aging system that had come to rely heavily upon its digital crutch. In response to these growing concerns, President Clinton created the President's Council on Year 2000 Conversion (referred to as the President's Council from here forward) on February 4, 1998. The group was made up of advisors from every vital sector of the federal government, and its purpose was to orchestrate and oversee the country's technological migration into the twenty-first century.[35]

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[33] S&P Indices, "National Home Prices Hit New Low in 2011 Q1 According to the S&P/Case-Shiller Home Price Indices," press release, May 31, 2011, http://us.spindices.com/documents/index-announcements/CSHomePrice_Release_053103.pdf.

[34] U.S. General Accounting Office, *Year 2000 Computing Challenge: Lessons Learned Can Be Applied to Other Management Challenges* (September 2000): 5, http://www.gao.gov/assets/240/230628.pdf. The General Accounting Office labeled the Y2K rollover a "high-risk area for the federal government" in February of 1997.

[35] The group included twenty-four federal agencies and "6,190 mission critical systems" that needed to be checked and updated or renovated. Among the many agencies were the U.S. Department of Agriculture, Department of Commerce, Department of Energy, Department of Health and Human Services, Department of Justice, NASA, Department of Transportation, Treasury Department, and Department of Defense. See U.S. Office of Management and Budget,

The NRC, and hence Shirley Ann Jackson, were part of this new council. Her department was a logical participant given the government's energy concerns and the commission's responsibilities over nuclear energy and public and environmental safety. Interestingly, however, the NRC had sent out advisories to the nuclear industry as early as December 1996, and it also released its first public request for information on "technical and regulatory aspects" the week before the formation of the President's Council.[36] The statement by the NRC was sent to nuclear power plants and licensees as a way to begin fielding and fixing possible software glitches. While no safety-related problems had been detected up to that point, the NRC did state that "...problems [had] been found in non-safety...computer-based applications." Vulnerabilities had been located in "security computers, control room display systems, inventory control, engineering programs, control systems, radiation monitoring, and emergency response."[37] The problems within the infrastructure were not devastating, but they were significant enough to warrant more attention and human resources, as well as a hastened sense of urgency. The NRC gave itself a six-month cushion by which to accommodate any communication, planning, and repairs associated with unanticipated Y2K problems, and thus determined that all nuclear power plants and licensees would be Y2K compliant by the middle of 1999.

In July of 1998, a few months after Clinton created the President's Council, Secretary of

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Progress on Year 2000 Conversion: 9th Quarterly Report (June 15, 1999): 3, http://clinton2.nara.gov/omb/inforeg/9th-quarterlyreport.pdf.

[36] Nuclear Regulatory Commission, "NRC Seeks Information on 'Year 2000' Readiness of Nuclear Power Plant Computer Systems; Asks Public Comment on Proposed Letter to Licensees," press release, January 28, 1998, http://pbadupws.nrc.gov/docs/ML0037/ML003710684.pdf.; Nuclear Regulatory Commission, "NRC Plans for Y2K Contingencies," press release, June 14, 1999, http://pbadupws.nrc.gov/docs/ML0036/ML003696545.pdf.

[37] Nuclear Regulatory Commission, "NRC Seeks Information."

Defense William Cohen started assembling a group of experts to conduct a large-scale analysis on the status of the nation's security. Drawing inspiration from the efforts that led to the *National Security Act* that was signed into law by President Truman in 1947,[38] the U.S. Commission on National Security/21st Century was charged with creating three reports over the course of three consecutive years.[39] The first report aimed to "describe the world emerging in the first quarter of the next century, the second [would] design a national security strategy appropriate to that world, and the third [would] propose necessary changes to the national security structure in order to implement that strategy effectively."[40] Headed by Gary Hart and Warren Rudman, the committee would eventually come to be referred to as the Hart-Rudman Commission (this will be discussed further in Chapter 4). This commission was catalyzed by the fears related to the changing technological landscape. But since it would take just over a year for the commission to release its first of three reports, the developing national security concerns had not yet become a predominant focus in presidential discourse.

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[38] Leading up to *The National Security Act of 1947*, Ferdinand Eberstadt led the Task Force Report on National Security Organization. The commission drew upon contemporary concerns surrounding the attack on Pearl Harbor six years prior, "the new technology of air power and the growing popularity and dynamism of totalitarian ideologies." In effect, the legislation overhauled the bureaucratic and institutional structure of the federal government by "[scrapping] a 160-year tradition of separation between the peacetime State Department and the wartime armed services..." and thereby creating "the National Military Establishment, the Central Intelligence Agency, and the National Security Council." Douglas T. Stuart, "Ministry of Fear: The 1947 National Security Act in Historical and Institutional Context," *International Studies Perspectives* 4 (2003): 294 and 297.

[39] While the commission was assembled in July of 1998, the first report was not released until September 15, 1999. The second was released on April 15, 2000, and the third was released on February 15, 2001.

[40] U.S. Commission on National Security/21st Century, *New World Coming: American Security in the 21st Century* (September 15, 1999): preface. http://fas.org/man/docs/nwc/NWR_A.pdf.

Presidential Optimism with a Tinge of Educational Pessimism

Instead of focusing on the emerging fears related to technological changes of Y2K, President Clinton's State of the Union Address in January of 1999 reflected the financial optimism that closed out the twentieth century for the U.S. He began, "Tonight I stand before you to report that America has created the longest peacetime economic expansion in our history...and the lowest peacetime unemployment since 1957." The president referred to the year the Soviet Union launched Sputnik: the commonly perceived catalyst for also launching massive U.S. funds into science and mathematics education and national defense.[41] Though he made this reference, he continued by reassuring the public that "...the state of our union is strong," and that the information age held much promise for citizens.[42]

In the midst of this optimism, his message was somewhat mixed when it came to the status of U.S. schools. The president spoke about rising math and SAT scores, but low international performance in math and science by the nation's high school students: "We must do better," he said.[43] His tone foreshadowed some of the governmental complaints about schooling that would continue to gain traction in the twenty-first century, and his suggestions for educational change foreshadowed future school reformers' efforts as well. That is, President Clinton envisioned ending the practice of social promotion, and he specifically cited what he believed were the successes of longer school days and mandatory summer school for low-achieving students in Chicago. He also suggested turning-around or closing low performing

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[41] Rudolph, *Scientists in the Classroom*, 34.

[42] CNN, "Transcript: Clinton's State of the Union Speech," January 19, 1999, http://www.cnn.com/ALLPOLITICS/stories/1999/01/19/sotu.transcript/ (emphasis added).

[43] Ibid., paragraph 35.

schools, holding districts accountable for teacher quality, offering more choice and information regarding schools, and adopting stricter discipline policies.[44]

Schooling was certainly not the only area in which the president requested public support for doing more and doing better. President Clinton touched briefly on the recession in Asian markets, as well as the need to build safeguards against terrorism, cyber-security, and biological warfare.[45] He spoke to the public about the looming technological concerns of Y2K, and he called on the public to assist wherever necessary to ensure that "this Y2K computer bug [would] be remembered as the last headache of the 20th century, not the first crisis of the 21st."[46] In regard to Y2K, one can presume that he was referring to the work of the President's Council as he reassured the public that the government was doing its part to avert such a crisis.

Jackson Leaves the Fed to Re-Enter Higher Education

By May of 1999, fourteen of the twenty-four agencies on the President's Council had demonstrated compliance among their "mission critical systems," and 93 percent of them were ready for the New Year to arrive.[47] The council's report boasted that one agency in particular had even completed evaluating all of its non-mission critical systems. That one was the NRC, the

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[44] Ibid., paragraphs 38-49.

[45] Ibid., paragraph 99. In this state of the union address, the economic, scientific, and technological optimism are very present. At the same time, however, there appears to be an expressed desire to protect all of these things: "We must work to keep terrorists from disrupting computer networks. We must work to prepare local communities for biological and chemical emergencies, to support research into vaccines and treatments."

[46] Ibid., paragraph 80.

[47] U.S. Office of Management and Budget, *Progress on Year 2000 Conversion,* 3.

agency headed by Jackson.[48] As the NRC tied up the loose ends on the Y2K oversight project, Jackson began making preparations to return to academia. She was to become president of the nation's oldest scientific, technological, and engineering research university: Rensselaer Polytechnic Institute.[49]

Just a few days before taking this new position, she told an audience at Howard University of a growing concern: "As a veteran of the private industrial sector, of the academic community, and of the Federal government, I often have made the point that this country does not have people to waste." Jackson's perspective was clearly shaped by her work in numerous sectors, but also her experience at the NRC. "The present and foreseeable challenges facing our nation," she continued, "are too great for society to ignore or to undervalue the capabilities of entire population segments."[50] Thus, Jackson called upon the black women in the academy to help raise a new generation of scientists and engineers by "motivating, developing, and mentoring more young black women."[51] This would continue to be a prominent cause in Jackson's work, but it was clearly not her only goal. She also hinted at a coalescence of interests

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[48] Ibid., 4.

[49] This historical significance is boasted on the university's website: "The Rensselaer School was established in Troy, New York, in 1824 by Stephen Van Rensselaer 'for the purpose of instructing persons...in the application of science to the common purposes of life.' It is 'the first school of science and school of civil engineering, which has had a continuous existence, to be established in any English-speaking country' according to Palmer C. Ricketts...." Rensselaer Polytechnic Institute, "RPI History," *About RPI* (website), last modified December 17, 2010, http://www.rpi.edu/about/history.html; Rensselaer Polytechnic Institute, "Profile of Shirley Ann Jackson."

[50] Shirley Ann Jackson, "Sources of Inspiration: Scholars, Mothers, Sisters, and Daughters" (speech, Washington, DC, June 25, 1999), U.S. Nuclear Regulatory Commission, http://pbadupws.nrc.gov/docs/ML0036/ML003696547.pdf.

[51] Ibid.

– similar to the one that had developed out of the Cold War[52] – which she would refer to eventually as the "government-industry-academic partnership."[53]

Jackson assumed her position at Rensselaer a week later, making yet another landmark transition: on July 1st, she became the first African-American woman to head a major research institution.[54] Jackson's background in science, academia, and policy, as well as her adherence to meritocracy[55] and her preference for corporate-style management, would find buoyancy in free-market politics and the rising tide of venture philanthropy. In particular, her interests and her ideology would find a comfortable alignment with those in venture philanthropy, like Eli Broad and Bill Gates. Not only was she part of a growing number of people interested in the increased production of human capital within the U.S.; she would enact the discourse that would soon enable ethical justifications and 'crisis' rhetoric to cloak industry's exploitive characteristics (see Chapter 5).

As a way to now explain how venture philanthropy came onto the education policy scene, the following two sections focus on the philanthropic evolution of each of the two philanthropists

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[52] Ibid., 3 and 6.

[53] Shirley Ann Jackson, "The Future of Education," interview by Tyler Mathisen, CNBC, September 27, 2011. http://video.cnbc.com/gallery/?video=3000047499. Jackson spoke of such a partnership as being able to "spur the economy, to grow our GDP…that really built our great research universities, that helped to generate the kind of intellectual property on which great companies have been built and are built" (4:30). Rudolph, *Scientists in the Classroom*, 2. Rudolph also referred to this relationship of the past as one between the federal government and "elite academic research scientists."

[54] Rensselaer Polytechnic Institute, "Profile of Shirley Ann Jackson."

[55] In this particular speech to women of color in the academy, she provided several scenarios aimed at perpetuating the belief that with education and productivity, "we can lift ourselves up by our own bootstraps." See Jackson, "Sources of Inspiration," 3.

in this narrative. I explain how each person accumulated their wealth and how their foundations eventually turned their interests toward K-12 public education.

Broad

The philanthropic work of Eli and Edythe Broad was well known throughout Los Angeles and its surrounding communities. While the couple had been involved in a multitude of philanthropic pet projects over the course of a few decades, art had tended to be their most consistent focus. For instance, they created their first of three foundations in 1984, which they called The Broad Art Foundation. Through the gradual acquisition of over 2,000 works of art,[56] their personal collection had come to function as a "lending library" of contemporary art for museums across the world.[57] Eli and Edythe had also helped "establish the Museum of Contemporary Art" in L.A.,[58] and they provided substantial funds and time to the project that built the Walt Disney Concert Hall for the L.A. Philharmonic.[59]

Accumulation

The fortune used to amass their art collection and to fund their philanthropic interests came from Eli's extensive business experiences in the housing, insurance, and retirement

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[56] Eli Broad, *The Art of Being Unreasonable: Lessons in Unconventional Thinking* (Hoboken: John Wiley and Sons, 2012), 66.

[57] "The Broad Art Foundation Fast Facts," *The Broad* (website), accessed October 20, 2015, http://www.thebroad.org/sites/default/files/pressroom/the_broad_art_foundation_fast_facts.pdf; Broad, *Art of Being Unreasonable,* 142. Even though they did not enter K-12 philanthropy until 1999, the Broads began giving higher education institutions "eight figure gifts" in 1991.

[58] Broad, *Art of Being Unreasonable,* 59. This project started in 1979.

[59] Ibid., 35. Fundraising and construction on this project started in 1987.

investment industries. One might say the venture began in 1957 when Broad and his business partner Donald Kaufman (Edythe's cousin-in-law) borrowed $12,500 from Edythe's father in order to start their first company: Kaufman and Broad Home Corporation (KB Home).[60] It ended up being an incredibly lucrative investment that led, quite simply, to many more. By 1969, their company "became the first homebuilder listed on the New York Stock Exchange."[61] But despite this success, Broad was a student of the market, and "[realizing] that the homebuilding industry was cyclical, he looked to diversify the business."[62] Thus in 1971, as the market was inflating KB stock,[63] they used their company's expanding profits to purchase "a small life insurance company" – Sun Life Insurance Company of America – for $52 million, which "they eventually transformed into [the] retirement savings empire" known as SunAmerica.[64]

Eli Broad had become "the first person to build two Fortune 500 companies from the ground up in two different industries."[65] Drawing upon his knowledge of business and accumulation, and by gradually leveraging more and more of their assets, the Broads' portfolio of philanthropic works grew right alongside their financial portfolio. By 1999, Eli and Edythe had not only boosted artistic development in their hometown; they had invested heavily in

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[60] Ibid., 59.

[61] Ibid., 20.

[62] Eli and Edythe Broad Foundation, "Eli and Edythe Broad," *About the Broads* (website), accessed March 25, 2013, http://www.broadfoundation.org/about_broads.html.

[63] Broad, *Art of Being Unreasonable,* 20.

[64] Eli and Edythe Broad Foundation, "Eli and Edythe Broad"; Broad, *Art of Being Unreasonable,* 22. The corporation was renamed SunAmerica in 1993.

[65] Broad, *Art of Being Unreasonable,* 1.

several California universities[66] and had utilized their enormous financial and political weight to attempt to bring a professional football team back to their hometown.[67]

The Push into National Politics

In addition to this assortment of localized philanthropic work, Eli Broad had also been a devoted and powerful supporter of the Democratic Party for several decades.[68] The same could be said regarding his affiliations with Al Gore and his long-time friend Bill Clinton,[69] whom he had been acquainted with since at least the 1980s.[70] Thus, after several years of throwing his philanthropic weight behind city-wide renovations in Los Angeles,[71] Broad started vying to have the 2000 Democratic National Convention awarded to his town of residence. A few weeks prior to the party's official decision, Broad courted the president and thirty leading Democrats by

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[66] Robert Tindol, "Caltech Launches Major Bioscience Initiative with $18 Million Donation from Eli Broad," *Caltech*, September 15, 1998, http://www.caltech.org/news/caltech-launches-major-bioscience-initiative-18-million-donation-eli-broad-281.

[67] "Eli Broad: Prince of L.A.," *Bloomberg Businessweek*, March 7, 1999, http://www.businessweek.com/stories/1999-03-07/eli-broad-prince-of-l-dot-a-dot.

[68] "Eli Broad Helps Shape the Issues: Influential Billionaire Stays Behind the Scenes," *Lubbock Avalanche-Journal*, December 25, 1999, http://lubbockonline.com/stories/122599/nat_122599057.shtml. "His highest-profile foray in politics was in 1968 when he was state chairman of Democrat Alan Cranston's U.S. Senate campaign. Broad helped build the campaign staff, develop strategy and use his contacts and recruiting talents to bring in additional supporters. Cranston went on to serve 24 years in the Senate" (paragraphs 12-13).

[69] Ibid., paragraph 9; "Eli Broad: Prince of L.A.," *Bloomberg Businessweek*.

[70] Broad, *Art of Being Unreasonable*, 40 and 103.

[71] "Eli Broad: Prince of L.A.," *Bloomberg Businessweek*; Broad, *Art of Being Unreasonable,* 36.

hosting an extravagant dinner and fundraiser in his L.A. home.[72] His investments and political connections paid off, and by the middle of March he had obtained his prize. Not only would the convention showcase Broad's philanthropic refurbishments to tens of thousands of people while bringing approximately $150 million in revenue to the city;[73] he would serve as the chairman on the DNC's Host Committee.[74]

Philanthropic Expansion into K-12 Education

During the same year that Broad obtained his bid for the convention, he also endeavored to expand his family's philanthropic work. SunAmerica, Broad's second Fortune 500 company, had agreed to merge with American Insurance Group (AIG) in August of 1998.[75] This was a move that had resulted in a $3 billion pay out to Broad,[76] and with so much excess cash in hand, his business logic deemed that it was time to diversify. Thus, the Broads made the decision to

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[72] "Eli Broad: Prince of L.A."

[73] "Democrats Set Dates for 2000 L.A. Convention," *Los Angeles Times*, April 15, 1999, http://articles.latimes.com/1999/apr/15/local/me-27610.

[74] Broad, *Art of Being Unreasonable,* 172.

[75] Walter Hamilton, "AIG to Buy SunAmerica: Insurance Giant Makes $16.5 Billions Deal for Annuity Marketer," *Los Angeles Times*, August 21, 1998, http://articles.latimes.com/1998/aug/21/business/fi-15071; Debora Vrana, "SunAmerica-AIG Union is Matchmaker's Dream," *Los Angeles Times*, January, 31, 1999, http://articles.latimes.com/1999/jan/31/business/fi-3409. The merger was announced in August of 1998, and the transition was underway by January of 1999.

[76] James Flanigan, "Deal Puts SunAmerica Chief in New Light," *Los Angeles Times*, August 21, 1998, http://articles.latimes.com/1998/aug/21/news/mn-15243.

enter the realm of K-12 education philanthropy in 1999 with the creation of their second non-profit organization: The Eli and Edythe Broad Foundation.[77]

The new foundation turned its attention and funds toward altering urban schools and districts by getting "district leaders to learn strategic planning, budgeting, accountability, data-driven decision making, technology, human resources, and other skills to improve the functioning of big-city bureaucracies."[78] Their primary interest may have been to alter the management of school districts by providing them with the equivalent of CEOs,[79] but again, Broad was also a savvy businessman. He had made his fortune from learning about and then skillfully riding the earlier waves of industry markets,[80] and this knack had won him massive financial gains that were tied to perfectly timed swells in the industries of home construction, insurance, and retirement investment. With the technology and the housing bubbles inflating rapidly at this point in time, it was a safe bet that they too would eventually pop. And when they did, there was no reason why "America's public schools" could not be the next place wherein to "leverage" their investments.[81]

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[77] This foundation began with a focus on education specifically, but the Broads would eventually merge their individual philanthropic interests in art, education, and science into a larger conglomerate umbrella called simply The Broad Foundations. The Broad Foundations, *Entrepreneurship for the Public Good in Education, Science and the Arts: 2009-2010* (Los Angeles, 2009), http://broadfoundation.org/reports/2009-10foundationrreportseport.pdf.

[78] Ravitch, *Death and Life*, 213.

[79] See Tyack, *The One Best System,* 126-176, to see how similar Broad's stance is to the corporate reformers who influenced schooling in the early 1900s.

[80] Broad, *Art of Being Unreasonable,* 26. "No matter how much our economy evolves, some things never change. If you know history, you know the indicators of a downturn, whether it's the1970s or 2009…That's when you know it's time to play defense."

[81] Ibid., 144.

Gates

The combined philanthropic works of Bill and Melinda Gates began in 1994 with the creation of the family's first trust: The William H. Gates Foundation. In their first year, they poured $94 million worth of Microsoft's stock into the foundation's purse[82] and then turned a majority of their philanthropic focus toward "global-health efforts."[83] Despite this large initial sum of money, however, the family has described the foundation as a relatively informal organization – at least for the first five years – that was managed primarily by Bill Gates' father.

Bill Gates Sr. was not only a successful corporate attorney; he also had a lengthy history of doing charitable work alongside his wife, Mary,[84] who served on the board of regents for the University of Washington and as chairwoman for United Way International.[85] Needless to say,

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[82] Bill and Melinda Gates Foundation, *Bill and Melinda Gates Foundation: Timeline*, (2010), accessed October 31, 2016, https://docs.gatesfoundation.org/documents/bmgftimeline.pdf. There are inconsistent reports from various sources about the foundation's initial funds, so the narrative reflects the amount notated by the foundation itself. Some news sources cite an initial grant of $106 million. For instance, see Andy Serwer and Jean Lee, "One Family's Finances: How Bill Gates Invests His Money Like a Lot of People," *FORTUNE Magazine*, March 15, 1999, http://archive.fortune.com/magazines/fortune/fortune_archive/1999/03/15/256491/index.htm.

[83] "Bill and Melinda Gates Foundation," *The Chronicle of Philanthropy*, August 26, 1999. $183.5 million of the total $225 million grants awarded by the foundation in 1999 had been given to health initiatives.

[84] Serwer and Lee, "One Family's Finances." As father and son, these two are commonly called junior and senior in reference to one another. I stick to this convention only to avoid confusion, but they are officially known as William H. Gates II (attorney) and William H. Gates III (Microsoft co-founder).

[85] Mary Maxwell Gates served on the board of regents from 1975-1993, and according to the bio at the university's site, she became the first woman to be appointed to chair the board of directors at United Way International in 1985. "Mary Maxwell Gates (1929-1994)," *University of Washington Undergraduate Academic Affairs* (website), accessed November 8, 2016, http://www.washington.edu/uaa/leading/mary-maxwell-gates/. See also Lisa Stiffler, "Interview: Bill Gates Talks About His Dad's Influence on His Life, the Tech Community and World,"

their son's foundation fit nicely into Gates Sr.'s own realm of philanthropic experience. Therefore, upon the foundation's creation, he began taking up the task of reviewing donation solicitations and proposals, especially when the submissions became too numerous and overwhelming for his son and daughter-in-law to handle effectively.[86]

Accumulation

At the time when the couple created their first foundation, Bill Gates was 39 years old and Melinda was 30. Both were staggeringly young in comparison to the individuals who had founded the most well known philanthropies in U.S. history. Each had also made the bulk of their fortunes from their work with Microsoft Corporation. Melinda had studied computer science, economics, and business at Duke University before joining the company in 1987. She developed their multimedia products and eventually became the General Manager of Information Products.[87] Her husband, on the other hand, was the CEO of the company since he had co-founded it in 1975 with his friend Paul Allen.[88]

GeekWire, November 30, 2015, http://www.geekwire.com/2015/qa-ish-with-bill-gates-jr/.; Serwer and Lee, "One Family's Finances."

[86] Sam Howe Verhovek, "Elder Bill Gates Takes on Role of Philanthropist," *The New York Times*, September 12, 1999, http://www.nytimes.com/1999/09/12/us/elder-bill-gates-takes-on-the-role-of-philanthropist.html?_r=1.

[87] "Melinda Gates Co-chair & Trustee," *Bill and Melinda Gates Foundation* (website), accessed October 27, 2016, http://www.gatesfoundation.org/Who-We-Are/General-Information/Leadership/Executive-Leadership-Team/Melinda-Gates.

[88] "Bill Gates: Co-chair & Trustee," *Bill and Melinda Gates Foundation* (website), accessed October 25, 2016, http://www.gatesfoundation.org/Who-We-Are/General-Information/Leadership/Executive-Leadership-Team/Bill-Gates.

The company was profitable from the start, with sales reportedly exceeding $1 million by its third year.[89] One of the most influential factors to facilitate Microsoft's early success was the deal it struck in 1981 with the hardware giant of the time, IBM. The agreement ensured that all of IBM's personal computers would be bundled with Microsoft's operating system, MS-DOS, which guaranteed the mass proliferation of its product in the growing markets of business and home computing. It is worth mentioning that this type of practice became a common tactic for Gates, eventually yielding many legal debates and a string of federal anti-trust lawsuits against Microsoft.[90]

The company's stock became publically traded in 1986,[91] and within a year's time, *Forbes Magazine* dubbed Bill Gates "the world's youngest self-made billionaire."[92] The couple's wealth only continued to balloon throughout the early 1990s as the tech bubble accelerated. In 1994, during the same year they founded William H. Gates Foundation, Gates proved his place among "the cream of the capitalistic crop," according to the *L.A. Times*, when he became the wealthiest person in the U.S. His net worth, which was estimated at $9.35 billion,[93] had

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[89] "Bill Gates Time Line," *Forbes Magazine* (website), June 16, 2006, http://www.forbes.com/2006/06/16/cz_rr_ck_billgatesslide.html.

[90] Wired News Report, "U.S. v. Microsoft: Timeline," accessed August 28, 2017, https://www.wired.com/2002/11/u-s-v-microsoft-timeline/.

[91] "Facts About Microsoft," *Microsoft Corporation* (website), accessed November 3, 2016, http://news.microsoft.com/facts-about-microsoft/#ImportantDates.

[92] Marie Thibault, "The Next Bill Gates," *Forbes Magazine,* January 19, 2010, http://www.forbes.com/2010/01/19/young-tech-billionaire-gates-google-yahoo-wealth.html.

[93] "Bill Gates Tops List in Forbes Ranking of Richest In U.S. Wealth: Microsoft Mogul's Net Worth is $9.35 Billion," *Los Angeles Times,* October 3, 1994, http://articles.latimes.com/1994-10-03/business/fi-45962_1_net-worth.

surpassed that of his personal friend and future co-philanthropist, Warren Buffet.[94] And finally, with the release of Windows 95 and Internet Explorer one year later, his wealth had grown to $12.9 billion, and he secured his rank as the richest man in the world.[95]

Bill Gates' affiliation with Microsoft is known broadly, but many may not know that he founded a second company as well. Like Broad, Gates also had an interest in accumulating art, but he had a strong desire to archive and catalogue images digitally so that they could be sold to businesses and the public. To this end, he created Corbis Corporation in 1989. While the company's initial focus was on "art-licensing" and digital image rights, it soon set its sites on the lofty aim of "captur[ing] the entire human experience throughout history." Because it took a while for desktop and Internet technologies to develop to a standard that would enable the sharing and purchasing of high-quality images, Corbis was not altogether profitable until almost a decade after it was created. In the meantime, however, Gates' personal fortune increased and so did his company's archive. After a while, Corbis had come to monopolize the digital rights to over 65 million of the most historically and culturally important images in human existence. These included images, artwork, and photographs from the Bettmann Archives; the Library of Congress; Leonardo da Vinci's Codex Leicester; and a multitude of photographic, classical, and contemporary artworks from the most renowned artists, art galleries, private collections, and journalism companies around the globe.[96] It is worth mentioning that Steven Davis, the president

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[94] Gates and Buffett met in July of 1991 at his parents' vacation home. Bill Gates, "25 Years of Learning and Laughter," *GatesNotes: The Blog by Bill Gates,* July 5, 2016, https://www.gatesnotes.com/About-Bill-Gates/25-Years-of-Learning-and-Laughter.

[95] James Bates, "Bill Gates Again at No. 1 on Forbes Wealthiest List," *Los Angeles Times*, October 2, 1995, http://articles.latimes.com/1995-10-02/business/fi-52371_1_bill-gates.

[96] The company was originally created as Interactive Home Systems and was switched to the current name in 1995. "Corbis Corporation," in *International Directory of Company*

and CEO who helped devise Corbis' successful business plan, had acquired his experience with intellectual rights law as an employee at the law firm of Bill Gates Sr.[97] Though there is no specific mention in literature or the media about whether Gates and Broad crossed paths via Corbis, it seems probable that they did given the aim of Gates' company and the size and content of Broad's collection.

A Corporate Model Turns Philanthropic

In 1995, a year after the creation of the first Gates foundation, Microsoft created an 18-month, self-described "community affairs initiative" called Libraries Online. Rather than being a project that was solely managed by the Gates family, however, this was a corporate "pilot project" designed "to see if the technology would be used if put in communities where people had rarely, if ever, used computers -- and to see if the library staff was receptive." After $17 million in monetary and software donations,[98] the program proved to be a promising effort because, as one reporter pointed out after the project's completion, "At many libraries in the

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Histories, ed. Tina Grant, Vol. 31. (Detroit: St. James Press, 2000), 139-142. *Business Insights: Essentials*. Accessed http://bi.galegroup.com/essentials/article/GALE|CX2843500043/401f6dacd504ff222c9576e58acd29f1?u=tusc49521, on March 22, 2017.

[97] Patrizia Dilucchio, "Bill Gates' Other CEO: The Corbis Digital Archive is Privately Held by Gates, But it's Former Human Rights Attorney Steve Davis' Job to Make it Work," *Salon*, February 7, 2000, http://www.salon.com/2000/02/07/corbis/.

[98] Bill and Melinda Gates Foundation, "Bill and Melinda Gates Establish Library Foundation Dedicated to Bringing Internet to Libraries," press release, June 1997, http://www.gatesfoundation.org/Media-Center/Press-Releases/1997/06/Bill-and-Melinda-Gates-Establish-Library-Foundation.

Microsoft program, there are now waiting lists to sit at keyboards."[99] Thus, not only had the effort provided technological access to under-resourced communities via 200 public libraries, but the corporation also found a way to increase their market spread by placing their software into the hands of individuals who were unlikely to afford it otherwise. Equally importantly, perhaps, was the fact that the project would inspire the future philanthropic work of the Gates family.[100]

Melinda left her position at Microsoft in 1996 in order "to focus on her philanthropic work and family."[101] Their first child was born the year she resigned, and in June of 1997, Bill and Melinda announced the creation of their second philanthropic organization: The Gates Library Foundation. This new foundation was not only an expansion of the project and the lessons learned from Microsoft's Libraries Online project;[102] it was most likely facilitated by President Clinton's earlier commitment to expand Internet access to libraries and schools.[103] With a more refined philanthropic purpose, however, The Gates Library Foundation aimed to "provide public libraries in low-income communities with the computer hardware and software required for community access to the Internet, as well as provide support and training for public library personnel throughout the U.S. and Canada." This foundation's initial assets, which totaled

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[99] Steve Lohr, "Gates to Help Libraries Acquire Gear To Go on Line," *The New York Times*, June 24, 1997, http://www.nytimes.com/1997/06/24/business/gates-to-help-libraries-acquire-gear-to-go-on-line.html?_r=0.

[100] Bill and Melinda Gates Foundation, "Bill and Melinda Gates Establish Library Foundation."

[101] "Melinda Gates Co-chair & Trustee," *Bill and Melinda Gates Foundation*.

[102] Bill and Melinda Gates Foundation, "Bill and Melinda Gates Establish Library Foundation."

[103] See my earlier argument about the *Telecommunications Act of 1996*, which was signed in February. See also Lohr, "Gates to Help Libraries," *The New York Times*.

$400 million, came from two sources: the Gates had provided $200 million in cash, and Microsoft had donated $200 million in software. The Gates then appointed Patty Stonesifer, a friend and former Microsoft vice president of Interactive Multimedia, to head The Gates Library Foundation.[104] With the creation of this second foundation, Bill Gates Sr. retired so he could manage The William H. Gates Foundation full time.[105]

Toward the end of 1998, during the second foundation's second year, the library grants were being aimed specifically at those states that had "a poverty threshold of 10 percent or higher."[106] The Gates awarded their first set of grants in Alabama,[107] where 95 percent of the state's public libraries qualified,[108] and they slated the implementations of those projects to begin the following summer. Shortly after the Alabama grants, awards were given to six other southern states: Arkansas, Kentucky, Louisiana, Mississippi, New Mexico, and West Virginia.[109] In

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[104] Bill and Melinda Gates Foundation, "Bill and Melinda Gates Establish Library Foundation."

[105] Serwer and Lee, "One Family's Finances."

[106] Bill and Melinda Gates Foundation, "Gates Library Foundation Distributes New 1998 Grant Applications," press release, August 1998, http://www.gatesfoundation.org/Media-Center/Press-Releases/1998/08/More-States-Eligible-for-State-Partnerships.

[107] In 2014, the foundation announced that it would initiate an end of life on the library grants project, which to date had donated $1 billion. Ian Chant, "Gates Foundation Prepares to Exit Library Ecosystem," *Library Journal*, May 22, 2014, http://lj.libraryjournal.com/2014/05/budgets-funding/gates-foundation-prepares-to-exit-library-ecosystem/#_.

[108] Bill and Melinda Gates Foundation, "Over 95% of Alabama Libraries Receive Grants from Gates Library Foundation to Bring Computer Access to Patrons," press release, January, 1998, http://www.gatesfoundation.org/Media-Center/Press-Releases/1998/01/Alabama-Receives-Library-Grant.

[109] Bill and Melinda Gates Foundation, "Gates Library Foundation Distributes New 1998 Grant Applications," press release, August 1998, http://www.gatesfoundation.org/Media-Center/Press-Releases/1998/08/More-States-Eligible-for-State-Partnerships.

February of 1999,[110] the Gates initiated a name change for their library foundation and retitled it The Gates Learning Foundation. They have claimed that this shift was intended "to reflect its focus on ensuring that low-income minority students are prepared for college and have the means to attend."[111] The evolution of this foundation, however, provides a brief genealogy that demonstrates how this endeavor started out as a corporate initiative – with profit-based interests – before it developed into a philanthropic focus on education.

Philanthropic Expansion into K-12 Education

The last major transition for the Gates' philanthropies occurred only four months before the official Y2K rollover and amid an escalating federal antitrust lawsuit against Microsoft.[112] In August of 1999, the software CEO announced that he would officially merge the two foundations created by his family.[113] The Gates Learning Foundation and the William H. Gates

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[110] There is not much on the specifics regarding the reasons for the name change. It simply appears to be a rebranding of their organization. Katie Hafner, "Bill Gates and His Wife Give Away $3.3 Billion," *The New York Times*, February 6, 1999, http://www.nytimes.com/1999/02/06/us/bill-gates-and-his-wife-give-away-3.3-billion.html; "Bill and Melinda Gates Foundation," in *International Directory of Company Histories*, ed. Tina Grant, Vol. 41. (Detroit: St. James Press, 2001), 53-55. *Business Insights: Essentials*. Accessed http://bi.galegroup.com/essentials/article/GALE|CX2844500021/4da5dea86264a09613654c3b949f98a0?u=tusc49521, on March 22, 2017.

[111] "Bill Gates: Co-chair & Trustee," *Bill and Melinda Gates Foundation*.

[112] The case, *U.S. vs. Microsoft Corporation*, was filed in May of 1998. John Frederick Moore, "MSFT Ruled a Monopoly: Federal Judge Says Software Firm Possesses Operating System Monopoly," *CNN Money*, November 5, 1999, http://money.cnn.com/1999/11/05/technology/microsoft_finding/. Gates testified on Microsoft's behalf in November of 1998. Elizabeth Wasserman, "Gates Deposition Makes Judge Laugh in Court," *CNN*, November 17, 1998, http://edition.cnn.com/TECH/computing/9811/17/judgelaugh.ms.idg/.

[113] Jolayne Houtz, "Gates Foundation Wields Newfound Clout," *The Seattle Times,* October 28, 2001,

Foundation, with combined assets of $17.1 billion, became the Bill and Melinda Gates Foundation.[114] The co-founders chose Bill Gates Sr. and Patty Stonesifer to be the co-chairs of their new organization.[115] Thus, the merger consolidated the two foundations' human and financial resources while simultaneously bringing together the Gates' foci on technology, global health initiatives, and access to learning opportunities for low-income communities.[116]

The new behemoth foundation hit the ground running in September of 1999 by rolling out its first $1 billion education initiative titled the Gates Millennium Scholars Fund.[117] The fund was designed to assist low-income minority students in both their undergraduate and graduate pursuits. Graduate scholarship recipients, according to the application requirements, were required to seek "advanced degrees in math, science, engineering, education or library science."[118] The foundation's interest in college graduates was accompanied by an incipient but

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http://community.seattletimes.nwsource.com/archive/?date=20011028&slug=gatesfoundation28m; "Bill and Melinda Gates Foundation," in *International Directory of Company Histories*.

[114] "Bill and Melinda Gates Foundation," *The Chronicle of Philanthropy*; "Bill and Melinda Gates Foundation," *International Directory of Company Histories*.

[115] Bill and Melinda Gates Foundation, *Bill and Melinda Gates Foundation Annual Report: 1999*, (Seattle: 1999), 5, www.gatesfoundation.org/~/media/GFO/Documents/Annual Reports/1999Gates Foundation Annual Report.pdf.

[116] Houtz, "Gates Foundation Wields Newfound Clout;" "Bill and Melinda Gates Foundation," in *International Directory of Company Histories*.

[117] The Gates Millennium Scholars, "The Gates Millennium Scholars Program," *About GMS* (website), accessed October 21, 2015, http://www.gmsp.org/publicweb/aboutus.aspx; "Gates Millennium Scholars: How Your Student Can Apply," *The Seattle Times*, September 16, 1999, http://community.seattletimes.nwsource.com/archive/?date=19990916&slug=2983460.

[118] "Gates Millennium Scholars," *The Seattle Times*. By 2013, the allowable areas of study changed to: "computer science, education, engineering, library science, mathematics, public health or science." See The Gates Millennium Scholars, "The Gates Millennium Scholars Program."

growing interest in K-12 education. For instance, they encouraged school-based technology integration in their home state of Washington through their support of the Teacher Leadership Program, but this focus was only just beginning to evolve.[119] Within a few months, the Gates Foundation would begin devoting its attention to "boosting high school graduation rates and college entry rates, especially in urban districts."[120] In this respect, the Gates' involvement broadened, and as it did, their focus on K-12 public schooling appears to have grown out of their interest in college education and graduates of science and technology. It should be noted that this developing interest in college and K-12 education also paralleled Bill Gates' lobbying efforts to expand the legal immigration and H-1B visas given to trained individuals who had expertise in the same fields (see Chapter 3).

Conclusion

Nineteen ninety-nine proved to be a major developmental year for members of the discourse coalition. The Gates family consolidated their two organizations and resources into one – the Bill and Melinda Gates Foundation – thereby setting themselves on the path to becoming the most prominent and wealthy philanthropic organization in history. The Broads, on the other hand, created their second organization, The Eli and Edythe Broad Foundation. Education became a prominent focus for each foundation at the same time that Jackson was preparing to re-enter academia as the president of Rensselaer Polytechnic Institute. As a result, the independent interests of Jackson, the Gates Foundation, and the Broad Foundation were certainly beginning to align, even though there appears to be no evidence of an explicit connection among the three

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[119] Bill and Melinda Gates Foundation, *Bill and Melinda Gates Annual Report*.

[120] Ravitch, *Death and Life*, 204.

of them at the time. That is, Jackson and Broad shared an interest in corporate-style management; Jackson and Gates shared common ground in terms of science, technology, math, and their interest in minority college students; and Broad and Gates shared an interest in K-12 urban schools.

I begin the next chapter by describing some of the shifting ideas about how philanthropy, venture capitalism, and technology could be used to one another's benefit. I also provide evidence for beliefs about how these could be applied to public education and to the notion of 'good citizenship.' These connections emerged from two events – one hosted by the president of the Carnegie Corporation of New York and another by the White House – and provide a glimpse at how philanthropic and federal interests converged around the developing conception of venture philanthropy. Given the fact that Broad and Gates both reorganized their foundations during this year, it is evident they played a role in shaping the changing conceptions of philanthropy as much as they were shaped by them. Finally, after exploring how the interests of the federal government and venture philanthropists started to converge upon education, I explain how the transition into Y2K influenced the federal government's understanding of managerial efficiency and the direction it would eventually take in regard to its own reorganization.

CHAPTER 3: EMERGING PARTNERSHIPS AND POST-Y2K LESSONS

Convergence of Philanthropic and Federal Interests

An enormous amount of wealth had been accumulating during the successive tech, telecoms, and housing bubbles of the 1990s. It was substantial enough that one newsource claimed, "Waves of millionaires and billionaires are being born every week, it seems..."[1] As a result of this, there developed an expressed desire to build a new philanthropic "portal," one that would allow the emerging high-tech developments of the time to encourage this new elite class, as well as the younger generations, to enter the charitable realm.[2] This concerted effort started amassing during the same timeframe that the Bill and Melinda Gates Foundation was created, but the evidence for this shift in strategy and interest can be found within U.S. philanthropic circles and the federal government alike.

The Largest Foundations Meet in New York

One of the prominent areas where this shift toward a symbiotic view of philanthropy can be detected is in the organizing efforts of Vartan Gregorian, the president of the Carnegie Corporation of New York. As the person responsible for overseeing the "oldest grant making

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[1] Paul Lieberman, "Vartan Gregorian: A Fund-Raiser in an Age of New Money Learns to Give in the Old Style," *Los Angeles Times*, July 18, 1999, http://articles.latimes.com/1999/jul/18/opinion/op-57066.

[2] Jennifer Moore and Grant Williams, "The Clintons Use Bully Pulpit to Encourage Giving," *The Chronicle of Philanthropy*, June 17, 1999.

foundation" in the U.S.,[3] Gregorian held the opinion that "most Americans confuse the difference between charity and philanthropy." He argued that "charity is given out of pity and sympathy," and because of this his organization's industrialist founder, Andrew Carnegie, "…did not believe in charity." Instead, he explained, "[Carnegie] wanted to help people help themselves, the whole social Darwinistic concept of providing ladders for people to climb in life toward respectability, toward enlightenment and so forth." Charitable giving, which from this perspective was clearly not conducive to the maintenance of meritocratic ideals, warranted a different approach, Gregorian argued: "Philanthropy, as it has evolved in America, is an investment in something enduring." Thus, when it came to charitable and philanthropic acts in the 1990s era of accumulation, he worried that there was "a great deal of confusion among young generations over which is the right thing to do."[4] He was equally concerned that without some "pressure" from the more seasoned philanthropists, the new elite might sit on their much-needed funds and wait until the end of their lives to make plans about how to invest in society's problems.[5]

With this concern in mind, Gregorian assembled a meeting in August of 1999 where he brought together "representatives of the 40 largest foundations to discuss ways in which their

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[3] Carnegie Corporation of New York, "About" (website), accessed November 16, 2016, https://www.carnegie.org/about/.

[4] Lieberman, "Vartan Gregorian: A Fund-Raiser," *Los Angeles Times*.

[5] Ibid., 3. Also, Gregorian later said, "There are people who deal with symptoms – somebody is poor, you give money. That's charity. Philanthropy...is to solve problems through investment and planning, not (just) through generosity." See also Donna Gordon Blankinship, "Foundation Says Gates, Wife Involved," *The Washington Post*, June 15, 2006, http://www.washingtonpost.com/wp-dyn/content/article/2006/06/15/AR2006061502019.html.

giving programs might complement one another."[6] The meeting convened in New York, but details regarding the meeting's attendees and a more specific description of the aims of the convergence are sparse. However, among the representatives of the wealthiest foundations were Bill Gates Sr. and Patty Stonesifer, the co-chairs of the Gates Foundation.[7] Their participation in this meeting should be of little surprise because Gregorian had been sitting on the board of the Gates Library Foundation since 1997,[8] and he was also serving as Bill and Melinda's philanthropic consultant. Equally important is the fact that Gregorian was advising other philanthropists who were or would eventually become involved in education reform as well (Gregorian was providing consultation to Walter Annenberg of the Annenberg Foundation,[9] and he had been a board member of the J. Paul Getty Trust since 1988).[10]

A majority of Gregorian's career was spent in high-profile academic and public service positions, most of which focused heavily on fundraising, so his connections extended well beyond those at this initial meeting. As a Stanford-trained historian, he worked through the

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[6] Jennifer Moore, "Gift Makes Gates Fund No. 1 in U.S.," *The Chronicle of Philanthropy*, August 26, 1999. See also Howe Verhovek, "Elder Bill Gates Takes on Role."

[7] Ibid.

[8] Bill and Melinda Gates Foundation, "Bill and Melinda Gates Establish Library Foundation."

[9] Moore, "Gift Makes Gates Fund No. 1." Annenberg is a political conservative whose philanthropy does not support vouchers or privatization. Through Gregorian's counsel, he was able to convince Annenberg that such practices work against his own aim of helping students from working-class families. Annenberg gave a speech at the White House in December of 1993 in his effort to bring attention to the plight of the public schools. He provided a $500 million grant to the public schools via the Annenberg Challenge, which at the point amounted to the largest in U.S. history. Dowie, *American Foundations*, 34.

[10] Gregorian retired from the board in July of 2000. J. Paul Getty Trust, "David Pierpont Gardner Elected Chairman of the Board for the J. Paul Getty Trust," press release, July 18, 2000, http://www.getty.edu/news/press/leaders/gardner.html.

academic and administrative ranks at several universities before becoming the provost at the University of Pennsylvania in 1978.[11] Then, throughout the 1980s, he served as president of the New York Public Library where he worked with the local community and philanthropists in order to fundraise an astounding $270 million to refurbish their grossly underfunded public system.[12] He returned to academia again in 1989 to serve as the president of Brown University where he doubled the university's endowment before taking the lead philanthropic position at Carnegie in 1997.[13] After taking the reins of the organization, he began steering its interests toward public education by suggesting that Carnegie's board cut support from prior projects so it could divert them to this cause.[14]

In this respect, Gregorian's work is important to this narrative because of his affiliation with the Gates Foundation and his lengthy history with fundraising and philanthropy. Even though it remains unclear exactly what occurred at this event, the criteria for the guest list alone leaves little doubt that this particular meeting, as well as Gregorian's reach in this effort, were both influential and wide. He possessed an exorbitant amount of social capital that provided him

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[11] Carnegie Corporation of New York, "President's Corner: Vartan Gregorian," *About* (website), accessed November 13, 2016, https://www.carnegie.org/about/trustees-and-staff/vartan-gregorian/.

[12] National Endowment for the Humanities, "Vartan Gregorian - Award & Honors: 1998 National Humanities Medalist," *About NEH* (website), accessed November 16, 2016, https://www.neh.gov/about/awards/national-humanities-medals/vartan-gregorian.

[13] Judith Miller, "Carnegie Corp. Picks a Chief in Gregorian," *The New York Times*, January 7, 1997, http://www.nytimes.com/1997/01/07/nyregion/carnegie-corp-picks-a-chief-in-gregorian.html. He started the position in June of 1997. See Carnegie Corporation of New York, "President's Corner."

[14] Dowie, *American Foundations*, 35. According to Dowie's investigation, this board meeting was held in January of 1999, only eight months before he assembled the New York meeting.

the perfect opportunity to initiate, if not shape, the conversations regarding the changing aims and foci of philanthropy in the U.S.

The White House Conference on Philanthropy

Less than two months after meeting with the wealthiest foundations, Gregorian's concerns started reflecting in a federal initiative, and thus the second event that alludes to the influential shift in philanthropic interest. The White House Conference on Philanthropy: Gifts to the Future, was hosted by President and Mrs. Clinton on October 22, 1999. It was co-sponsored by the National Endowment for the Humanities, and among the list of supporters was one of the organizations that Gregorian represented: the J. Paul Getty Trust. The conference was described to be the first of its kind and aimed to do the following:

> …[bring] together individuals who are engaged in philanthropy–including donors, young people, policy experts, business leaders and representatives from nonprofit organizations, foundations, and educational programs–to highlight the unique American tradition of charitable giving; to discuss the diverse and changing face of philanthropy; and against the backdrop of eight years of unprecedented economic growth, to explore how to preserve and expand this tradition for future generations.[15]

Similar to the meeting that Gregorian organized earlier in New York, the list of attendees at the White House that day is also vague at best. The guest list is obscured in part because, while the conference was held face-to-face, it was also transmitted "via satellite [to] more than

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[15] White House, *The White House Conference on Philanthropy*, (Washington, DC, n.d.): 4, accessed August 12, 2016, https://clinton4.nara.gov/media/pdf/philanthropyreport.pdf. The release date of this report is not clear, but it must have been released after June of 2000. The summary offers a post-conference follow-up on philanthropic organizing on this topic. It references, in past tense, a recap on a youth summit on philanthropy that was held June 22-25. It also provides tax policy proposals for philanthropies (i.e. tax breaks), which President Clinton attempted to pass later that year, and budget proposals for fiscal year 2001. See p. 21.

3,000 sites around the country." This allowed a multitude of individuals to attend virtually.[16] However, review of the conference transcript indicates there was a vast array of participants, from state-based organizations to professional fundraisers. It included as well representatives from the Girls Scouts, United Way, 4-H, and the U.S. Committee for UNICEF. Among the speakers were the young pop star Justin Timberlake; Patty Stonesifer of the Bill and Melinda Gates Foundation; and the founder of America Online (AOL), Steven Case. It also included two panelists – Kevin Fong and Catherine Muther – who spoke specifically about the characteristics and benefits of venture philanthropy.

Kevin Fong of the Mayfield Fund, "a California-based venture capital partnership," spoke first about his work in the two-year long organized effort to merge the practices of venture capitalism with philanthropy.[17] He was part of an organization called Silicon Valley Social Venture, which was dedicated solely to "starting venture philanthropists," particularly in that region. Fong outlined what he saw as the principles of venture philanthropy, claiming that it requires a willingness for risk and failure, ongoing investment of one's time and assets, persistent means of measurement to ensure accountability, and the utilization of company stock options or founders stock for the purposes of fundraising. According to Fong, venture philanthropy is "all about changing the world and doing things differently." He clarified, "That's not saying that things that were done in the past were poor or wrong; it's just that maybe…we can think about new ways of doing things. It's worked for Silicon Valley…and we hope other people will follow us as well," he concluded.

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[16] White House, "White House Conference on Philanthropy: Gifts to the Future" (conference transcript, Washington, DC, October 22, 1999): 2, accessed October 20, 2016, https://clinton3.nara.gov/Initiatives/Millennium/Philan/html/transcript.html.

[17] Ibid., 27.

After Fong spoke, the First Lady introduced Catherine Muther and asked her to share her philanthropic experience and "thoughts about how more people from the high-tech community can become investors in the non-profit sector." As the founder of the Three Guineas Fund, Muther's primary philanthropic interest rested with freeing up "women's access to capital." It was a worthy cause, she explained, because "women, when given an opportunity to participate in the economy, tend to reinvest in social value."[18] Such areas, she claimed, tended to be in education, health, and sanitation. Similar to Fong's efforts to create a generation of venture philanthropists, Muther explained how her organization was "creating a kind of learning lab in entrepreneurship" and philanthropy by asking each of their donors to reinvest 2 percent of their company's value "into an equity reinvestment fund."[19]

Finally, Muther provided an insightful expansion to Fong's definition of venture philanthropy by describing what she saw as the attitudes inherent to this mode of giving. "One of those," she said, "is a sense of urgency. And sometimes this looks like impatience… Sometimes this looks like arrogance. In fact, sometimes it is arrogance. And," she added, "we have a sense of accountability and results. And sometimes this looks like control." Muther viewed these attitudes, as well as their "set of business practices and assumptions," as the "human capital" that the venture capitalists had to offer the philanthropic realm. Her conclusion, however, was perhaps most telling: "…philanthropy is the soul of the new economy" and because of this, technology and philanthropy promised "a transformative effect in the independent sector."[20]

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[18] Ibid., 30.

[19] Ibid., 31.

[20] Ibid., 33.

When President Clinton addressed the audience, he attempted to draw parallels between philanthropic practice and Alexis de Tocqueville's interpretation of democracy in the U.S. during the 1830s. He said,

> …charity in America was something more than simple compassion. It was a sign of good citizenship. [de Tocqueville] wrote, "Americans make great and real sacrifices to the public welfare. They hardly ever fail to lend faithful support to one another." Today, this is a strong tradition. And the face of this tradition is changing.[21]

For Clinton, at least, the understanding of citizenship was not only being conflated with philanthropy; it was being infused with the values of venture capitalism. This view of citizenship was evident also in the ways that he and others advocated for "systematizing philanthropy" by adding "community service to the curriculum of public schools" so that "more young people [could] decide how the money they raise is given out."[22] In addition to this conflation of citizenship, these statements hint also at a belief that perhaps venture philanthropy should be the free-market's approach to taxation: individuals choose the social causes that are worthy and how much money to give away. Said simply, venture philanthropy emerged directly out of the neoliberal rationale.

Schooling politics aside, if the federal government was going to work with this changing face of philanthropy, it was necessary to facilitate a convergence with the nonprofit sector. Thus, President Clinton pledged to assemble "an inter-agency task force to strengthen [a] philanthropic partnership between government, nonprofit groups, and citizens." His pledge involved commissioning a report on philanthropic trends in the U.S., as well as orchestrating a meeting

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[21] Ibid., 5.

[22] Ibid., 26.

between the Treasury Department and members of the nonprofit sector to discuss ways "to generate more constructive philanthropy."[23]

It is unclear whether or not the Broad Foundation was present at the White House Conference on Philanthropy, but one business-related newsource reported that both Eli Broad and Bill Gates were on the short list of people to be highlighted at the event for their philanthropic efforts.[24] While Broad was not mentioned in the conference transcript, Bill and Melinda Gates were praised throughout by the president and others for the major philanthropic contributions they had "given to the education of minority children for the future."[25] Steven Case from AOL even credited the Gates with "really building a culture of service, a culture of philanthropy."[26] As the presentation portion of the conference drew to a close, the president concluded by saying, "Of all the philanthropic things that the high-tech community can do, the obvious best candidates to me are education, for the obvious reasons, and the relations of technology."[27]

The Clintons' conference provides a glimpse at some developing conceptions of philanthropy and citizenship, as well as the parts that technology and venture capitalism might have been able to play in this transition. Vartan Gregorian's meeting in New York, on the other

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[23] Ibid., 8.

[24] Michael Dell was also included in this list. See Stephen Braun and Jack Gillum, "Hillary Clinton Sanctioned Tax Breaks for Wealthy Charity Donors," *Business Insider*, May 22, 2015, http://www.businessinsider.com/hillary-clinton-sanctioned-tax-breaks-for-wealthy-charity-donors-2015-5.

[25] White House, "Conference Gifts to the Future," 26.

[26] Ibid., 34.

[27] Ibid., 40.

hand, demonstrates an emergent desire among the largest foundations in the U.S. to not only utilize the rapid accumulation of the booming economy, but to also shape the youthful holders of that wealth. These two events signify an influential point of convergence wherein the federal government and nonprofit sectors started expressing an interest in partnering with one another. Of course, this partnership and the developing notion of venture philanthropy melded together perfectly under the rationale of neoliberalism. If a tenet of neoliberalism holds that the government's stewardship over social needs and services should be increasingly relinquished to private interests, then who better to hand them over to than those who effectively perpetuate the myth that the 'free market works.' The White House conference kindled enough interest that the nonprofit sector picked up and carried on this annual discussion for at least three consecutive years afterward,[28] thus providing ample opportunity for individuals to connect, share ideas, and possibly build a coalition around the aims and purposes of venture philanthropy.

The federal government had taken an interest in forming a partnership with those in venture philanthropy and the technology sector at the same time that Jackson was beginning to stress the necessity of a "government-industry-academic partnership" like the one that had developed during the Cold War. With the Gates and Broad foundations already expanding into projects aimed at reshaping public schooling, and with Jackson working in academia again, it can be said that all four entities in the discourse coalition had developed reasons for focusing on, scrutinizing, and wielding influence over education. And coincidentally, whether it was in their

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[28] The Corporate Social Responsibility Newswire, "Technology and Philanthropy Leaders Convene to Discuss How Online Engagement Makes a Difference for the Nonprofit Sector," press release, March 11, 2003, http://www.csrwire.com/press_releases/21548-Technology-and-Philanthropy-Leaders-Convene-to-Discuss-How-Online-Engagement-Makes-a-Difference-for-the-Nonprofit-Sector.

philanthropic or their professional lives, each member would also be embarking on a major transitional phase in the coming year.

The next section picks up on January 1, 2000, just as President Clinton entered his last year in office. Following an uneventful Y2K rollover, his administration released two influential reports that were designed to reflect on the overall process. The first came from the President's Council on Year 2000 Conversion and the second from the Government Accounting Office. These reports foreshadowed major federal reorganization as the commission sought ways to maintain the business-like, managerial efficiency and collaborative momentum it realized during the Y2K transition. From the understandings laid out in these reports, one can begin to get a sense for a convergence of interests that facilitated the government-industry component of the partnership.

Also, by the time 2000 rolled around, the technology industry had become quite a powerhouse in Washington, D.C. In order to understand how this occurred, the narrative then turns to explore the 'crisis' that incited the technology industry: immigration law and H-1B visas. Both components threatened the tech industry's unfettered access to international high skilled labor, and in response, they created a massive and heavily funded lobby network. After almost a decade of organizing, their efforts yielded numerous pieces of legislation while helping to solidify the industry-academic partnership.

Post-Y2K Transitions

The new millennium came and went with minimal effect on the technological infrastructure of the U.S. On January 2nd, the chief of the President's Council on Year 2000 Conversion (President's Council), John Koskinen, expressed his relief to reporters by saying, "We've made it look too easy...Maybe we did our job too well." At the same time, Bill Gates

credited the success of the transition to effective collaboration and a deliberate focus on the problem at hand: "It ended up being a fairly minor issue because people really worked together…if people had ignored the thing, then we would be seeing some real impact."[29] The long and expansive project had finally come to an end.

Less than two weeks after the Y2K rollover, and in a bit of a surprise to many, Gates announced that he would be stepping down as the CEO of Microsoft. He and his company had been involved in a lengthy, unresolved federal anti-trust case since 1998 wherein Microsoft had been accused of intentionally seeking to monopolize the operating systems and Internet browser markets.[30] Gates delivered his announcement amid rumors "that Justice Department lawyers [had] proposed splitting Microsoft Corp. as a remedy for the company's allegedly anti-competitive behavior."[31] Though he would remain the chairman of the corporation he co-founded,[32] he relinquished his seat as CEO before the month was over.[33] Steve Ballmer took the reins of the company, and Gates became Microsoft's chief software architect. While many speculated that the corporate restructuring was related to turmoil surrounding the lawsuit, Gates assured reporters otherwise, saying "I'm returning to what I love most – focusing on

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[29] CNN, "Millennium 2000: Apocalypse Not," January 2, 2000, http://www.cnn.com/TRANSCRIPTS/0001/02/se.24.html.

[30] Mark Geier, "United States v. Microsoft Corp.," *Berkeley Technology Law Journal* 16 (2001).

[31] CNNMoney, "Microsoft Promotes Ballmer: Gates to Give Up Management Duties to Focus on Strategies," January 13, 2000, http://money.cnn.com/2000/01/13/technology/microsoft/.

[32] Gates served as chair of Microsoft until 2014. David Goldman, "Microsoft Names Nadella CEO, Gates Out as Chair," *CNNMoney*, February 4, 2014, http://money.cnn.com/2014/02/04/technology/enterprise/satya-nadella-microsoft/.

[33] Joe Wilcox, Michael Kanellos, and Aimee Male, "Gates Turns Over Reins of His Empire," *CNET News* January 13, 2000, http://news.cnet.com/2100-1001-235639.html.

technologies for the future…This was a personal decision, one I have discussed with Steve [Ballmer] and our board of directors for some time."[34] In light of this reorganization, it is worth noting that a stream of federal investigations and cases had been brought against the company for attempts to monopolize portions of the market.[35] Neither the rumors nor the federal cases, however, amounted to any serious, direct action against Microsoft.[36]

By March, the Gates announced their foundation's first substantial move into the realm of education through its establishment of the High School Grants Initiative. This five-year program aimed at "creating and redesigning U.S. high schools"[37] by focusing on "three priority areas: model schools and districts; professional development opportunities for teachers, principals, and superintendents; and scholarships to broaden access to higher education."[38] As the year

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[34] CNNMoney, "Microsoft Promotes Ballmer."

[35] These started as early as 1990, with the initial business relation forged between Microsoft and IBM. Wired News Report, "U.S. v. Microsoft: Timeline."

[36] Norman Hawker and Robert Lande, "As Antitrust Case Ends, Microsoft is Victorious in Defeat," *The Baltimore Sun*, May 16, 2011, http://articles.baltimoresun.com/2011-05-16/news/bs-ed-microsoft-20110516_1_windows-monopoly-web-browser-market-internet-explorer. The lead prosecuting attorney on the case was Joel Klein. He became chancellor of New York City Public Schools in 2002, received "more than $100 million in Gates and Broad funding" while in the district, and was appointed to the board of directors of the Broad Center in 2009. See Michael Klonsky, "Power Philanthropy: Taking the Public Out of Public Education" in *The Gates Foundation and the Future of U.S. "Public" Schools*, ed. Philip Kovacs (New York, 2011), 24; The Broad Center, "Broad Center Announces New Board of Directors," press release, March 19, 2009, http://www.broadeducation.org/asset/419-tbc_board_announcement.pdf.

[37] Bill and Melinda Gates Foundation, *Bill and Melinda Gates Foundation: Timeline*, (2010), 7.

[38] Bill and Melinda Gates Foundation. *Bill and Melinda Gates Foundation 2000 Annual Report* (Seattle: 2000), 51, https://www.gatesfoundation.org/~/media/GFO/Documents/Annual-Reports/2000Gates-Foundation-Annual-Report.pdf?la=en. Though the project would last five years, it included a $108,900,000 scholarship allotment that would span 13 years. This

progressed, the Gates Foundation would award eighty-six grants totaling over $398 million. These recipients included public and private organizations, research institutions, and schooling entities that had agreed to work toward the foundation's aims. Of the initiative's total budget, approximately 30 percent would be given for technological integration and training in schools, and another 29 percent would be designated specifically for "at-risk students." The remaining sum would be allocated as follows: 20 percent was spent on training teachers and leadership, 16 percent was dedicated to the creation of small schools,[39] 1 percent went toward researching and refining assessments, 0.5 percent was spent developing personalized learning, and 3.5 percent was used on miscellaneous projects and expenditures.[40]

Prior to the High School Grants Initiative, the educational involvement of the Bill and Melinda Gates Foundation had been confined primarily to their home state of Washington. This initiative, however, marked their foundation's first step toward implementing education reforms

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commitment was made to the Washington Education Foundation for the purpose of creating the Washington State Achievers Scholarship Program. Ibid., 55.

[39] During this initiative, the Gates Foundation had taken an interest in small schools. In contrast to comprehensive high schools, these typically enroll less than 600 students. This educational approach, Michael and Susan Klonsky explain, is rooted in the Freedom School movement of the 1960s and has historically been oriented toward social justice. According to their analysis, however, the Gates Foundation did not maintain an interest in the type of communal and democratic interaction that had been key to the small schools movement. See Klonsky and Klonsky, *Small Schools*; David Hill, "Breaking Up is Hard to Do," *Education Week*, October 10, 2001, http://www.edweek.org/ew/articles/2001/10/10/06gates.h21.html; American Institutes for Research and SRI International, *Evaluation of the Bill and Melinda Gates Foundation's High School Grants Initiative: 2001-2005 Final Report* (Washington, D.C.: August 2006), 3, https://docs.gatesfoundation.org/documents/year4evaluationairsri.pdf.

[40] The percentages and categories defined here are based on my analysis of the grants given during 2000. Though some grants can easily fall into more than one category, they are classified by the predominant interest of each grant. Ibid., 51-55.

across the country:[41] the schools, districts, and organizations that received Gates money were spread throughout twenty states and the District of Columbia.[42] This program was announced only five months after the White House Conference on Philanthropy, where President Clinton urged philanthropists from the tech sector to turn their attention toward public education (see Chapter 2). It had also been less than a year since the shooting attacks at Columbine High School, a tragic event that raised a multitude of concerns, including the potential for alienation and violence inside large high schools.[43] Federal funding for the small schools concept would eventually be written into NCLB, thus demonstrating that a shared interest between Gates and the federal government had aligned yet again.[44]

Managerial Efficiency and the Government-Industry Partnership

During the same month the Gates announced their national education initiative, the federal government released a reflective internal analysis called *The Journey to Y2K: Final Report of the President's Council on Year 2000 Conversion*. The President's Council reported that the Y2K preparations and fixes, occurring between 1996 and 2000, ended up costing the

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[41] Tompkins-Stange, *Policy Patrons: Philanthropy, Education Reform*, 21.

[42] The states included Alaska, Arkansas, California, Colorado, Florida, Illinois, Indiana, Louisiana, Maine, Massachusetts, Minnesota, Mississippi, New Jersey, New York, North Carolina, Oregon, Texas, Virginia, Rhode Island, West Virginia. Bill and Melinda Gates Foundation. *Gates Foundation 2000 Annual Report*, 51-55.

[43] Lynn Addington, "Cops and Cameras: Public School Security as a Policy Response to Columbine," *American Behavioral Scientist* 52 (2009); Klonsky and Klonsky, *Small Schools,* 29.

[44] U.S. Department of Education, "Smaller Learning Communities Program," *Programs* (website), accessed June 16, 2017, https://www2.ed.gov/programs/slcp/index.html; *No Child Left Behind Act of 2001*, Public Law 107-110, *U.S. Statutes at Large* 115 (2002): section 5431.

federal government $8.5 billion.[45] Amazingly, government and businesses in the U.S. spent approximately $100 billion[46] on Y2K preparations, and a staggering $500 billion was spent worldwide.[47] It is worth reiterating that the value of the U.S. stock market had tripled during these same years.[48] There can be little doubt that the exponential growth in the U.S. stock market was spurred in part because of the massive, worldwide Y2K expenditures. With the fears of the millennial rollover in the past, there was little need for governments and corporations to continue spending on personnel, infrastructure, and fixes that were no longer needed. Thus, when the Y2K 'crisis' was over, funding was cut, and the tech bubble started to give way. Within a couple of months, the stock market started crashing.[49]

The financial data that emerged from the report of the President's Council was informative if not shocking, but there were a few key lessons – what they called "principles" – that the Council learned from the Y2K transition process. The first and perhaps most important principle was the assertion that "top management needs to be involved in information technology decisions on an ongoing basis." In other words, the President's Council had become keenly aware of the prevalence of commercially created machines and software programs within the government's agencies. Because the government had to rely upon industry personnel in order to

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[45] The President's Council on Year 2000 Conversion, *The Journey to Y2K: Final Report of The President's Council on Year 2000 Conversion*, (Washington, D.C., March, 2000), 19, http://chnm.gmu.edu/cipdigitalarchive/files/91_PresCouncilY2Kfinalreport032900.doc.

[46] Teitelbaum, *Falling Behind?*, 56; CNN, "Millennium 2000: Apocalypse Not."

[47] John Quiggin, "The Y2K Scare: Causes, Costs and Cures," *Australian Journal of Public Administration* 64, no. 3 (September 2005): 46.

[48] Kraay and Ventura, "The Dot-Com Bubble, the Bush Deficits," 460.

[49] Ibid., 462.

fix the impending problems associated with Y2K, this factor facilitated, if not demanded, the creation of a "public-private partnership."[50] Through this collaboration, furthermore, leadership apparently became frustrated by their agencies' bureaucratic inefficiencies the longer the project progressed. "In many companies," the report stated, "it was only when the Board of Directors or the CEO took ownership of the Y2K problem that sustained progress became evident. This was also true in some Federal agencies. Only senior management could make Y2K a top priority..."[51] Concerns regarding the "impediments to efficient operations" ran throughout another one of the President's Council's principles: "Organizations need to do a better job keeping track of and managing the technology they use and the functions that technology perform." The President's Council claimed that such an inventory would allow organizations to eradicate "inconsistent systems and processes."[52] Put simply, reflection upon the experience and urgency of Y2K allowed the President's Council to develop the belief that the government's managerial techniques had become obsolete.

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[50] Ira Goldstein, *The Federal Management Playbook: Leading and Succeeding in the Public Sector*, (Washington, D.C.: Georgetown University Press, 2016), 15.

[51] The President's Council on Year 2000 Conversion, *The Journey to Y2K*, 19. The reference to top-down, corporate-style management or centralized control was very similar to the language Shirley Ann Jackson used to describe the reorganization she implemented at the NRC. See Rensselaer Polytechnic Institute, "Profile of Shirley Ann Jackson." It also paralleled her colleagues' complaints about her method. The difference between the two, however, was that Jackson perceived managerial efficiency where her colleagues perceived "friction." See U.S. Congress, House of Representatives, Committee on Oversight and Government Reform, *A Crisis of Leadership*.

[52] The President's Council on Year 2000 Conversion, *The Journey to Y2K*, 19. The remaining principles emphasized the importance of running and updating contingency plans, supporting National Information Centers that could restore critical services, and disclosing information to the public during times of 'crisis.'

"The story of Y2K" the report concluded, "is one of diverse organizations – industry associations, companies, and government agencies that often had opposing agendas and interests – coming together to recognize the power of information sharing and collaborations to achieve a commonly held goal."[53] This statement, along with the fact that the federal government needed help with commercially designed machines and software systems, suggests that this segment of the government had a revelation about the value of a government-industry partnership. It also reveals two overarching shifts in the mentality of the President's Council on Year 2000 Conversion.[54] The first shift, embedded in the five principles, came in the management mentality of those involved. Similar to the critiques of Jackson's management style when she was at the NRC (see Chapter 2), the perspective on management had transitioned from a "collegial" and more democratic method of working with the staff and peers inside state organizations, to a more hierarchical and centralized businesslike approach.[55]

The second shift, located in the conclusion and also centered on the idea of management, involved a transition in the perception of collaboration. That is, by the project's end, the type of collaboration that was valued was not the type that might occur laterally among those in each individual organization. Instead, it was a form of inter-organizational collaboration among the department heads, CEOs, and boards of directors. Through this *hierarchized centralization*, so to

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[53] Ibid., 26.

[54] Another report was released in September 2000 that further summarized the Y2K transition. It also mentioned collaboration as a key element, the necessity to maintain that momentum, the importance of "strong and focused leadership providing undivided attention and direction," and the need to apply "this leadership lesson to other ongoing major management issues." U.S. General Accounting Office, *Year 2000 Computing Challenge*, 5.

[55] For further explanation, refer to Chapter 2. See also U.S. Congress, House of Representatives, Committee on Oversight and Government Reform, *A Crisis of Leadership,* 12.

speak, agency heads from numerous realms realized their own power to execute defined aims if they collaborated exclusively with other departmental, business, and industry leaders. The problem with this line of thinking about managing, however, is that many voices are excluded outright while others have a chance for acknowledgement only if they are able to fight their way to the top of an organizational hierarchy. Given the inherent exclusion built into this structure, the 'commonly held goal' is common among only those who are in the highest positions, and such an arrangement, of course, rarely guarantees that decisions are for the common good.

This shifting perspective regarding the management of federal agencies was restated six months later in yet another governmental report: *Year 2000 Computing Challenge: Lesson Learned Can Be Applied to Other Management Challenges*. Though this second report was authored by the U.S. General Accounting Office, it served as an extension of the one that was originally completed by the President's Council. It expressed similar concerns and deliberately sought pathways for maintaining the managerial efficiency and collaborative "momentum" that was discovered by portions of the government during the Y2K transition.[56] In fact, the hierarchized centralization surrounding Y2K and the shifting perspective about federal management were significant enough that this particular example would eventually serve as a case study to help guide future governmental management tactics.[57]

The uncertainty of Y2K constituted a convergence of interests for the federal government and the technology industry: the government needed industry to help fix its commercially devised systems, and technology corporations wanted federal protection from legal recourse

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[56] U.S. General Accounting Office, *Year 2000 Computing Challenge*, 4.

[57] Goldstein, *The Federal Management Playbook*.

related to the Y2K bug (this will be discussed further in the next section).[58] Needless to say, these needs facilitated the government-industry partnership, and through their interactions, it appears as though the government's desire to emulate a business-like approach to management only grew as their interests coalesced symbiotically around Y2K.

Some scholars have argued that the government-industry partnership described here, as well as the resurgence of the Cold War mentality, was tied to the neoliberal push for a "globalized" workforce. For instance, similar revelations were observed in the Canadian government around the same time, wherein federal and corporate anxieties about globalization were made evident in the expressed desire for legislative processes that could respond quickly to the rapidly changing economy.[59] Under the tenets of neoliberalism, this resulted in a bait and

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[58] On October 19, 1998, when the *Year 2000 Information and Readiness Disclosure Act* was signed, at least eight lawsuits had already been filed against technology companies for their failure to proactively engage consumers regarding the Y2K glitches in their products. The bill provided temporary protection to the industry in exchange for being more proactive. Blaise Zerega, "Clinton Bill Would Protect Vendors from Y2K Lawsuits," *Computerworld*, August 4, 1998, http://www.computerworld.co.nz/article/516627/clinton_bill_would_protect_vendors_from_y2k_lawsuits/; Mark Leibovich, "High Tech is King of the Hill," *Washington Post*, October 16, 1998, https://www.washingtonpost.com/archive/business/1998/10/16/high-tech-is-king-of-the-hill/754a9b70-c0a7-4635-9236-b423fdf8b615/?utm_term=.125ceae26cb0.

[59] The work of Abu-Laban and Gabriel explain this explicitly in the realm of shifting immigration policy and the race to attract high-skilled labor. While the reports explored thus far in this study – those from the President's Council and the Government Accounting Office – pre-dated the attacks of September 11, 2001, some scholars have also analyzed a similar trend of federal and corporate partnership in the post-September 11th political climate in Canada. Yasmeen Abu-Laban and Christina Gabriel, *Selling Diversity: Immigration, Multiculturalism, Employment Equity, and Globalization* (Orchard Park: Broadview Press, 2002), 78-80; Leslie G. Roman, "States of Insecurity: Cold War Memory, 'Global Citizenship,' and Its Discontents," in *Race, Identity, and Representation in Education*, eds. Cameron McCarthy, Warren Crichlow, Greg Dimitriadis, and Nadine Dolby (New York: Routledge, 2005).

switch, so to speak, where one type of centralization was traded out for another.[60] That is, this demonstrated an expressed shift away from a statist or federal regulation model toward one that instead centralized power into the hands of a partnership of people commonly referred to as "stakeholders:" otherwise known as a group of unelected and non-federally employed individuals from a variety of hierarchized groups who represent corporate, nonprofit, and consumer-based interests (one cannot help but notice the absence of the citizen or human being from this list).[61] However, given the effects of globalism on this changing management dynamic and the emergent government-industry partnership described thus far, it is necessary to turn next to a segment of the labor market that had become particularly influential in Congress. It is likely that this is where the convergence of interests developed into a more enduring government-industry partnership.

The Tech Lobby Coalition

By this point in the narrative – the fall of 2000 – the information technology (IT) industry had gained a significant amount of power and influence in Washington, D.C., especially when it came to shaping the discourse about legal immigration. This had been building for just under a decade as lobbyists, corporations, and tech industry organizations devoted much energy and funds to building a coalition, making advantageous political connections, and in turn learning

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[60] Abu-Laban and Gabriel refer to such partnership as "a more decentralized model." While I agree that it is a move away from the classic federal-based concept of centralization, I maintain that this shift in power displaces it (i.e. centralizes it) into a different set of predominantly private hands. Abu-Laban and Gabriel, *Selling Diversity*: 80.

[61] Goldstein, *The Federal Management Playbook*: 19. Goldstein points out, but fails to problematize, the fact that when it comes to weighing the concerns of "customers, clients, and beneficiaries" in the realm of policy, not all stakeholders are treated equally. Note the absence of language referring to the interests of the citizenry or the general public. Ibid., 23-24.

how to maneuver about the internal obstacles in Congress.[62] The coalition began in the 1990s with many organizations – from the political right and left – and an assortment of the largest and well-known technology corporations.[63] By 2000, however, the industry had effectively formed a solid partnership with the academic. The history is somewhat dramatic, providing fascinating glimpses into the changing political dynamics of the era and a keen space wherein to see Derrick Bell's *interest convergence* at play. A brief version of that story is provided here, though the more extensive account is best told by other authors who experienced it.[64]

The most important aspect of this technological coalition was that, through their very well funded and coordinated efforts, they started shifting from an explicitly industry-focused lobbying effort to a partnership with universities and fields of public and private research as well. In this respect, the coalition's evolution by the year 2000 is significant because it appears to be not only a moment of convergence, but it underscores the interest around which the industry-academic partnership coalesced. In order to capture some part of this dynamic, and thus demonstrate that in 2000 the governmental-industry partnership was emerging simultaneously to the industry-academic component, it is necessary to backtrack in the narrative.

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[62] John Heilemann, "Do You Know the Way to Ban Jose?," *WIRED*, August 1, 1996, https://www.wired.com/1996/08/netizen-11/; Teitelbaum, *Falling Behind?,* 106-109.

[63] Heilemann, "Do You Know the Way?"

[64] For a more thorough explanation of the complex dynamics and interests surrounding H-1B visas, see Lucie Cerna, *Immigration Policies and the Global Competition for Talent* (New York, 2016); Teitelbaum, *Falling Behind?*; Gimpel and Edwards, *The Congressional Politics of Immigration*; Heilemann, "Do You Know the Way?"

H-1B Visas and the Crisis for Tech

It could be said that the H-1B visa classification was born alongside the incipient tech bubble. Created through the *Immigration Act of 1990*, the H-1B visa serves as a temporary, work-related visa given to people for up to six years who desire to "perform work in a 'specialty occupation'" in the U.S. Such specialty occupations have tended to include "computer systems analysts and programmers, physicians, professors, engineers, and accountants." In order to qualify, the applicants are typically required to have either 1) a bachelors degree or higher or 2) a practitioner's license from a field that is in high demand.[65] When this classification was originally enacted, Congress permitted a maximum of 65,000 H-1B visas to be granted each year.[66]

This annual allotment of H-1Bs was the most problematic component of the legislation, many technology companies had complained, because it put "a cap" on their access to the international labor pool at a time when their demand for more human capital was becoming insatiable. Therefore, they argued, the cap affected both their labor costs and their ability to build and sustain global operations.[67] This certainly constituted a 'crisis' for the technology industry, and in response, the 1990s saw the mobilization of a series of lobbying associations that became devoted to the political dimensions of this very specific type of immigration and its influences on the expansion of a technological workforce.

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[65] U.S. Citizenship and Immigration Services, U.S. Department of Homeland Security, *Characteristics of Specialty Occupation Workers (H-1B): Fiscal Year 2004* (November 2006), 3, http://www.uscis.gov/sites/default/files/USCIS/Resources/Reports%20and%20Studies/H-1B/h1b_fy04_characteristics.pdf.

[66] Cerna, *Immigration Policies and the Global Competition*, 168.

[67] Teitelbaum, *Falling Behind?*, 91.

Among the associations that were lobbying on behalf of either immigration or the technology industry prior to the inception of the H-1B visas were the American Immigration Lawyers Association (AILA), The National Association of Manufacturers (NAM),[68] the Information Technology Association of America (ITAA changed its name to TechAmerica in 2009),[69] and the Information Technology Industry Council.[70] Also making connections in D.C.

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[68] AILA helped create American Business for Legal Immigration Coalition under an affiliation with the National Association of Manufacturers (NAM). Teitelbaum, *Falling Behind?*, 57-58. As it was in the information age, NAM was also incredibly influential during the industrial era. That is, in 1905 and 1912 they released two consecutive reports titled the *Report of the Committee of Industrial Education of the National Association of Manufacturers*. In both documents, NAM began arguing for the creation of vocational education programs. They did so by drawing upon fears and feelings of inferiority in terms of German economic development and their approach to schooling. According to Joel Spring, the second report "directly related concerns about developing human capital to fears of foreign competition" and "warns: 'We should act at once because of the stress of foreign competition. We are twenty-five years behind most of the nations that we recognize as competitors. We must come nearer to the level of international competition.'" Five years after the second report, the concerns of and discourse stoked by NAM had manifest in the *Smith-Hughes National Vocational Education Act of 1917*. Joel Spring, *The American School, 1642-1996* (New York: McGraw-Hill, 1997), 233-234; Randall S. Hewitt, "Democratic Education: A Deweyan Reminder," *Education and Culture* 22, no. 2 (2006): 45.

[69] The organization was founded in 1962 under the name Association of Data Processing Service Organizations. It assumed the name ITAA in 1991 and then, because of its "strong government relations and policymaking efforts," merged with the Government Electronics and Information Technology Association in 2007. Then in January of 2009, it merged with another industry organizations to form *TechAmerica*, which was eventually acquired in 2014 by another group called *CompTIA*. "A New Name Should Stand For Something," *Computerworld* (advertisement), November 25, 1991: 70; Gautham Nagesh, "Hard Times Push IT Associations to Consider Merger," *Government* Executive, November 7, 2007, http://www.govexec.com/technology/2007/11/hard-times-push-it-associations-to-consider-merger/25699/; Elena Malykhina, "Tech Advocacy Groups CompTIA, TechAmerica Merge," *Information Week*, May 5, 2014, http://www.informationweek.com/government/leadership/tech-advocacy-groups-comptia-techamerica-merge/d/d-id/1235082; "Our Story," *CompTIA* (website), accessed March 27, 2017, https://www.comptia.org/about-us/our-story.

[70] This organization has existed since 1916, but it has been under the current name and tech-oriented mission since 1994. ITI, at the time of this writing, is comprised of over fifty of the largest technology companies. "Member Companies," *Information Technology Industry Council* (website), accessed March 27, 2017, https://www.itic.org/about/member-companies; "Our

from the tech industry during this time was the Business Software Alliance (BSA): an association cofounded and heavily funded by Microsoft. Since 1988, BSA had been in the business of prosecuting companies for software piracy and lobbying national and international governments about corporate intellectual property rights.[71]

These few associations were actively working on Congress in regard to their own isolated interests, but James Gimpel and James Edwards recall that prior to the creation of the H-1B cap, "Business had never been this involved in immigration legislation because it had never felt so directly assaulted. Established groups such as [NAM] and the U.S. Chamber of Commerce had always followed immigration legislation," the authors concede, "but the business community had never spoken with one voice." That all started to change, however, once drafts for a new immigration bill started circulating around the House and Senate in the early part of 1995.

History," *Information Technology Industry Council* (website), accessed March 27, 2017, https://www.itic.org/about/our-history.

[71] Business Software Alliance started prosecuting U.S. businesses and seeking financial retribution in 1993. See Ray Geroski, "What are the Repercussions of a BSA Audit?," *Tech Republic,* April 18, 2002, http://www.techrepublic.com/article/what-are-the-repercussions-of-a-bsa-audit/. They obtained $4 million in 1994 and again in 1995, and have since branched out to over 60 countries. See Stanley Ziemba, "Software Sleuths Track Piracy of Hi-tech Seas," *Chicago Tribune*, September 13, 1995, http://articles.chicagotribune.com/1995-09-13/business/9509130163_1_unlicensed-software-software-industry-trade-group-robert-kruger. And between 2006 and 2007, their "worldwide settlements soared 53 percent…to $56 million." This practice is not only "lucrative," but they "[demand] at least twice the retail price of software" when figuring the settlement amounts for noncompliant companies. Furthermore, it was reported in 2007 that BSA was spending "more than $3 million a year on lobbying, prodding Congress on such issues as patent reform and Internet security." See Brian Bergstein, "Software Piracy Fight Makes Enemies," *The Washington Post,* November 25, 2007, http://www.washingtonpost.com/wp-dyn/content/article/2007/11/25/AR2007112500791_pf.html. Of the $56 million collected between 2006-2007, almost $13 million came from small U.S. businesses. See News Services, "Software Piracy Group Targeting Small Business," *Chicago Tribune*, November 26, 2007, http://articles.chicagotribune.com/2007-11-26/news/0711260440_1_bsa-open-source-software-small-businesses.

The proposals were incredibly restrictive, and they drew energy from the anti-immigration sentiments that had helped pass California's *Proposition 187*: a ballot initiative that "sought to deny public education, nonemergency health care, and government-provided welfare benefits to undocumented immigrants and their children."[72] Some lawmakers claimed that this federal bill proposal was designed to target illegal immigration specifically, but corporate interests realized that it simultaneously threatened "to slash legal immigration by 40 percent."[73] Needless to say, these developing legislative prospects did not bode well for either the immigration advocacy groups or the technology industry.

Thus, in April of 1995, an experienced immigration lawyer with his own longstanding concerns related to immigration and refugees, set to work on the issue. Rick Swartz had developed a knack for building "left-right coalitions" around polarized political issues. He first started honing his lobbying and political capacity in 1982 when he created the National Forum on Immigration and Refugee Policy and then further strengthened his talents when he helped rally support for the North American Free Trade Agreement. As the climate around immigration continued to heat up into the mid-1990s, however, Swartz started assembling a new group that included "a far-flung assortment of advocates, who would meet every two weeks" to discuss political strategies. The budding coalition included a wide spectrum of interests from the American Civil Liberties Union, to religious groups, to the libertarian CATO Institute.[74]

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[72] This was a response to rising public costs. The law was eventually defeated in court, but it further fueled immigration debates and legislative proposals. Gimpel and Edwards, *The Congressional Politics of Immigration*, 201-202.

[73] Heilemann, "Do You Know the Way?"

[74] Swartz was backed by the funding of Richard Gilder – a Wall Street broker and long-time client of Swartz's – and the suggestion for this particular coalition allegedly came from him as well. Other members included the Center for Equal Opportunity, La Raza, the Organization of

The dialogues among the coalition led Swartz to see the rigid political polarity between the member groups: conservative groups wanted tighter sanctions and documentation processes for illegal immigrants; those on the left were concerned about the harmful effects of such sanctions against immigrant families and refugees; businesses wanted fewer restrictions on legal immigration and lower employer fees related to their hiring. As Swartz grappled with how to keep the coalition intact despite these political schisms, he finally took the advice of Stephen Moore[75] from the CATO Institute. It was decided that, in order to make political headway, this emerging left-right coalition had to conceive of legal and illegal immigration as two entirely separate legislative topics. The task laid out before them, then, was to convince key members in Congress to do the same and "split-the-bill."[76]

Swartz and his coalition's organizations were certainly not the only ones paying visits to Congressional members over immigration. Many technology corporations – Microsoft, Intel, Cisco, Texas Instruments, Oracle, Hewlett-Packard, Sun Microsystems – were each busily lobbying their representatives too. According to journalist James Heilemann's account, though, Swartz was personally working with Microsoft in order to build connections and thereby forward the cause of splitting the immigration bill. The other tech corporations stood in contrast to Microsoft, however, in that they not only struggled to organize; they failed to commit to the

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Chinese Americans, the US Catholic Conference, the American Jewish Committee, the National Association of Manufacturers, the National Federation of Independent Businesses, and congressional staffers from both the Republican and Democratic parties. Heilemann, "Do You Know the Way?"

[75] Gimpel and Edwards, *The Congressional Politics of Immigration*, 244-246.

[76] Ibid., 246.

broader coalition. Explaining the rationale of these other tech companies, one of their lobbyists said:

> We looked at this split-the-bill alliance and decided it was just too fragile to stay together for the long term…I heard people say, 'I can't go to my CEO and say, 'We're not taking [this] deal because we're working with these family and ethnic groups.' Plus, we weren't sure those guys would be with us in the end anyway. When people started screaming about businesses importing immigrants as cheap labor, maybe they'd join in and we'd get screwed. It was just a clash of cultures.[77]

It is obvious that at this point in time, and in the eyes of this lobbyist at least, a convergence of interests had not yet become apparent to many of the technology companies. Because of their lack of commitment, Swartz recalled, "The ethnic groups, the church groups, even the groups on the right all felt that they'd been double-crossed by business…My feeling was that the business people had made a huge mistake in terms of their self-interest."[78]

By November, Congressman Alan Simpson released an even more restrictive and exclusionary reform proposal. This one aimed to place healthcare requirements on the families of immigrants; significantly reduce the annual allotment of family and worker visas; "make more information available electronically" about non-citizens; impose restrictions on student visas; and increase employer fees for non-immigrant workers.[79] As one might imagine, the fees in this proposal ignited a sense of urgency for the technology industry and kicked them into cohesive action.

Some of the major tech firms involved in the fight up to that point decided they needed to form a new association. By the earliest part of 1996, they had hired Jennifer Eisen, an

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[77] Heilemann, "Do You Know the Way?"

[78] Ibid.

[79] Gimpel and Edwards, *The Congressional Politics of Immigration*, 241-242.

immigration lobbyist from AILA, whose mother – Phyllis Eisen – was also an immigration lobbyist for NAM and a former colleague of Swartz's at his National Forum on Immigration and Refugee Policy.[80] Drawing on Eisen's expertise and social capital, they created American Business for Legal Immigration Coalition (referred to as ABLI, but would rename itself Compete America in 2004).[81] Though the association involved NAM, the U.S. Chamber of Commerce, and corporations such as Texas Instruments, Motorola, and Sun Microsystems, the effort was substantially funded by Microsoft and Intel.[82] Similar to the approach of Swartz, Eisen and ABLI "brought businesses' representatives together in weekly meetings to cultivate an effective lobbying strategy…The coalition drafted talking points, scheduled conferences, briefed Capitol Hill staff, and brought in CEOs to lobby members directly."[83] With ABLI's coordinated efforts functioning at high capacity, and with Representative Simpson's bill proposal still looming over the industry's interests, "the high-tech forces began gravitating back toward Swartz's coalition."[84]

Over the next couple months, through their persistent presence on Capitol Hill, some crafty political strategizing, and the proliferation of reports alleging that there was a shortage of

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[80] Heilemann, "Do You Know the Way?"

[81] ABLI was founded in 1996; it was heavily funded by Microsoft, Cisco, and Intel; and it eventually changed its name to Compete America in February 2004. Gimpel and Edwards, *The Congressional Politics of Immigration*, 47; Teitelbaum, *Falling Behind?*, 57-58; Sara Schaeffer Munoz, "Strapped Employers Hope to Expand Visa Program," *College Journal from The Wall Street Journal,* March 17, 2004, https://web.archive.org/web/20040812121245/http://www.collegejournal.com/successwork/workplacediversity/20040317-munoz.html.

[82] Gimpel and Edwards, *The Congressional Politics of Immigration*, 46.

[83] Ibid., 243.

[84] Heilemann, "Do You Know the Way?"

technology workers in the U.S.,[85] the massive coalition effectively forced Congress to split the bill. As of March 14th, the new legislation turned to focus explicitly on illegal immigration. Of course, this yielded several pertinent upshots. The most obvious is that the interest convergence becomes very evident in this scenario. That is, according to Gimpel and Edwards' account, "Once legal reform was dead, business groups lost interest." This meant that the tech industry had essentially pulled the rug out from underneath the segment of the coalition that focused on the welfare of immigrant families and refugees.[86] Clearly the tech industry was there to 'do business,' – not to advocate values or human rights. Thus, without cohesive support from the entire coalition, attention was diverted explicitly onto illegal immigrants. The bill signed later that September became the *Illegal Immigration Reform and Immigrant Responsibility Act of 1996*.

The second consequence was that the immigration legislation of the early- to mid-1990s was the crisis that brought the technology industry to Washington, D.C., so to speak. More importantly for the purposes of this narrative, it brought Gates to Washington. Prior to this point, the technology and software industries had barely dabbled in politics, but the H-1B visa cap changed everything. The lead up to the 1996 legislation was a catalyzing experience that connected the industry members, CEOs, and lobbyists to other political groups. In doing so, it helped them become adept at maneuvering and advocating for their own interests at the national

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[85] Ibid. According to Heilemann, "ABLI also commissioned studies to refute…claims that high-tech firms use immigrants as cheap labor." The Alexis de Tocqueville Institute also issued pro-immigration reports about patent production by immigrants. After the 1996 bill passed, other groups in the coalition also started creating reports along similar lines to shape the narrative about tech and H-1Bs.

[86] Gimpel and Edwards, *The Congressional Politics of Immigration*, 287.

level. This expertise, along with their unending flow of capital, made sure that they would become an influential, permanent fixture in and around Congress for a long time to come.

Emergence of the Industry-Academic Partnership

When the topic of immigration was revisited again in 1998, ABLI, the individual corporations, and the many other tech industry associations in Washington D.C. were much better organized and effective at influencing the discourse. In fact, by this point, one of the prominent lobbyists working for both Microsoft and the IT industry lobby was Jack Abramoff. Not only did they have the help of perhaps the most notoriously, corrupt lobbyist of recent history;[87] the economic conditions at the time certainly helped their cause as well.

Recall that the tech bubble was rapidly inflating by this point, and hence causing a dramatic effect on the economy. Therefore, the corporations, CEOs, and lobbyists from the technology sector used this economic clout to gain the ear of Congress and thereby to legitimize their claims. They argued that "because the IT industry made up nearly one-third of the growth of the U.S. economy and IT had entered almost all sectors, a shortage of high-skilled IT labor threatened the global competitiveness of the U.S." and its technological innovation.[88] By this point, Lucie Cerna explains, "Many influential companies sent representatives to testify before

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[87] Abramoff worked for the law firm of Gates, Sr. from 1994-2001, and Microsoft recorded paying Jack Abramoff $1.74 million from 1998-2000. Teitelbaum, *Falling Behind?*, 102-105. Abramoff, a "flamboyant lobbyist who amassed a fortune by showering gifts on Congressional and executive branch officials while bilking Indian tribes of millions of dollars" was found guilty of fraud, corruption, and conspiracy and sentenced to four years in a minimum-security prison in 2008. His misdeeds and connection to House Republican leader Tom DeLay also led to DeLay's resignation. See Neil A. Lewis, "Abramoff Gets 4 Years in Prison for Corruption," *The New York Times*, September 4, 2008, http://www.nytimes.com/2008/09/05/washington/05abramoff.html.

[88] Cerna, *Immigration Policies and the Global*, 175.

Congress, such as Sun Microsystems and Microsoft." But the list had stretched beyond the corporate realm somewhat, in that it also included academic representation by a dean from the University of Michigan's College of Engineering.[89]

Pushing this same discursive line, more organizations started commissioning and releasing industry reports to press the idea of a tech hiring shortage in the U.S. The ITAA, for instance, released *Help Wanted: The IT Workforce at the Dawn of the New Century* in 1997, and they released a follow-up report again in 1998. Both reports – which were eventually discredited methodologically by the federal Government Accountability Office – were circulated around Congress and in the media.[90] Regardless of the validity of their claims, however, their reports and lobbying efforts made the intended impact on Congress.

The industry coalition helped shape the *American Competitiveness and Workforce Improvement Act of 1998*, which successfully raised the visa cap for three consecutive years. It permitted 115,000 H-1Bs in 1999, 115,000 in 2000, and 107,500 in 2001 before reverting back to 65,000 in 2002.[91] While their initial interest in this legislative round might have been H-1Bs, lobbying efforts yielded much more for the tech industry. *The Washington Post* reported, "Among the industry's victories was new legislation that will…restrict taxation on Internet commerce, create uniform national standards for shareholder lawsuits, and give copyright protection to software, music, and other written material on the Internet." There can be no doubt that these latter wins were a direct result of BSA's focused work on behalf of the software

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[89] Ibid., 176.

[90] Teitelbaum, *Falling Behind?*, 94.

[91] Cerna, *Immigration Policies and the Global*, 175.

corporations. Finally, the article stated, "Congress also passed a bill that will allow companies to share information about how to fix the Year 2000 computer glitch, without fear of lawsuits."[92]

This last legislative component referred to by the reporter is a significant one because of what it implies about the development of the government-industry partnership. In other words, at the same time that the *American Competitiveness and Workforce Improvement Act of 1998* was being negotiated, President Clinton was also working to get a separate tech-related bill through Congress. This one was casually referred to as the "Good Samaritan Law," and it was designed to stave off an impending accumulation of Y2K-related lawsuits against the technology industry. As of August of 1998, at least eight suits had been filed against various companies for their failure to proactively disclose the Y2K glitches in their products or engage consumers in regard to the necessary fixes. Eight lawsuits may not sound very threatening, but without this bill, one analysis "estimate[d] that year-2000 litigation costs could reach $1 trillion."[93]

Congress, therefore, passed the *Year 2000 Information and Readiness Disclosure Act*, and it was signed the same week as the immigration bill. Along with it, the technology industry was safeguarded from legal liability until July of 2001 in exchange for being more forthcoming with federal agencies about Y2K-related information, preparation, and fixes.[94] The details of the bill demonstrate that the federal government had already been negotiating with the technology industry about its approach to Y2K, and thereby helping to create the government-industry leg of the larger partnership.

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[92] Leibovich, "High Tech is King of the Hill."

[93] Zerega, "Clinton Bill Would Protect Vendors."

[94] *Year 2000 Information and Readiness Disclosure Act*, Public Law 105-271, *U.S. Statutes at Large* 112 (1998): 2391.

The lobbying and coalition building really came to a head in 1998, and when Jennifer Eisen of ABLI was asked about the legislative wins that year, she said, "There was a lot of gloom and doom that turned into a double rainbow for us."[95] Through the incessant discourse about a tech labor shortage and its effects on global competition, a rather troublesome belief had started to develop. That is, according to an interview with one Congressional staffer, many had come to believe that "whatever was in Microsoft's best interest would be in the U.S. economy's best interest."[96]

With the industry's momentum building in D.C., they were poised more than ever to tackle yet another piece of legislation in 2000. This time around, the tech lobbyists invited research universities into the coalition.[97] The tech sector's funding and the lobbying efforts of the massive technology coalition finally paid off in October when President Clinton signed the *American Competitiveness in the 21st Century Act of 2000*.[98] The passage of "The Act tripled the number of H-1B visas from 65,000 to 195,000 each year for fiscal years 2001, 2002, and 2003." Like the previous two bills, the hike in the allotted visas was not intended to remain permanent; it was written into the bill that the cap would revert back to 65,000 in the year 2004.[99] As it was in 1998, the immensity of technological growth was used to justify this legislation yet again.

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[95] Leibovich, "High Tech is King of the Hill."

[96] Cerna, *Immigration Policies and the Global Competition*, 176. This uncritical bestowal of trust to Gates would continue to follow him for at least a decade. Tompkins-Stange, *Policy Patrons: Philanthropy, Education Reform*, 6-8.

[97] Ibid., 170.

[98] *American Competitiveness in the 21st Century Act of 2000*, Public Law 106-313, *U.S. Statutes at Large* 114 (2000): 1251-1265.

[99] Teitelbaum, *Falling Behind?*, 58; U.S. Citizenship and Immigration Services, U.S. Department of Homeland Security, *Characteristics of Specialty Occupation Workers*, 4.

That is, corporations had an insatiable demand for more human capital while the tech bubble was expanding. But this law was signed in October of 2000 – several months after the bubble had already given way – and thus the sense of urgency used to justify the expansion of the technological workforce would soon burst along with it.

There is one striking aspect of this legislation that warrants mention: this particular bill introduced exemptions for those individuals who would "be employed at institutions of higher education or related or affiliated nonprofit entities, or at nonprofit research organizations or governmental research organizations."[100] This means that prior to 2000, the corporations, universities, and non-profits all had to compete *against one another* for a fraction of the 65,000 H-1B visas granted each year. According to Michael Teitelbaum's analysis, this legislative move signifies that the tech industry had realized the political benefit of aligning their efforts with the nation's universities and nonprofit organizations. Since so many venture philanthropists were coming out of Silicon Valley, it was probably quite effortless for the tech industry to build its connection with the nonprofit realm. Nonetheless, it is apparent that the partnership between industry and academe had been strengthened, if not forged, through this piece of legislation. Then, because this law exempted nonprofits from the H-1B count, it all but guaranteed that the venture philanthropists and their foundations would benefit from unfettered access to international labor. Furthermore, and this may be the more important point, by providing such exemptions to the research industry and non-profit sectors, the corporations wiped away much of their competition for H-1B visas, thus securing for themselves an even larger portion of this expanding pie.[101]

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[100] Ibid.

[101] Teitelbaum, *Falling Behind?*, 114.

Conclusion

Concerns about immigration and the effects of the H-1B visa cap were the catalyst for the technology industry's involvement in Washington. Even though Swartz's organizing efforts attempted to bring together corporations, industry associations, and immigration organizations on this topic, most of the technology companies resisted the coalition. They committed only after realizing that they needed the numbers to encourage Congress to split the bill and conceive of illegal and legal immigration as two separate topics. Once the focus was taken off H-1Bs and legal immigration, the IT industry went on about its business, leaving the rest of Swartz's coalition to fend for itself. The human rights cause continued to lose out as the industry component strengthened its own coalition and partnered with the academic. With the formation of this partnership, and the persistent mantra of a tech workforce shortage, it could be said that human capital effectively trampled human rights.

Recall that around the same time that the tech lobby coalition had come up to full steam, in 1999, two important things were also occurring by way of the federal government. First, of course, is the fact that the government had taken an interest in venture philanthropy and that President Clinton had specifically called upon the philanthropists from the tech sector to turn their attention and capital toward the public schools. Second, the federal government's ideas about internal federal management and hierarchized collaboration were also transitioning (this will be discussed further in Chapters 4 and 5). This occurred in light of the Y2K preparation project, further reinforcing the desire to turn toward, and perhaps even emulate, the management techniques of the private sector. The most important change, however, was that by 2000 the government-industry leg of the partnership was solidifying at the same time as the academic-industry segment. As a result of almost a decade of lobbying by the IT industry, H-1B visas were

on the rise, and research institutions had received an exemption from the count. As it would soon turn out, however, the steady influx of college enrollments by international students would come to an abrupt halt after the attacks on September 11th (see Chapter 6).

CHAPTER 4: SHIFTS IN BIOMED, BIOTECH, AND NATIONAL SECURITY

Eli Broad's insurance and retirement investment company, SunAmerica, had been purchased by American Insurance Group (AIG), and it was nearing the end of its merger transition by September 2000.[1] Gradually, Broad had been relinquishing his executive responsibilities throughout that year, and he decided to announce that January 1st of 2001 would bring about change for him and the company. Similar to the move made by Gates in January of that same year (see Chapter 3), Broad was going to resign from the position of CEO and become the chairman of his company. Less responsibility at SunAmerica would free him to explore other avenues. According to a local reporter, "[Broad] has developed a passion for what he calls 'venture philanthropy,' where he funds new programs rather than giving to established institutions, in the belief that such an approach fosters innovation."

Both science and education would be receiving more of Broad's time and money because, as he saw it, there was a great need to create more "knowledge workers." The California Institute of Technology (Caltech) had, after all, just broken ground on the Broad Center for Biological Sciences: an endeavor that was initiated in 1998 and made possible by a $23 million donation from Broad. Though the construction had only just begun, he envisioned the center to be an interdisciplinary place that "groups experts in biology, physics, chemistry and engineering together…" Its creation was necessary, he claimed, for a couple of reasons. First, Broad explained, he and his wife helped fund the project because, "we believe that the major

[1] The merger was announced in August of 1998. Vrana, "SunAmerica-AIG Union."

improvements in the human medical condition will not come from the major medical centers...but rather from areas where pure researchers can work together."[2] He followed his critique of academic institutions and their "silos"[3] with a second justification: "As we have gone from a manufacturing economy to an information economy, education becomes even more important because of the pay gap between knowledge workers and others." Broad concluded by saying, "We have to give our kids the opportunity to become knowledge workers or else we will wipe out the middle class."[4] His rationale provides insight into how he started to see the interrelatedness of scientific research, K-12 education, and the economy.

As Broad diversified his philanthropic ventures into the field of biomedical research, his interests would yet again find a close alignment with those of Gates. In fact, their interests intersect in the spaces of stem cell and genetic research, to be exact. The Human Genome Project was evolving in tandem with the discoveries and political battles related to human stem cell research. In the following section I provide a brief history of each separate field, but it is important to bear in mind that they were emerging simultaneously. Understanding the relation of one field to the other is important because both would eventually become entwined, taken up as interests by both Gates and Broad, and in many ways begin shaping the direction of public education reform. In order to weave these threads into this study's larger narrative, as well as

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[2] Jerry Hirsch, "Eli Broad to Retire as Chief of SunAmerica," *Los Angeles Times*, (September 15, 2000), http://articles.latimes.com/2000/sep/15/business/fi-21372. Broad's use of the word "pure" and its context parallels the use of the scientists behind the scientific and technological push of the Cold War. Differences between "pure" and "applied" research signified their (and Vannevar Bush's, in particular) argument for scientific autonomy. Rudolph, *Scientists in the Classroom,* 41; Urban, *More Than Science and Sputnik,* 139.

[3] Broad, *Art of Being Unreasonable,* 95.

[4] Hirsch, "Eli Broad to Retire."

explain the impact that the intermittent crises of the early 2000s would soon have on the discourse coalition, it is necessary to backtrack once again before returning to the current storyline of Broad's involvement with biomed and its connection to schooling.

The Human Genome Project

The Human Genome Project was a defining one for the federal government and academic research institutions alike. For science, the endeavor represented both a paradigm shift[5] and a "collision" of two particular fields: molecular biology and human genetics.[6] But the project was important also because, similar to the Space Race[7] or the lead up to Y2K, the individuals and entities involved had created (or witnessed) the type of collaborative momentum that allowed them to tackle a seemingly insurmountable feat: decipher the genetic makeup of the human body. The immensity of both the task and the resulting data was expected to be so vast that, at the beginning of the project, one newspaper described it the following way:

> The Genome is composed of the 23 pairs of chromosomes in each of your cells, and the chromosomes in turn are composed of double-stranded DNA molecules. These molecules are "words" built out of a kind of four-letter "alphabet:" four nucleotides called adenine, guanine, cytosine and thymidine. There are an estimated 3 billion of these nucleotide letters. That is roughly equivalent to 13 sets

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[5] Peter Godfrey-Smith, *An Introduction to the Philosophy of Science: Theory and Reality*, (Chicago: The University of Chicago Press, 2003). Godfrey-Smith provides an explanation for how Thomas Kuhn's conception of the paradigm shift has influenced understandings of the field of science.

[6] Robert M. Cook-Deegan, "The Human Genome Project: The Formation of Federal Policies in the United States, 1986-1990," in *Biomedical Politics*, ed. Kathi E. Hanna, (Washington, D.C.: National Academy Press, 1991), 102.

[7] Ibid., 117. In the planning phases, Charles DeLisi, the head of the Department of Energy's Office of Health and Environmental Research, described this effort as "analogous to a space program, but requiring the efforts of many agencies and a more distributed work structure."

of the Encyclopedia Britannica – 13 sets squeezed into each of your cells.[8]

The proliferation of the personal computer certainly seemed to offer some promise for such a large project, but at the time it would still be insufficient for the massive task at hand. If researchers were going to read, analyze, store, and share the massive amounts of data on the human genome, the field of biological science would need to turn to the field of computer science. In this respect, developments in software, computation and database capacity, as well as the emergence of the Internet and website technologies would all prove to be vital tools for making such work possible.

Leroy Hood had an interest in building a bridge between the realms of science and technology. As a graduate from Caltech who also became a faculty member there, he drew inspiration from the ideas of his own professor, William Dreyer. Hood firmly believed that innovations in technological tools spurred the development of new ideas.[9] He was driven by the symbiosis between the two, and by 1986 he had become well-known throughout his field for leading the teams at Caltech that created the first protein sequencers, protein synthesizers, DNA

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[8] Bill Dietrich, "Future Perfect – Thanks to Bill Gates' $12-million Endowment, Scientist Leroy Hood Continues His Search for a New Genetic Destiny," *The Seattle Times,* February 9, 1992, http://community.seattletimes.nwsource.com/archive/?date=19920209&slug=1474735#_ga=2.252409865.1034760656.1493848185-780773464.1489457782. This quote is used to capture the assumptions about the size of the human genome, though interestingly, it ended up being far less complex than most initially expected. It was originally predicted that the human would have 100,000 genes, but it was discovered by project's end that the species possesses less than 30,000. Paul Rabinow and Talia Dan-Cohen, *A Machine to Make a Future: Biotech Chronicles*, (Princeton: Princeton University Press, 2005), 1.

[9] Ibid.

synthesizers, and automated DNA sequencer. Each of these instruments would soon help pry open the gates to genomic analysis.[10]

Universities and researchers around the globe had been thinking about and tinkering with the idea of mapping the entire genetic makeup of simple organisms (i.e. yeast, nematode worms, flies, and mice) since the late 1970s.[11] But the application of this science to the complexity of the human seemed farfetched to many experts, and on top of it, "several proposals to apply these methods to human chromosomes were rejected by scientific review groups in the mid-1980s."[12] By Hood's account, this prospect started to change in 1984 when Renato Dulbecco, the 1975 Nobel Prize winner, suggested the idea of a large-scale human genome sequence project. Dulbecco argued that genetic research could provide much needed knowledge about the complexities of cancer. Researchers, as well as various health organizations and departments within the federal government, spent a couple years throughout the mid-1980s debating not only how such work might be conducted, but *if* it should be done at all.

As one might expect, the people and organizations in this debate remained heavily divided on the topic. More specifically, several scientific researchers had "a lot of suspicion of the 'big science' approach" when it came to their work.[13] They expressed concerns about whether this would be a good move for their discipline as a whole or whether it would jeopardize the funding and resources of those conducting the more autonomous, single investigator projects.

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[10] "Leroy Hood, MD, PhD," *Institute for Systems Biology* (website), accessed May 9, 2017, https://www.systemsbiology.org/bio/leroy-hood/.

[11] John Sulston and Georgina Ferry, *The Common Thread: A Story of Science, Politics, Ethics, and the Human Genome*, (Washington, D.C.: The Joseph Henry Press, 2002), Chapter 1.

[12] Cook-Deegan, "The Human Genome Project," 109.

[13] Sulston and Ferry, *The Common Thread*, Chapter 1.

Hood, of course, was not among the critics, but he explained that in their earliest discussions as much as "80 percent of biologists were against" the idea of sequencing the genome. Aside from the debates over big science, Hood recalled people sharing concerns that "the genome is mostly junk that would not be worth sequencing; that we were not ready to undertake such a complex project and should wait until the technology was adequate for the task; and that mapping and sequencing the genome was a routine and monotonous task that would not attract appropriate scientific talent."[14]

Other debates included how the project would be funded, which countries should be invited onto the project, and which organization should lead it.[15] The National Institutes of Health (NIH) and the Department of Energy (DOE) had both been involved in the dialogues about sequencing the human genome, but the agencies demonstrated varying amounts of support for the project as well as resistance to one another.[16] The angle on the debate started to shift, however, once the DOE questioned whether "knowing the genome sequence would help us understand the radiation effects on the human genome resulting from exposure to atom bombs and other aspects of energy transmission."[17] Specific reference was made to Hiroshima and Nagasaki,[18] leading one to see that with the invention of tools for genomic analysis, at least some

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[14] Leroy Hood and Lee Rowen, "The Human Genome Project: Big Science Transforms Biology and Medicine," *Genome Medicine* 5, no. 79 (2013): 1.

[15] Cook-Deegan, "The Human Genome Project," 115. One specific concern raised by the DOE in January of 1986 was whether the Soviet Union should be included in this international consortium.

[16] Sulston and Ferry, *The Common Thread*, 61-62.

[17] Hood Rowen, "The Human Genome Project,"1.

[18] Cook-Deegan, "The Human Genome Project," 113.

came to seriously question the long-term and seemingly undetectable ramifications of scientific and technological developments on the human body. Support for the project strengthened further once the director of the NIH, James Wyngaarden, started advocating that the genome project held great promise for making sense of yet another prevalent fear of the mid-1980s: AIDS and HIV.[19] With the DOE's interest piqued and the NIH on board, the National Academy of Science soon threw its support behind the project and requested that the National Research Council explore "the whole question of an international genome effort."[20]

The endeavor to decipher and sequence the genetic makeup of the human species was an interdisciplinary, cross-institutional, and international effort. It was a consortium of twenty research institutions located throughout the U.S., U.K., Japan, France, Germany, and China.[21] Though it was a shared project, each facility within the international consortium was responsible for acquiring funding via their own governmental, university, and philanthropic connections. With the U.S. government finally behind the idea of funding the research inside its own institutions, the Human Genome Project got underway in 1990.[22]

As other researchers and their facilities got the project off the ground, Hood grew increasingly disenchanted with Caltech because of its "lack of a medical school or sympathy

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[19] Ibid., 135.

[20] Sulston and Ferry, *The Common Thread*, 61.

[21] National Human Genome Research Institute, "The Human Genome Project Completion: Frequently Asked Questions," press release, April 14, 2003, https://www.genome.gov/11006943/human-genome-project-completion-frequently-asked-questions/.

[22] For an extensive historical account of the project's creation and funding, see Cook-Deegan, "The Human Genome Project."

with biotechnology."[23] The University of Washington (UW), however, had a longstanding interest in recruiting him because, again, he had quite the reputation. Bill Dietrich from *The Seattle Times* claimed:

> His lab has done far more than develop machines, however. It has worked on a safe vaccine for hepatitis. It helped discover a new kind of renegade protein called prions. It came up with a simple blood test to diagnose T-cell leukemia. It helped discover how the AIDS virus attaches to cells. It discovered that multiple sclerosis is caused by certain immugens.

Finding the factory-like qualities of Caltech's facility to be most impressive, Dietrich reported, "Hood oversees a staff of more than 40 scientists in a lab that runs round the clock and generated important papers at a rate of nearly one a week." This stood in contrast, the article continued, to "most university biology labs" where they "average 10 scientists producing five or 10 research papers a year."[24] Verifying the reporter's claims might prove difficult, but at the very least this statement says something about the perceptions regarding Hood, the demand within his lab, and the output he yielded.

If UW was going to attempt to support Hood's work and the type of lab he was accustomed to working with, they knew their campus would need to build a new facility. Therefore in November of 1990, the director of the university's Center for Bioengineering, Lee Huntsman, reached out to Bill Gates at one of their home football games (recall that although Gates had not attended UW, both of his parents were well-known alumni). Fortunately for Huntsman, Gates had already taken an interest in the bioengineering work being done in the

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[23] Dietrich, "Future Perfect – Thanks to Bill." Robert Sinsheimer, the chancellor of University of California at Santa Cruz, had been trying for some time to get the state's university system to create a genome institute, but it was met with political resistance and, hence, failure. Sulston and Ferry, *The Common Thread*, 58-60.

[24] Dietrich, "Future Perfect – Thanks to Bill."

private sector. He had invested $5 million into a Seattle-area company called Icos,[25] and though it would still be three years before Gates would create his first philanthropic trust (The William H. Gates Foundation in 1994), he ended up deciding to spread his reach into public sector biotech research as well. He provided a $12 million donation in 1991 – the largest given to UW at that point – in order to found the university's Molecular Biotechnology Department.[26] With Gates' commitment, Hood finally accepted the offer by UW. He began his appointment as department chair in the summer of 1992 where he was accompanied by roughly fifteen fellow researchers who followed him from Caltech.[27]

By 1996, about halfway through the life of the Human Genome Project, five of the twenty consortium institutions had developed into the predominant sites for sequencing. This group, referred to as the G5, included one center from the U.K. and four from the U.S.: the Wellcome Trust Sanger Institute, the Whitehead Institute for Biomedical Research at the Massachusetts Institute of Technology (MIT), Washington University in St. Louis, Baylor College of Medicine, and the Department of Energy's Joint Genome Institute. At this point, some of the key scientists of the G5 came to realize that it was necessary to establish an agreement on how to handle the release of and access to the project's data. Because of 1) the

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[25] Ibid. The work of Icos became most known for was the creation of the erectile dysfunction drug called Cialis. See Associated Press, "Eli Lilly to acquire Icos for $2.1 Billion," *NBC News*, October 17, 2006, http://www.nbcnews.com/id/15300673/ns/business-us_business/t/eli-lilly-acquire-icos-billion/#.WRR_kY60ync.

[26] Bill and Melinda Gates Foundation, "Record Gift Boosts UW's Position as World Leader in Genomics Research," press release, April 24, 2003, http://www.washington.edu/news/2003/04/24/record-gift-boosts-uws-position-as-world-leader-in-genomics-research/; University of Washington, "A History of the Department of Genome Sciences," *Genome Sciences* (website), accessed May 10, 2017, http://www.gs.washington.edu/about/gshistory.htm.

[27] Dietrich, "Future Perfect – Thanks to Bill."

group's global span, 2) the collaboration it required to accomplish the work, and 3) the necessity therefore to keep the project open and non-competitive, the scientists agreed that it was vital to keep "as much of the genome information as possible universally available in the public domain and therefore unpatentable."[28] To foster trust among the group, each member agreed to release their sequencing data to one another on an ongoing basis. Furthermore, by keeping the findings "freely available and in the public domain for both research and development," the group aimed "to maximize its benefits to society."[29] This agreement, which was hashed out at a meeting with the project's key participants, became known among the international consortium as the Bermuda Principles.

Unfortunately, the scientists would have to fight time and again to uphold the altruistic aim of the Bermuda Principles. This aim was threatened by numerous political battles throughout the process, of course, but worse yet, there was a plethora of attempts by independent researchers, companies, and investors to capitalize on the data and discoveries made along the way.[30] For example, one such researcher was Craig Venter, a fellow associate of Leroy Hood. Venter effectively left the consortium in 1998 to start his own company (Celera Genomics),[31] and upon doing so, alleged that he could outpace the Human Genome Project by having the complete sequence done in a year.[32] He used the argument that as a private entity, he could get

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[28] Sulston and Ferry, *The Common Thread*, 90.

[29] Ibid., 146.

[30] Ibid., 87, 110. Sulston explains that "from 1992 onwards genome scientists in universities found venture capitalists hammering on their doors."

[31] Rabinow and Dan-Cohen, *A Machine to Make a Future*.

[32] Sulston and Ferry, *The Common Thread,* 150.

the work done faster and cheaper, but the scientists in the international consortium vehemently argued that the quality of his work would be inferior to the collective's.[33] In stepping outside the project and their agreement on the Bermuda Principles, Venter signified to the scientists at the publically funded facilities that he was intent on privatizing the genome by patenting and then commercializing the data.[34] Shortly after Venter's announcement, Hood also decided to leave his academic post for the private sector, and one might say that his abrupt resignation from UW did not bode well for his relationship with Gates.[35]

By this point, needless to say, the race was on between the public institutions and private companies. John Sulston, a lead researcher at the U.K.'s Sanger Institute throughout the duration of the Human Genome Project, provides a fascinating autobiographical account of the ensuing power dynamics and the feverish attempts to patent the presumably unpatentable: the genetic code of humanity. The scientists in the consortium fought to get their data released as soon as possible because they knew that as long as they could get it into the public domain, the information about our "common heritage"[36] – our DNA sequence, genetic maps, and expressed sequence tags – could not be patented by and profitable to private interests. Among the scientists in the U.S. who seemed particularly enflamed and committed to beating Venter to the end was Eric Lander. Lander was the lead researcher at one of the G5 sites – MIT's Whitehead Institute for Biomedical Research – which in a few years would end up partnering with Harvard to form

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[33] Ibid., 160.

[34] Ibid., 163.

[35] Luke Timmerman, "Biotech Breakup: Lee Hood, Bill Gates and 'A Kick in the Teeth,'" *The Seattle Times*, August 11, 2016, http://www.seattletimes.com/business/technology/lee-hood-bill-gates-and-a-kick-in-the-teeth/.

[36] Sulston and Ferry, *The Common Thread*, viii.

one of the leading genomics centers in the U.S.: The Eli and Edythe Broad Institute.

Human Embryonic Stem Cell Research

As mentioned before, the stem cell field was changing rapidly right alongside the field of genetics. Scientists had been conducting stem cell research since at least the early 1980s.[37] As Zach Hall explains, "In 1982, Martin Evans in the United Kingdom and Gail Martin in the United States independently discovered mouse embryonic stem cells…"[38] Like the sequencing of the genome, the discovery of stem cells also held great promise and upheaval for the biological sciences and medicine. Stem cell research was conducted only on non-human embryos for the first decade and a half after discovery.[39] But the dynamics and fears surrounding these studies changed considerably in the U.S. during the mid-1990s when the complex ethical debates about the field became intricately tied to the religious beliefs and politics that circulated around the issue of abortion.[40]

More specifically, concerns were escalating in the U.S. about the sources of stem cells and the potential ramifications of the research itself. Given this climate, Congress wrote the Dickey-Wicker Amendment into the 1995 federal spending bill as a means to prevent federal agencies from funding research in which "a human embryo or embryos are destroyed, discarded, or knowingly subjected to risk of injury or death…" Congress made a similar move yet again in

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[37] National Institutes of Health, "Stem Cells Basics I," *Stem Cell Information* (website), accessed May 10, 2017, https://stemcells.nih.gov/info/basics/1.htm.

[38] Zach W. Hall, "Stem Cell Research in California: The Intersection of Science, Politics, Culture, and Law," *Minnesota Journal of Law, Science & Technology* 10, no. 1 (2008): 7.

[39] National Institutes of Health, "Stem Cells Basics I."

[40] Hall, "Stem Cell Research in California," 6.

1996, but this time applied its restrictions directly to the NIH, one of the largest scientific funding agencies in the country.[41] It was a legislative action that was undoubtedly influenced by fears of cloning because, at the same time, Ian Wilmut from the United Kingdom had just utilized *in vitro* fertilization and a process called nuclear transfer to create Dolly, the first cloned sheep.[42]

Few politicians possessed either the knowledge or the courage that would have been necessary for taking on the political complexities of these scientific developments. In the absence of such debate, Hall argues, these two legislative moves mark "the beginning of federal human stem cell research policy." It is worth pointing out, however, that by abstaining from involvement, Congress' stance was "one that effectively removed the United States government from any role in funding" and, more importantly, "regulating the field."[43] As one might imagine, this sudden dearth of federal resources posed a major threat to the stem cell researchers and public institutions who had long relied on the NIH and other government agencies for funding. This meant that the federal aversion to the complicated conversations about the ethics of 'life' – from embryonic to adult, from naturally occurring to scientifically altered – would leave the research, the funding, and the ethical debates in the U.S. to be shaped primarily by private and corporate entities.

In September of 1998 – three years after the Dickey-Wicker Amendment was implemented and six years after Lee Hood had left Caltech for UW – Broad announced that he

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[41] Phillip B.C. Jones, "Funding of Human Stem Cell Research by the United States," *Electronic Journal of Biotechnology* 3, no. 1 (2000).

[42] Hall, "Stem Cell Research in California," 7.

[43] Ibid., 8.

was going to provide an $18 million donation to Caltech for the construction of The Broad Center for the Biological Sciences.[44] The university president who accepted this substantial sum was David Baltimore, a Nobel Laureate who had spent his life researching virology, "cancer, AIDS, and the molecular basis of the immune response."[45] With all of the rapidly occurring changes in biomed and biotech, Baltimore and Broad were both incredibly optimistic. In an interview with one campus newsource, Caltech's president said, "I see great strides ahead in the manipulation of genes in myriad areas from medicine to information technology to agriculture…"[46] In contrast to the more traditional separation between public and private interests in research and development, Baltimore had started to envision a closer relationship between the academy and corporate industries. That is, he imagined "tens and maybe hundreds of small companies taking individual discoveries from Caltech and other institutions in the area and developing beneficial products."[47] In one interview, he said he believed such symbiotic ventures would grow throughout California, but also in Cambridge, Massachusetts.[48] These

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[44] Tindol, "Caltech Launches Major Bioscience Initiative."

[45] Jill Perry, "Baltimore to Retire as Caltech President, Will Remain at Institute as Biology Professor," *Caltech*, October 3, 2005, http://www.caltech.edu/news/baltimore-retire-caltech-president-will-remain-institute-biology-professor-1049. Prior to going to Caltech, Baltimore was the founding director of the Whitehead Institute at MIT, the research institution that prides itself on "making the single largest contribution to the Human Genome Project." Whitehead Institute for Biomedical Research, "Introduction," *History* (website), accessed May 17, 2017, http://wi.mit.edu/about/history.

[46] Tindol, "Caltech Launches Major Bioscience Initiative."

[47] Kenneth R. Weiss and Paul Jacobs, "Caltech Joins Rush to Foster Biotech Spinoff Companies," *Los Angeles Times*, September 16, 1998, http://articles.latimes.com/1998/sep/16/news/mn-36937.

[48] David Baltimore was the founder of MIT's Whitehead Institute – Eric Lander's facility and one of the G5 sites – prior to going to Caltech. Perry, "Baltimore to Retire as Caltech President."

changes would happen because, he said, "We are entering the post-genomic age."[49] Baltimore, in fact, was not far off.

Parallel Growth in Biotech and Biomed

The Human Genome Project was eight years along and moving rapidly when Broad announced his initiative with Caltech, and though Baltimore and Broad may or may not have known it at the time of their interview, the Broad Center for the Biological Sciences would open just before the complete genome sequence would be made public. Furthermore, as luck would have it, Caltech's announcement came just two months before another major scientific discovery. That is, on November 6th of 1998, the laboratory headed by professor James Thomson of the University of Wisconsin, Madison reported that the first stem cells were successfully created from early stage human embryos. The news incited more fears, obviously, as well as innumerable dreams about the possibility for innovation, from pharmaceuticals to therapy to transplant medicine. This discovery offered incredible promise to biomed and biotech, but it stood in stark contrast to the publicly funded Human Genome Project because, in accordance with the federal guidelines imposed after the Dickey-Wicker Amendment, it was funded by two private entities: a California-based corporation called Geron and the Wisconsin Alumni Research Foundation.[50]

A year and a half after Thomson released his findings about human embryonic stem cells, the Human Genome Project finally hit a substantial milestone. On June 26, 2000, President Clinton and Prime Minister Tony Blair held joint press conferences in the U.S. and the U.K. to

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[49] Tindol, "Caltech Launches Major Bioscience Initiative."

[50] Jones, "Funding of Human Stem Cell Research."

announce that the very first working draft of the human genome had been completed.[51] The scientists predicted that it would take until 2003 for them to finish converting the draft into the full genetic sequence, and once it was done, they anticipated that researchers would likely spend decades interpreting it. In total, the Human Genome Project ended up being a thirteen-year endeavor, and the work done at the U.S. sites cost taxpayers $3 billion.[52] But as it drew to a close, it became apparent that through some very strategic collaboration, the international consortium had indeed succeeded in its aim to ensure free and open access to the human genome.

Between the ongoing release of data from the Human Genome Project and the emergent discoveries in human stem cell research, the fields of biotech and biomed were reaping enormous benefits. In the midst of this rapid evolution, Broad and Gates were each becoming increasingly influential in these fields. That is, Gates had been trying to convert Seattle into one of the globe's premier biotech and genomic centers for quite some time.[53] This endeavor started with his private investment in the company Icos and his first public investment in UW (and Leroy Hood) back in 1991. Even though Hood left in 1999, the university's program was building and continuing to thrive.[54] Furthermore, Gates' support of UW's genomic research would only increase as the Human Genome Project came to an end. By its conclusion, UW had on their

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[51] Sulston and Ferry, *The Common Thread*, 187.

[52] Hood and Rowen, "The Human Genome Project," 2.

[53] Timmerman, "Biotech Breakup."

[54] Luke Timmerman, "Gates Gives $70 Million for Genome Work at UW," *The Seattle Times*, April 24, 2003, http://community.seattletimes.nwsource.com/archive/?date=20030424&slug=gatesgift24.

faculty two of the most prominent scientists from the consortium: Maynard Olson[55] and Robert Waterston.[56] In the years to come, the Gates Foundation would give another $70 million to help create the university's Department of Genome Sciences (formerly the Molecular Biotechnology Department headed by Leroy Hood) and its Department of Bioengineering.[57] Gates' focus on transforming Seattle's biotech industry continued to build and was likely tied to his interests in curing HIV and understanding other deadly viruses. Scientists believed biomed and biotech would be key to doing this, and so it seems probable that Gates' interest was driven less by financial profit and more so by the potential for legacy.

Broad, on the other hand, was only just beginning to put his spurs into California's biomed industry as the research on human stem cells and human genomics was really coming to a head. As was stated at the beginning of this chapter, he had helped fund the creation of the Broad Center for Biological Sciences at Caltech in 1998. The facility was not scheduled to open until 2002, but they had just started construction on it when Broad announced that he was stepping down from AIG SunAmerica to spend more time engaging in venture philanthropy.

Though Gates and Broad had developed different philanthropic approaches and interests by the end of the summer in 2001, both had invested significantly in the fields of biomed and biotech. As a result of their philanthropic projects in these fields, as well as Gates' continued

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[55] Olson founded the Department of Molecular Biotechnology with Hood in 1992. Justin Reedy, "Maynard Olson Receives 2007 Gruber Prize for Genetics," *UW Today*, July 19, 2007, http://www.washington.edu/news/2007/07/19/maynard-olson-receives-2007-gruber-prize-for-genetics/.

[56] Waterston ran the center at Washington University in St. Louis, and then joined the faculty in January 2003. University of Washington Medicine, "Robert H. Waterston, M.D., Ph.D.," *Chairs and Professorships at UW Medicine* (website), accessed May 15, 2017, http://depts.washington.edu/givemed/prof-chair/holders/robert-waterston/.

[57] Timmerman, "Gates Gives $70 Million," *The Seattle Times*.

involvement in the tech industry, Gates and Broad each stood to profit from the expansion of science, technology, engineering, and mathematics labor markets. At the same time, however, the federal landscape was experiencing its own shifts. This in turn induced a desire for larger numbers of native-born IT professionals and a more diverse science and engineering workforce. In the next section, I will explain the federal government's growing interest in the production of human capital in these areas.

The Hart-Rudman Commission and the Fed's Crisis in Human Capital

By the beginning of 2001, some segments within the federal government had already experienced shifts in their views about federal management[58] and the benefits of a government-industry partnership. This was evident in the reflections provided by The President's Council in *The Journey to Y2K: Final Report of the President's Council on Year 2000 Conversion* as well as in the U.S. General Accounting Office's *Year 2000 Computing Challenge: Lesson Learned Can Be Applied to Other Management Challenges* (see Chapter 3). Recall, however, that at the same time President Clinton created this council to oversee the technological well being of the country leading into Y2K, he also assembled another study group to conduct a two and a half year-long assessment of the security of the nation (see Chapter 2). The United States Commission on National Security/21st Century (referred to as the Hart-Rudman Commission

[58] The growing discontent with management strategies seems to be characteristic of the Clinton-era, and it is likely that the *Government Performance and Results Act*, at least in part, induced this awareness. This will be explained more thoroughly in Chapter 5.

from here forward)[59] was chartered in October of 1998. With a finite focus on what the country might look like in the year 2025, the commission aimed to:

> …determine the global security environment of the first quarter of the 21st century; analyze the character of the nation during that timeframe and develop an appropriate national security strategy; and to recommend alternatives to the current national security apparatus and processes to implement the new strategy.[60]

In order to do this, the group determined that it needed to "seek extensive input from a wide range of experts in business, academia, the private sector and key former and current security experts…"[61] This is yet another space where the intention to strengthen a government-academic-industry partnership is made explicit. The commission launched a website to facilitate this dialogue, and upon doing so, it proclaimed to be the first attempt by a "government-sponsored study" to "[maintain] a permanent direct connection with the American public during its drafting process."[62] The Hart-Rudman Commission released its first report in September 1999[63] and its second in April of 2000.[64] The concluding report, however, was scheduled to be released after the new administration moved into the White House.

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[59] It was originally named the Boren-Rudman Commission, but that would change by April of 1999. U.S. Commission on National Security/21st Century, "New Open Forum for National Security Study Group," press release, May 24, 1999, http://govinfo.library.unt.edu/nssg/News/Press/press.htm.

[60] U.S. Commission on National Security/21st Century, "DOD Establishes the Boren-Rudman Commission," press release, October 13, 1998, http://govinfo.library.unt.edu/nssg/News/Press/press.htm.

[61] Ibid.

[62] U.S. Commission on National Security/21st Century, "New Open Forum."

[63] U.S. Commission on National Security/21st Century, *New World Coming,* preface.

[64] U.S. Commission on National Security/21st Century, *Seeking a National Strategy: A Concert for Preserving Security and Preserving Freedom*, (April 15, 2000).

George W. Bush was inaugurated in January of 2001 after an enormously contentious presidential election. Less than a month after he stepped into his new post, the Hart-Rudman Commission released its third and final report, as planned, on February 15th.[65] The study culminated with *Road Map for National Security: Imperative for Change*, a report that attempted to understand and suggest ways for controlling the rapid changes brought on by technological advancements and economic shifts. It also sought to reform "government structures and processes to enable the U.S. government to implement…any strategy that would depart from the embedded routines of the last half-century."[66]

The Hart-Rudman Commission had provided the most thorough evaluation of U.S. national security and the most extensive strategic proposals since the *National Security Act of 1947*. Not surprisingly, the report concluded that changes in "scientific-technological, economic, socio-political, and military-security domains" would come to heavily impact the nation's security by 2025.[67] It was anticipated that certain sectors would play a significant role in protecting the nation and its critical systems from biological, terrorist, and cyber attacks.[68] Finally, given the substantial scientific discoveries and technological developments during that

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[65] Among the many participants were Norman Augustine (Lockheed Martin); John Dancy (NBC News Correspondent); Leslie Gelb (Council on Foreign Relations, Arms Control at DOD, NY Times columnist, Carnegie); and Newt Gingrich (Speaker of the House under President Clinton and FOX News affiliate). U.S. Commission on National Security/21st Century, *Road Map for National Security: Imperative for Change*, (February 15, 2001): 135-137.

[66] U.S. Commission on National Security/21st Century, *Road Map for National Security*, v.

[67] Ibid., 2.

[68] Ibid., 27.

time, the commission predicted that the space, energy, information technology, and biotechnology sectors would be of most value in the coming decades.

An over-arching theme of the report was frustration with what the commission saw as governmental obsolescence and managerial inefficiency, particularly in terms of defense. In fact, the synopsis on federal agencies was scathing: "Strategic planning is absent in the U.S. government and its budget processes are so inflexible that few resources are available for preventive policies or for responding to crises, nor can resources be reallocated efficiently to reflect changes in policy priorities." The critique continued unapologetically:

> The economic component of U.S. national security policy is poorly integrated with the military and diplomatic components. The State Department is demoralized and dysfunctional. The Defense Department appears incapable of generating a strategic posture very different from that of the Cold War…[69]

As the commission saw it, the government's defense agencies were "slow, inefficient, and burdened by excess regulation."[70] Much like the President's Council on Y2K Conversion and the U.S. General Accounting Office, the Hart-Rudman Commission also had become frustrated by what it saw as obsolescence and managerial inefficiency. In a similar fashion, it also pushed for a hierarchized centralization that would concentrate control to "an interagency coordinating group" of "heads of departments and agencies" who could then oversee the implementation of orders.[71]

To rectify concerns over national security and organizational inefficiency, the commission offered five strategies. First, it recommended the creation of a National Homeland Security Agency to oversee the "planning, coordinating, and integrating" of all governmental

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[69] Ibid., 8.

[70] U.S. Commission on National Security/21st Century, *Road Map for National Security,* 8.

[71] Ibid.,100.

activities that are related to national security[72] (bear in mind that this particular suggestion came seven months *prior* to the attacks on September 11, 2001). The commission argued that the security infrastructure at the time was primarily devised to respond to the type of threats relevant during the Cold War era. Portions of the federal government had taken some steps to prepare for emergencies related to "weapons of mass destruction,"[73] but the commission believed that the U.S. was ill equipped to handle the "new threat environment – from biological and terrorist attacks to cyber attacks on critical systems."[74] In other words, the rapidly occurring scientific discoveries and technological developments posed as much threat as they did promise, and the commission believed there was an urgent need for organizational restructuring to handle it.

The second suggestion was aimed at education. The commission's primary claim was that "the U.S. need for the highest quality human capital in science, mathematics, and engineering is not being met"[75] (this belief was bolstered by the NSF and will be discussed in Chapter 6). The Hart-Rudman Commission alleged that too many citizens were steered away from these careers because of 1) the "demanding training" required for these fields and 2) the lucrative salaries offered by other fields. When put in these terms, it seems apparent that U.S. citizens had done little more than engage in a simple cost-benefit analysis. However, the commission pressed its argument, claiming that in contrast to U.S. students, many international students enrolled in the country's university system *because* of its strength in science, math, and engineering. Such a trend resulted in a disproportionate representation of U.S. students in the

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[72] Ibid., 15.

[73] Ibid., 26.

[74] Ibid., 27.

[75] Ibid., 30.

most valued knowledge areas, leading the commission to believe that too much of the nation's 'knowledge assets' were tied up in foreign students.[76] This constituted a vulnerability to them, and just as it was with *Sputnik I*, education was dubbed a "national security imperative."[77]

In light of the university enrollments and the lack of interest on the part of U.S. students, the report claimed that the K-12 "education system is not performing as well as it should."[78] It is worth noting, however, that there was no mention of the data that was used to draw such a conclusion. While the report conceded that "the word 'crisis' was much overused," it affirmed nonetheless that "if the United States does not stop and reverse negative educational trends…it will be unable to maintain its position of global leadership..."[79] Thus, the commission suggested that the areas of science, mathematics, engineering, and computer science be given immediate attention. Specific proposals included increasing federal funding for research and development in those specific fields as well as bolstering science and math in the K-12 setting.

Given the breadth of the proposal, the Hart-Rudman Commission anticipated limited funding for these educational changes, so it made a particularly significant proposal. That is, it encouraged leaders to form partnerships with "corporate and private philanthropists," and it asked Congress to entice donors by offering "enhanced corporate tax benefits" for those

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[76] Ibid., 34.

[77] Ibid., 38. In the era surrounding *Sputnik I*, Congress and the Eisenhower's administration also chose to focus on science education. Rudolph, *Scientists in the Classroom,* 108; Urban, *More Than Science and Sputnik,* 4.

[78] U.S. Commission on National Security/21st Century, *Road Map for National Security,* 30.

[79] Ibid., 41. Despite that note on 'crisis' over-usage, the word did appear over 40 times in 117 pages.

individuals and organizations who did.[80] Note that this report was released about a year and a half after President Clinton hosted The White House Conference on Philanthropy, wherein he pressed the idea that there was a need to facilitate a convergence with the nonprofit sector.

The third suggestion offered by the Hart-Rudman Commission stemmed from their belief that the Executive Branch was in desperate need of being reorganized. Though this included a large umbrella, specific attention was paid to the National Security Council, the State Department, the Department of Defense, as well as the nation's intelligence agencies and its space infrastructure. A series of departmental consolidations and eliminations was recommended for the Department of State because, according to the study group, the agency's responsibilities had been spread so thin that it weakened the organization's efficiency and impact. For the Department of Defense, however, the commission advised that the Secretary reduce the costs tied up in personnel and infrastructure through a reorganization that embraced the tactics of outsourcing and privatization.[81]

The commission's fourth recommendation involved laying the groundwork for recruiting and then retaining a workforce that could satiate the government's growing need for IT professionals. Though this concern is similar to the one raised by the tech lobby in their fights for H-1B visas (see Chapter 3), the commission's problem had a slightly different twist on it. According to the Hart-Rudman Commission, three primary problems undergirded the government's overarching concern with human capital. First, the report pressed the fact that the government's IT workforce was aging. This makes sense because many of the people who had been schooled after *Sputnik I* and under the human capital push from NDEA would have been in

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[80] Ibid., 44.

[81] Ibid., 47 and 66.

the twilight years of their careers as Y2K approached. In addition, the government's aging workforce was effected by two other related problems: "the 'Generation X' cohort [was] less inclined toward government employment," and the government could not compete with the IT salaries and benefits that were being offered in the private sector.[82] Interestingly, the commission also noted the government's inability to compete with "the intrinsic interest of the work" that individuals derived from being in the private and non-profit sectors.[83] In other words, the federal government's problem with its own workforce was created primarily *because* of the tech bubble – not because of schools – and it just so happened that this influential factor was in the process of dissipating as the Hart-Rudman Commission was writing its second and third reports. From their perspective, though, the government's scientific and technological workforce was dwindling, and they felt the need to foster a national commitment to both civil and military service in order to recuperate this loss of human capital.[84]

The final recommendation offered by the commission stemmed from its belief that "[only] by having the five most powerful members of the Congress directly involved is there any hope of real reform."[85] Therefore, they suggested that Congress be re-evaluated and re-aligned so the commission's foreign policy and national security objectives could be actualized. However, in order for those Congressional members to be most efficient in their management, the

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[82] Ibid., 96-97.

[83] Ibid., 86.

[84] I focus on the Hart-Rudman Commission here because of the expressed interest in the field of education. However, at the time of the report's release, other federal agencies were also exploring concerns about a human capital shortage as well as its management. These emergent concerns will be discussed further in Chapter 5.

[85] U.S. Commission on National Security/21st Century, *Road Map for National Security*, 110.

commission claimed it was necessary to develop "a system for the ongoing basic inventory stewardship of the nation's capital knowledge assets."[86] Such assets included not only the national security and technological infrastructures, but the "knowledge-workers" as well.[87] It was determined that the NSF and the National Academies of Science (NAS) should oversee such a system, but it was also advised that the expertise of "leaders in science" and those "in the high-technology, venture-capital arena" be brought into direct contact with Congress so their policymaking would be more informed.[88] In other words, the commission encouraged members of Congress to open their doors to the interests of corporations and venture philanthropists.

In one way or another, all five suggestions were rooted to reorganization, privatization, and/or education. In this respect, the Hart-Rudman Commission's report was pivotal because it signified the culmination of a change in perspective within the U.S. government and hence a shifting direction. Similar to the President's Council and the U.S. General Accounting Office, it had come to view collaboration among a centralized hierarchy (agency and department heads, Congressional leaders, industry CEOs, etc.) as managerial efficiency.[89] The commission also came to believe that the education system would need to find ways to produce more human capital if the country's security and economic and technological superiority were to be

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[86] Ibid., 34, 114.

[87] Ibid., 44.

[88] Ibid., 114.

[89] Ibid., 50. Ironically, they did so despite their own complaints about a balance of power. The Commission argued that a decade-long shift in power had occurred: too much power had been centralized to the National Security Council (NSC) while the State Department had been severely weakened.

buttressed.[90] In light of this belief, they prioritized technology, science, and math as "knowledge assets" to be cultivated and overseen by NSF. However, in the wake of Y2K, the nation was moving headlong into a recession, and the government could not afford to fund another Space Race like it did in the 1950s and 1960s.[91] Therefore, in order for the nation to compete, the commission suggested that the government turn toward corporate and philanthropic funding, outsourcing, and privatization. But the commission did not feel it would be enough to simply create more 'assets;' they required protection as well. And since the rapid changes in technology, biotech, and the economy seemed to bring on as much anxiety as they did fervor, the commission laid out the conceptual plans for a national homeland security agency.

Conclusion

The Hart-Rudman Commission's *Road Map for National Security: Imperative for Change* was crucial for numerous reasons. First, it provides a glimpse at how the government was increasingly coming to see privatization and philanthropy as the preferred panaceas to its funding and managerial hurdles. Second, the report details the government's concerns that rapid developments in technologies, biomed, and biotech were shifting the dynamics of warfare, at the same time that vital components of the government's national security workforce were failing to be replenished at its desired rate. The commission attributed the workforce shortage to two

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[90] The issue of human capital is synonymous with complaints by the Eisenhower administration prior to the launch of Sputnik. Rudolph, *Scientists in the Classroom,* 57-77.

[91] Recall that the stock market plummeted post-Y2K. The U.S. "sank into a recession in March [2001], ending 10 years of growth that was the longest expansion on record…" See "Economists Call it Recession," *CNN Money*, November 26, 2001, http://money.cnn.com/2001/11/26/economy/recession/; Kraay and Ventura, "The Dot-Com Bubble," 462.

problems within the citizenry: the propensity of those with IT expertise to gravitate toward and remain in the tech industry, and the lack of citizens pursuing higher education degrees and careers in science, math, and engineering. Finally, the Hart-Rudman Commission is most important to this inquiry because its focus foreshadowed impending changes for the field of education. That is, while it leveled a heavy critique against K-12 education in general – arguing that the system was obsolete – it simultaneously proposed that educational institutions serve as the mechanism for increasing the production of human capital in science, math, and engineering. In effect, it was the first report in this era to tie specific human capital needs to education via the rhetoric of 'crisis.' In fact, it even went so far as to say, "Second only to a weapon of mass destruction detonating in an American city, we can think of nothing more dangerous than a failure to manage properly science, technology, and education for the common good over the next quarter-century."[92] Out of concern, the commission therefore argued for appointing the NSF and NAS to oversee the nation's knowledge assets and knowledge workers.

While the suggestions from the Hart-Rudman Commission are illuminating, its focus on human capital was certainly not unique during this time. In order to detail how this became a driving force within twenty-first century education policy and rhetoric, it is beneficial to understand how a similar perspective and suggestion about knowledge assets had been evolving from within the NSF. I explain this in the following chapter, and it is worth pointing out that this thread in the narrative provides yet another instance of Bell's theory of *interest convergence*.

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[92] U.S. Commission on National Security/21st Century, *Road Map for National Security*, 30.

CHAPTER 5: THE CONFLATION OF EQUITY WITH HUMAN CAPITAL

As explained in the previous chapter, the Hart-Rudman Commission's *Road Map for National Security: Imperative for Change* was pivotal because of the way it equated the security of the country with very specific components of education via the rhetoric of 'crisis.' The commission was not the only segment of the government, though, that was intently focused on human capital. The science and engineering human resources of both industry and higher education had long been a topic of concern within the NSF as well. The evolution of NSF's concern is fascinating because it demonstrates the emergence of an intensive desire to assess and then manage the nation's human capital more generally. This push was borne out of Clinton-era policy and endured well beyond his time in office, of course. But, this portion of the narrative not only explains how questions about inclusion and equity in industry and higher education became conflated with human capital; it explains how K-12 came to be viewed as a means toward that end.

NSF and the Shift from Diversification to Human Capital

Toward the end of 1980, President Carter signed the *National Science Foundation Authorization and Science and Engineering Equal Opportunities Act*.[1] This piece of legislation

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[1] *National Science Foundation Authorization and Science and Engineering Equal Opportunities Act*, Public Law 96-516, *U.S. Statutes at Large* 94 (1980): 3007-3014. An interesting side note is that a component of this law, called the *National Science Foundation Authorization Act*, also amended the guidelines for the National Medal of Science, which were first established under the *National Science Foundation Act of 1950*. Specifically, the fields of

established within the NSF one committee and two subcommittees that were wholly dedicated to "proposing a comprehensive national policy and program, including budgetary and legislative recommendations, for the promotion of equal opportunity for women and minorities in science and technology."[2] To assist with this attempt to realize equality, Congress commissioned a biennial report from NSF that would evaluate the diversity of the "scientific and technical fields, including mathematics and computer skills." NSF became responsible for the compilation of a variety of labor-related data – disaggregated by sex, race, ethnicity, and discipline – that could then be used for gauging "the participation of women and in men in scientific and technical positions." It was determined that this report should include information regarding temporary and permanent work, unemployment rates, salaries, promotions, the prevalence "of individuals serving as principal investigators" in studies, and the numbers of those pursuing educational interests in the designated fields.[3]

The first report, titled *Women and Minorities in Science and Engineering*, was released in January of 1982. The director of NSF, John B. Slaughter, introduced this new series of reports with the following statement:

> The human resources of this country constitute one of its most important assets. This is especially true of individuals with science and engineering skills, who expand the frontiers of knowledge, develop new technologies, and teach future generations. The importance of these activities makes it essential that the best

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recognition for the award were broadened beyond "physical, biological, mathematical, and engineering" to include also the behavioral and social sciences. Ibid., 3010.

[2] This was called the Committee on Equal Opportunities in Science and Technology. Ibid., 3012.

[3] Ibid., 3013.

talent be drawn to science and engineering activity from every available pool.[4] The pools of interest, so to speak, in their quantitative analysis included women; minority women; and racial minorities who identified as black, Asian, and Native American. Hispanic representation was considered separately, and only as it related to those who were working as or studying to be scientists and engineers (S&Es). Among the conclusions drawn by NSF was that it had limited data on Hispanic S&Es, and it believed this was primarily "because of small sample sizes and high levels of nonresponse" to their surveys.[5]

When the subsequent report came out in 1984, the NSF added to its analysis the demographic of "physically handicapped S&Es."[6] Their analysis was incredibly brief and seemed to query if or how disability was affecting the employment of S&Es. Aside from that one addition in 1984, the foci remained relatively consistent throughout 1986. By 1988, however, the NSF had shifted its language to embrace the more critical terminology in regard to ability – "physically disabled" – and included some clarifications regarding its definition of "disabled." Similar to the 1982 concern about insufficient data on Hispanic S&Es, the 1988 report acknowledged once more that there was not enough consistent data from which to draw a solid conclusion about disabled S&Es. NSF attributed this to a problem of self-identification, stating that "the data for the physically disabled…reflect[s] respondent self-perceptions." Therefore, "Terminology makes it very difficult to precisely measure the number of scientists and engineers

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[4] National Science Foundation, *Women and Minorities in Science and Engineering*, (Arlington, 1982), i.

[5] Ibid., 15.

[6] National Science Foundation, *Women and Minorities in Science and Engineering*, (Arlington, 1984), i.

who may have a physical disability."[7] Again, notice that the focus on disability is limited only to those who were already committed to the S&E workforce in some capacity and not on issues of accessibility for the broader population.

NSF's concern about data inconsistency and its relation to self-identification and terminology was reiterated once more in 1990,[8] and at the same time, there was a noticeable shift in the language used to talk about S&Es generally. Up until this point, the NSF reports tended to use people-centered language when referring to these fields, using terms like individuals, women, members of minority groups, scientists, engineers, and "the best talent." The earlier discourse had focused on individuals as human resources, but in the 1990 report there is a subtle shift toward the value and commodification of these individuals in that the language refers to "*the supply* and *quality* of human resources available for this country's scientific and technological activities."[9] Needless to say, this theme would carry over into future reports.

By 1992, NSF had been tracking the diversity of the S&E workforce and higher education programs for a decade. As a result, there were a few notable changes in this report. One such change was in the NSF's mention of the private industry and its concerns over the well-being of S&E human resources. The introduction to that report opened with the following statement:

> As cold war tensions ease and attention is diverted increasingly to economic and technological competitive arenas, both public and private sector decisionmakers seek detailed information about the supply and quality of human resources

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[7] National Science Foundation, *Women and Minorities in Science and Engineering*, (Arlington, 1988), 27.

[8] National Science Foundation, *Women and Minorities in Science and Engineering*, (Arlington, 1990), 57.

[9] Ibid., i, (emphasis added).

> available to drive the Nation's science and technology enterprise. It is, after all, the national science and technology enterprise to which we must turn if we are to sustain high societal levels of education, environmental quality, medical research, national security, and technological competitiveness."[10]
> (p. i).

In addition to the mention of private interests, the 1992 report was also the point where NSF started distinguishing between international students and U.S. citizens when considering the numbers of people receiving doctoral degrees. These data indeed suggested some serious, underlying problems for the nation. "In 1990," NSF explained, "blacks, Hispanics, and Asians accounted for over 2 percent, over 3 percent, and 22 percent, respectively, of all S&E doctorates awarded by U.S. universities. When these figures are adjusted to include only U.S. citizens, however, the percentages of doctorates awarded…drops to less than 2 percent, less than 3 percent, and less than 4 percent." Thus, in the decade since the inception of *Women and Minorities in Science and Engineering*, "modest gains" had been made for "minorities who are U.S. citizens." However, despite the growth among the broader group, NSF expressed concern that the number of doctorates awarded to African Americans had "declined in recent years."[11]

The last notable change to occur within 1992 is that NSF finally started considering the education of disabled people. It confined its analysis to post-secondary education and provided data on the self-identified disabilities of college students (i.e. learning disability, visual handicap, hard of hearing, deafness, speech, orthopedic, health impairment) as well as a breakdown of disabled students' chosen fields of study.[12] This expressed interest in the education of disabled

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[10] National Science Foundation, *Women and Minorities in Science and Engineering*, (Arlington, 1992), i.

[11] Ibid., xii.

[12] Ibid., 65. The fields included business, education, engineering, health, general studies, natural sciences, social sciences, trade/industrial, and other.

people is more encompassing than the previous reports, where they focused solely on disabled S&Es. Bear in mind, however, this was the first NSF report to follow the enactment of the *Americans with Disabilities Act of 1990* (ADA), which provided disabled individuals with avenues for legal recourse in cases of exclusion.[13]

The Inclusion of Persons with Disabilities in the Call for Human Capital

Some fairly significant changes would come about for NSF as it worked its way toward the release of its next report, and this was primarily a result of the introduction of a new administration. In August of 1993, for instance, President Clinton signed the *Government Performance and Results Act*, thereby initiating systematic reforms across all federal agencies. In many respects this is a law that reads more like a business plan than the typical piece of legislation. Aiming at efficiency by way of accountability, the law required federally-funded agencies to "initiate program performance reform;" promote "a new focus on results, service quality, and customer satisfaction;" and "help Federal managers improve service delivery, by requiring that they plan for meeting program objectives and by providing them with information about program results and service quality."[14] To do this, each agency was responsible for crafting a report detailing how this series of goals could be achieved by the articulation or reorganization of its priorities, mission, and strategies. Though agencies were given four years to submit their drafts to the U.S. Office of Management and Budget, NSF would begin working on this project almost immediately.

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[13] *Americans with Disabilities Act of 1990*, Public Law 101-336, *U.S. Statutes at Large* 104 (1990).

[14] *Government Performance and Results Act*. Public Law 103-62. *U.S. Statutes at Large* 107 (1993): 20-1.

Shortly after the introduction of this broader federal reform initiative, President Clinton established the National Science & Technology Council (NSTC), which was "a cabinet-level body formed…to guide the nation's scientific progress."[15] Neal Lane, who had only just begun serving as Director of NSF a month earlier,[16] was appointed to lead the NSTC.[17] Members of this newly created office worked in conjunction with the Office of Science and Technology Policy, the National Institutes of Health, and NSF to organize a conference called the Forum on Science in the National Interest. They effectively convened over 200 participants from "academia, industry, laboratories, professional societies, and government" to meet at the National Academy of Sciences in late-January of 1994.

As a result of this forum, President Clinton and Vice President Gore would go on to co-author *Science in the National Interest* later that year.[18] The report provided a synopsis of the conference as well as their understandings regarding the suggestions offered for future policies. The president and vice president credited the Forum on Science in the National Interest with

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[15] Clinton Whitehouse Archives, "What is This?" *Science in the National Interest* (website), accessed December 26, 2017, https://clintonwhitehouse3.archives.gov/WH/EOP/OSTP/Science/html/Sitni_Home.html.

[16] National Science Foundation, "Biography," *History* (website), accessed December 27, 2017, https://www.nsf.gov/about/history/bios/nflane.jsp.

[17] Clinton Whitehouse Archives, "Neal F. Lane," *Office of Science and Technology Policy* (website), accessed December 28, 2017, https://clintonwhitehouse3.archives.gov/WH/EOP/OSTP/html/lanebio.html.

[18] Executive Office of the President, Office of Science and Technology Policy, *Science in the National Interest*, by William J. Clinton and Albert Gore, Jr. (Washington, D.C., 1994), 7, https://files.eric.ed.gov/fulltext/ED373994.pdf. This document began with a reference to Vannevar Bush's manifesto, *Science: The Endless Frontier*, suggesting that the administration drew upon his framework for inspiration in the their own approach to science policy.

being "a milestone in the shaping of this Administration's goals and strategies for science."[19] Expressing their belief that technology is "the engine of economic growth" and "Science fuels technology's engine," they argued that "science and mathematics education must provide our children with the knowledge and skills they need to prepare for the high-technology jobs of the future, to become better leaders in scientific research, and to exercise the responsibilities of citizenship in the twenty-first century."[20] They then proposed five goals that the administration should use to guide its approach to science policies. These included maintaining "leadership across the frontiers of scientific knowledge" by producing "the finest scientists and engineers" and raising "the scientific and technological literacy of all Americans." Achieving these goals, they argued, required a commitment to fostering "partnerships that promote investments in fundamental science and engineering and effective use of physical, human, and financial resources."[21] Specifically, they expressed the desire to create "partnerships with industry, with state and local governments, and with schools, colleges, and universities across the country."[22]

Two months after *Science in the National Interest* was published, the board of NSF met and approved a draft of its vision, goals, and strategic plan. It was agreed that the title of the forthcoming document would be *NSF in a Changing World* and that its publication and dissemination would come in early 1995.[23] This, of course, would set NSF well on its way to

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[19] Ibid., 4.

[20] Ibid., 6.

[21] Ibid., 13.

[22] Ibid., 6.

[23] National Science Foundation, *NSF in a Changing World: The National Science Foundation's Strategic Plan*, (February 28, 1995): Resolution.

meeting the organizational requirements mandated under the *Government Performance and Results Act*.[24] The draft would include a series of long-range goals and strategies that were quite similar to those laid out by the president and vice president. One significant difference between the two reports, however, was that NSF stated that its first strategy would be to "develop intellectual capital," thus entailing that it "Seek out and support excellent activities among groups and regions that traditionally have not participated as full stake holders in science, mathematics, and engineering, including women, minorities, and individuals with disabilities." At the same time, it would attempt to "integrate research and education" by "Infus[ing] education with the joy of discovery and an awareness of its connections to exploration through directed inquiry, careful observation, and analytic thinking for students at all levels."[25] The process to redefine the foundation's goals and strategies under the Clinton administration clearly influenced the direction NSF would take.

In light of ADA, as well as the growing interest in the relation of disability to the S&E workforce and a clearly defined interest in "developing intellectual capital," NSF changed the name of its biennial analysis to *Women, Minorities, and Persons with Disabilities in Science and Engineering*. Numerous characteristics set the 1994 report apart from all prior versions. Aside from alterations to the title and layout, its thoroughness was significant, including over forty additional pages of analysis. This extensive detail was possible, NSF explained, because of

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[24] NSF released its strategic plan, per the *Government Performance and Results Act*, in September of 1997. National Science Foundation, *GPRA Strategic Plan: FY 1997-FY 2003*, (September, 1997), https://www.nsf.gov/od/gpraplan/gpraplan.htm.

[25] Ibid., Executive Summary.

"improvements in data quality" and availability from both new and old data sets.[26] In this capacity, this was the first year NSF incorporated elementary and secondary education data analysis[27] and a discussion about "student achievement." The social complexities that impact the quality of a student's education – like family and school factors and the range of opportunities open to students – were mechanistically referred to as "inputs." Finally, the most prominent difference between the 1994 edition and those of prior years is that this version took a noticeable turn toward social science and educational research. In its consideration of equity and access, it drew upon the work of notable educational researcher, Jeannie Oakes. It was also the first time NSF included analyses on the perceptions, attitudes, and patterns of interest in regard to science and scientists.[28]

The realm of K-12 education became a permanent fixture in the NSF's biennial reports from here forward, maintaining a clear conception that those populations that had been historically marginalized from the S&E industries now constituted the intellectual capital most essential to the nation's economic and scientific superiority. There was also an incipient realization that the public schools could, conveniently, be used to alleviate the types of data ambiguities and inconsistencies (i.e. Hispanic representation and self-identification of disability)[29] that were problematized in previous reports and within S&E industry surveys. With

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[26] National Science Foundation, *Women, Minorities, and Persons with Disabilities in Science and Engineering*, (Arlington, 1994), 1.

[27] It appears as though much of the K-12 data came from the National Assessment of Educational Progress.

[28] Ibid.

[29] Ibid., 24. The 1994 report was the first to hint at the realization that the schools could be used to gain a more accurate picture of "the range of disabilities" and the need for support.

the 1996 report, NSF not only started incorporating expanded analyses of the data sets taken from the National Assessment of Educational Progress; it also took a much more serious look at K-12 curricular access to and participation in mathematics and science courses.[30]

From S&E to SET in the *Land of Plenty*

Even though NSF had been considering accessibility in S&E industries in their analyses since 1984, it took until the summer of 1998 for Congress to amend the *National Science Foundation Authorization and Science and Engineering Equal Opportunities Act* so that it officially recognized persons with disabilities among the populations of concern (recall this law was enacted in 1980).[31] A couple months after this amendment, Congress established the Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development (CAWMSET). The commission consisted of eleven people from industry and academe who were "appointed by the President, the majority and minority leaders of Congress, and the Chair and Vice Chair of the National Governors' Association."[32] In contrast to the NSF's focus on S&E, this commission took an interest in SET: science, engineering, and technology. CAWMSET was created with the explicit aim to "analyze and describe the current status of women, underrepresented minorities, and persons with disabilities in the science,

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[30] National Science Foundation, *Women, Minorities, and Persons with Disabilities in Science and Engineering*, (Arlington, 1996).

[31] *National Science Foundation Authorization Act of 1998*, 874.

[32] Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development, *Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering, and Technology*, (September, 2000): 74. The addition of the National Governors Association here is important because it would eventually play an influential part in the creation and dissemination of the Common Core State Standards.

engineering, and technology pipeline, beginning in early education classrooms and progressing through the SET pipeline to professional life in industry, government, and academe." Given its purpose, it was also tasked with providing "recommendations regarding the recruitment, retention, and advancement of women, underrepresented minorities, and persons with disabilities in SET education and careers."[33]

The work of CAWMSET culminated with the September 2000 publication of *Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering, and Technology*. The commission wrote that it had come to the conclusion that there was need for "a major shift in how we educate, train, and recruit citizens in the fields of science, engineering, and technology." Note that the focus here is on *citizens*, which stood in contrast to the tech industry's interest in foreign labor. *Land of Plenty* bolstered this conclusion with three arguments. The "national imperative," the authors believed, was that "the education and skills of the workforce" would soon become "the dominant competitive weapon."[34] CAMWSET justified this point by claiming, "Other nations have been investing in the SET education and training of their citizens instead of sending them to U.S. universities."[35] It explained that foreign investment was occurring at the same time that education and industry were "failing to attract and keep those U.S. citizens" – women, minorities, and disabled people – "who together comprise approximately 70 percent of the U.S. workforce." Mirroring NSF's complaints about data inconsistencies, CAWMSET maintained that the "consistent collection of comprehensive data" was necessary for "a fuller

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[33] Ibid., iii.

[34] Ibid., 9.

[35] Ibid., 13.

understanding of the forces that inhibit…participation in SET careers."[36] Despite this lack of data, it was asserted that the U.S. should cultivate a homegrown SET workforce out of this plethora of diverse individuals.

CAWMSET's push for the acceptance and promotion of diversity was justified purely in economic terms. That is, the report claimed that there was "factual evidence that businesses and other organizations see a significant return on their investment when diversity is achieved," thereby bringing about "superior corporate performance." Thus, they posited, "the absence" of marginalized people "from the highest level of corporate management deprives corporations of diverse strategic skills and competencies in management that translate into economic gains."[37] The use of language here is incredibly important because it expresses the view that the primary concern over the injustice of exclusion and discrimination was the impact caused to corporations, not to the human beings and communities who have long endured its affects.

Finally, CAWMSET took the stance that training and "education boosts the bottom line." According to its analysis,

> …a 10 percent increase in capital stock or work hours can boost productivity 3.4 percent or 5.6 percent, respectively, while the same percentage of increase in education yields a productivity increase of 8.6 percent. As the data indicate, an increased investment in SET education will boost U.S. global competitiveness by increasing productivity.[38]

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[36] Ibid., 11.

[37] Ibid., 12.

[38] Ibid., 14.

Put simply, CAWMSET asserted that diversity is good only because it is good for business,[39] and if business was indeed interested in ramping up production, then it should turn its attention and capital not to H-1B visas, but to education in the U.S.

Land of Plenty outlined six suggestions to Congress, the Clinton Administration, and the National Governors Association. For K-12 education, it was suggested that states adopt and implement "comprehensive high-quality education standards…concerning mathematics and science curricula, mathematics and science teacher qualifications…technological assets, built environments, assistive technologies, and physical infrastructure."[40] It was recommended that access to higher education be stimulated through "financial investment in support of underrepresented groups in SET" and by enacting "focused intervention efforts" to assist populations of interest transition from high school through all levels of post-secondary education.[41] Then, once women, minorities, and disabled people were in the workforce, it was suggested that "employers be held accountable for the career development and advancement of their employees …"[42] Also, because the public's perception of scientists tended to be masculine and white, CAWMSET advised the creation of a body to oversee public relations campaigns aimed at creating among the public a more inclusive image of science and scientists.[43] At last, because CAWMSET was a temporary commission, its last recommendation was that the federal

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[39] Ibid., iv. The report added, "…industries will benefit from their diverse viewpoints and approaches, as well as their skills."

[40] Ibid., 25.

[41] Ibid., 42.

[42] Ibid., 58.

[43] Ibid., 65.

government would carry on this work by establishing "a collaborative body to continue the efforts of the Commission through the development, coordination, and oversight of strong, feasible action plans."[44] Within a year after the publication of *Land of Plenty*, the federal government would help establish an organization to continue the work of CAWMSET. This 501(c)3 organization, which will be discussed in the next chapter, would be named Building Engineering and Science Talent and known commonly as BEST.[45]

Prioritizing Human Capital Management

As argued earlier, the transition from thinking about human resources to the interest in human capital management gained momentum throughout the Clinton presidency. One such example is the U.S. General Accounting Office (GAO), which had been working on an extensive study called *Human Capital: Key Principles from Nine Private Sector Organizations*. This report, which was also a reaction to the *Government Performance and Results Act* signed in 1993, set out to examine the corporate realm so that the federal government could begin retooling the public sector with "performance-based management" strategies. A vital component to this mission, it was believed, was the management of "human capital," which the GAO defined as follows:

> The human capital idea centers on viewing people as assets whose value to an organization can be enhanced through investment. As with any investment, an organization's goal is to maximize the value of its people to increase

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[44] Ibid., 66.

[45] John Yochelson, Kelly Carnes, and Mary McCain, *The Talent Imperative in Science and Technology: An External Evaluation of the Army Educational Outreach Program* (San Diego: Building Engineering and Science Talent, October 2006): 3, http://www.bestworkforce.org/sites/default/files/research/downloads/AEOP%20Final%20Report.pdf.

> organizational performance capacity, and thus its value to clients and other stakeholders, while managing the related costs and risks.[46]

The GAO conducted case studies on Federal Express; IBM; Marriott International; Merck; Motorola; Sears, Roebuck and Company; Southwest Airlines; Weyerhaeuser; and Xerox. These corporations were of particular interest to the GAO because they had been recognized for "being innovative or effective in strategically managing their human capital."[47] The researchers distilled their findings into ten defining principles. They then released their study in January of 2000, around the time when the Hart-Rudman Commission was midway through its three-year project. The GAO then went on to release a second report a year later, titled *Human Capital: Meeting the Governmentwide High-Risk Challenge.* Thus, immediately following the inauguration of President Bush at the beginning of 2001, the GAO escalated the issue of human capital management and designated it a top concern to be addressed across all governmental agencies.[48]

A second agency, called The Commission to Assess United States National Security Space Management and Organization, had taken an interest in human capital as well. This group, which was chaired by Donald Rumsfeld, released their report a few weeks before the Hart-Rudman Commission published its final assessment on national security. It concluded the following:

> Government needs to play an active and deliberate part in expanding and deepening the pool of military, civilian, and commercial talent in science,

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[46] Ibid., 4.

[47] U.S. General Accounting Office, *Human Capital: Key Principles from Nine Private Sector Organizations* (January 31, 2000): 1, http://www.gao.gov/new.items/gg00028.pdf.

[48] U.S. General Accounting Office, *Human Capital: Meeting the Governmentwide High-Risk Challenge* (February 1, 2001): 1, http://www.gao.gov/new.items/gg00028.pdf.

> engineering, and systems operations the nation will need to maintain its position as the number one space-fairing country in the 21st century.[49]

Nine days after Rumsfeld's commission released this report, the newly inaugurated President Bush selected him to serve as Secretary of Defense.[50] Rumsfeld's appointment ensured that, at the very least, such concerns and suggestions would have a voice inside the oval office. Unlike the Hart-Rudman Commission, however, none of the preliminary reports by the GAO or The Commission to Assess United States National Security Space Management and Organization drew explicit connections between human capital, STEM fields, and education. But, with these existing concerns percolating up from within federal agencies, it should be expected that some variation of them would soon become manifest in the goals of the new administration.

The *President's Management Agenda* was released on August 25, 2001,[51] and this document contained an explanation of the major governmental and programmatic changes President Bush hoped to implement. The very first priority on the list of his reforms was the "strategic management of human capital."[52] In justification of this priority, it cited the GAO's

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[49] Commission to Assess United States National Security Space Management and Organization, *Report of the Commission to Assess United States National Security Space Management and Organization*, (January 11, 2001): 10, https://fas.org/spp/military/commission/executive_summary.pdf.

[50] White House, "Donald Rumsfeld: Former Secretary of Defense," *Government* (website), accessed October 26, 2017, https://georgewbush-whitehouse.archives.gov/government/rumsfeld-bio.html.

[51] U.S. Office of Management and Budget, "OMB to Release President's Management Reform Agenda; Conduct Media Briefing," media advisory, August 24, 2001, https://georgewbush-whitehouse.archives.gov/omb/pubpress/2001-30.html.

[52] U.S. Office of Management and Budget, *President's Management Agenda, Fiscal Year 2002* (August 25, 2001): 11, https://georgewbush-whitehouse.archives.gov/omb/budget/fy2002/mgmt.pdf;

report, *Human Capital: Meeting the Governmentwide High-Risk Challenge*, as being especially influential[53] because it "designated" this concern "a government high-risk area."[54] In addition to human capital, the remainder of the *President's Management Agenda* included initiatives aimed at making federal spending on scientific and technological research and development more efficient,[55] downsizing the federal government through privatization and commercial bids,[56] and utilizing information technologies to decrease federal bureaucracy.[57] Throughout this agenda, the term "human capital" was used in a broad context that referred to the government's human resources in general (that is, it was much more similar to the language used by the NSF before 1990). Also, though there was one initiative aimed at reforming financial aid for students of higher education,[58] K-12 education went unmentioned in the document. This is likely due to the fact that the final drafting of NCLB was already well underway at this point, in that it had passed both the House and Senate.

Conclusion

Recall that by the time President Bush released his agenda on August 25, 2001, at least four major reports had already been published on the connections between human capital and

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[53] U.S. Office of Management and Budget, *President's Management Agenda,* 12.

[54] U.S. General Accounting Office, *A Model of Strategic Human Capital Management*, (March 2002): 4, http://www.gao.gov/assets/80/76653.pdf.

[55] U.S. Office of Management and Budget, *President's Management Agenda*, 43.

[56] Ibid., 17, 39, 66.

[57] Ibid., 23.

[58] Ibid., 47.

national security. These reports were the GAO's *Human Capital: Key Principles from Nine Private Sector Organizations* in January 2000; Rumsfeld's *Report of the Commission to Assess United States National Security Space Management and Organization* in January 2001; the GAO's *Human Capital: Meeting the Governmentwide High-Risk Challenge* in February 2001; and the Hart-Rudman Commission's *Road Map for National Security: Imperative for Change* in February 2001. Three of these reports were released during the president's first month in office, but not one of them had been commissioned by his administration.

Several federal agencies and commissions had been gradually making a connection between human capital and national security. The NSF, on the other hand, had been developing these ideas for well over a decade. It started out by focusing on equitable access to S&E positions in industry and higher education specifically, but throughout the 1990s, NSF's interests came to include K-12 as well. The analysis of the NSF's biennial reports and *Land of Plenty* is useful, however, because it enables one to see the evolution of discourse. Though the NSF had always considered the quality of the workforce in its reports, the language used to refer to individuals gradually became commodified and, hence, more dehumanizing. Between the 1980 signing of the *National Science Foundation Authorization and Science and Engineering Equal Opportunities Act* and the publication of *Land of Plenty* in 2000, ethical concerns over equity and inclusion became synonymously conflated with interests in human capital. This in turn became fused to K-12 education, thereby meaning that the language of exploitation was forced onto the lives of children as well.

To be clear, this point is not made in an effort to absolve the public schools from their historic propensity to disable students and exclude people of color. However, rather than consider how the workforce – and S&E industries specifically – might be responsible for similar

tendencies that are in need of remedy, the schools were constructed as both the problem and the panacea. Finally, the conflation of equity and inclusion with human capital provides one more space to see a broader conception of Derrick Bell's interest convergence at play. Bell's conception deals specifically with the co-optation of black interests when it benefits whiteness. Through the evolution of the NSF reports, however, one can see that the concerns of marginalized people in general – women, minorities, and disabled people alike – were accommodated primarily because there was a larger, more dominant desire to increase human capital production.

Thus far, the narrative has laid out numerous 'crises' and instances of convergence that had occurred. The tech lobby had coalesced over immigration legislation and H-1B visas; the federal government and philanthropists had converged on the topic of education; the disciplinary convergence between biomed and biotech had taken place; and a convergence over human capital interests had finally aligned among the tech industry and the federal government. As a result, the government-industry partnership had forged over Y2K preparations and the government's litigation intervention, and the industry-academic partnership had fused around the issue of an H-1B visa cap. In both legs of the partnership, industry was the fulcrum. The growing connection between education; human capital; and the scientific, engineering, and technological

workforce had been developing for over a decade, but it would really be brought to the forefront immediately following September 11th.[59] The final chapter explores this convergence.

[59] The *President's Management Agenda* was published three weeks before September 11th. U.S. Office of Management and Budget, "Implementation of the President's Management Agenda and Presentation of the FY2003 Budget Request" (memorandum for Heads of Executive Departments an Agencies, October 30, 2001), accessed October 29, 2017, https://obamawhitehouse.archives.gov/omb/memoranda_m02-02/. Shortly after the attacks, the Office of Management and Budget released standards for measuring the five priorities outlined in *The President's Management Agenda*. They were measured by a scoring system that utilized a three-tier, color-coded, bubble sheet that was designed to indicate departmental levels of success. U.S. Office of Management and Budget, "Executive Branch Scorecard," (October 30, 2001), accessed October 29, 2017, https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/omb/memoranda/m02-02scorecard.pdf.

CHAPTER 6: TERROR AND THE CRISIS FOR HIGHER EDUCATION

STEM, Terror, and Culminating Transitions

A stream of unrelated and almost spasmodic events occurred in the year following the release of the final report by the Hart-Rudman Commission. Granted, a new administration came into office, but the changes are all the more curious in light of the commission's conclusions and suggestions. The first of such events came on August 9, 2001 when President Bush announced that, instead of boosting federal investments in biotechnology research, he had decided to place restrictions on the types of stem cell research that could be eligible for federal funding.[1] In effect, Bush extended the line of argument that was present in the Dickey-Wicker Amendment of 1995 and the human embryonic stem cell prohibition that was imposed on the NIH in 1996. As he grappled with this "difficult moral intersection, juxtaposing the need to protect life in all its phases with the prospect of saving and improving life in all its stages," he held a press conference in which he laid out his compromise regarding federal funding for the increasingly controversial field of human stem cell research.[2] The president, attempting to "[promote] scientific progress while respecting ethical boundaries,"[3] claimed that there was a bank of

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[1] CNN, "President George W. Bush's Address on Stem Cell Research," (speech, Crawford, TX, August 9, 2001), http://edition.cnn.com/2001/ALLPOLITICS/08/09/bush.transcript/.

[2] Ibid.

[3] White House, Domestic Policy Council, *Stem Cells: A Timeline (2000-2008)*, (Washington, DC, n.d.), accessed May 2, 2017,

existing stem cell lines – sixty, reportedly – that he and his board of advisors believed could be utilized for research purposes under these newly prescribed federal guidelines. Bush conceded, "we should allow federal funds to be used for research on [the] existing stem cell lines, where the life-and-death decision has already been made."[4] Specifically, he was referring to the excess, discarded embryos from *in vitro* fertilization that are typically frozen and/or destroyed.

Through this move, President Bush was attempting to prevent the intentional destruction of more human embryos, while also pushing for further research into "umbilical cord, placenta, adult and animal stem cells, which do not involve the same moral dilemma."[5] But this federal restriction yielded one particularly relevant consequence according to Joel Adelson and Joanna Weinberg. Namely, it meant that all federally-funded, public institutions could still use private funds to continue human stem cell research, but they would have to use "alternative laboratory space and equipment that had not been purchased or built with federal funds."[6] This, in effect, condoned the utilization of public university land and human resources *for* private research. Though this type of privatization on public space was likely an unintended consequence, it was a change that someone like Broad, at the very least, would eventually come to see as "opportunistic."[7]

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https://www.georgewbushlibrary.smu.edu/~/media/GWBL/Files/Digitized%20Content/Staff%20Sec%20-%20Bush%20Record%20Policy%20Memos/t088-009a-stcelltmln-26757.ashx.

[4] CNN, "President George W. Bush's Address."

[5] Ibid.

[6] Joel W. Adelson and Joanna K. Weinberg, "The California Stem Cell Initiative: Persuasion, Politics, and Public Science," *American Journal of Public Health* 100, no. 3 (2010): 446.

[7] Eli Broad, "Entrepreneurial Philanthropy in the 21st Century: Willow Bay in conversations with Eli Broad," interview by Willow Bay, *The Center on Philanthropy and*

Another significant though seemingly subtle occurrence during this timeframe was the construction of the term 'STEM.' The NSF had been using the acronyms S&E and SMET since the 1990s to refer to the interrelatedness of science, mathematics, engineering, and technology. In 2001, however, the NSF's Assistant Director of Education and Human Resources, Judith Ramaley,[8] suggested that the acronym be reconfigured to STEM for aesthetic reasons. Ramaley recommended the change because "science and math support the other two disciplines," whereas "The older term implies that science and math came first or were better."[9] She thought STEM was more appealing, and she argued further that it was more dynamic because it created "an image of branching development…and continued innovation."[10] Above all, she believed it suggested "a more meaningful connection among [the disciplines]."[11] The transition from SMET to STEM occurred during a period of prevalent debates and coverage about the field of stem cell research. There is no evidence of either a conscious or direct relation between this field and the revised acronym, and thus it seems as though the adoption of STEM was little more than a fashionable choice. Aesthetics aside, this linguistic change would come to have a lasting impact upon educational and curricular discourse in the U.S.

Public Policy 2007-08 Distinguished Speakers Series at the University of Southern California, October 25, 2007, http://cppp.usc.edu/doc/Eli_Broad_Transcript.pdf, 7.

[8] National Science Foundation, "NSF Announces New Head of Education and Human Resources," press release, July 12, 2001, http://www.nsf.gov/od/lpa/news/press/01/pa0101.htm.

[9]Eleanor Chute, "Focus Shifts to Making Science, Math Accessible to More Than Just Brightest," *Pittsburgh Post-Gazette*, February 10, 2009, http://www.post-gazette.com/news/education/2009/02/10/STEM-education-is-branchingout.

[10] Madeline Patton, *ATE@20: Two Decades of Advancing*, 12.

[11]Chute, "Focus Shifts to Making Science."

Also, it was during this same time when BEST was created, "with seed funding from seven federal agencies including the Department of Defense,"[12] to carry on the work of CAWMSET.[13] The nonprofit identified itself as a "public-private partnership dedicated to building a stronger, more diverse U.S. workforce in science, engineering and technology by increasing the participation of under-represented groups." The founding leadership consisted of twenty-seven members with a range of affiliations. Among them were a handful of legislators, as well as representatives from the Association for Women in Science, the National Action Council for Minorities in Engineering, NSF and NAS, Lockheed Martin, and some of the most reputable science and engineering university programs in the U.S. Leading the executive committee, of course, was Shirley Ann Jackson of Rensselaer Polytechnic Institute and two businessmen: Alfred Berkeley, the vice-chairman of NASDAQ, and Irwin Mark Jacobs, the chairman and CEO of QUALCOMM.[14]

The fourth and undoubtedly most impactful event following the release of the Hart-Rudman Commission's report came the week after BEST was incorporated as a 501(c)3.[15] That is, the national security warnings issued in *Road Map for National Security: Imperative for*

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[12] Yochelson, Carnes, and McCain, *The Talent Imperative in Science and Technology*, 3.

[13] Rensselaer Polytechnic Institute, "The Quiet Crisis: A Report," *The Quiet Crisis: American Education's 'Perfect Storm'* (website), accessed November 6, 2017, https://www.rpi.edu/homepage/quietcrisis/best.html.

[14] Shirley Ann Jackson, *The Quiet Crisis: Falling Short in Producing American Scientific and Technical Talent*, (San Diego: Building Engineering and Science Talent, 2002): i, http://www.bestworkforce.org/PDFdocs/Quiet_Crisis.pdf. The organization would continue its work and in 2005, "the Office of the Secretary of Defense selected BEST…as its principal contractor support for developing a K-12 portfolio of STEM outreach activities." Building Engineering & Science Talent, "About BEST" (website), accessed December 1, 2017, http://www.bestworkforce.org/node/25.

[15] Ibid., 5; Rensselaer Polytechnic Institute, "The Quiet Crisis: A Report," (website).

Change were actualized in the horror and tragedy of the attacks that occurred in New York, Washington D.C., and Pennsylvania on September 11, 2001. The dynamics surrounding this event, of course, further worsened the recession that was already proceeding from the burst of the tech bubble.[16] Though the full effects of these circumstances could never be known, it stands to reason that the commission's report was given legitimation amid the anguish, confusion, and fury. Many of its suggestions – from a national homeland security agency and a centralized hierarchy,[17] to investment in a federal scientific and technological workforce, to initiating federal involvement in K-12 science and mathematics education,[18] to seeking involvement from corporate and private philanthropists[19] – would become increasingly evident in policy and practice.

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[16] Mark Gongloff, "Bush Says He Inherited Recession," *CNN Money*, August 7, 2002, http://money.cnn.com/2002/08/07/news/economy/bush_cheney/.

[17] The Department of Homeland Security was created approximately a year and a half later in November 2002, and when it was, it officially consolidated "22 Federal departments and agencies into a unified, integrated Department." U.S. Department of Homeland Security, "Creation of the Department of Homeland Security," (website), accessed April 10, 2013, http://www.dhs.gov/creation-department-homeland-security.

[18] NCLB was signed into law only a few months after the attacks, and an explicit emphasis was placed on the training of math and science teachers and the creation of "rigorous" standards and curricula that aligned with "post-secondary study in engineering, mathematics, and science." The law also encouraged the creation of partnerships among "State educational agencies, institutions of higher education, local educational agencies, elementary schools, and secondary schools." It was proposed that this should be a means to 1) improve academic achievement in these content areas and 2) "improve and upgrade the status and stature of mathematics and science teaching." *No Child Left Behind Act,* section 2201.

[19] Ibid. Under NCLB's section that defines eligible partnerships for math and science, the law specifically mentioned cultivating partnerships with businesses, nonprofits, and "for-profit organizations." This type of involvement only increased with the *Race to the Top* initiative and the development of Common Core State Standards.

Post-September 11th and the Government-Industry-Academic Partnership

It goes without saying that the attacks ignited a sense of urgency as the federal government experienced both a validation and an intensification of its national security fears. Very shortly afterward, in October of 2001, the Government-University-Industry Research Roundtable (GUIRR)[20] configured one of its three annual meetings around what it perceived to be "science and engineering (S&E) workforce issues."[21] This group, though it is considered to be an appendage of the National Academies and the National Research Council, included representatives from governmental agencies; executives from Exxon, Intel, Stryker Corporation, and Hercules Incorporated; and university leadership. Among those leading the dialogue on the part of academia was Shirley Ann Jackson, the president of Rensselaer Polytechnic Institute.[22] According to this meeting's docket, industry and government officials were each encouraged to use this space to share their concerns regarding S&E "workforce projections and needs." Federal departments, meanwhile, were asked to explain what they were "doing to mitigate risks

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[20] According to the organization's website, "GUIRR was created in 1984 in response to a report of the National Commission on Research that called for an institutionalized forum to facilitate dialogue among the top leaders of government and non-government research organizations. The concept of an ongoing mechanism to address controversial issues at the government-university interface in a non-adversarial setting was first proposed by the National Commission in 1980 as an innovative way of responding to potentially intractable problems." The organization meets three times a year and takes up special topics through a collaborative agenda. National Academies, "History," *Government-University-Industry Research Roundtable* (website), accessed October 29, 2017, http://sites.nationalacademies.org/PGA/guirr/PGA_082333.

[21] Shirley Ann Jackson, *Envisioning A 21st Century Science and Engineering Workforce for the United States: Tasks for University, Industry, and Government,* (Washington D.C.: National Academies Press, 2003), vii.

[22] Ibid., v.

associated with the various projections," and academics were urged to consider how they could increase student engagement and the "participation of minorities in S&E" in particular.[23]

From what can be surmised from this meeting's agenda, the event occurred over the course of twenty-four hours, it had five panels with eight invited speakers, and several of the forums focused on how to forge ahead in light of the concerns that had been discussed. Though this meeting appears to have been a relatively intimate gathering, GUIRR would soon begin laying out the plans for a far more expansive meeting. The *Pan-Organizational Summit on the U.S. Science and Engineering Workforce*, as it would be named, would schedule to meet in November 2002 so it could continue building on the conversations about S&E human capital that took place immediately after September 11th. That meeting would grow to include position papers from thirty-two nonprofit organizations and a keynote address by Jackson.[24]

The Evolving Commitments of Gates and Broad

With the nation's insecurities and wounds still laid bare, Gates and Broad pushed onward with their philanthropic endeavors. Of course, it is entirely possible that the combination of the recession, the federal restrictions on human embryonic stem cell research, and the attacks gave each of the foundations a greater sense of urgency. But either way, The Bill and Melinda Gates Foundation opened their first office in Washington D.C. that October. It was led by David Lane,

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[23] National Academies, "Envisioning a 21st Century Science and Engineering Workforce: Tasks for Universities, Industry, and Government" (meeting agenda, Government-University-Industry Research Roundtable Council, Washington, D.C., October 23-34, 2001).

[24] Government-University-Industry Research Roundtable, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. *Pan-Organizational Summit on the U.S. Science and Engineering Workforce: Meeting Summary*, ed. Marye Anne Fox (Washington, D.C.: National Academies Press, 2003), https://www.ncbi.nlm.nih.gov/books/NBK36359/.

"a former top economic adviser in the Clinton administration,"[25] and created with the expressed intent to cultivate their "government relations efforts."[26] During the same month, the Broads paid their first visit to Eric Lander. Recall that Lander was leading MIT's Whitehead Institute, one of the G5 sites that would be busily crunching out the data for the Human Genome Project until 2003.

Broad had heard much praise about Lander's lab, but more importantly perhaps, he was also "studying a gene related to Crohn's disease." Eli and Edythe were as impressed as they were intrigued by what they saw, and Broad recalled the following of their meeting:

> …we saw an ideal work environment, packed with young scientists and humming with the sound of robotics. The scientists were working on the weekend because they loved what they were doing. It seemed like no one wanted to go home. We asked Eric how long his work would take and what he planned to do when he was finished decoding the human genome. We were fascinated when he told us about his idea to start an interdisciplinary institute to take what he had learned about the genome to bedside application—so it would benefit patients by helping to treat and even prevent disease. Eric had a vision for a new way of conducting science, breaking down the silos that usually keep medical researchers, biologists, and engineers from collaborating on common projects.[27]

From this point, Broad started cultivating what would become a longstanding relationship with Lander.[28]

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[25] Houtz, "Gates Foundation Wields Newfound Clout."

[26] Bill and Melinda Gates Foundation, "Office Locations," (website), accessed March 29, 2013, http://www.gatesfoundation.org/jobs/office-locations.

[27] Broad, *Art of Being Unreasonable*, 95.

[28] Lander would eventually leave Whitehead and become the founding director of the Broad Institute. Members of the science community would come to criticize him for the part he played in "big science," as well as his failure to disclose conflicts of interest in a historical essay about a genome editing technology called CRISPR. Some of the most vociferous criticisms came because his essay "downplayed the role of two key CRISPR scientists who happen to be women," Jennifer Doudna and Emmanuelle Charpentier. Sharon Begley, "Why Eric Lander Morphed From Science God to Punching Bag," *STAT*, January 25, 2016,

A month after this visit, in November of 2001, The Eli and Edythe Broad Foundation created two new philanthropic initiatives: The Broad Medical Research Program[29] and The Broad Superintendents Academy.[30] The medical initiative intended "to fund and encourage innovative research that will advance the prevention, therapy, or understanding of inflammatory bowel disease."[31] The impetus behind their involvement, Broad explains, was their son's struggles with Crohn's disease and their own feelings of helplessness.[32] Lander was one of the grant program's first recipients, and he and Broad would soon begin discussing ways to bring together MIT and Harvard for a collaborative project that could merge research fields on "human genomics, stem cell research, and inflammatory bowel disease."[33] The superintendents academy,

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https://www.statnews.com/2016/01/25/why-eric-lander-morphed/. Some critiques argued that "…Lander failed to recognize in his article…that [The Broad Institute] is currently involved in a billion-dollar patent dispute with" these two particular scientists. Joanna Rothkopf, "How One Man Tried to Write Women Out of CRISPR, the Biggest Biotech Innovation in Decades," *Jezebel*, January 20, 2016, https://jezebel.com/how-one-man-tried-to-write-women-out-of-crispr-the-big-1753996281. Doudna's institution, University of California Berkley, would continue to push the patent case against the Broad Institute. Sarah Buhr, "The CRISPR Patent Battle is Back on as UC Berkley Files and Appeal," *TechCrunch*, July 26, 2017, https://techcrunch.com/2017/07/26/the-crispr-patent-battle-is-back-on-as-uc-berkeley-files-an-appeal/.

[29] "Program to Fund UCLA Medical Research," *Los Angeles Times*, November 3, 2001, http://articles.latimes.com/2001/nov/03/local/me-65223. As of 2013, the Broad Medical Research Program provided "forty percent of all private funding for [irritable bowel disease] in the United States." See "Fostering Broad Changes," *Leaders Magazine*, 36 no. 2, 2013: 32.

[30] It was originally called The Broad Center for Superintendents, but the name changed by 2002. The Broad Center, "Eli Broad and Governor John Engler Launch The Broad Center for Superintendents," press release, November 16, 2001, http://www.broadcenter.org/news/full/eli-broad-and-governor-john-engler-launch-the-broad-center.

[31] Broad Institute, "Eli Broad," *People* (website), accessed May 2, 2017, https://www.broadinstitute.org/bios/eli-broad.

[32] Broad, *Art of Being Unreasonable*, 94.

[33] Broad Institute, "Eli Broad."

on the other hand, set out "to identify, train and support talented business, non-profit and government executives – along with traditional education leaders – to serve as superintendents in urban public school districts."[34] With this initiative, the Broads had taken their first step toward trying to reshape the country's public education system by infusing it with the values and management practices of business. Among those were "competition, efficiency, effectiveness, and accountability."[35] Scholars have thoroughly detailed these and other inherently problematic components of The Broad Superintendents Academy, and they should be referred to for further elaboration.[36]

Standards Alignment, "Public-Private Partnerships," and Data Production via NCLB

The final noteworthy event to follow the report by the Hart-Rudman Commission was the passing of the *No Child Left Behind Act of 2001* that December. President Bush had worked deliberately and strategically to ensure that the bill received bi-partisan support. Patrick McGuinn explains that, amid the aftermath of the attacks on September 11th, policymakers approved it with the hope that its passage might "reassure a jittery public by providing a symbol of a unified and functioning government."[37] Countless education scholars have explained the

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[34] The Broad Center, "Eli Broad and Governor John Engler."

[35] Tompkins-Stange, *Policy Patrons: Philanthropy, Education Reform*, 29.

[36] Vachel W. Miller, "The Broad Challenge to Democratic Leadership: The Other Crisis in Education," *Democracy and Education* 20, no. 2 (2012): 1-11; Ravitch, *Reign of Error*; Ravitch, *Death and Life*; Saltman, "The Rise of Venture Philanthropy;" Reckhow, *Follow the Money*, Michele Fine et al., "Struggling Against Privatization in the Suburbs: Prec(ar)ious Solidarities Between Labor, Parents, and Community Activists in Montclair New Jersey" (presentation, Save Our Schools Activist Conference: New and Experienced Organizers Working for Public Education and Communities, Washington, D.C., July 9, 2016).

[37] McGuinn, *No Child Left Behind and the Transformation*, 176.

great significance of this piece of legislation and the many reforms and ramifications that resulted from it, but there are a few aspects of NCLB that are particularly significant to this narrative.

Under Title II of the law, local and state educational agencies were encouraged to develop recruitment and training programs that could produce "high-quality" teachers and administrators. The specific content areas that were deemed in need of attention were writing, "traditional American history" and civics, as well as math, science, and technology. While these content areas constitute a sizable portion of the typical school curriculum, it is instructive to analyze them and the prescriptions provided to them in terms of two broader categories: the humanities and the sciences. For example, in order to improve teaching for each of the humanities-related areas, the law advocated that schools and states partner with institutions of higher education, museums, libraries, and other nonprofit organizations dedicated to history and the humanities.[38] This included partnerships with and funding for the dissemination of pre-established programs like the National Writing Project and the We the People Program.[39]

The areas related to science, on the other hand, did not have programs prescribed *to* them. Instead, states were required to develop "rigorous" standards and curricula that aligned with "post-secondary study in engineering, mathematics, and science." In order to bridge what was viewed as a science-based curricular gap between K-12 and higher education, the legislation proposed a solution similar to the one it provided to the humanities: create inter-agency mathematics and science partnerships among "State educational agencies, institutions of higher

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[38] *No Child Left Behind Act*, section 2351.

[39] Ibid, section 2331-2344.

education, local educational agencies," and K-12 schools.[40] However, at the same time that a broad spectrum of educators were encouraged to work together on this aim, NCLB also happened to suggest that these math and science partnerships be pursued with businesses, nonprofits, and "for-profit organizations."[41] In addition, technological integration was prioritized based on the assumption that it would improve student achievement. The federal government then made prescriptions for technological enhancement that were consistent with those that were given to the sciences. That is, it emphasized the need to develop "public-private partnerships,"[42] particularly with for-profit businesses and organizations that develop, design, and manufacture "technology products and services."[43]

Through NCLB, it is possible to see some of the ways that the Hart-Rudman Commission's suggestions started to manifest in education policy. This is evidenced by the attention the federal government placed on the teaching and curricula of science and mathematics, as well as by the fact that it asked public education agencies to throw open their doors to philanthropists and businesses, especially to those from the tech industry. At the same time, NCLB also underscores policymakers' epistemological assumptions about the humanities, the sciences, and the teaching profession. Put simply, the legislation did not encourage humanities-related fields to draw upon their disciplinary insights as a means to develop curricula or programs that might foster student engagement. Instead, constraints were constructed around

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[40] Ibid, section 2201.

[41] Ibid, section 2202. See the section defining "eligible partnerships" for math and science.

[42] Ibid, section 2402.

[43] Ibid, section 2403.

K-12 humanities through prescribed partnerships and conservative notions of "tradition" and "history." In this respect, the humanities were asked to maintain the cultural and historical status quo – and thereby aim at agreement and compliance – at the same time that the sciences were called upon to innovate. It thus becomes apparent that skills in math, science, and technology were believed to be synonymous with 'quality' and therefore integral to repairing the perceived deficiencies of the teaching profession.

Finally, there is one last component of NCLB that warrants mention: data. The legislation not only required that every child be tested; it mandated that adequate yearly progress be applied to every public school student.[44] The students who were referenced specifically in the law were "low-achieving children in our Nation's highest-poverty schools, limited English proficient children, migratory children, children with disabilities, Indian children, neglected or delinquent children, and young children in need of reading assistance." It also focused explicitly on "the achievement gaps between minority and nonminority students."[45] While the language of NCLB makes no explicit connection between the testing mandate and the suggestions provided by NSF and *Land of Plenty*, it is entirely plausible that the data component was at least informed by them. That is, most of the student groups mentioned in the law also fell into the longstanding realm of interest for the NSF. Thus, by testing every public school student, NCLB could create the type of data that NSF could use to begin clearing up the persistent ambiguities it had noticed about disabled and/or marginalized populations within the STEM workforce.

The remainder of this chapter explains how the government's crisis in human capital came to be reflected in academia after the attacks on September 11th. It also details how this

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[44] Ibid., 1111.

[45] Ibid., 1001.

culmination helped solidify the STEM focus throughout the government-industry-academic partnership and the part that Jackson played in facilitating it.

Developing the "Quiet Crisis"

Shortly after NCLB's passage and GUIRR's meeting on its concerns of a shortage in the nation's S&E workforce, Jackson penned a report called *The Quiet Crisis: Falling Short in Producing American Scientific and Technical Talent*. She published the piece in 2002 on behalf of BEST (Building Engineering and Science Talent).[46] The 'crisis,' she claimed, was due to "the gap between the nation's growing need for scientists, engineers, and other technically skilled workers, and its production of them." She went on to say that the generation educated during the Sputnik-era was nearing retirement, and the nation's "colleges and universities are not graduating enough scientific and technical talent to step into research laboratories, software and other design centers, refineries, defense installations, science policy offices, manufacturing shop floors and high-tech startups." She saw this deficit as a threat that also created a "need to make the nation safer from emerging terrorist threats that endanger the nation's people, infrastructure, economy, health, and environment." Thus, she claimed that the nation was experiencing a critical gap in its technological and scientific workforce and concluded that ignoring the gap would be highly detrimental.[47]

In *The Quiet Crisis*, Jackson referred to the tech bubble of the 1990s as "A Golden Age of Prosperity." She described this era as a period of national stability, safety, and wealth.

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[46] Shirley Ann Jackson, "Waking Up to the 'Quiet Crisis' in the United States: It's Time for a New Call to Action," *The College Board Review* 210 (2007): 22; Jackson, *The Quiet Crisis*.

[47] Jackson, *The Quiet Crisis,* 1.

Interestingly, she related this prosperity to "the break-up of the Soviet Union and the triumph of market-based economics," and she pointed to the attacks on September 11th as the specific moment when the "assumption of continued progress" was destroyed for the American public. She stated that in the wake of such a crisis, national defense and intelligence were important, but that they were not nearly as important as "developing the human capital to remain the world's most productive economy."[48] For Jackson, the arguments of NSF and CAWMSET became indisputable and thus congealed in the 'Quiet Crisis' and the years-long advocacy that would follow.

In November of 2002, GUIRR hosted The *Pan-Organizational Summit on the U.S. Science and Engineering Workforce*. This event drew together participants from across the government-industry-academic spectrum to continue conversations that took place immediately after September 11th about the relation of an S&E human capital shortage to national security and the economy. Jackson was one of the keynotes for the event and her comments, along with the position papers presented by the thirty-two nonprofit organizations, would be published in a volume containing the conference proceedings. The list also included papers written by BEST and Educational Testing Service, as well as some influential organizations from the tech lobby like Information Technology Association of America and National Association of Manufacturers (see Chapter 3).[49] Perhaps one of the most egregious examples of dehumanization in regard to the S&E workforce came from the Council on Competitiveness. Like much of the discourse discussed in this study, they argued that the nation's human capital was the "economy's most

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[48] Ibid.

[49] Government-University-Industry Research Roundtable, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. *Pan-Organizational Summit*.

important asset." However, they went so far as to justify their desire to "cultivate a dynamic corps of homegrown scientists and engineers…Because it is expensive and shortsighted to rely so heavily on imported skills."[50] Jackson would go on to work with the Council on Competitiveness in her future work,[51] but one cannot help but notice that in their particular paper at least, there was a complete absence of concern for equity, accessibility, or basic human flourishing.

Following the summit, GUIRR asked Jackson to "present her position on these issues in a report to the Roundtable."[52] That report, which GUIRR published in 2003, was titled *Envisioning A 21st Century Science and Engineering Workforce for the United States: Tasks for University, Industry, and Government*. In it, Jackson cited many of the organizations and briefs that had been building in recent years. Among those sources were the Hart-Rudman Commission, the NSF's biennial reports, the *President's Management Agenda*, and the Council on Competitiveness. She used this space to reiterate her call to bring more women and minorities into STEM: "Women comprise 46 percent of the total labor force, but only 23 percent of the S&E labor force. African Americans and ethnic minorities constitute 24 percent of the total population but only 7 percent of the S&E labor force. This means the majority of Americans is underrepresented in S&E."[53]

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[50] Amy Kaslow, "Building a Pipeline for American Scientists and Engineers," paper presented at *Pan-Organizational Summit on the U.S. Science and Engineering Workforce: Meeting Summary*, Washington, D.C., 2003, https://www.ncbi.nlm.nih.gov/books/NBK36353/. President Reagan formed the Council of Competitiveness in 1986, but it was originally named the Commission on Industrial Competitiveness. "About the Council," *Council of Competitiveness* (website), accessed October 12, 2017, http://www.compete.org/about/about-council.

[51] Council on Competitiveness, *Innovate America*.

[52] Jackson, *Envisioning A 21st Century Science and Engineering*, vii.

[53] Ibid., 5.

Furthermore, she claimed, the 'quiet crisis' could be ameliorated if school incentive programs were aimed at enticing women and minorities into STEM fields. Jackson stressed, however, that such tactics entailed developing better data systems so "at-risk eighth graders [could] be identified."[54]

Finally, Jackson drew upon Sputnik-era reactions and policy for inspiration, arguing that because of the sense of crisis, "…the United States passed the National Defense Education Act, quickly producing government and private aid programs that recruited young people to S&E, and tripled the National Science Foundation (NSF) budget." She then overlaid this onto the current climate, explaining that "September 11 triggered a patriotic response and a new awareness of the power of technology to protect the homeland, to strengthen the nation militarily, and to mitigate conditions that may foster terrorism." Her final prescription was that "this realization could be used to kindle another national effort to encourage production of scientists and engineers." This, of course, was the perfect opportunity she argued, to "Tap into the talent inherent in groups that are underrepresented in S&E."[55]

Jackson was surely correct in stating that a crack of consciousness occurred for many people and in many different capacities after the attacks in Washington D.C., New York, and Pennsylvania. But at the same time, the fallout from September 11th had also started to influence H-1B visas and the university enrollments of foreign-born students. This, of course, incited even more alarm for industry and her realm in particular: academia. Needless to say, Jackson would spend the next several years advocating that the 'quiet crisis' justified the need for a homegrown STEM workforce.

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[54] Ibid., 16.

[55] Ibid., 13.

International Enrollments and the Crisis for Higher Education

The post-Y2K economic downturn had already started to take a financial toll on colleges and universities across the nation, forcing many to raise tuition and enact budget cuts.[56] But then, the horror on September 11th and the resulting national security measures immediately impacted immigration. This, of course, started having a noticeable impact on international student enrollments in U.S. universities. At the beginning of the 2001-2002 academic year, just prior to the attacks, the percentage of international students entering U.S. universities had in fact hit a 53-year peak. That is, 3.7 percent of the students enrolled in higher education were international students. In the year immediately following the attacks, however, the growth in international enrollments all but stopped for the first time since 1949. The numbers then declined for three consecutive years: 2002-03 showed only .6 percent growth in enrollments, 2003-04 decreased by 2.4 percent; 2004-05 decreased 1.3 percent; and 2005-06 decreased .05 percent. It would take until the 2006-2007 school year for the enrollment numbers to recover to where they were prior to September 11th.[57]

Student enrollment rates from Middle Eastern countries such as Saudi Arabia, Kuwait, Jordan, Cyprus, and the United Arab Emirates all declined by double digits. The Institute of International Education argued that the declines could be "attributed to a variety of reasons, including real and perceived difficulties in obtaining student visas (especially in scientific and technical fields), rising U.S. tuition costs, vigorous recruitment activities by other English-

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[56] Sara Hebel, "Public Colleges Feel Impact of the Economic Downturn," *Chronicle of Higher Education* 47, no. 45 (2001): A21-A22.

[57] Institute of International Education, "International Students, Enrollment Trends, 1948/49-2013/14," *Open Doors Report on International Educational Exchange*, accessed August 20, 2016, http://www.iie.org/Research-and-Publications/Open-Doors/Data/International-Students/Enrollment-Trends/1948-2015.

speaking nations, and perceptions abroad that international students may no longer be welcome in the U.S."[58] Clearly, stateside fears and Islamaphobia cannot be discounted as contributing factors here.

Some data can help give weight to the country's economic interest in international students, helping to shed light on how the declining enrollments might constitute a 'crisis' for academia. According to the Department of Commerce, during the 2003-04 school year, "International students brought over $13 billion dollars to the U.S. Economy in money spent on tuition, living expenses, and related costs." Because of this, the report concluded, "data ranks U.S. higher education as among the top 10 largest service sector exports."[59] It is worth considering that this data was released when the international enrollments were in the midst of the post-September 11th slump. In spite of the lull, the amount of money the U.S. made off international students from 2000 to 2011 more than doubled, climbing from $10.2 billion to over $21 billion.[60] It seems fair to say that international students provide a great source of profit to academia, and thereby constitute a significant interest, particularly when their enrollments decline.

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[58] Institute of International Education, "International Student Enrollments Declined by 2.4% in 2003/4," press release, November 10, 2004, http://www.iie.org/en/Who-We-Are/News-and-Events/Press-Center/Press-Releases/2004/2004-11-10-Open-Doors-International-Student-Enrollment.

[59] Ibid., paragraph 11.

[60] Rajika Bhandari and Patricia Chow, *Open Doors 2011: Report on International Educational Exchange* (New York: Institute of International Education, 2012), 16-17.

Convergence of Interests for the Academy and Industry

If countries across the globe had long provided U.S. universities with students interested in STEM fields, then the same can be said for industry as well. Of all the S&E professionals in the U.S. industry, that is, "approximately 17 percent of bachelor's degree holders, 29 percent of master's degree holders, and 38% of doctorate holders" were "foreign-born." According to a 2004 analysis by the NSF, this proportion of foreign-born S&Es had hit a record by 2000. It then explained that as of 2002, however, the unemployment rates for scientists and engineers in the U.S. spiked to 3.9 percent. It credited this change to the post-September 11th climate,[61] but if one considers the effects of Y2K on the economy, it seems obvious that these changes in labor were influenced equally by the expansion and contraction of the tech bubble. Said plainly, there was an increased need for labor as everything ramped up to Y2K. But by 2002, after the tech bubble had popped, there was a surplus again.

Declines in international enrollments not only meant a crisis for academia in terms of economics and decreased numbers of people going into the coveted STEM fields; it could simultaneously reduce industry's access to that post-graduate, U.S.-trained, foreign labor. This represents an alignment of interests between industry and academia. It is made apparent because, despite the cooling effect in the post-Y2K tech industry and the data about the increasing numbers of unemployed S&Es in the country in 2002, the industry would continue to claim that there was a shortage of labor and thereby vie for more H-1B visas.

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[61] National Science Foundation, *Science and Engineering Indicators 2004*, (2004), accessed April 2, 2013, http://www.nsf.gov/statistics/seind04/c3/c3h.htm, 3-4.

In December of 2004, the Council on Competitiveness held its National Innovation Initiative Summit in Washington, D.C.[62] The summit was geared toward creating an "industry-academic alliance"[63] that could help ward off what participants viewed to be a national crisis: innovation and competition in the international "playing field" had been leveled by technological advancements and the emergence of the global economy.[64] Similar to many of the other events and conferences discussed in this study, this summit was also hosted and attended by university leaders and corporate executives. Jackson was among the first presenters, and she spoke of the need for collaboration, entrepreneurship, and greater government funding for "America's innovation enterprise." This enterprise, she pressed, could be fuelled by reaching into an untapped resource: the nation's growing diversity. Because a large proportion of the population had long been marginalized by the STEM industry, she proposed that these particular people represent the "American strength that must be exploited."[65] Though a broad swath of people attended the summit, there was one notable attendee. Robert M. Gates sat on the Council's board at the time, and his presence is significant because within two years of the summit, he would be chosen to succeed Donald Rumsfeld as the U.S. Secretary of Defense. In short, this effectively ensured that traces of these same concerns and ideas would remain in the presidential cabinet even after Rumsfeld vacated (see Chapter 5).

A few months later, in April of 2005, Bill Gates articulated concerns similar to those discussed at the summit hosted by the Council on Competitiveness. He expressed his intense

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[62] Council on Competitiveness, *Innovate America: National Innovation*, 14.

[63] Ibid., 10.

[64] Ibid., 8.

[65] Ibid., 21.

frustration over the nation's laws on visas and the inability of U.S. corporations to hire international talent: "It doesn't make any sense. We'll have Canadians sitting on the border until some bureaucratic thing happens." The federal caps on H-1B visas had long been a point of frustration for Gates and the tech lobby, but then the president of Princeton University bolstered Gates' argument by complaining that post-September 11th immigration policies effected international enrollments to the point that they were "not coming in the numbers they used to."[66] The overall urgency of the 'crisis' was likely hastened by what Gates said was an "increased caliber of research institutions in China and India." In other words, immigration restrictions not only hindered the ability of the U.S. to attract talented recruits from other countries, but a fear had developed that Asian research institutions were beginning to outpace those in the U.S. Whether real or perceived, the changing perceptions about the quality of U.S. STEM institutions easily represented both a threat and an interest to industry and academia alike. Simultaneously, the complaints about a STEM workforce and the quality of STEM education aligned yet again with those of the government.[67]

By August 2005, Deputy Under Secretary of Defense Michael Wynn shared his concerns about the government's STEM worker deficit. His greatest fear at that time was a perceived limitation to the number of the "clearable" U.S. citizens who were prepared and willing to fill the growing number of STEM positions within the military and the private defense industries. The use of the term "clearable" is really most important here: these positions are typically reserved

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[66] Declan McCullagh, "Gates Wants to Scrap H-1B Visa Restrictions," *CNET News*, April 27, 2005, http://news.cnet.com/Gates-wants-to-scrap-H-1B-visas/2100-1022_3-5687039.html.

[67] U.S. General Accounting Office, *Year 2000 Computing Challenge*, 22; The United States Commission on National Security/21st Century, *Road Map for National Security*, 38-46.

for U.S. citizens.[68] Thus, Wynn's point underscores the government's interest in continuing the push toward a STEM focus in K-12 schools and universities. Again, the combination of a growing government-based technological infrastructure and the anticipated retirement of its aging federal STEM workforce was certainly at play here. However, unlike the venture philanthropists, corporations, and universities that benefitted from the human capital of a foreign-born STEM workforce, the government was in need of an abundance of STEM-educated, clearable, U.S. citizens.

Conclusion

The stream of events outlined in this study, as well as their innumerable effects, had all started to intertwine in varying degrees by the end of 2001. The most obvious problem was that a swell of technological, scientific, economic, and national security-related anxieties were colliding for the citizenry and the government alike. There were, however, many other things going on in the background. For instance, the venture philanthropy movement was becoming much more organized just as Gates and Broad were beginning to make larger investments in biotech, biomed, and education. Their investments picked up, of course, as the sequence of the human genome was going public and as human stem cell research started advancing. President Bush's stance on funding for human embryonic stem cells, meanwhile, constrained public research agendas at the same time that it inadvertently encouraged the use of public space for private research.

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[68] Jackson, "Waking Up to the 'Quiet Crisis'," 23. A similar complaint was voiced regarding the baby-boomers in the Hart-Rudman report. See The United States Commission on National Security/21st Century, *Road Map for National Security*, 97.

This conflation over public and private research in the academy occurred amid the federal government's shifting perspective about organizational structure and its desire to emulate a more hierarchical and centralized, businesslike approach to governing. As the government struggled to resolve its managerial inefficiencies and funding issues, it started looking to open its doors to philanthropic and corporate involvement, both internally and in fields of education. Then, not only were Gates and his foundation becoming permanent policy fixtures in D.C. during this time, but post-September 11th immigration fears started to jeopardize the headway made by the tech lobby after several years of working to remove the cap on H-1B visas. Immigration fears also caused academia to feel squeezed for a few years by the decreasing enrollments of international students. This yielded worsening financial impacts to the colleges, universities, and local economies that were already dealing with the effects of the post-Y2K recession. This lull in enrollments, however, also threatened to reduce the quantity of international laborers that industry could hire out of U.S. STEM programs. Simultaneously, the horror of the attacks stirred existing fears about biomedical and technological threats to national security, thereby justifying greater interest and expenditures in those areas at the same time that it made the need for a native-born, STEM workforce all the more pressing.

And finally, the national education policy landscape was being sent into a major transitional phase that would begin ushering in an unconscionable emphasis on high-stakes testing, data, technology, and the curricular areas of science and mathematics. This was occurring just as the Gates and Broad foundations were becoming philanthropically involved in education at the national level, but also right as the federal government's and academia's desire for a homegrown STEM workforce aligned with the tech sector's demand for more human capital. Needless to say, even though the acronym was generated in 2001, STEM would develop

a mimetic quality over the next decade, transmitting the symptoms of human capital and, like a disease, metastasizing throughout the realm of education.

The attacks not only justified a series of incipient concerns; it ignited a sense of urgency to strengthen partnerships around those concerns. Through an examination of the actions and words of the members of the discourse coalition – the federal government, Gates, Broad, Jackson – it is possible to see how ideas about equity, accessibility, and human rights were included only insofar as they could be *used* to rationalize the ends of human capital and exploitation. And sadly, it is in the midst of these inter-related though not necessarily intentional interactions that one can get a sense for how K-12 public education got yanked into the fray, if not absorbed, by the multitude of public and private interests.

REFLECTION

I came through school and into adulthood in the midst of a major socio-technological revolution, where a strengthening interest in science and engineering human capital not only fueled a desire for data; it took an especially strong interest in the extraction of data from individuals belonging to historically marginalized populations. I see now that these interests were gaining momentum throughout my high school years, but because they had not been implemented with any real force before I graduated, they did not influence my schooling experience in any noticeable way. In the short span between my high school graduation and my re-entry into the institution as a teacher in 2002, much had changed. Worse yet, so much more was still looming out on the horizon. Many of these changes were ignited by the economic and national security concerns preceding and emanating from Y2K and the attacks on September 11, 2001. A strong fervor for human capital, and the dehumanizing effects therein, was just entering into the institutional psyche when President Bush signed NCLB. But with the solidification of the government-industry-academic partnership, the proliferation of neoliberal ideology, and the political leeway assumed by venture philanthropists, this problem would continue to exacerbate under the Obama presidency. In short, a conglomeration of dynamics brought on the educational data movement[1] in the public schools, and this was my point of entry and, hence, my point of disequilibrium over the inhumanity of education policy and the absurd number of confinements constructed around my students, my craft, and me.

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[1] Piety, *Assessing the Educational Data Movement*.

Once I was in graduate school, I had the resources to begin making sense of my teaching experiences and the factors that shaped them. But in this space, I soon learned that higher education was also running parallel to K-12 in what I now see as the systematic elimination of the most intriguing and often beautiful nuances that are inherent to teaching, learning, and understanding. In other words, just as K-12 had been thrown into the data movement, the educational research fields most responsible for exploring the complexities of human beings and their institutions – like the disciplines of qualitative research[2] and the social foundations of education[3] – were being squeezed by the move toward scientism.[4] Even though this was occurring in slightly different ways, I could not help but see that the space I left behind and the space to which I fled were each being consumed by an overwhelming fetish for quantified data.

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[2] Yvonna S. Lincoln and Gaile S. Cannella, "Dangerous Discourses: Methodological Conservatism and Governmental Regimes of Truth," *Qualitative Inquiry* 10, no. 1 (2004); Kenneth R. Howe, "A Critique of Experimentalism," *Qualitative Inquiry* 10, no. 1 (2004).

[3] Kenneth R. Howe, "The Question of Education Science: Experimentism and Experimentalism," *Educational Theory* 55, no. 3 (2005); Joe L. Kincheloe and Randall Hewitt, eds., *Regenerating the Philosophy of Education: What Happened to Soul?* (New York: Peter Lang Publishing, 2011); Aaron M. Kuntz and John Petrovic, "The Politics of Survival in Foundations of Education: Borderlands, Frames, and Strategies," *Educational Studies* 47 (2011).

[4] NCLB and the National Research Council's report titled *Scientific Research in Education* (SRE) are marked as being particularly influential to the educational research community. NCLB emphasized a desire to use the principles of scientific research as a means for determining "what works" in education, thus suggesting that there must be one best way to teach and learn. NCLB also opened avenues for federal funding to those interested in engaging such research models. SRE was released the same year as NCLB and endeavored to provide the federal government with guidance on how this type of scientific project could be implemented. The report claimed, "Recent enthusiasm for 'evidence-based' policy and practice in education—now codified in the federal law," via NCLB, "have brought a new sense of urgency to understanding the ways in which the basic tenets of science manifest in the study of teaching, learning, and schooling." See "Scientific Research in Education," *National Academies Press* (website), accessed January 9, 2018, http://www.nap.edu/catalog/10236/scientific-research-in-education. As a result, NCLB and SRE worked simultaneously to bolster the infusion of evidence-based research into education.

As my studies progressed, it became clearer to me that my personal experiences were intricately tied a global, neoliberal education reform movement as well.[5]

As I have worked my way through this study, I have been continually reminded that crises are social constructions. They are memes assembled in the mind and through the environment; they spread through interaction, pheromone, and discourse. But because the conditions that constitute a 'crisis' are going to vary for each individual, it is vital to ask during moments of upheaval, *Whose crisis is this, really?* That being said, Bell's conception of crisis convergence has been most instructive because it begs an even more important question: *Who has the power and the means by which to convince the rest of the people that their crisis is most pressing?*

I began this inquiry by exploring parallels between *Sputnik I* and *Sputnik II*. I identified rhetorical similarities that were related to notions of 'crisis,' 'democracy,' 'failing schools,' and the expanding belief that 'science will save us.' In addition to these, there are a few other threads that became apparent as I progressed in the writing of this narrative. First, there is the terrible contradiction that schools were being constructed as the problem at the same exact time that they were being positioned as 'the first line of defense.' Aspects of this confusing thread were certainly woven throughout both eras, but the notable difference between the two rests in the question of *who* was given the authority over this perceived problem. The reforms of *Sputnik I* were wrapped up in the logic that the desire for more scientific thinking and more scientific production necessitated intervention on the part of more scientific experts. As a result of this, scientists were dubbed the saviors most suited to take education into the scientific age. But with

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[5] Tröhler, "Change Management in the Governance;" Shahajahan, "Coloniality and a Global Testing Regime;" Meyer, "The OECD as Pivot;" Meyer et al., "Accountability: Antecedents, Power, and Processes."

Sputnik II, the venture philanthropists were cast as the champions fit to deliver schools unto the information age. This new class of philanthropist was, of course, comprised of businessmen who had accumulated the bulk of their wealth in the successive booms and busts of the technology, telecoms, and housing industries. Equally important, though, is the fact that they also happened to emerge out of the proliferating rationale of neoliberalism. Because of the conjunction between these two, it was easily assumed that the individuals best suited for solving the problem of *Sputnik II* were those who had also managed to 'master' the 'free' market.

A second thread is wound up in the aims and purposes driving the reforms of these two eras. As I stated earlier in the study, human capital has long been a varying, though chronic, component in U.S. education policy. The same could certainly be said for national security as well. And while many critiques can surely be lobbed at the scientists who took part in the reforms of *Sputnik I*, it is worth pointing out that in at least some capacity, they were driving at the idea that science should be learned for the sake of science. This stands in significant contrast to the predominant aims expressed in *Sputnik II*, especially after considering the language used in *Land of Plenty* and in the rhetoric adopted by Jackson. From 2000 forward, the argument was increasingly being broadcast that science should be learned for the sake of business. Such a shift not only corrupts the aims of scientific inquiry with concerns about profit; it simultaneously compromises the discipline's potential to lead toward discovery and growth in human understanding. As if this is not insidious enough, the argument for equity and the inclusion of women, minorities, and disabled people effectively disguised the exploitive properties inherent to the push for human capital, thereby giving it the illusion that it was somehow a 'moral quest.'

The third thread relates to the collaboration of the government-industry-academic partnership. Cooperative federalism was partly responsible for the facilitation of the reforms of

Sputnik I. This is where the federal government pursues its aims while maintaining some faith in the ability of the states to do the same. An especially troubling characteristic about *Sputnik II* is that this dynamic seems to have changed significantly, resulting in a scenario where the government pursues its aims at the same time that it grants enormous faith in corporatists to solve the problems of the public sector (simply consider the components of public education that have been splintered off in recent years only to be sold to the highest bidder). While I am confident that scholars have written on the problems associated with the demise of cooperative federalism, I have yet to read their works. This is an area that I will likely pursue in future studies. For the time being, though, it is hard for me to see this trend in *Sputnik II* as anything other than *cooperative corporatism*, or perhaps *corporate federalism*.

Finally, there is the issue of venture philanthropy itself. In terms of etymology, the word philanthropy means "love of mankind." Venture, on the other hand, has numerous meanings, even though they are all very similar. Those definitions are as follows:

> 1. Fortune, luck; chance.
> 2. Danger, jeopardy, hazard, or peril; the chance or risk of incurring harm or loss.
> 3. An act or occasion of trying one's chance or fortune; a course or proceeding the outcome of which is uncertain, but which is attended by the risk of danger or loss; an enterprise, operation, or undertaking of a hazardous or risky nature.
> 4. An enterprise of a business nature in which there is considerable risk of loss as well as chance of gain; a commercial speculation.[6]

If one considers the definitions of venture in isolation, she might believe that the venture philanthropist puts himself in seriously dire situations where he has so much to lose. And to be fair, the amount of capital put forth is indeed large – in the millions and billions, depending on the individual. But this begs the question: if one can afford to put millions and even billions of

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[6] *Oxford English Dictionary*, 3rd ed. Oxford: Oxford University Press, 2006. Also available at http://www.oed.com/.

dollars in jeopardy, does that individual *really* have anything to lose? I am inclined to say no; there can be minimal risk involved when one who has such a fortune feels enabled to 'play' with such substantial amounts of money.

The severe injustice about this type of social intervention, however, rests in the fact that the risk is not the philanthropist's at all. Instead, it belongs to the ever-growing majority in our society: those who have so little, that just one loss can yield perilous and even lifelong consequences for them and possibly their families. As such, the philanthropists' ventures actually *create* risk, with real consequences, for the real people whose lives are touched by the institutions that are being toyed with. In any other social space, this type of behavior would simply be called gambling. If it was severe enough, it would be pathologized, interventions would be organized, and treatment would be prescribed. But again, just as the discourse of inclusion and equity has disguised the aims of human capital, the addition of the 'philanthropic' descriptor has only permitted a destructive habit to masquerade as benevolent and humane. In the end, venture philanthropy can never be anything more than the love of making oneself feel good about using one's fortune to take risks with the lives of others.

When it comes to inquiry and the approach to problem solving in general, Dewey points out that, "*The problem fixes the end of thought* and *the end controls the process of thinking*."[7] This occurs because the direction of our actions is inevitably shaped by the language and metaphors we draw upon in our efforts to articulate the problem at hand as well as when we attempt to define the ends we desire. In this regard, Lakoff and Johnson explain, our linguistic conceptions tend to manifest as self-fulfilling prophecies. This is the case regardless of whether or not those ends are conscious to the speaker or writer. Thus, no matter how one might attempt

[7] Dewey, *How We Think*, 12 (original emphasis).

to dress up the aims of human capital – even if it they wrap it in illusions of equity and inclusion – exploitation *will* become a driving force and dehumanization *will* be the end result. This is especially so, I believe, so long as the structural confinements related to racism, sexism, ableism, and classism remain unaddressed in industry and schooling alike. In conclusion, all I can say is this: the language we choose really does matter, and I believe it is most important to remember this when talking about the lives and relations of human beings. At the same time that language can reveal an underlying logic and the ethic behind the words, it also possesses a subtle yet astounding power to steer the course that we, as a society, take.

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